FY2024

For the Earth, For the Next Generation

SATREPS

Science and Technology Research Partnership for Sustainable Development Program

SATREPS
https://www.jst.go.jp/global/english/

@Friends of SATREPS
@SATREPS
global@jst.go.jp

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

VEGETABLE OIL INK

2024.10

JST AMED JICA

Contents

Greetings

Japan Science and Technology Agency (JST)

President
HASHIMOTO Kazuhito

Japan Agency for Medical Research and Development (AMED)

President
MISHIMA Yoshinao

Japan International Cooperation Agency (JICA)

President
TANAKA Akihiko

SATREPS is a joint research program between Japan and developing countries that aims to find solutions to issues of a global scale, such as global warming, bio-resources, natural disasters, and infectious diseases. It is part of Japan's "science and technology diplomacy" collaboratively pursued by the science and technology sector and the diplomatic sector to promote mutual development. Global issues become more and more complex every year, and they tend to hit developing countries particularly hard. They have gone beyond the stage where they can be solved by any single country alone. Their solutions will require international innovations and research outcomes in science and technology to be fed back into the community, as well as the development of human resources and upgrading of research capabilities.

In September 2015, the United Nations Sustainable Development Summit was held at U.N. headquarters. This Summit culminated in the adoption of the Sustainable Development Goals (SDGs), a collection of goals for the international community to work together to achieve by 2030. The SDGs are an important guideline for the elimination of poverty and the realization of sustainable growth by 2030. They emphasize the importance of global partnerships among all parties working to achieve them. The intention of SATREPS is to contribute to the international community as it aims to achieve sustainable development through the SDGs, by having researchers from Japan and developing countries work together on issues, creating new knowledge and technologies based on local needs, which can be put to use in the actual community.

JST, AMED and JICA will continue to engage in global issues together with developing countries and, by building strong bonds of trust, pursue the creation of new values in science and technology.

~ Japan Science and Technology Agency and Sustainable Development Goals ~

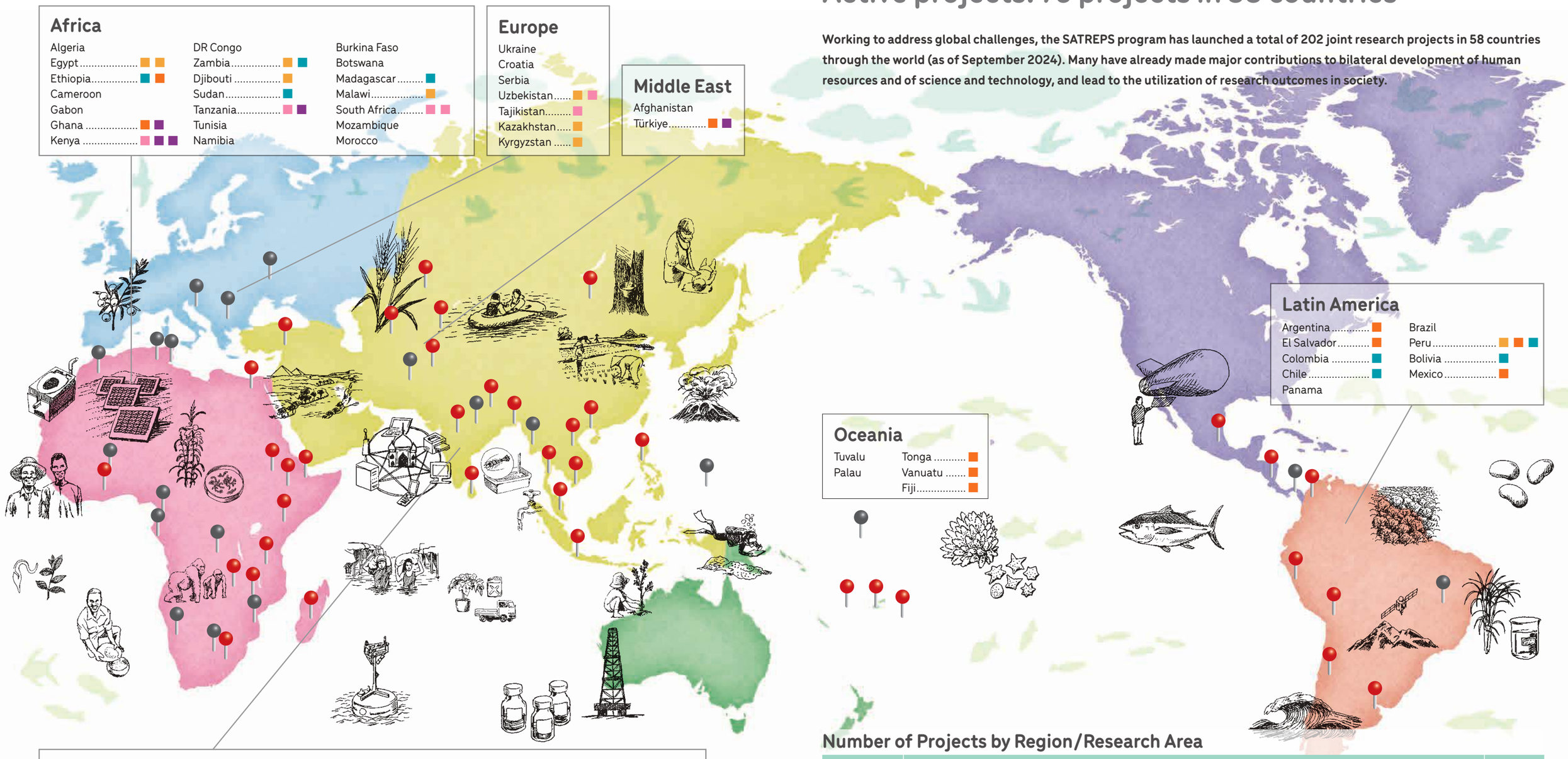
The 2030 Agenda for Sustainable Development, consisting of 17 Sustainable Development Goals (SDGs) and 169 targets, was unanimously adopted by the United Nations General Assembly on September 2015. The SDGs encompass challenges that affect all of humanity and our planet. For Japan, the resolution of these issues is closely linked to the realization of Society 5.0 and the Fourth Industrial Revolution described in the Fifth Science and Technology Basic Plan, which is one of Japan's growth strategies. They are also the basic principles of Japan's contribution to developing nations and the international community at large.

In June 2016 the United Nations held for the first time a forum focused on how science, technology and innovation (STI) can help achieve the SDGs. There are strong expectations that STI can provide the scientific grounding for tackling various challenges concerning sustainability that humanity faces today and for making better policy decisions.

To enable STI to help realize the SDGs, it is vital to ensure collaboration among all the diverse stakeholders, such as government agencies, universities, research centers, non-government organizations, and business enterprises. The Japan Science and Technology Agency will take advantage of all its many functions—including think tank, research and development, collaboration with industry and academia, people development, and science communication—to contribute actively to SDG initiatives in Japan.

Active projects: 76 projects in 38 countries

Working to address global challenges, the SATREPS program has launched a total of 202 joint research projects in 58 countries through the world (as of September 2024). Many have already made major contributions to bilateral development of human resources and of science and technology, and lead to the utilization of research outcomes in society.



Africa

Algeria	DR Congo	Burkina Faso
Egypt	Zambia	Botswana
Ethiopia	Djibouti	Madagascar
Cameroon	Sudan	Malawi
Gabon	Tanzania	South Africa
Ghana	Tunisia	Mozambique
Kenya	Namibia	Morocco

Europe

Ukraine
Croatia
Serbia
Uzbekistan
Tajikistan
Kazakhstan
Kyrgyzstan

Middle East

Afghanistan
Türkiye

Latin America

Argentina	Brazil
El Salvador	Peru
Colombia	Bolivia
Chile	Mexico
Panama	

Oceania

Tuvalu	Tonga
Palau	Vanuatu
	Fiji

Asia

India	Thailand	Bhutan	Mongolia
Indonesia	Nepal	Vietnam	Laos
Cambodia	Bangladesh	Malaysia	
Sri Lanka	Philippines	Myanmar	

: Countries/regions where the project is being implemented

: Countries/regions where projects have been implemented (in the past)

Distribution of research areas of the projects: Global-scale Environmental Issues, Carbon Neutrality, Bioresources, Disaster Prevention and Mitigation, Infectious Diseases Control

* SATREPS projects in the field of Infectious Diseases Control have been transferred to AMED – the Japan Agency for Medical Research and Development. (On April 1, 2015.)

Number of Projects by Region/Research Area

Region	Ongoing Projects						Projects*
	Global–scale Environmental Issues	Carbon Neutrality	Bioresources	Disaster Prevention and Mitigation	Infectious Diseases Control	Total	
Asia	10	9	10	6	6	41	108
Middle East	-	-	-	1	1	2	4
Europe	3	2	-	-	-	5	8
Africa	5	4	4	2	4	19	51
Latin America	1	-	4	3	-	8	28
Oceania	-	-	-	1	-	1	3
Total	19	15	18	13	11	76	202

* Total number of projects carried out under SATREPS since its inception in 2008
* Ongoing projects involving more than one partner country are included in the count for each region involved, but only counted as a single project in the totals. Consequently, the totals given for the number of ongoing projects may be less than the sums of the number of projects in individual regions/research areas in the table.

–SATREPS and Science & Technology Diplomacy–

Science & Technology becomes a resource for diplomacy

KOTANI Motoko

SATREPS Program Director

Executive Vice President, Tohoku University
Specialties: Mathematics, Geometry, Discrete Geometric Analysis

Today, the Sustainable Development Goals (SDGs)s are a focus of worldwide attention, requiring the urgent resolution of challenges including climate change, food security, natural disaster mitigation, and infectious diseases, as well as international collaboration toward their solutions. The SATREPS program contributes to the SDGs by advancing and supporting joint research between Japan and developing countries with the aim of tackling these global challenges. The most important feature of this program, which is also part of Japan's official development assistance (ODA), is that it not only aims at making significant scientific findings, but also creates a clear path for the utilization of these findings in society, both in partner countries and elsewhere, on an ongoing basis after projects are complete. SATREPS is a shining example of Japan's hands-on science and technology diplomacy and a valuable component of our foreign policy.

Why "Science & Technology Diplomacy" ?

In 2008, when the SATREPS program was launched, people from the Cabinet Office, the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), the Ministry of Foreign Affairs, and other agencies put together a policy for "Science and Technology Diplomacy" that could utilize a broad range of Japan's science and technology as a resource for diplomacy. As you can see from the large number of Nobel Prizes awarded to Japanese researchers in comparison with other Asian countries, Japan is very strong in science and technology, but our framework for actively contributing to science and technology in developing countries still has room for further improvement. In terms of bilateral agreements for scientific and technological collaboration, Japan has signed fewer accords with developing countries than have other advanced nations. I am convinced of the importance of Japan's greatly expanding this science and technology diplomacy as a policy for creating good relationships with developing countries, by using science and technology to meet their expectations.

What role does SATREPS play in science & technology diplomacy?

SATREPS is a program that supports international joint research between Japan and developing countries by adding a government science and technology budget allocation to the existing overseas development assistance (ODA) budget. Japanese researchers and those from developing countries work as equals in joint studies to tackle global challenges for which international collaboration is required. The SATREPS program aims not only to help resolve such global issues, but also to train young researchers who are capable of working internationally, generate innovation through the acquisition of new knowledge and skills, and ensure that the outcomes of this research can make a lasting contribution to society in the partner country.

Top: Botswana project (Low Carbon/Energy, FY2011)
Bottom: Bolivia project (Bioresources, FY2019)

Oussouby SACKO

Member of the program committee

The SATREPS program of partnerships in projects needed to address global challenges

Our planet faces a number of issues that affect its future. In addition to population concerns, food crises, life-threatening risks, infectious diseases, and education issues in Africa, Asia, and other areas of the world. We face natural disasters and, environmental and energy issues caused by human activity that have a global impact. Tackling these challenges requires strong collaborative partnerships between research institutions across the world. The SATREPS program is a Japan-led initiative in which researchers from Japan and partner countries collaborate directly with each other on research and development, increasing international technological and research capacities. Moreover, SATREPS projects enable the next generation of researchers to learn from each other and grow together as they work to develop the approaches and innovations required for solving global issues. There is an African proverb that says, "If you want to go fast, go alone; if you want to go far, go together." Pooling our strengths through the SATREPS program gives us a platform through which we can work together to tackle the issues facing the "commons" that is our planet.

SATREPS : Science and Technology Research Partnership for Sustainable Development

SATREPS is a Japanese government program that promotes international joint research. The program is structured as a collaboration Among the Japan Science and Technology Agency (JST) and the Japan Agency for Medical Research and Development (AMED), which provides competitive research funds for science and technology projects, and the Japan International Cooperation Agency (JICA), which provides development assistance (ODA). Based on the needs of developing countries, the program aims to address global issues*1 and lead to research outcomes of practical benefit to both local and global society*2.

*1 Global issues: Issues that affect more than a single country or region, and cannot be resolved without international collaboration. Examples include energy/environment issues, disaster risk reduction, infectious disease control, and food security.
*2 Utilization of research outcomes: The research projects should lead to future social and economic benefits, achieved by using newly obtained knowledge and technology to enhance government services or to develop products that can be deployed in the market.

International Cooperation to Address Global Issues, Advance Science, Develop Capacity

1. International Cooperation
Enhancing international cooperation in science and technology between Japan and developing countries

2. Addressing Global Issues and Advancing Science
Acquiring new knowledge and technology that lead to the resolution of global issues and the advance of science and technology, and through this process, creating innovations

3. Capacity Development
Boosting self-reliant research and development capacity in developing countries through international joint research, constructing sustainable research systems that can contribute to resolving issues, coordinating networking between researchers, and training future human resources in developing countries and in Japan

Utilize Research Outcomes

SATREPS joins and coordinates functions, activities, and capabilities that were once separate, using scientific research potential as a mediator for developmental diplomacy

Science and Technology Promoting science and technology, encouraging innovation	×	International Cooperation ODA, development assistance
Meeting Global Needs Resolving global issues and contributing to the science and technology community	×	Meeting Local Needs Capacity development to address issues emerging as local needs in developing countries
Japan's Capabilities • World-leading technology, proven research capacity • Soft power	×	Developing Countries' Capabilities • Direct experience, knowledge, and data needed for research on global issues • Potential to contribute to the global economy through new markets and industries

Research Fields

SATREPS projects typically share the following characteristics:

- To envisage their outcomes being applied to the benefit of broader society as well as in the developing country
- To cover topics in developing countries for which research and development to resolve an issue is particularly necessary, and for which capacity building of researchers is required
- To contribute to the resolution of global issues and scientific and technological progress

* A project is not eligible if it consists merely of transfer of Japanese technology without entailing any joint research, or solely of surveys and other simple operations that do not make any contribution to the advancement of science and technology, or if it produces outcomes that can only be of benefit to one particular country.

Environment/Energy

Global-scale Environmental Issues

This research area aims to resolve environmental and energy issues occurring on a global scale triggered by deterioration of ecosystems and biodiversity, increased pollution, concentration of urban population, increased production and consumption activities, and climate change.

Examples of eligible research projects

- Research on the observation, prediction, impact assessment, and adaptation to climate change
- Research that contributes to assessing and predicting the abundance of water resources and improving safe, sustainable water resource management, utilization, and treatment (including proposals to strengthen the capacity of water utilities and improve service quality, and research concerning the reconciliation of conflicting interests pertaining to water resources and how to build consensus)
- Research on establishing a material-cycle society (including collection and reuse of waste and useful resources)
- Research on the conservation and restoration of ecosystems and biodiversity on land and in the sea
- Research on urban environmental conservation (including greening) for the purpose of smart city construction, mitigation of environmental degradation as a result of urbanization, land use that contributes to climate change mitigation, and the construction and operation of urban plans
- Research on reconstruction and restoration of environments damaged by large-scale disasters(including the preservation of cultural heritage)
- Research on sustainable use of natural resources
- Research on chemical pollution, its risk reduction and remediation

Research Supervisor
YAHARA Tetsukazu

Promote socially implemented science to help solve environmental problems

Global environmental issues such as climate change and biodiversity loss remain serious concerns. SATREPS emphasizes the implementation of research results to provide solutions to these issues through continuous monitoring, assessment, and the development of systems for the application of new technologies. We promote socially-implemented research in collaboration not only with researchers in partner countries, but also with government agencies, business sectors, and citizen organizations.

Research Supervisor
TAKAMURA Yukari

Research Supervisor
YAMAGUCHI Yasushi

Research Supervisor
NAKAIWA Masaru

Co-create a carbon-neutral future

Global warming and climate change are already becoming real-life threats worldwide. The SATREPS program is facing up to this difficulty by funding the co-creation of advanced technologies by Japan and emerging nations and promoting their social implementation. The projects currently underway around the world aim to utilize the characteristics of the countries and regions concerned in order to resolve global issues while combining carbon neutrality with economic development.

Research Supervisor
SHIKAZONO Naoki

Research Supervisor
KAMIMOTO Masayuki

Carbon Neutrality

This research area consists of energy conservation, promotion of the utilization of renewable energies, and research and development of smart society; research outcomes can potentially be utilized to cut greenhouse gas emissions and realize a carbon neutrality.

Examples of eligible research projects

- Studies of the introduction and validation of social systems contributing to the realization of lowcarbon societies and green transformation (GX) in developing countries, such as carbon pricing and energy transition
- Research on renewable energy, such as sunlight and solar heat, wind power, ocean energy,geothermal energy, and biomass.
- Research promoting the use of renewable energy through the generation and utilization of carbon recycling, green hydrogen, blue hydrogen, ammonia, methane and other substances for the purpose of contributing to decarbonization
- Research on energy conservation in industrial processes and elsewhere
- Research utilizing digital technologies to create sustainable, resource-recycling cities and communities in forms such as smart cities, smart communities, smart agriculture, transport networks, and next-generation infrastructure
- Component technologies related to carbon capture, usage, and storage (CCUS) and negative emissions
- Research contributing to reducing greenhouse gas emissions from non-energy sources, such as CH_4, N_2O, and HFCs
- Research contributing to sustainable aviation fuel (SAF), synthetic fuel for use in transportation machinery, and reducing carbon gas emissions in the transport sector field

* Each of the Research Supervisors has overall responsibility for research in a specific research area. He or she joins external experts on the screening committee, a committee that decides on candidates for SATREPS projects (including candidates for conditional selection). After projects have been approved, the Research Supervisors handles the research management for his or her research area by coordinating the research plans of the individual research projects, exchanging ideas and views with principal investigators, giving advice concerning the research, conducting project evaluations, and by other means as necessary.

Bioresources

Bioresources provide us with foods, medicines, animal feeds, textiles, energy, and much more, but sustainable production is threatened recently by problems such as desertification, salinization of agricultural land, pests, unstable temperatures, and unreliable rainfall. This research area concentrates on collaborative research that can point the way to sustainable means of production and utilization.

Examples of eligible research projects

- Research and development contributing to the sustainable production and utilization of bioresources (including resource management, breeding, cultivation, propagation and culturing technology for plant, animal, marine and microbial resources, production/distribution systems)
- Research contributing to the evaluation and effective utilization of bioresources, including unutilized resources (including using biodiversity for discovery, identification, and production of valuable substances derived from biological resources but excluding human drug development)
- Research on improving the environmental settings for bioresources (including the prevention of damage to agricultural crops and livestock, and the creation and improvement of green infrastructure)
- Research contributing to mitigating the effects of climate change on the production of biological resources

Bioresources contributing to the SDGs

Research Supervisor
IRIE Kenji

For the conservation and effective utilization of global bioresources that are essential for our future, it is important to strengthen and expand development cooperation, particularly with regard to human resources. We call for research and development on production, utilization, and management of bioresources crucial to SDGs initiatives through international collaborative research, taking into account the distribution of benefits to countries of origin.

Research Supervisor
MASUDA Misa

Research Supervisor
NAGAMINE Tsukasa

Research Supervisor
IGUCHI Masato

Use disaster prevention science and technology to achieve the SDGs

Natural disasters have many causes, but in recent years climate change and the complexification of society have made disaster prevention and mitigation measures more difficult. Achieving the SDGs is not an easy task, but science and technology are an important key to resolving these issues. Projects in the SATREPS Disaster Prevention and Mitigation research area are conducting research and development into the science and technology required for this unceasing effort and implementing the results in society in collaboration with developing countries.

Research Supervisor
ASAEDA Takashi

Research Supervisor
TAMURA Keiko

Disaster Prevention and Mitigation

To realize safe, resilient and sustainable cities and society, this research area will engage in comprehensive and systematic research, within a global framework on prevention and mitigation of natural disasters as well as increasingly serious large-scale disasters caused by urbanization, leveraging the experience and knowledge accumulated in Japan.

Examples of eligible research projects

- Research on clarifying the mechanisms and prediction of disasters associated with natural phenomena such as earthquakes, tsunami, volcanic eruptions, storms, storm surges, inundation, drought, heat waves, and landslides, together with prevention and mitigation measures to prevent such disaster risks and damage from becoming more large-scale, as well as measures for restoration and reconstruction, and research on effectiveness of investment in disaster risk reduction
- Research on understanding the relationships between climate change and large-scale natural disasters and measures for adapting to damage thought to be caused by climate change
- Research on identifying the mechanisms whereby large-scale natural disasters that are exacerbated by urbanization (such as urban flooding caused by localized heavy rainfall, sea level rise, or ground subsidence; earthquake damage and associated fire damage in regions with vulnerable buildings and urban fabrics; and damage to lifelines, transport networks, and other social infrastructure) become widespread, and on damage mitigation strategies.
- Research contributing to the prevention and mitigation of regional and urban disasters through the prompt collection and effective utilization of disaster information (including the development of technologies to utilize disaster observation satellites, remote sensing, UAV, GIS, GNSS, ICT, IoT, Big Data, AI, and other digital technologies)
- Research on building national resilience to create and maintain disaster-resistant, resilient communities, land use planning and urban design, and improvements to social infrastructure and its sustainable operation
- Research for the prevention of, mitigation of, and recovery from disasters that combines approaches across the natural sciences, humanities, and social sciences to help establish precise and practical disaster forecasting and enable effective recovery
- Research on disaster countermeasures prompted by the occurrence of the COVID-19 pandemic and improving overall social resilience

Infectious Diseases Control

People and goods now cross national borders so frequently that the threats of HIV/AIDS, malaria, Dengue fever, tuberculosis, highly pathogenic influenza, Ebola hemorrhagic fever, COVID-19 and other emerging and reemerging infectious diseases are not confined to developing countries. Japan is keen to boost international cooperation regarding infectious diseases that have the potential to enter Japan, in order to accumulate knowledge in advance of any actual outbreak.

Examples of eligible research projects

- Zoonosis such as avian influenza, rabies and others
- Epidemiology, diagnostics, vaccines and therapeutics for the detection and control of emerging and re-emerging infectious diseases including HIV/AIDS, Ebola hemorrhagic fever, protozoa and parasites like malaria, Dengue fever, tuberculosis and bacteria resistant to antibiotics like carbapenem and colistin

SATREPS projects in the field of Infectious Diseases Control have been transferred to AMED – the Japan Agency for Medical Research and Development. (The transfer took place on April 1, 2015. Projects that finished before that date were not transferred.)

Build capacity to counter infectious diseases around the world!

Program Supervisor
WATANABE Haruo

Unless prompt and effective countermeasures are taken, infectious diseases can flash around the world, as demonstrated by outbreaks of SARS, novel flu virus infection (H1N1pdm), Ebola hemorrhagic fever, and COVID-19. Therefore, it is important to strengthen each country's ability to quickly recognize signs of an outbreak, and to build each country's capacity for taking appropriate measures, such as tracking of outbreak trends, diagnosis, treatment, and prevention. SATREPS helps the world cope with infectious diseases by using science and technology cultivated by Japanese universities and research institutes in research collaborations that benefit all countries around the world.

Program Officer
KITA Kiyoshi

Program Officer
YAMADA Akio

Program Officer
MORIKANE Keita

Program Officer
AIGA Hirotsugu

Program Officer
TOKUNAGA Katsushi

The Cooperation among JST, AMED and JICA

Competitive Research Funds/ODA Technical Cooperation Projects

Overall research and development management of the international joint research is handled jointly by JST and AMED, both of which have expertise in funding research projects at research institutions in Japan, and JICA, which has expertise in technical cooperation in developing countries.

It is expected that the promotion of international joint research activities under this program will enable Japanese research institutions to conduct research more effectively in fields and targets where it is advantageous to implement the research in developing countries. Meanwhile, it is hoped that for research institutions in the developing countries (primarily universities and research institutions focusing on activities for public benefit, but excluding those related to military affairs), the establishment of research center facilities and the development of human resources through joint research activities will make it possible to develop self-reliant, sustainable research systems.

JST and AMED will provide financial support to the Japanese research institutions for the project activities in Japan and JICA will provide financial support to the research institutions in the ODA recipient countries within the framework of technical cooperation projects*.

* As JICA supports the partner country with ODA under the technical cooperation framework, the country is required to depend on its own efforts. Consequently, the local institution's costs incurred for the project (labor cost, office rent, consumables by local researchers, operation and maintenance of equipment provided, domestic transportation fees for local researchers, conference attendance allowances, and other miscellaneous costs) should in principle be covered by its own country.

Point

■ **Research fields**
Environment/Energy, Bioresources, Disaster Prevention and Mitigation, Infectious Diseases Control
• SATREPS projects in the field of Infectious Diseases Control have been transferred to – the Japan Agency for Medical Research and Development (AMED). (The transfer took place on April 1, 2015. Projects that finished before that date were not transferred.)

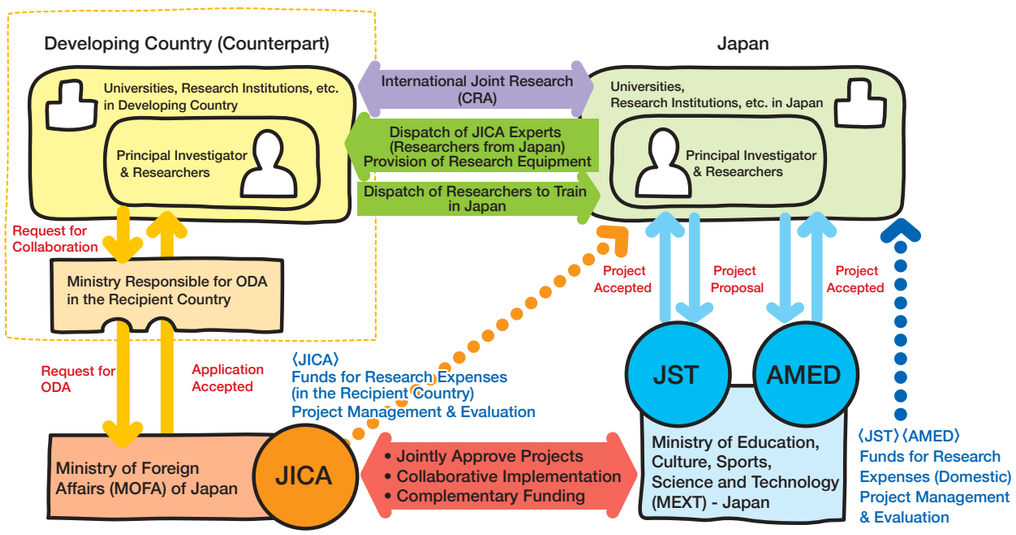
■ **Duration of research**
3-5 years

■ **Countries covered by SATREPS**
ODA 'Technical Cooperation Projects' receiving countries

■ **Project budget**
Approx. 100 million yen/year for one project
(JST: 35 million yen/AMED: 32 million yen
(JICA: 60 million yen)

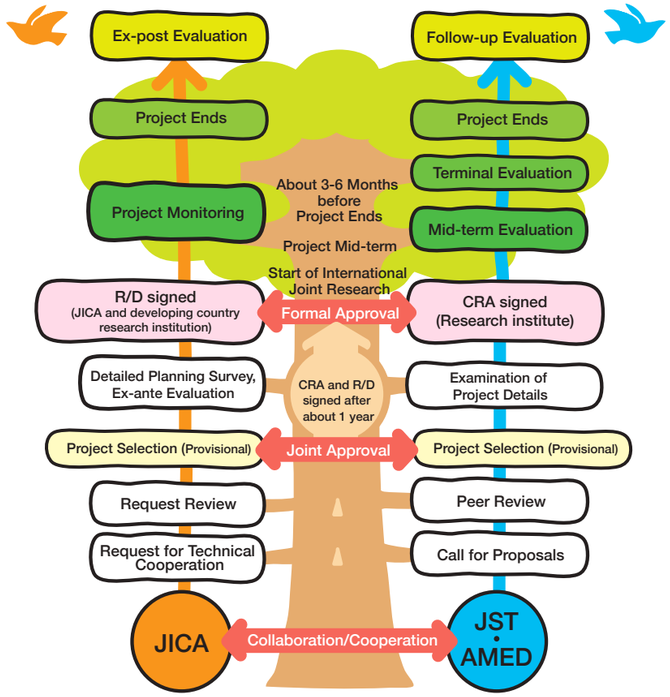
Ref. Application Guideline
https://www.jst.go.jp/global/english/koubo.html

SATREPS Project Scheme



SATREPS Project Step

Project Progress



Applications of Research Proposals and ODA Technical Cooperation

JST and AMED invite researchers at universities and research institutes in Japan to submit research proposals in specific research areas. While JST and AMED select proposals, requests are received from developing countries for ODA technical cooperation for the international joint research, and Ministry of Foreign Affairs(MOFA) reviews these requests in conjunction with JICA in Japan. Therefore, it is essential for the Principal Investigator(PI) in Japan to coordinate with researchers in the ODA recipient country in order to confirm the details of the joint research when making an application to JST and AMED. Official requests for ODA technical cooperation must be submitted by the research institution in the recipient country to MOFA by the specified deadline, via the ministry or agency in the recipient country responsible for ODA and the local Japanese embassy.

Selection of SATREPS Projects (Provisional)

The selection process for research projects at JST / AMED and the screening process for ODA technical cooperation at MOFA / JICA are interlinked. The applications submitted to JST/AMED by the Japanese PI and to MOFA (local Japanese embassy) for ODA technical cooperation must be provisionally selected in order for the research project to be supported under the program.

Preparation for an International Joint Research Project

To implement the international joint research, a Record of Discussions (R/D) must be signed by the research counterpart(s) in the developing country and JICA to confirm that they agree on the details of the ODA technical cooperation. In addition, a Memorandum of Understanding (MOU) or similar document about the joint research must also be signed between the research institutions (parties concerned) in Japan and the ODA recipient country.

Evaluation by JST, AMED and JICA

Projects are reviewed by JST, AMED, and JICA, acting in collaboration. JST/AMED evaluate the whole of the international joint research project, both in Japan and in the developing country, from the perspective of the project outcome benefiting society by contributing to the resolution of global issues, and from the perspective of the project advancing science and technology. JICA evaluates the joint activities of the PI and other researchers including the counterpart research institutions' researchers from an ODA project perspective, confirming that the project has contributed to developing human resources and enhancing capacity in the developing country, and has contributed to the developing country's needs.

* Provisionally selected: At this stage, discussion of details with the counterpart research institution or circumstances in the developing country may still result in small modifications to the project name or description, a shorter project term, or even termination of a newly-selected research project. For that reason, the project is described as provisionally selected.

Environment and Energy (Global-scale Environmental Issues)

Solve the lead (Pb) contamination problem through a multi-disciplinary approach!

Principal Investigator
Prof. ISHIZUKA Mayumi
Japan
Graduate School of Veterinary Medicine, Hokkaido University

Principal Investigator
Prof. Luke E Mumba
Republic of Zambia
Vice Chancellor, The University of Zambia

Advantage of Joint Research

In addition to the research benefit of being able to elucidate the toxicological impact etc. of types of environmental pollution not seen in Japan today, this project provides the opportunity to train students and young researchers, and has the potential to produce outcomes that enhance Japan's presence in Africa by contributing to the alleviation of environmental pollution.

In addition to the project's potential to remediate the environment and restore human and animal health by working through cross-disciplinary research activities including the elucidation of lead contamination mechanisms and risks, the development of environmental remediation techniques, the implementation of educational activities to prevent future contamination, and the visualization of economic losses, etc., it is training human resources through the joint research process.

Research Field

Location of Zambia

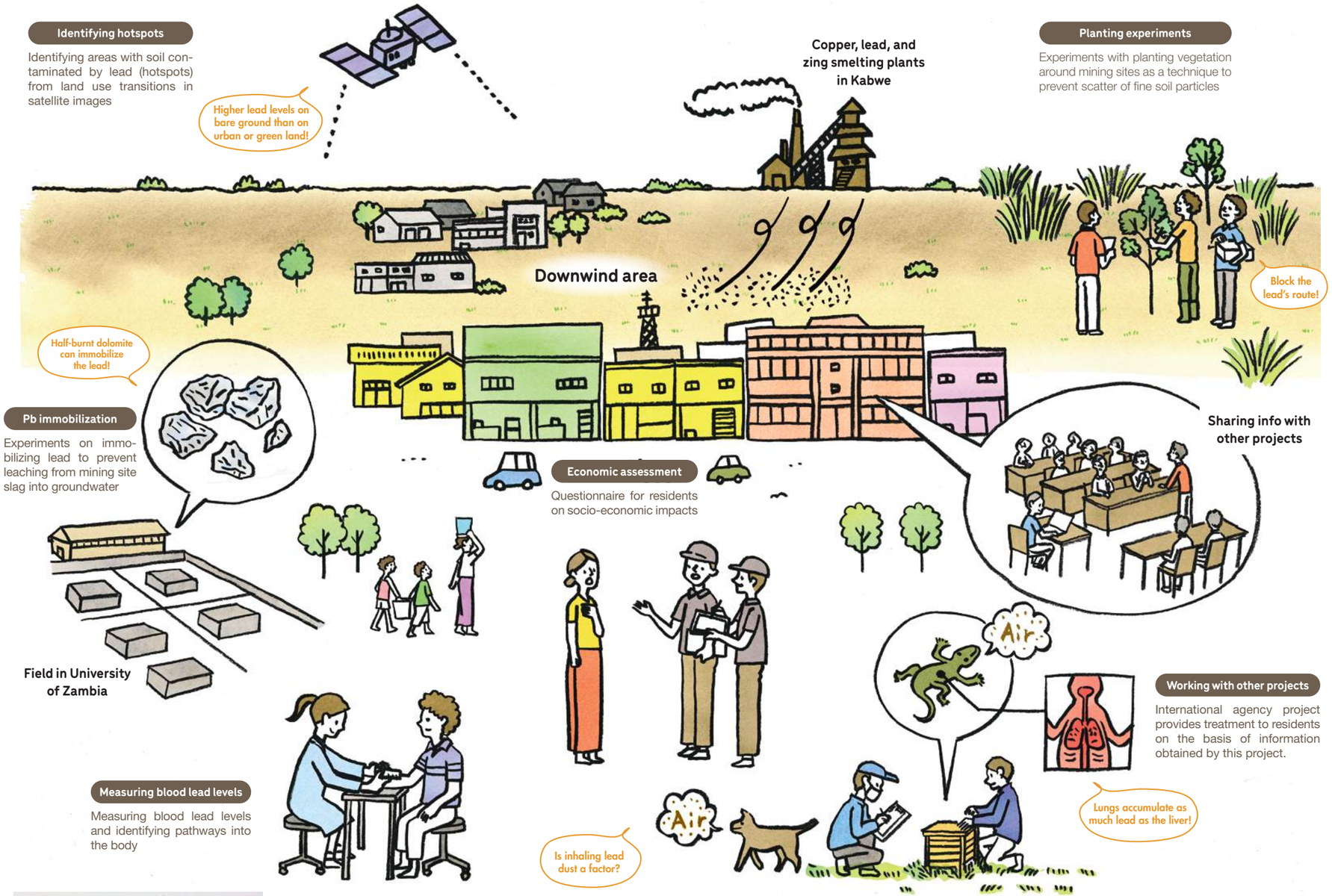
Mining is the driver of Zambia's economic growth, but it is increasing the severity of hazardous metal contamination in humans and in livestock, and of environmental contamination triggered by the development of mining. There are strong hopes that anti-contamination measures will provide a solution, but the extent of contamination had not been elucidated, and in this situation, government policies to combat contamination remain undecided.


Blood samples from livestock


Residents surveyed regarding family composition and economic status

- Adoption Fiscal Year: FY 2015
- Country: Republic of Zambia
- Research Institution in Zambia: University of Zambia
- Research Institution in Japan: Hokkaido University
- Research Period: 5 years
- Reference data: https://www.jst.go.jp/global/english/kadai/h2701_zambia.html

Visualization of Impact and Geo-Ecological of Chronic/Latent Chemical Hazard Remediation




Mining factory in Kabwe mine district


Groundwater survey on site

Involvement of experts in multiple fields helps resolve pollution issues

Water and soil pollution, along with high levels of lead contamination in human and animal bodies had been found in the area around the Kabwe mine in the Zambian Central Province. However, the contamination mechanism had not been identified, and the specific effects on human health and the socioeconomic impact were still unclear. This project brought together experts in multiple fields to provide a composite approach by 1) explicating contamination mechanisms, 2) assessing health risk and economic risk, and 3) developing environmental remediation techniques, in order to produce real solutions to the issues of pollution and the serious risk to health.

Project data and expertise tied into practical support

During the project period, the project exchanged memoranda with international agencies working on environmental remediation and medical support. As a result, research expertise and statistical data on lead contamination obtained by the project has become part of the scientific basis behind the medical and environmental remediation activities. Furthermore, assessments of health and economic impact, along with effective environmental remediation technologies etc. obtained by the project will eventually be submitted to the Zambian government in the form of proposals for countermeasures. They will raise awareness of environmental pollution in Africa, leading potentially to solutions for the issues.

Background to SATREPS research proposal

Hokkaido University and the University of Zambia have a relationship that dates back some 37 years (as of 2020). When Professor Ishizuka visited the University of Zambia in 2007, she was invited, as a specialist in toxicology, to research the lead contamination in Zambia. Since then, she has been involved in joint research for over 10 years. The research setup and network steadily took form over the years, including the appointment to the University of Zambia teaching staff of a Zambian veterinarian whose doctorate was awarded by Hokkaido University. Hearing about SATREPS from engineering researchers engaged in pollution issues, it was decided to submit a proposal to SATREPS to take the joint research a step forward.

Kabwe mine district

Preparing for formal approval of the project

A large number of Zambian government agencies are involved in the project, so it took some time to reach agreement and complete the procedures. From past experience, talking directly to the people at the top of the organization is an effective way of moving smoothly through this stage, so we produced and shared clear explanations of the outcomes expected from the project, and the significance of participation by a Japanese institute. This approach facilitated agreement on the Zambia side.

Kick off meeting (The first JCC)

Young researcher's comments

I have been stationed long-term in Zambia, working on field research and liaison with government agencies, and handling technical transfer of research expertise. There are times when a sense of values differing from what I would expect in Japan adds difficulty to the tasks, but listening to the thoughts and ideas of the joint researchers and making a specific point of respecting the local culture has enabled us to build a good relationship for cooperation.

Press and publicity activities

In July 2016 and October–November 2018, the Japanese media carried a substantial number of reports outlining the project and describing the contamination issue in Kabwe. In Zambia, major newspapers carried articles in December 2018, and the project was given news coverage on the national broadcasting network in August 2019.

In addition to informing the press, we are constantly working to communicate what can be done about lead contamination. Wearing masks and washing hands is an effective measure against contamination by lead dust as well as against infection, so we created an educational video about masks and hand-washing. With help from the Japanese embassy, the video was distributed to provinces throughout Zambia by the Zambian government.

Interim Period

Leading up to signing R/D, CRA

Formal approval

After a project has been selected, it is required that the research institute in the partner country reaches agreement on project details with JICA within the framework of technical cooperation, for the SATREPS project to be formally adopted and international joint research can commence. In the provisional selection period after selection and before formal approval, the principal investigator and JST (AMED) meet several times, and the principal researcher typically travels to the partner's institute to discuss details in preparation for signing the R/D (Record of Discussion) and CRA (Collaborative Research Agreement). This process takes about a year.

The nickname derives from the wish for both countries to be able raise their glasses and smile at the end of the project as they say ... "KAMPAI !" (It also stands for the KAbwe Mine Pollution Amelioration Initiative.)

1st year

The first JCC
Kick off meeting

2nd year

JCC

3rd year

JCC
Mid-Term Evaluation

4th year

JCC

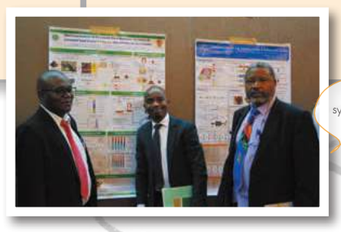
5th year

The final JCC
Terminal Evaluation

After the research period

At the JCC

Counterpart training. Learning about lead contamination countermeasures in Japanese mines



International symposium hosted by the project

Equipment provision/Training human resources in partner country

A monitoring lab was established at the University of Zambia, where we installed precision instruments and other equipment for surveying and analysis. The setup was designed to enable analysis of samples taken from contaminated districts to be conducted locally in Zambia. In addition, a monitoring farm was constructed in Kabwe, and used for growing plants to investigate the effectiveness of planting for suppressing the scatter of lead dust. The farm also investigates which plants grow well in high-lead soil.

To learn how to handle the equipment and analyze the data, over 20 staff and students from the University of Zambia were invited to Japan to take part in training sessions. Technology transfer is also ongoing at the University of Zambia monitoring lab. People using the equipment for the first time seemed excited and were very keen to learn how to use it, making comments like "I've seen these in videos but never thought I'd get to use one," and "I've only used this sort of equipment outside Zambia."

This project is conducting training field-by-field across a broad range of academic fields, including veterinary medicine, medicine, agriculture, engineering, and economics. This provides a strong contribution to building research capacity in terms of human resources on the Zambia side.

Learning analysis techniques in monitoring lab at University of Zambia

Short break with maize juice and orange juice between sampling tasks.

Researchers warmly welcomed by children when surveying local elementary schools.

Principal investigator's comments

We aim to contribute to resolving local issues, and to raise awareness of environmental pollution in Africa so that the project outcomes can extend outwards.

Environmental challenges are difficult to resolve by only tackling a single field, so collaboration between a number of fields is a key factor. This project involved collaboration between a large number of experts, with interconnecting expertise ranging from fundamentals to social implementation, a combination that can surely be applied to other issues, too. Regarding changes after medical treatment and environmental remediation, it is necessary to continue acquiring measurement data to provide verification of effectiveness. Consequently, the research will be continued after the termination of the SATREPS project.

Partner country principal investigator's comments

In the KAMPAI project, we assessed lead exposure levels of residents, including women and children, in matrices such as blood and urine. Survey results showed clearly that lead levels have an impact on the surrounding environment and on the human body.

We also worked with the Kabwe Municipal Council and Ministry of Health to communicate this new information and to raise the level of interest and awareness of the problem of lead among the residents and local health workers.

In order to be able to propose effective measures, the project will continue to participate in lead contamination impact surveys and environmental remediation activities.

Environment/ Energy (Carbon Neutrality)

Utilize Renewable Geothermal Energy for a Low-carbon Society

Principal Investigator
Prof. KOIKE Katsuaki
Japan
Graduate School of Engineering, Kyoto University

Principal Investigator
Prof. Sudarto Notosiswojo
Republic of Indonesia
Faculty of Mining and Petroleum Engineering, Insitut Teknologi Bandung (ITB)

Advantage of Joint Research

Indonesia conducts a great deal of research in the field of geothermal energy research. Partnering with Institut Teknologi Bandung (ITB), where there were already many projects involving groups of Japanese researchers, provided the opportunity to train young researchers and to make advances in globalization of research. Use of turbines in geothermal energy projects may also lead to future business for Japanese companies.

Developing technology for identifying steam spots has resulted in progress in geothermal energy exploration. This provides a means of meeting predicted growth in energy consumption. In addition to helping to keep down greenhouse gas emissions, the research has led to training new researchers, and has greatly enhanced ITB's research potential by making a substantial upgrade to research facilities.

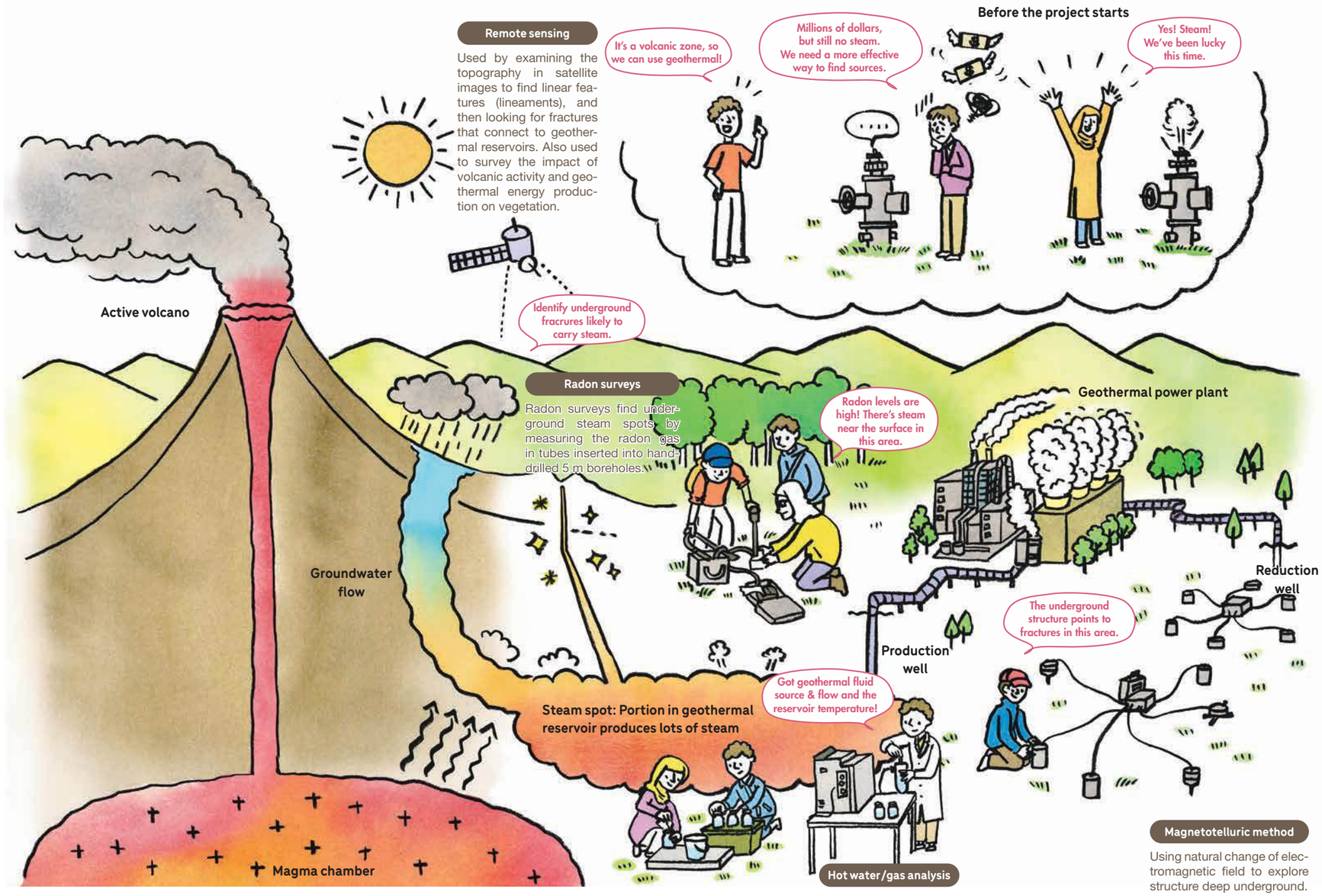
Research Field

Indonesia has a population of over 200 million, and a massive demand for electricity. Decarbonization is a national policy objective, and the country hopes to make use of geothermal energy as a renewable energy source associated with Indonesia's large number of active volcanoes. One difficulty with this approach has been the requirement for large-scale test drilling to find locations underground that have an abundance of geothermal energy resources. Such drilling involves a large initial investment and has a high risk of failure, and as a result, geothermal power generation did not grow as fast as originally expected.

- Adoption Fiscal Year; FY2014
- Country: Republic of Indonesia
- Research Institution in Indonesia: Insitut Teknologi Bandung (ITB)
- Research Institution in Japan: Kyoto University
- Research Period: 5 Years
- Reference data: https://www.jst.go.jp/global/kadai/h2601_indonesia.html

Technology Development for Large Enhancement of Steam-spot Detection and Sustainable Resource Use of Geothermal Power Generation in Indonesia

7 AFFORDABLE AND CLEAN ENERGY
13 CLIMATE ACTION



Technology developed for precise identification helps cut initial costs

Identifying locations suitable for geothermal energy production usually requires deep drilling, incurring high initial costs. Moreover, test drilling sometimes fails, and the combination of high initial costs and large operating risk meant that new exploration had not made much progress. This project combined remote sensing techniques with geochemistry and mineralogy techniques to develop technology that could identify optimal locations (steam spots) for geothermal energy production with greater precision. The aim was for technology that cut both initial costs and operating risk, thereby contributing to the progress of geothermal exploration in Indonesia.

Optimization systems help ensure long-term use of geothermal energy

The project developed technology for precisely identifying optimal locations (steam spots) for geothermal energy production. This reduces the number of exploratory drillings required, which can cut initial costs. The project also developed environmental monitoring technology that enables use of geothermal energy in harmony with the environment, and optimization systems that help to ensure that the geothermal energy can continue to be used in the long term. These technologies make it possible to increase the proportion of Indonesia's energy provided by geothermal energy sources, which can help to meet the country's expected growth in demand for energy, and can potentially help to achieve large cuts in carbon dioxide emissions.

Technology Development of Steam-spot Detection and Sustainable Resource Use for Large Enhancement of Geothermal Power Generation in Indonesia

Environment/ Energy (Carbon Neutrality)

Background to SATREPS research proposal

Professor Koike already had strong links with Institut Teknologi Bandung (ITB) in resources engineering and earth science, and four of the teaching staff at ITB gained their doctorates under Prof. Koike. The first collaborative research began in 2004 with a geostatistical assessment project of coal resources, and the relationship has grown since then, including collaboration in conference organization and jointly-authored papers. After hearing that a proposal from the same department as Prof. Koike in Kyoto University had been selected as a SATREPS project, this joint research project was planned and proposed, aiming to deepen a joint research on sustainable energy, and to boost the strength of research at ITB through an initiative taking a comprehensive approach to geothermal energy research.

Equipment provision

As part of the project we deployed twelve different types of state-of-the-art measurement/analysis equipment, including scanning electron microscope and chromatographs and three types of software. These are in full use. In addition to their use by ITB, they handle requests for analysis from other entities, including universities and research institutes throughout Indonesia, and police and customs agencies. Costs of consumables and maintenance are secured by ITB, and the instruments are kept ready for use at all times.

Analyzing soil gases with the new equipment

Training human resources in partner country

In order to train people to handle geothermal exploration in Indonesia, a broad range of training is provided, including inviting over ten Indonesian trainees to Japan each year, including ITB graduate students, young researchers, and young private sector engineers. In addition to classroom learning, trainees get practical training through field surveys in Oita Prefecture, practice analyzing samples, and give presentations of their results.

Practical training through field surveys and analyzing samples

Private sector collaboration

Tie-ups with a number of companies in the partner country led to jointly-conducted field survey results being published in international journals, and to locations pinpointed by the project being adopted as new drilling sites. During the project, we were also able to extend the research to other districts, providing additional sites for verifying the accuracy of steam spot detection, and making it easier to implement our research outcomes in society. Japan-side companies also helped us to resolve a number of problems concerning geothermal energy exploration and cooperated in numerical simulations, etc.

Interim Period

Leading up to signing R/D, CRA

Formal approval

1st year

The first JCC
Kick off meeting

Project logo.
The nickname "BAGUS" is an Indonesian phrase meaning "Very Good."

JCC (Joint Coordination Committee) is the highest decision-making body for the project, bringing together all the project stakeholders in a key meeting each year to hear reports on the project's progress, subsequent schedule, etc., and to discuss and to make decisions on behalf of the project.

2nd year

JCC

3rd year

JCC
Mid-Term Evaluation

JST/AMED and JICA collaborate and cooperate on project evaluation. See p.13 for more information about the perspectives employed in evaluations.

4th year

JCC

Newsletter summarizing project progress (nine issues).

5th year

The final JCC
Terminal Evaluation

Booth at international symposium

After the research period

Before signing R/D, CRA

When we started organizing the project, communication with the ITB side was almost completely based on email. But with email, it was difficult to discuss things in depth, and everything took a long time. Convinced that direct meetings were important for reaching a consensus, soon after provisional selection was announced, we invited the key ITB members to Kyoto University to discuss research objectives, content, schedule, equipment and software required, and the outcomes that we hoped to obtain. We conducted the discussion of these and other topics over two full days that were packed with meetings.

After that, we kept in close contact, giving full respect to each other's culture, including ensuring that schedules took the partner's regular events and customs into account. This approach ensured that the research proceeded on schedule, and was vital in ensuring that we were able to achieve the outcomes on time.

Japanese and Indonesian principals signing

Ganesa Wirya Jasa Adiutama (The prize of Insitut Teknologi Bandung)

ITB's highest-ranking award. In presenting the award, ITB valued the implementation of joint research over long years, and gave a particularly high rating to the big upgrade in research equipment, the substantial enhancement in research capacity through training, and to the way that the project has been steadily producing results right from the start.

Award ceremony at ITB

Nasi Bungkus purchased as food for overnight field research. Choose your favorite ingredients from those on display at the shop, and have them packed in a paper wrapper.

After setting up field survey equipment, researchers demonstrate Japanese toys such as kendama and kites to local people.

Principal investigator's comments

In addition to promoting geothermal energy production and fulfilling our mission of contributing to low carbon society, arranging for joint researchers from Indonesia and other countries to conduct research in collaboration with Japan is boosting networking between researchers and strengthening alliances. We hope to develop this project into world-leading research. The outcomes obtained by the SATREPS project will provide a foundation for extending both the research and research networks through initiatives such as the development of technology for exploring deeper parts of reservoirs to enable an increase in the generating capacity in districts that have already been explored. They also provide a foundation for further joint research with Egypt, Mozambique, and other countries.

Partner country principal investigator's comments

The aim of the BAGUS project was to reduce costs and reduce the risk of failed exploration in order to realize relatively inexpensive but precise technology meeting the needs of geothermal resource exploration in Indonesia.

By means such as introducing state-of-the-art experimental equipment and software, the activities of the BAGUS project have led to the development of science and technology, the enhancement of exploration techniques, and of course, training of ITB people. The people who have been trained are now working as engineers or as university teaching and research staff in the field of geothermal energy.

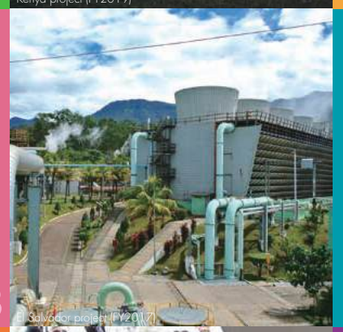

Kenya project (FY2019)

Environment/Energy
(Global-scale Environmental Issues)


Thailand project (FY2019)

23

Environment/Energy
(Carbon Neutrality)


Salvador project (FY2012)

33

Bioresources


Bolivia project (FY2019)

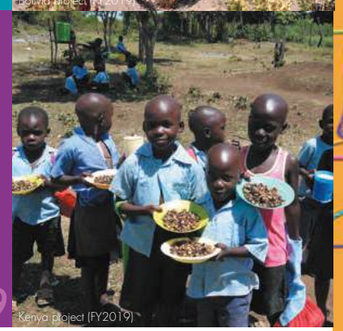
41

Disaster Prevention and
Mitigation


Argentine project (FY2021)

51

Infectious
Diseases Control


Kenya project (FY2019)

59

SATREPS 2024

Environment/Energy (Global-scale Environmental Issues)

01 = Utilization Technology of Rubber Seeds for Green Products to Mitigate Global Warming and Plastic Pollution =

“Natural rubber seeds”, the unlimited potential hiding in natural rubber plantations

Adoption Fiscal Year FY 2023

Principal Investigator
Associate Prof.
KANEHASHI Shinji

Graduate School of Engineering, Tokyo University of Agriculture and Technology

Principal Investigator
Prof.
Suwabun Chirachanchai

The Petroleum and Petrochemical College, Chulalongkorn University

A natural rubber plantation in Thailand, the world’s largest producer of natural rubber

Utilization of the highly potential of natural rubber seeds: from collection to thorough utilization

Against the backdrop of environmental issues such as global warming and marine debris, Thailand is aiming for sustainable economic development under the BCG (Bio-Circular-Green) economy model, which aims to achieve carbon neutral society and to reduce economic disparities among industries by utilizing renewable resources and resource recycling. Therefore, a partnership between Japan and Thailand establishes a sustainable biomass procurement system, develop green products, and build a value chain for social implementation by utilization of natural rubber seeds, still an untapped biomass resource in the natural rubber industry.

Creating social impact through the added value of natural rubber seeds

Creation of a new biomass industry by reviewing the value of natural rubber seeds and building a value chain. The value of the seeds will lead to higher profits for producers and a reduction in economic disparities between industries. In addition, the expanded use of the green products making from rubber seeds can contribute to mitigating social problems related to the environment and resource depletion.

Natural rubber seeds, an unutilized resource, left neglected at a natural rubber plantation

Test extraction of the vegetable oil contained in natural rubber seeds

Research Institutions in Thailand	Chulalongkorn University / Kasetsart University / Walailak University / Thailand National Science and Technology Development Agency (NSTDA)
Research Institutions in Japan	Tokyo University of Agriculture and Technology / Osaka Metropolitan University / Kyoto Institute of Technology / University of Tokyo / Nippon Institute of Technology / Japan International Research Center for Agricultural Sciences (JIRCAS)
Research Period	5 Years

02 = Risk-based Participatory WASH Planning and Citizen-data WASH Statistics for African Peri-urban Settlements =

Experienced, not taught - Realizing safe water, sanitation and hygiene in Africa

Adoption Fiscal Year FY 2023

Principal Investigator
Associate Prof.
HARADA Hidenori

The Center for African Area Studies, Kyoto University

Principal Investigator
Dr. Kawawa Banda

Senior Lecturer, Integrated Water Resource Management Centre, University of Zambia

A toilet in a low-income community on the periphery of Lusaka. The cloth-covered toilets have holes to hold excrement, but there are no lids, and the contents overflow during the rainy season.

Participative visualization of diarrhea risk to design your own WASH plan

Cholera outbreaks sporadically occur in low-income areas of peri-urban Lusaka, the capital of Zambia. People own cell phones but not sanitary lavatories. Water, sanitation and hygiene are not simply an issue of money, but of prioritization. Supported by an app to be developed under the project, residents themselves will examine the contamination around them and visualize the risk of diarrhea. By “experiencing” potential risks rather than “being taught” about these, residents will be better able to design their own remedial measures and implement them proactively.

The prevention of diarrhea and cholera in African urban slums with poor sanitation

By having residents design risk-based improvement plans by themselves and practicing improvement activities based on their actual experience, contamination of water and food and outbreaks of diarrhea and cholera can be prevented, leading to the realization of a healthier and more hygienic way of life. The project will create a new type of practical science to solve serious social problems by combining citizen science with advanced science.

An outdoor water tap, shared by 20 to 30 households, is used to fetch water. The faucet is located right on the ground due to the low water pressure. Water is stored at home, but contamination occurs by the time it is consumed.

Young people in the community testing samples they have collected for coliform bacteria

Research Institutions in Zambia	University of Zambia / Lusaka City Council – Department of Public Health / Lusaka Water Supply and Sanitation Company
Research Institutions in Japan	Kyoto University / Tohoku University / Hokkaido University
Research Period	5 Years

03 = Establishing Sustainable Water Supply System Resilient to the Contamination of Drinking Water Sources =

From grossly contaminated river water to drinking water!

Adoption Fiscal Year FY 2022

Principal Investigator
Prof.
FUJIOKA Takahiro

Graduate School of Engineering, Nagasaki University

Principal Investigator
Associate Prof.
TRAN Thi Viet Nga

Faculty of Environmental Engineering, Hanoi University of Civil Engineering

Reduce the startup and operational costs of advanced water purification by 80%!

River water is the main source of drinking water in Southeast Asia, including Vietnam, but increasing pollution means regular treatment methods cannot guarantee its safety. The high startup costs and operational costs of advanced water treatment methods capable of removing these pollutants prevent their widespread use in developing countries. In this project, we are developing an advanced water treatment method that is cheap, uses very little energy, and uses locally procurable components, as well as water quality measurement technology to enable online water safety monitoring.

Studying the pollution level of river water

Sustainable water supply for residents and industry

Display for monitoring the operational status of all the water purification plants in Haiphong City

This project will expand the use of advanced water treatment in water-using facilities (purification plants, commercial buildings, and industries using industrial water) in developing countries, benefiting society by providing a sustainable supply of safe, cheap water to residents and industry. It will also help promote production by Japanese companies and organizations in those regions by supplying them with low-cost thoroughly treated water.

Inspecting water supply equipment installed under a JICA Grant Assistance Project

Research Institutions in Vietnam	Hai Phong Water Joint Stock Company / Thuy Loi University / Hanoi Architectural University / Vietnam Water Supply and Sewerage Association / Ministry of Construction / DNP Water
Research Institutions in Japan	The University of Kitakyushu / Ryukoku University / National Institute of Advanced Industrial Science and Technology / Kyoto University / Kyowakiden Industry Co., Ltd. / Kyowakiden Vietnam Co., Ltd. / Fuso Corporation / Mitsubishi Chemical Aqua Solutions Co., Ltd.
Research Period	5 Years

04 = Development of Easy-operation High-tech Analytical Devices and Human Resource for Food Safety and Environmental Quality Control =

Toward resolving environmental pollution through technology and personnel capable of on-site analysis!

Adoption Fiscal Year FY 2022

Principal Investigator
Prof. MAWATARI Kazuma

Graduate School of Information, Production and Systems, Waseda University

Principal Investigator
Director / Prof.
Noi Nguyen Van

Key Laboratory of Advanced Materials for Green Growth, VNU

The Analysis R&E Center in the new VNU Hoa Lac campus building (the base for technology development and human resource training in this project)

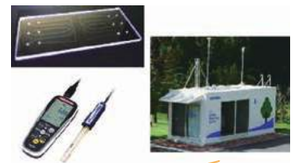
Develop device technology and personnel capable of analyzing water and air quality on-site

In Vietnam, analysis systems in analysis laboratories cost time, money, and labor and are often unable to deal with environmental issues, creating a bottleneck. We are therefore developing microflow device technology, electrochemical detection technology, and monitoring technology to enable on-site air and water analysis. In collaboration with the Vietnamese Ministry of Natural Resources and Environment, we are also developing a certification system for qualified analysts and training analysis personnel as well as engaging with big data science in order to establish an on-site analysis system.

Analyst training

Resolving environmental problems by closing up the mesh of environmental analysis

Our aim is to help resolve Vietnam’s environmental issues by developing an on-site analysis system capable of a large volume of environmental analysis on a daily basis, both contributing to the sustainable development of the country, which is undergoing rapid economic growth, and encourage networking between personnel in industry and academia in Japan and Vietnam. Extending this model to other developing countries will also contribute to resolving global environmental issues.



IoT analysis devices and monitoring station

Environmental pollution in Bac Ninh Province

Research Institutions in Vietnam	VNU University of Science / Ministry of Natural Resources and Environment (MONRE) / Bac Ninh Department of Natural Resources and Environment (DONRE)
Research Institutions in Japan	Waseda University / The University of Tokyo / DKK-TOA CORPORATION / HORIBA, Ltd.
Research Period	5 Years

05 = Development of Palm Oil Mill Effluent (POME) Treatment System for Sustainable Energy Production and Resource Recovery based on Material Innovation =

Recover water, electric power, and mineral resources from palm oil mill effluent!

Adoption Fiscal Year FY 2022

Principal Investigator
Associate Prof.
YOSHIDA Naoko
Graduate School of Engineering,
Nagoya Institute of Technology

Principal Investigator
Vice-Chancellor Prof. Datuk
Ir Ts Dr Ahmad Fauzi Ismail
Universiti Teknologi Malaysia


Palm plantation

Materials innovation plus methane fermentation/ electricity generation/photosynthesis equals resource recovery water treatment

Malaysia is the world's second largest producer of palm oil, but milling effluent has been shown to cause water pollution. In this project, we are developing a system to use milling effluent to produce methane gas, recover electric power by using microbial fuel cells, and collect nutrient salts by photosynthesis, as well as manufacturing reclaimed water from the treated water. By encouraging or suppressing the microbial reactions in each process, and by developing materials that increase the capacity to isolate the substances concerned, we will establish a highly efficient water treatment process for resource recovery.

Turning effluent treatment into a resource recycling system to create new value

Transforming conventional energy-consuming water treatment into a resource-recycling process will not only resolve water pollution issues but also greatly reduce greenhouse gases, improving the sustainability of palm oil production. This will be an important model case as a form of environmental infrastructure for the fuel production created by carbon fixation from widespread photosynthesis.


Palm oil milling effluent water treatment plant


Visiting the Tenaga National Research Institute

Research Institutions in Malaysia	Universiti Teknologi Malaysia / Malaysia Palm Oil Board / Tenaga National / Berhad Research / National Hydraulic Institute of Malaysia
Research Institutions in Japan	Nagoya Institute of Technology / Kyoto University
Research Period	5 Years

06 = Strengthening Tropical Forest Resilience Based on Management and Utilization of Genetic Resources Capable of Climate Change Adaptation =

Tackling climate change issues by selecting and planting resilient forestry seedlings!

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. Dr. TANI Naoki
Senior Researcher, Forestry Division,
Japan International Research Center for
Agricultural Sciences (JIRCAS)

Principal Investigator
Prof. Dr. Ir. Mohammad
Na'iem
Professor, Faculty of Forestry,
Universitas Gadjah Ma

Utilize genomic data to select tree species that are highly resilient to climate change

In this study, we are focusing on six tree species that are suitable for tropical forest regeneration and social forestry (community-based forest management), using genomic information (the sequence of bases in DNA) to select exceptional individual trees that exhibit greater resistance to climate change, and establishing the technology for the mass production of samplings from these exceptional trees by means such as cell culture. We are evaluating the effect of this in promoting forestry with greater resilience to climate change by assessing the amount of timber produced and ecological functions (including greenhouse gas absorption and the amount of non-timber resources) from the viewpoints of local communities and the local economy, in order to ascertain the necessity and value of forestry promotion in scientific terms.


Studying the genetic resources of tropical forests in the partner country

Making tropical forestry a sustainable industry even under climate change


Measuring the trunk growth of one of the types of tree studied (dipterocarp)

We will create international and regional incentives for afforestation designed to cope with climate change, and improve the current forestry industry to enable the sustainable use of forest resources even under climate change. Going forward, this will lead to the development of environmentally, economically, and socially sustainable forest management models using saplings highly adapted to climate change, which will encourage climate change adaptation and mitigation


Surveying the seedling cultivation process, ready to select on the basis of genomic data


Young teak trees that will produce high-quality timber, with maize cultivation on the forest floor

Research Institutions in Indonesia	Universitas Gadjah Mada/ National Research and Innovation Agency
Research Institutions in Japan	Japan International Research Center for Agricultural Sciences (JIRCAS) / Sumitomo Forestry Co., Ltd. / University of Tsukuba / Forestry Research and Management Organization (FRMO) / Nagasaki University / National Institute for Environmental Studies (NIES) / Kansai University
Research Period	5 Years

07 = Establishment of Risk Management Platform for Air Pollution in Cambodia =

Develop human resources to solve air pollution problems in Cambodia! Observation, analysis then countermeasures

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. FURUUCHI Masami
Faculty of Geosciences and Civil
Engineering, Institute of Science and
Engineering, Kanazawa University

Principal Investigator
Director/H. E. Dr. Po Kimtho
Institute of Technology of Cambodia

Establish an air monitoring network for the state of art science of air pollution and a framework for human resource development


Evening traffic congestion at a corner nearby ITC

Air pollution in Cambodia has been becoming a critical issue due to a rapid economic growth that leads to increasing air pollutant emissions from various sources such as traffic, constructions and open burning of waste and agricultural residues. However, there is a serious lack of human resources capable of evaluating and managing this situation based on a scientific understanding. In this project, under the collaboration with the Institute of Technology of Cambodia (ITC) and the Ministry of Environment, Cambodia (MoE) as well as other related organizations, a platform that consists of an air monitoring network and research facilities, a self-reliant and sustainable structure for capacity building and provision of reliable environmental information to be used for environmental policy making will be established.


Visit to the monitoring site at the MoE rooftop


GPS signal test on the ITC roof, with a view of construction in the center of Phnom Penh

Developed human resources will contribute to the clean air in Cambodia.

Through all activities of the project, not only officers and engineers who can skillfully manage the monitoring network but also young researchers who can take initiatives in cutting-edge researches on atmospheric science and engineering will be developed. Reliable environmental data will be shared by people in Cambodia and utilized to proposals for environmental policies for the mitigation of health risk.


The kickoff meeting of the SATREPS project for air pollution in Cambodia (ITC, 19, Sep. 2022)

Research Institutions in Cambodia	Institute of Technology of Cambodia / University of Health Sciences / National University of Management / Ministry of Environment
Research Institutions in Japan	Kanazawa University / Nagasaki University / Osaka Metropolitan University / Osaka Ohtani University
Research Period	5 Years

08 = Innovation of Science and Technology on Natural Rubber for Global Carbon Process =

Time to switch from fossil-fuel-derived materials to those made from sustainable natural rubber!

Adoption Fiscal Year FY 2021

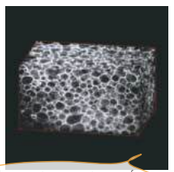
Principal Investigator
Prof. YAMAGUCHI Takashi
Graduate School of Engineering,
Nagaoka University of Technology

Principal Investigator
Assoc. Prof. Phan Trung
NGHIA
Director of Center for Rubber Science
and Technology, Hanoi University of
Science and Technology

Refinement of protein-free natural rubber, its product development, and biodegradation technology for resource recycling

This study focuses on natural rubber, with the aim of laying new industrial foundations with this sustainable biological resource. We are starting out by developing technology for the mass production of natural rubber materials from which the natural rubber proteins, which are the cause of allergies and diminished performance, have been removed. We will then work toward the development of automobile tires and rubber products for medical use from these protein-free natural rubber materials, technology for the biodegradation of natural rubber products, and environmentally friendly wastewater treatment technology, which overall will reduce global warming.


Collecting natural rubber (field latex) from a Hevea rubber tree


Electron microscope image of a nanomatrix, an example of the science of natural rubber

Reducing global warming by creating a world based on the science of natural rubber

This project aims to strengthen intellectual property related to protein-free natural rubber and promote its international standardization, creating a natural rubber industry to replace conventional synthetic rubber. We are also aiming to create environmental preservation industries related to the resource recycling of natural rubber. Transforming society through the use of materials derived from natural rubber will also reduce global warming.


Decomposition of a latex glove by natural rubber-decomposing bacteria


Making a water/natural resources recycling device for recycling resources from natural rubber processing

Research Institutions in Viet Nam	Hanoi University of Science and Technology
Research Institutions in Japan	Nagaoka University of Technology / Tottori University of Environmental Studies / National Institute of Technology, Tokyo College / National Institute of Technology, Numazu College/ National Institute for Environmental Studies / Sumitomo Rubber Industries, Ltd./ Sumitomo Riko Company Ltd. / Shiraishi Calcium Kaisha, Ltd. / Shiraishi Central Laboratories Co., Ltd. / National Institute of Technology (KOSEN), Kure College.
Research Period	5 Years

09 = Development of Innovative Climate Resilient Technologies for Monitoring and Controlling of Water Use Efficiency and Impact of Salinization on Crop Productivity and Livelihood in Aral Sea Region =

Achieve sustainable agriculture through active use of real-time data and halophytes!

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. TANAKA Kenji

Disaster Prevention Research Institute, Kyoto University

Principal Investigator
Director, Xabibullaev Baxitjan Sagidullaevich

International innovation Center for Aral Sea basin (IICAS) under the Ministry of ecology, environmental protection and climate change of the Republic of Uzbekistan

Selection of crops for circular halophytes mixed farming (CHMF) and utilization of real-time data

Years of irrigation-based agriculture have shrunk the Aral Sea, and salt damage and drought are becoming increasingly severe in the surrounding area. This project is designed to use climate data and information from earth observation satellites to grasp conditions in the area around the Aral Sea: the amount of usable water resources, the amount of evapotranspiration, and the status of crop growth. In addition, we will work to prevent the worsening of salinity problems by developing a sustainable agricultural model that combines appropriate irrigation drainage management methods, halophyte-based biological restoration of saline soil, and cultivation of crop species that use water efficiently.


Monitoring soil moisture in an alfalfa field

Development of a circular business model for managing agricultural land, water, and salt


A camel and halophytic plants from the Alhagi family

We will explore and propose optimal combinations of crop species from the standpoints of resistance to drought and salt, ability to remove salt from soil, and efficient use of water, in order to realize resource-efficient, sustainable agriculture through irrigation and drainage management based on the amount of water resources available, the amount of evapotranspiration taking place and the status of crop growth, and through active cultivation of halophytes in salinity-affected areas.


Sheep eating a feed mixture containing halophytes


Measuring soil moisture and electrical conductivity

Research Institutions in Uzbekistan	International Innovation Center for Aral Sea Basin / Uzbek Hydrometeorology Institute / Tashkent Institute of Irrigation and Agricultural Mechanization Engineers / National University of Uzbekistan / Uzbek Design Research Institute / Nukus Branch of Tashkent Agrarian University
Research Institutions in Japan	Kyoto University / Kobe University / Chiba University / Mie University / The University of Kitakyushu/Tottori University
Research Period	5 Years

10 = Establishment of Integrated Forest Management System Model for Conservation of Mountain Forest Ecosystems in the Andean-Amazon =

Solve the challenges facing the Andean-Amazon region by sustainable forest management

Adoption Fiscal Year FY 2020

Principal Investigator
Re-employed Research Specialist
HIRATA Yasumasa

Forest Research and Management Organization, Forestry and Forest Products Research Institute

Principal Investigator
Prof. Zoila Aurora Cruz Burga

Faculty of Forest Sciences, La Molina National Agrarian University

Develop forest management systems that support the conservation and use of forest ecosystem services

There are concerns about deterioration of ecosystem functions in mountain forest ecosystems from the Andes Mountains to the Amazon Basin as a result of disturbances caused by human activities and a lack of water resources due to climate change. Through understanding the effects of increasing forest fires and logging as well as understanding the amount of water resources available for supply, we aim to develop a forest management system that enables local residents to recieve ecosystem services while conserving the forest, and to apply that system in a way that benefits society by creating tools to support decision-making for use in management of water and forest resources by local residents.


Biomass survey: measuring tree height

Achieve sustainable conservation and use of mountain forest ecosystems through participation by local residents


Biomass survey: establishing plots

Develop an integrated forest management system that makes it possible to present forest allocation that balance the resource usage needs of residents with the conservation of ecosystems. We anticipate that the use of this system will encourage local residents to conserve the fragile forest ecosystems of the Andean-Amazon region and to use ecosystem services in a sustainable fashion.


An intentional burn


Eucalyptus plantation

Research Institutions in Peru	La Molina National Agrarian University / National Forest and Wildlife Service
Research Institutions in Japan	Forest Research and Management Organization, Forestry and Forest Products Research Institute / Chiba University / Kyushu University / Japan Forest Technology Association
Research Period	5 Years

11 = Formation of a Center of Excellence for Marine Plastic Pollution Studies in the Southeast Asian Seas =

Discover how plastic wastes are released into the oceans and clarify their impact on the ocean environment

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. ISOBE Atsuhiko

Center for Oceanic and Atmospheric Research, Research Institute for Applied Mechanics, Kyusyu University

Principal Investigator
Prof. Voranop Viyakarn

Aquatic Resources Research Institute, Chulalongkorn University

Researching ways in which plastic wastes are released into the oceans and the impact of marine plastic debris on the ocean environment

The Southeast Asian region is thought to be a hotspot for marine plastic pollution. However, the influence of marine plastic on the ecosystem and human activity is not yet sufficiently clear. This project establishes a research center in Thailand to survey the ways in which plastic wastes are released into the oceans and the impact of the debris on the ocean environment. It also aims to monitor the routes of marine plastic debris from land to the ocean and the volume of plastic emitted, and to forecast future levels of marine microplastic emissions.


Giving an overview of the project at the Ministry of Natural Resources and Environment's Pollution Control Department


Marine plastic debris washed ashore on Samaesan Island, site of the survey

Proposing an action plan for mitigating marine plastic debris to the Thai government

The project will support Thailand's government in formulating a policy for reducing marine plastics based on scientific knowledge. It will also roll out the initiative in Thailand to other surrounding nations and contribute to sustainable reduction of marine plastics in Southeast Asia. Among other things, this research center is expected to play a role in demonstrating the scientific basis for bolstering policies for reducing marine plastics.


Signing the RD (Record of Discussions) at Chulalongkorn University

Research Institutions in Thailand	Chulalongkorn University / Eastern Asia University / Walailak University / Ministry of Natural Resources and Environment
Research Institutions in Japan	Kyusyu University / Tokyo University of Marine Science and Technology / Kagoshima University / Kumamoto University / Kyoto University / Tokyo University of Agriculture and Technology / Chuo University / Public Works Research Institute Civil Engineering Research Institute for Cold Region
Research Period	5 Years

12 = Development of Management Systems for Multiple Utilization of Biodiversity in the Tropical Rainforests at the Protected Areas in Sarawak =

Reveal the full scale of biodiversity in Sarawak's tropical rainforests

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. ITIOKA Takao

Graguate School of Global Environmental Studies, Kyoto University

Principal Investigator
Ms. Runi Sylvester Pungga

Senior Assistant Director, Forest Department Sarawak

Building a system for assessing and utilizing tropical rainforest biodiversity

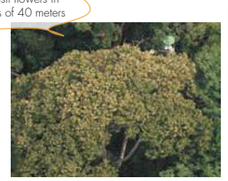
Using cutting-edge technology such as DNA barcoding, this project conducts an exhaustive survey of the distribution and state of conservation of the diverse life forms inhabiting the tropical rainforests that cover much of Sarawak. It builds data archives that store the results, creating research infrastructure for the study of biodiversity in Sarawak. It formulates education programs and community engagement programs, raises awareness among local residents regarding the value of intellectual resources regarding biodiversity, and contributes to training in scientific skills.


Open-air class on tropical rainforest biodiversity for forest science students (Lambir Hills National Park)

Enhancing multifaceted utilization and management of tropical rainforest biodiversity

This project will aid in the creation of policy proposals for the multifaceted utilization and management of tropical rainforest biodiversity based on information accumulated in data archives. It will also organize the latest information on biodiversity and provide information based on the various needs of local communities, including those of the tourist and biotech industries and scientific and environmental education.


The canopy of Sarawak's tropical rainforests, home to rich biodiversity (Lambir Hills National Park)


Collecting insects that visit flowers in forest canopies at heights of 40 meters


Surveying canopy-dwelling insects (Lambir Hills National Park)

Research Institutions in Malaysia	Forest Department Sarawak / Sarawak Forestry Corporation / Sarawak Biodiversity Center
Research Institutions in Japan	Kyoto University / Tokushima University / Shimane University / Kochi University / National Institute for Environmental Studies / Tokyo Metropolitan University
Research Period	5 Years

13 = Establishment of a Sustainable Community Development Model based on Integrated Natural Resource Management Systems in Lake Malawi National Park =

Create sustainable futures by integrating practices by people in local communities with interdisciplinary science

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. SATO Tetsu

SDGs Promotion Office, Ehime University

Principal Investigator
Prof.
Bosco Rusuwa

Dept. of Biological Sciences, Faculty of Science, University of Malawi
Chancellor College

Improving sustainability of the natural environment and resources through integrated natural resource management

Fishing with open-water seine (chilimila net) widely used on Lake Malawi

The life and livelihood of people in rural villages of Malawi, which is among the least developed countries, depends on the diverse natural resources supported by the country's rich natural environment. By integrating the latest in resource management sciences and effective initiatives based on the traditional knowledge and skills of local communities through transdisciplinary research,* this project takes adaptive approaches to improving and reinforcing the management systems of diverse resources that have been handled separately up until now, and builds integrated resource management systems that takes advantage of synergies emerging from integration.

* Transdisciplinary research is adaptive processes of co-production of knowledge, driven by repeated trials and feedbacks with close collaboration of diverse stakeholders, including scientists and innovative practitioners both within and outside local communities.

A particular variety of tree obtained from the nearby forest is the wood of choice for smoking fishery products

Improve people's lives and well-being with integrated resource management systems

This project will build integrated management systems of diverse resources supported by the rich natural environment through collaboration between practitioners in local communities and scientists, and establish a framework for effective decision makings and actions led by community members to achieve sustainable natural resource management Thereby, the project is expected to contribute to improving the quality of life and well-being of people.

Small irrigation channels made in the fields of innovative local farmers

People hoping for fish gather around fishing boats on their return to the village beach

Research Institutions in Malawi	University of Malawi Chancellor College / Lilongwe University of Agriculture and Natural Resources / Department of Fisheries / Department of National Parks and Wildlife
Research Institutions in Japan	Ehime University / The university of Tokyo / Tokyo University of Agriculture / Ryukoku University / Yokohama National University / Saga University
Research Period	5 Years

14 = Sustainable Replantation of Oil Palm by Adding Value to Oil Palm Trunk through Scientific and Technological Innovation =

Stop disorderly expansion! Utilize oil palm trunks for sustainable plantations

Adoption Fiscal Year FY 2018

Principal Investigator
Project Leader
KOSUGI Akihiko

Biological Resources and Post-harvest Division, Japan International Research Center for Agricultural Sciences (JIRCAS)

Principal Investigator
Prof. K. Sudesh Kumar

School of Biological Sciences, Universiti Sains Malaysia (USM)

Oil palm. After growing for about 25 years, fruit bunch productivity declines, and the tree is felled.

Develop technology that utilizes palm trunks to resolve oil palm plantation issues

Malaysia produces approximately 30% of the world's palm oil. Oil palm trunks (OPT), trunks from palm trees that are felled at the end of their economic life, are left on plantations, causing issues that include the spread of soil-borne diseases, greenhouse gas emissions from decomposition, and deforestation as tropical forest is cleared to make way for new plantations. This project is conducting scientific and economic assessments of the impact of OPT abandonment, and attempts to transform OPT into a more valuable resource by developing technology for producing a range of high-value-added products, including biogas and biodegradable materials.

Sustainable plantation management and creation of new industries through OPT technology

This project is based on collaboration between industry, government, and academia in Malaysia and Japan. It aims to raise the resource value of oil palm trunks and create new industries by developing technologies that utilize OPT to produce high-value-added products. This contributes to the achievement of sustainable palm plantation management by facilitating the removal and use of felled OPT and making replantation possible within existing palm plantations.

Plantation after felling. Oil palm trunks left on the ground are thought to have a negative effect on the soil environment, encouraging the spread of soil-borne pathogens.

A facility set up in Malaysia demonstrating technology for utilizing oil palm trunks. Equipped with biogas production/power generation and water treatment facilities, it produces high-quality OPT pellets and other high-value-added products from OPT with zero emissions.

Research Institutions in Malaysia	Universiti Sains Malaysia (USM) / Malaysian Palm Oil Board (MPOB) / Forest Research Institute Malaysia (FRIM) / Standard and Industrial Research Institute of Malaysia (SIRIM)
Research Institutions in Japan	Japan International Research Center for Agricultural Sciences (JIRCAS) / IHI Corporation /Hiroshima University / National Institute for Environmental Studies / Panasonic Corporation / NISSIN SHOJI CO., LTD.
Research Period	5 Years

15 = Advanced and Sustainable Methods on Water Utilization Associated with Greening Potential Evaluation =

Create sustainable agropastoral practices in the Djibouti desert through developmental management of water resources

Adoption Fiscal Year FY 2018

Principal Investigator
Prof. SHIMADA Sawahiko

Department of Bioproduction and Environment Engineering, Faculty of Regional Environment Science, Tokyo University of Agriculture

Principal Investigator
Dr. Djama Mohamed Hassan

President of University of Djibouti

Assessing water resources/greening potential and demonstrating agropastoral practices

Fact-finding interviews at the site for a demonstration farm in the Arta Region

Most of Djibouti is a harsh desert environment, and the country's food self-sufficiency ratio is only about 13 percent by value. This project aims to ascertain the distribution, circulation pathways, and sustainable usage levels of Djibouti's water resources over a wide area and from a three-dimensional perspective, and expand the area where agropastoral practices are used. Satellite images and UAV images taken throughout Djibouti are used to assess the current situation based on the relationship between water resources and greening potential/sheep farming potential. The project also aims to propose water-saving agropastoral models as an extension of the oasis farming model by developing useful plants and feed crops, along with greening through effective use of urban waste.

Measuring power output and panel temperature to analyze efficiency of a solar pumping system at a progressive farm in Dikhil

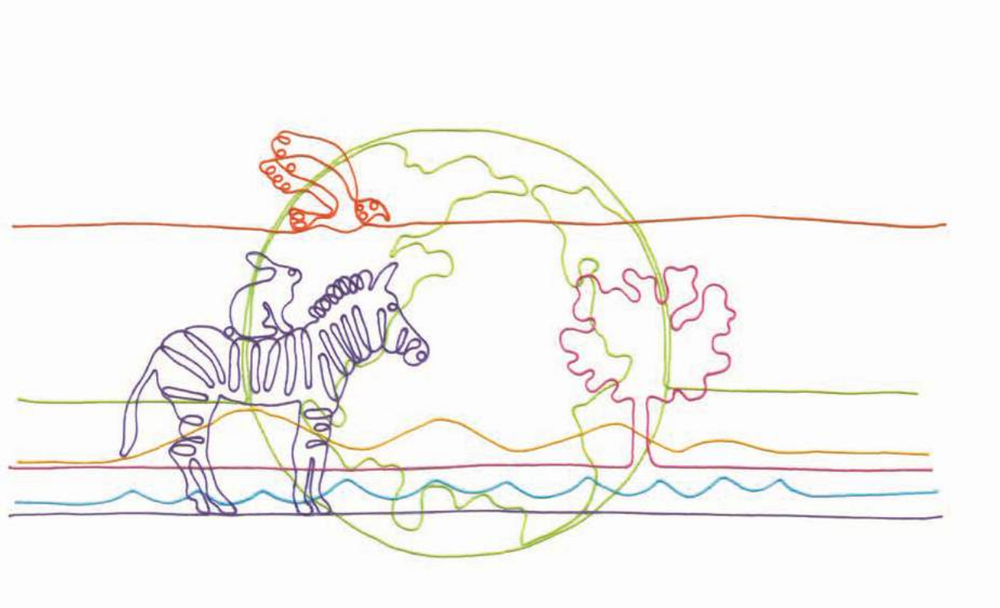
Making efficient use of water resources to enhance arid areas by greening wasteland and by creating agropastoral land

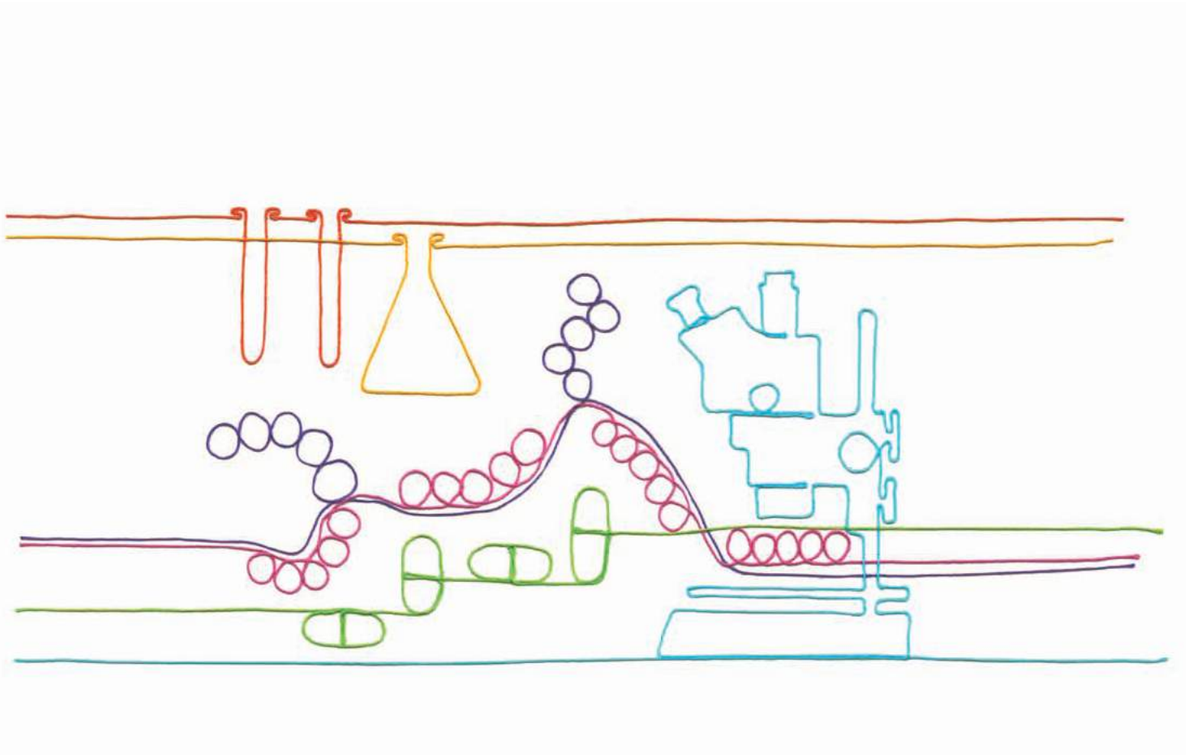
Sampling to identify algae growing in water tanks at a test farm in Damerjog

This project aims to identify optimal areas for greening and to extend the use of sustainable agropastoral practices suitable for arid lands by conducting demonstrations at suitable locations. The process involves determining the circulation of water in Djibouti as a whole, and, by extension, groundwater flow systems throughout Africa, and identifying other arid lands with potential for implementation of the techniques

Monitoring crop growth using a drone with multispectral sensors at a progressive farm in Dikhil

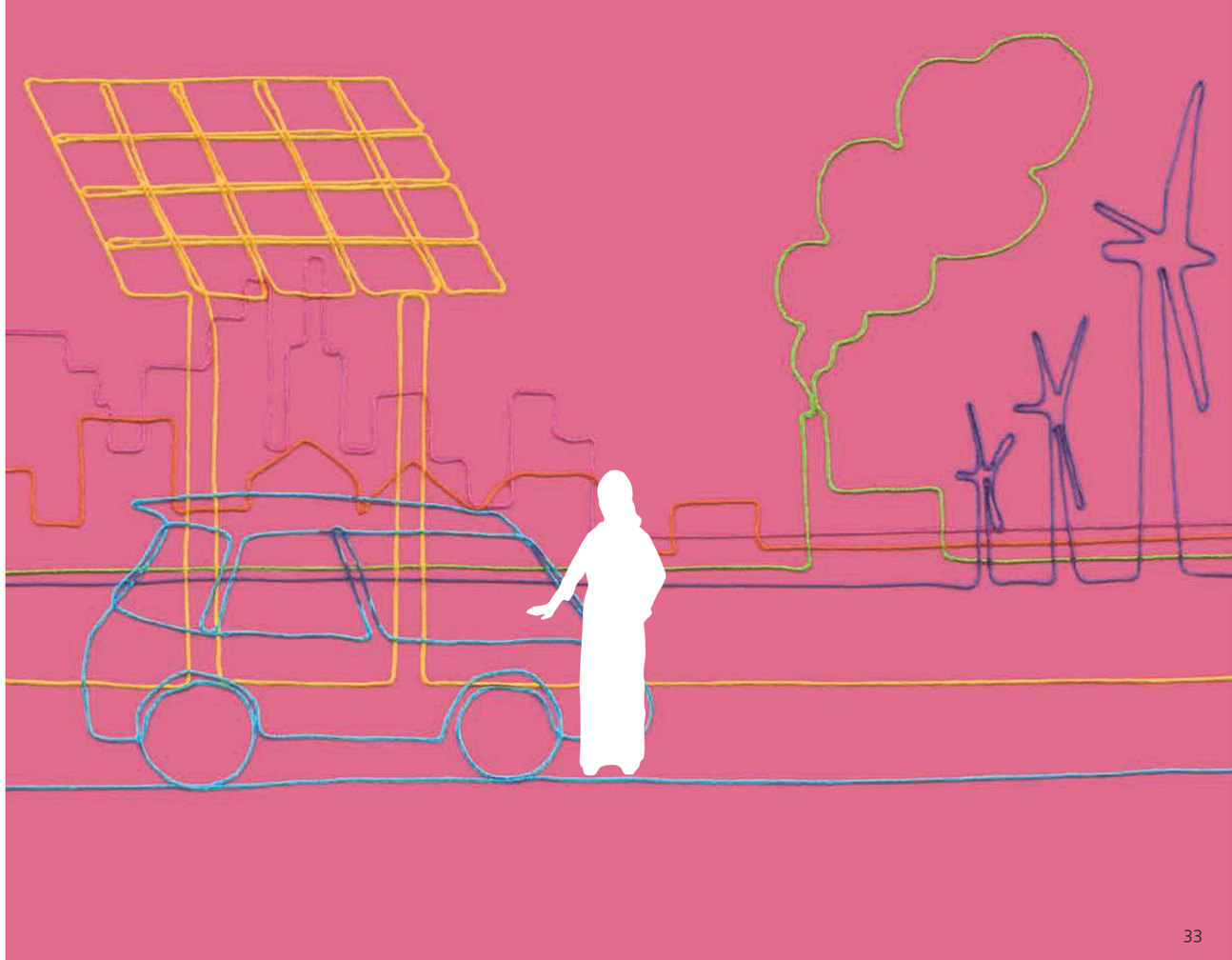
Research Institutions in Djibouti	University of Djibouti / Center for Studies and Research of Djibouti / Ministry of Agriculture, Water, Fisheries, Livestock and Marine Resources of Djibouti
Research Institutions in Japan	Tokyo University of Agriculture / Kansai University / The University of Shimane / Kyoto University /Geosphere Environmental Technology Corp. / Oriental Consultants Global Co., Ltd.
Research Period	5 Years





SATREPS 2024

Environment/Energy (Carbon Neutrality)



16 = Development and Social Implementation of Greenhouse Gas Emission Reduction Technologies in Paddy Fields of West Tonle Sap Lake by Establishing a Large Paddy Area Water Management System =

Using water management to reduce methane emissions from rice paddies!

Adoption Fiscal Year FY 2023

Principal Investigator
Project Leader IZUMI Taro
Rural Development Division,
Japan International Research Center for Agricultural Sciences

Principal Investigator
Acting Head of Department
Mr. Thav Sopheak
Faculty of Forestry Science,
Royal University of Agriculture

Development of a water management system to reduce methane emissions from rice paddies over a large area

In the Asia-Monsoon region, which includes Cambodia, methane emitted from rice paddies is a major source of greenhouse gas (GHG) emissions. It is known that methane emissions from paddy fields can be reduced by introducing intermittent irrigation, such as alternate wetting and drying (AWD), but little verification has been conducted over large areas of paddy fields. This project will develop and socially implement a large area water management method that reduces methane emissions without reducing rice paddy yields, and a method for monitoring and evaluating GHG reductions.


Drone photograph of paddy fields at the model site

Establishment of efficient water management, MRV, and methods to create incentives for farmers

The project will develop efficient water management methods from the watershed to the field level to implement intermittent irrigation over a large area, methods to measure, report, and verify (MRV) reductions in methane emissions, and methods to create incentives for farmers by utilizing carbon credits such as the Joint Crediting Mechanism (JCM) promoted by the Japanese government.

The official logo for RiceGX-SATREPS project


Interviewing farmers


Sampling of paddy field methane emissions using the chamber method

Research Institutions in Cambodia	Royal University of Agriculture / Institute of Technology of Cambodia
Research Institutions in Japan	Japan International Research Center for Agricultural Sciences / National Agriculture and Food Research Organization / Tokyo Gakugei University / Tokyo University of Agriculture / Hokkaido University / Kyushu University
Research Period	5 Years

17 = Development of Integrated Bio-circular Economy from Food and Energy Estate Waste Fraction to Biofuel and Bio-chemicals =

Creating a new chemical industry linked to Indonesian agriculture!

Adoption Fiscal Year FY 2023

Principal Investigator
Prof. OGINO Chiaki
Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University

Principal Investigator
Research Prof.
Puspita Lisdiyanti
Research Organization for Life Sciences and Environment, National Research and Innovation Agency (BRIN)

Putting agricultural residues to use by converting to fuel and chemicals through the power of microorganisms

In Indonesia, where agriculture is thriving, a variety of crops such as pineapple, cassava, and palm are grown on a large scale. As these crops are processed, residues (wastewater, solid residues, oils, etc.) are generated in large amounts. When disposed of, this waste generates methane gas, contributing to global warming. This research aims to make effective use of these agricultural residues and convert them into biofuels and bio-chemicals through the power of microorganisms. This will lead to the creation of a new chemical industry linked to agriculture.


Cassava being transported from farm to plant


Wastewater discarded from a palm plantation

Combating global warming by reducing agricultural residues from large-scale agriculture

If agricultural waste is converted into biofuels and chemicals, the chemical industry, which until now has been dependent on fossil resources, can evolve into a new chemical industry linked to agriculture. If this industrial structure can be changed, it will have a great impact on the securing of resources in Japan's chemical industry and assist in combating global warming.


Bench plant where biofuels and chemicals will be produced


Meeting on social implementation with the Indonesian Biofuel Council

Research Institutions in Indonesia	National Research and Innovation Agency (BRIN) / Bandung Institute of Technology / Lampung University / Padjadjaran University
Research Institutions in Japan	Kobe University / Japan International Research Center for Agricultural Sciences / The University of Shimane
Research Period	5 Years

18 = Development of Innovative Technologies for Efficient Generation of Green/Blue Hydrogen for Realization of Carbon-neutral Society with Consideration of Industrial and Environmental Characteristics in the Region =

Establishing hydrogen production technologies that fully utilize everything from solar power to underground resources!

Adoption Fiscal Year FY 2023

Principal Investigator
Prof. SUGAI Yuichi
Faculty of Engineering,
Kyushu University

Principal Investigator
Dr. Zukhra Kadirova
Deputy Director, Uzbek-Japan Innovation Center of Youth

Development of hydrogen production technologies that make use of Uzbekistan's regional characteristics

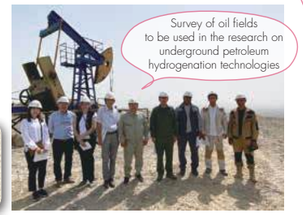
To establish a foundation for turning Uzbekistan into a hydrogen society, the project will develop a blue hydrogen production technology that produces nothing but hydrogen through the underground conversion of oil remaining in the country's old oil fields into hydrogen while sequestering byproduct CO_2 underground, a high-efficiency green hydrogen production technology that combines perovskite solar cells and steam electrolysis, and a new green hydrogen producing photocatalyst using metal slag.


Meeting concerning perovskite solar cell field tests to be conducted at the National Scientific Research Institute of Renewable Energy Sources (NSRI-RES)

Contributions to the building of a realistic and sustainable hydrogen society using existing resources

By establishing multiple hydrogen production technologies that maximize the use of resources easily procured in Uzbekistan, we will contribute to the building of a sustainable hydrogen society based on a stable hydrogen supply system. These technologies are expected to be deployed globally from Central Asian countries with similar regional characteristics as high quality technologies originating in Japan.


Fluid survey being conducted in an oil well produced from a petroleum reservoir


Survey of oil fields to be used in the research on underground petroleum hydrogenation technologies

This molecular model-like logo represents the project's philosophy of creating new values by combining hydrogen (H_2) and Uzbekistan (Uz). The symbol colors are taken from national flag of Uzbekistan and also mean green & blue hydrogen for sustainable future.

H_2Uz

Research Institutions in Uzbekistan	Uzbek-Japan Innovation Center of Youth / National University of Uzbekistan / Navoi State University of Mining and Technologies / National Scientific Research Institute of Renewable Energy Sources
Research Institutions in Japan	Kyushu University / Waseda University
Research Period	5 Years

19 = Integrated Sustainable Energy and Food Production from Microalgae-based Carbon Capture and Utilization =

Healthy people, healthy world: Transforming CO_2 with microalgae

Adoption Fiscal Year FY 2022

Principal Investigator
Team Leader
MOCHIDA Keiichi
Center for Sustainable Resource Science, RIKEN

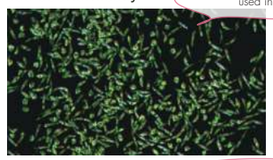
Principal Investigator
Prof. SUBROTO Toto
Padjadjaran University

Technology to make fertilizer and fermented foods from microalgae

Indonesia is highly dependent on coal for its energy, and needs to lower its carbon emissions or decarbonize its coal-fired power stations. Malnutrition among the poor is also a serious issue, and new industries that can eliminate malnutrition and contribute to healthcare are required. In this study, we are developing technology for the large-scale culture and fermentation of microalgae, hydrogen generation from biomass, and reducing emissions from coal-fired power stations by mixed burning with hydrogen-based fuel. Based on the results, we will propose economically realistic policies.

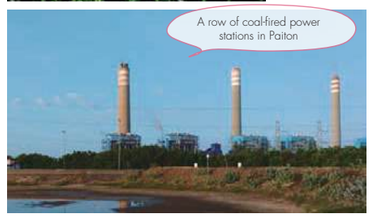

The research building of Universitas Padjadjaran, where the study equipment is located.

Euglena, a species of microalgae used in industry



Fixing CO_2 with microalgae to produce fermented foods and hydrogen-based fuel

Through the development of technologies for efficient CO_2 fixation by microalgae, for using microalgae to create high-value fermented foods, for generating green hydrogen from biomass, and for the mixed burning of biomass and hydrogen-based fuels with coal, will help reduce carbon emissions by coal-powered power plants and improve nutrition with fermented health foods.


A row of coal-fired power stations in Paiton

Research Institutions in Indonesia	Padjadjaran University / Bandung Institute of Technology / Indonesia University of Education / Gadjah Mada University / National Research and Innovation Agency / Jawa Power / Awina Sinergi International
Research Institutions in Japan	The University of Tokyo / Euglena Co.Ltd
Research Period	5 Years

20 = Development of New Ammonia Synthesis System using Renewable Energy and Hydrogen =

From the world's strongest sunlight, making the cheapest ammonia to save Africa and Japan

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. AIKA Ken-ichi
National Institute of Technology (KOSEN), Numazu College

Principal Investigator
Prof. Dmitri Bessarabov
HySA Infrastructure Centre of Competence, North-West University

Support advances in South Africa's electrolysis technology by building a new ammonia production plant with the latest Japanese technology

Visiting a HySA Infrastructure outdoor facility

South Africa depends on coal from its eastern region for 70% of its domestic energy, and also exports coal. Today, there are issues with how to green the coal and the need for a new means of distribution as a consequence. Power generated from renewable sources can only be used at the site where it is generated, and if it is changed to hydrogen this is not cheap to transport. Converted to ammonia, however, it can be transported worldwide. South Africa, which possesses cheap renewable energy and abundant precious metals for use as catalysts, and Japan, with its high-level chemical technologies, are cooperating to develop novel clean ammonia production technology with the potential to be used worldwide.

Greening South Africa's coal production industry, providing fertilizer to the African continent, and reducing Japan's and the world's CO_2

We are using solar ammonia produced in western South Africa to green coal. The ammonia can also be used to meet the shortage of fertilizer on the African continent. Japan has added ammonia to its new energies for use in place of coal-fired power, and the fruits may contribute to the development of new technologies within Japan. They may also be widely applicable in other countries.

HySA Infrastructure Center outdoor facility. The center uses shipping containers to conduct a range of research. The new ammonia production plant is also planned to be stored.

Professor Aika delivering a lecture for HySA Infrastructure staff and students

Professor Aika and lecture attendees

Research Institutions in South Africa	North-West University
Research Institutions in Japan	National Institute of Technology, Numazu College / Utsunomiya University / Chiba University / The University of Tokyo / Institute of Science Tokyo / Nagoya University / Kumamoto University
Research Period	5 Years

21 = Development of a Decarbonized Heat Energy Supply System using Ground Heat Source =

Use ground heat in arid regions to tackle both energy access and global warming!

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. INAGAKI Fumiaki
Graduate School of International Resource Sciences, Akita University

Principal Investigator
Dr. Kodirov Anvar
Director, Center for innovative development of science and technologies of the Academy of Sciences of the Republic of Tajikistan

Provide sustainable heat energy with a ground-source heat pump designed for arid regions

Tajikistan has few hydrocarbon resources and is dependent on hydroelectric power for 96% of its energy, one of the highest rates in the world. However, it still faces issues with energy access. In the cold season, demand for heating increases, straining the electricity supply, and restrictions are imposed in rural areas. Since the Soviet period the country has used coal as an alternative, but these facilities have become dilapidated and their use, however tempting, is not ideal from the viewpoints of both air pollution and global warming. We are therefore developing an energy-saving, clean ground-source heat pump designed for use in arid regions.

Survey of ground-water levels

Survey of well-drilling technology

Improving energy access and tackling global warming through the use of ground heat sources

Ground heat has not been utilized because of the low water table and poor soil water content. The development of a ground-source heat pump designed for use in arid areas (Tajikistan model), will contribute to combating global warming and tackling energy access not just in Tajikistan but also in Afghanistan and other neighboring countries.

Meeting with a well-drilling company

Kickoff symposium at the Tajikistan Academy of Sciences (June 2022)

Research Institutions in Tajikistan	Center for innovative development of science and technologies of the Academy of Sciences of the Republic of Tajikistan (CIDSNT)/ Ministry of Energy and Water Resources / Ministry of Industry and New Technology / Ministry of Health and Social Protection / Dushanbe City Office.
Research Institutions in Japan	Akita University / AIST / Tsukuba University /Hokkaido University / Toyo University / Japan Groundwater Development Co., Ltd. / Zeneral Heatpump Industry Co Ltd. / EXEO Group, Inc / D.D.L. Co Ltd
Research Period	5 Years

22 = Development of a Carbon Recycling System toward a Decarbonised Society by using Mineral Carbonation =

Absorb carbon dioxide by means of mineral carbonation, and clean up the environment at the same time

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. IIZUKA Atsushi
Graduate School of Environmental Studies, Tohoku University

Principal Investigator
Prof. Tunde Victor Ojumu
Cape Peninsula University of Technology (CPUT)

Concrete demolition debris outside of Cape Town

Develop a carbon recycling system using mineral carbonation as a step toward climate neutrality

The cement industry is taking various approaches to the reduction of CO_2 emissions. Our approach is to focus on process-related CO_2 emissions that account for 60 percent of the industry's CO_2 emissions, and to develop a carbon recycling system based on performing mineral carbonation of alkaline by-products and waste materials. The resulting carbonates are recycled for use in cement production. Resources that cannot be recycled are used as environmental purification materials, thereby creating a new circulation loop.

Use mineral carbonation to reduce carbon emissions, and contribute to the circular economy with environmental purification materials

We are advancing toward carbon neutrality by developing technologies with low CO_2 marginal abatement costs for making equipment that can easily be procured, operated, and maintained by entities in developing countries. In addition, low-cost, useful products like environmental purification materials made from alkaline by-products and waste products are being developed, and it is expected that they will be used also for the treatment of acid mine drainage.

Environmental pollution caused by acid mine drainage in South Africa

Research Institutions in South Africa	Cape Peninsula University of Technology / University of Cape Town / University of the Western Cape / Council for Geoscience
Research Institutions in Japan	Tohoku University / Seikei University / Fukuoka Institute of Technology / Taiheiyo Cement Corporation
Research Period	5 Years

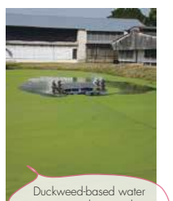
23 = Development of the Duckweed Holobiont Resource Values towards Thailand BCG Economy =

Discover the power of microbial symbiosis and help realize a resource-recycling society

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. MORIKAWA Masaaki
Faculty of Environmental Earth Science, Hokkaido University

Principal Investigator
Prof. Arinthip THAMCHAIPENET
Faculty of Science, Kasetsart University



Duckweed-based water treatment reduces carbon footprint and cuts duckweed production costs

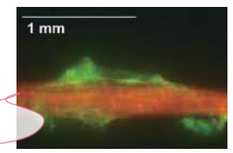
Duckweed farmer: "I wish my harvest would be more reliable …"

Establish a holobiont resource research center to study combination of duckweed and coexisting microorganisms

Contribute to the construction of a sustainable society by utilizing plants in the Lemnaceae family (duckweeds), which have high resource value and can grow in contaminated water where there is a high concentration of CO_2. Specifically, (1) create a biobank of complex organisms consisting of duckweed and coexisting microbes, (2) understand and enhance microbial symbiosis that accelerates the growth rate of duckweed, (3) develop low-carbon water treatment technologies and duckweed production technologies, (4) manufacture biofuels, bioplastics, and livestock feeds, and (5) improve edible duckweed productivity and develop highly functional foods.

Develop greenhouse gas reduction technologies and valuable resources ranging from duckweed foods to biofuel

Contribute to the Bio-Circular-Green (BCG) economic model being promoted by the Thai government and to carbon offsetting by simultaneously addressing everything from development of duckweed-based bioresources to the creation of new industries.



Microscopic view of duckweed holobiont

Courtesy visit to the president and dean of the Faculty of Science at Kasetsart University

Research Institutions in Thailand	Kasetsart University / Khon Kaen University / Chulalongkorn University / Mahidol University / Nakhon Pathom Rajabhat University / BIOTEC / NANOTEC / Advanced GreenFarm
Research Institutions in Japan	Hokkaido University / Kyoto University / Osaka University / Tohoku University / University of Yamanashi / National Institute for Environmental Studies / Saraya Co., Ltd.
Research Period	5 Years

24 = Development of Low-Carbon Affordable Apartments in the Hot-Humid Climate of Indonesia towards Paris Agreement 2030 =

Achieve comfortable living environment in Indonesia using affordable low-carbon technologies

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. KUBOTA Tetsu

Graduate School of Advanced Science and Engineering, Hiroshima University

Republic of Indonesia

Principal Investigator
Dr. Muhammad Nur Fajri Alfata

Researcher, Directorate of Engineering Affairs for Human Settlements and Housing, Ministry of Public Works and Housing

Developing low-carbon technologies suitable to hot-humid regions with the aim of implementing them in society

Under the Paris Agreement signed in 2016, developing countries have targets for reducing greenhouse gas emissions. Securing healthy, comfortable housing is a priority in countries with insufficient living standards, but low-carbon targets have to be met as well – achieving both goals is not easy. Targeting high- and medium-high-rise apartment housing, which is becoming more prevalent in Indonesia, this project develops low-carbon construction technologies suitable to hot-humid regions. It aims to have the technologies incorporated into actual buildings and into national standards and other legally-binding construction regulations.

Experimental housing built in Indonesia with vertical void inside

Meeting with the central government in Indonesia

Low-carbon apartment housing that can contribute to achieving Paris targets

By implementing both hardware and software aspects of comprehensive low-carbon technologies, this project will contribute to Indonesia for achieving its greenhouse gas reduction targets under the Paris Agreement through the application of low-carbon technologies in Indonesia's building sector. Subsequently, it will aim to expand research facilities in Indonesia and disseminate and share information with neighboring countries.

Kick-off meeting in Tokyo

Research Institutions in Indonesia	Directorate of Engineering Affairs for Human Settlements and Housing, Ministry of Public Works and Housing / City of Tegal / Agency for Meteorology, Climatology and Geophysics (BMKG) / Bandung Institute of Technology (ITB) / Indonesia University of Education (UPI) / Sepuluh Nopember Institute of Technology (ITS) / University of Brawijaya (UB) / University of Indonesia (UI) / The YKK AP R&D Center of Indonesia
Research Institutions in Japan	Hiroshima University / Institute of Science Tokyo / Kagoshima University / Shinshu University / Waseda University
Research Period	5 Years

25 = Comprehensive Solutions for Optimum Development of Geothermal Systems in East African Rift Valley =

Resolve issues slowing use of the Great Rift Valley's geothermal resources

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. FUJIMITSU Yasuhiro

Faculty of Engineering, Kyushu University

Republic of Kenya

Principal Investigator
Prof. Bernard W. IKUA

Deputy Vice Chancellor, Jomo Kenyatta University of Agriculture and Technology (JKUAT)

Olkaria II geothermal power plant, the target field of this project

Solving issues to achieve optimum development of the Great Rift Valley's unique geothermal systems

Kenya is in the process of switching its main source of power from hydropower, which is unstable due to frequent droughts, to geothermal power, which has high power generation potential and enables stable supply. This project aims to resolve issues at every stage, from planning through to actual energy use, and promote sustainable geothermal energy use in Kenya and surrounding nations through the utilization of hybrid exploration geophysics, development of models of geothermal systems unique to the Great Rift Valley, and establishment of methods of dealing with scaling in order to improve the operational efficiency of power plants, as well as by proposing scenarios for improving acceptance of geothermal heat use by society.

Geothermal well drilling rig in the Menengai area, which includes geothermal fields in this project

Contributing to achieving SDGs by utilizing geothermal heat, a stable, renewable energy source

The outcome of this project is expected to contribute to achieving the Kenyan government's goal of increasing the capacity of geothermal power generation facilities to 5,000MW by 2030 as well as contribute to the government's Kenya Vision 2030 economic development plan to turn Kenya into an industrial nation. Kenya's renewable energy based power generation makeup will also contribute to global environmental conservation.

A heated swimming pool near Olkaria II geothermal power plant. The project proposes scenarios for utilization of heat, as well as for power generation.

Research Institutions in Kenya	Jomo Kenyatta University of Agriculture and Technology (JKUAT) / University of Nairobi (UoN) / Kenya Electricity Generating Company Ltd. (KenGen) / Geothermal Development Company Ltd. (GDC)
Research Institutions in Japan	Kyusyu University / West Japan Engineering Consultants, Inc.
Research Period	5 Years

26 = Development of Advanced Hybrid Ocean Thermal Energy Conversion (OTEC) Technology for Low Carbon Society and Sustainable Energy System: First Experimental OTEC Plant of Malaysia =

Achieve sustainable power supplies using temperature differences in the ocean

Adoption Fiscal Year FY 2018

Principal Investigator
Prof. IKEGAMI Yasuyuki

Director, Institute of Ocean Energy, Saga University

Malaysia

Principal Investigator
Prof. Dato' Ir
Dr. A. Bakar Jaafar

Ocean Thermal Energy Centre, University of Technology, Malaysia (UTM)

SATREPS kick off ceremony with UTM Vice Chancellor in July 2019.

Develop an OTEC Malaysia Model with an innovative hybrid ocean thermal energy conversion system at its core

This project will conduct a demonstration of an innovative hybrid ocean thermal energy conversion system (H-OTEC) in Malaysia, a nation that has great potential for ocean thermal energy conversion. The hybrid OTEC system can resolve issues seen with conventional systems such as the cost of heat exchangers and the need for anti-fouling measures. There are high expectations for the system's ability to desalinate seawater at the same time as generating energy. This project also aims to investigate the economic viability and construct models of systems that can utilize the deepwater raised by OTEC for other purposes in addition to power generation. Furthermore, the project is planning the utilization of research outcomes in society.

OTEC system in service on Kumejima (Okinawa)is a reference point for the Malaysia Model.

Making available new sources of clean power and safe water supplies

Deep ocean water utilized by hybrid OTEC has high added value, including nutritional value. Availability of deepwater can jumpstart the creation of new industries in areas such as farming and fishing, permitting the construction of a sustainable, low carbon Malaysia Model OTEC system that is advantageous to local industry in Malaysia. This model can then be rolled out to other parts of the world, including other Asian and Pacific Island countries.

Inspecting the UTM I-AQUAS project site

Research Institutions in Malaysia	University of Technology, Malaysia(UTM) / University Putra Malaysia(UPM) / University of Malaya / University Kebangsaan Malaysia / University Malaysia Terengganu
Research Institutions in Japan	Saga University / The University of Tokyo / AIST
Research Period	5 Years

27 = Development and Dissemination of Innovative Oil-Extracting Technology from Crop Process Residue for Rural Electrification and Value Addition of By-products =

Utilize agricultural residues for rural electrification and achieving a low carbon society!

Adoption Fiscal Year FY 2018

Principal Investigator
Research Prof. / Emeritus
Prof. SAKO Takeshi

Energy System Section, Graduate School of Science and Technology, Shizuoka University

United Republic of Tanzania

Principal Investigator
Associate Prof.
Emrod Elisante

Department of Chemical and Mining Engineering, College of Engineering and Technology, University of Dar es Salaam

Japanese and Tanzanian project members

Develop technologies for extracting fuel oil from agricultural residues and efficiently using by-products

Rural areas in Tanzania have a low electrification rate, but demand is increasing for electric power to charge the growing number of mobile phones, and to provide lighting, enabling children who work on farms during the day to study at night. Many kinds of agricultural residue, such as rice bran, contain good-quality oil. This project will develop technology using CO2-expanded hexane to extract unique oils for power generation that are energy-saving and have a low environmental impact. It will also develop technology for producing high-value-added products from extraction residues.

Survey at rice mills in Morogoro

Contributing to the supply of power in rural Tanzania by extracting oil from agricultural residues

This project aims to will contribute to the rural electrification of Tanzania using renewable energy and provide a model for achieving a sustainable, low carbon society. Generation of electricity using oil extracted from oil-bearing agricultural residues will provide power to rural areas. Manufacture of products such as soap from part of the extracted oil will also open the way towards employment and cash earnings in rural areas.

Rice bran piled up near a rice mill

Research Institutions in Tanzania	University of Dar es Salaam / Sokoine University of Agriculture
Research Institutions in Japan	Shizuoka University / Central Research Institute of Electric Power Industry / Nihon University
Research Period	5 Years

SATREPS 2024

Bioresources

28 = Development of Sustainable Seaweed Based Functional Products for Promoting Blue Economy =

Promoting the blue economy by utilizing seaweed resources!

Adoption Fiscal Year (FY 2023)

Development of fundamental technologies to sustainably produce functional products using seaweed

In Indonesia - the world's second largest producer of commercial seaweed and a place where a variety of unutilized seaweed species can be found - there are high expectations for the sustainable and advanced utilization of seaweed resources. The project will develop and consolidate academic knowledge for the efficient and environmentally friendly production of high value-added functional products made from seaweed in the food industry and other fields. Advanced seaweed cultivation methods and processing technologies will be developed using the knowledge gained, as well as production base technologies for the industrial utilization of seaweed resources.

Promotion of the blue economy through the development of functional products using seaweed

A fundamental model for the advanced use of seaweed in Indonesia will be built that globally promotes sustainable marine economy activity, the "Blue Economy," by encouraging the multifaceted industrial use of seaweed resources through the development of a series of fundamental technologies from seaweed cultivation to processing and manufacturing of functional products, as well as through environmental impact assessments and economic analysis.

* Blue economy: Sustainable economic activity related to oceans and marine environments.

Research Institutions in Indonesia	National Research and Innovation Agency (BRIN) / Hasanuddin University / Sahid University
Research Institutions in Japan	University of Tsukuba / Kyoto University
Research Period	5 Years

Principal Investigator
Prof. ICHIKAWA Sosaku

Institute of Life and Environmental Sciences, University of Tsukuba

Principal Investigator
Prof. Hari Eko IRIANTO

Research Center for Marine and Land Bioindustry, National Research and Innovation Agency (BRIN)

29 = Establishment of an Alert System for Fusarium oxysporum f. sp. cubense, the Banana and Plantain Wilt Pathogen, and Mitigation Strategy of the Disease =

Stop the invasion and spread of banana wilt from threatening the banana industry!

Adoption Fiscal Year (FY 2022)

Propose a comprehensive package to control banana wilt with low environmental impact

We are proposing the following to local governments in the La Selva region of Peru as a comprehensive package to control banana wilt, a disease that causes crippling damage to bananas: (1) banana wilt diagnosis systems at the field and molecular levels; (2) obtaining banana lines that are resistant/resilient to banana wilt as a result of mutagenesis; (3) a disease-free sapling production/distribution system; (4) investigation of microbial ecosystems forming disease-suppressing soil; and (5) disease control methods with a low environmental impact, combining methods such as bio-pesticide.

Banana wilt in a banana field in the La Selva region of Peru has turned the leaves yellow and wilted. The inset at the bottom right shows how the vascular bundles have turned brown.

Ensure stable banana production and help improve farmers' standard of living

In the banana-producing region of the Selva, Peru, personnel (technicians) are being trained to advise farmers on the basis of the comprehensive package to control banana wilt, which has been adopted as technology for widespread use and is being utilized by farmers. This is helping to improve the standard of living of small-scale farmers in the Selva.

Interview with farmers and advisers in a small-scale banana farm in the La Selva region of Peru.

Research Institutions in Peru	Universidad Nacional Agraria La Molina (UNALM) / Instituto Nacional de Innovacion Agraria (INIA) / Universidad Nacional de la Selva (UNAS)
Research Institutions in Japan	Tokyo University of Agriculture and Technology (TUAT) / Japan International Research Center for Agricultural Sciences (JIRCAS) / Tottori University (TU)
Research Period	5 Years

Principal Investigator
Prof. ARIE Tsutomu

Institute of Agriculture, Tokyo University of Agriculture and Technology (TUAT)

Principal Investigator
Prof. Liliana Aragon Caballero

Universidad Nacional Agraria La Molina (UNALM)

30 = Recovering High-Value Bioproducts for Sustainable Fisheries in Chile (ReBiS) =

Create a new industry by effectively recovering bioproducts from fisheries waste!

Adoption Fiscal Year (FY 2022)

Establish the technology and manufacturing foundations for high-value bioproducts from fisheries processing waste

In Coquimbo, Chile, which has a flourishing fishing industry, 14,000 tons of fisheries waste from Humboldt squid, shrimp and langoustine processing is thrown away every year; however, this fisheries waste contains a large amount of high-value bioproducts. To utilize these discarded bioproducts, we are studying the substances that comprise these biomaterials in detail and establishing processes for their purification and manufacture. We are also working toward the development and application of novel biomaterials synthesized from fine bioproducts.

Establish a localized circular economy on fishery resources in Chile

Progress is being made in the assessment and identification of high-value bioproducts in fisheries waste, the establishment of manufacturing processes for fine bioproducts, the development of novel biomaterials, and enhanced networking with those involved in the supply chain for fine bioproduct manufacture, and the recovery of fisheries waste is being promoted by the development of a localized circular economy in Chile.

Research Institutions in Chile	University of La Serena / Universidad Católica del Norte
Research Institutions in Japan	Hokkaido University / National Institute of Technology, Tomakomai College / Hokkaido Research Organization / Hokkaido Soda Co., LTD.
Research Period	5 Years

Principal Investigator
Prof. ONODA Akira

Faculty of Environmental Earth Science, Hokkaido University

Principal Investigator
Assoc. Prof. Ronny Martinez

Department of Food Engineering, University of La Serena

31 = Breeding Innovation in Chili Pepper and Tomato to Accelerate Sustainable Vegetable Production in Tropical Regions =

Achieve sustainable vegetable production in tropical regions using advanced breeding technology!

Adoption Fiscal Year (FY 2022)

Cultivation of Tomatoes for creation of mutant pools (at Universitas Padjadjaran)

Cultivation of chili peppers for creation of mutant pools (at Universitas Padjadjaran)

Establishing advanced breeding platform for sustainable vegetable production in Tropical Regions.

To ensure food security in preparation for rapid climate change, improve farm income, and promote public health, sustainable production and supply of vegetables is essential in tropical regions where rapid population growth and economic growth are expected in future. The project therefore aims to build an innovative breeding platform using advanced molecular breeding and genome editing technology that can rapidly develop heat tolerant tomatoes and disease resistant chili peppers in Indonesia, facing climate change in the tropical regions.

Contribution to sustainable vegetable production in Indonesia and other tropical regions of the world

We will establish The Center of Advanced Breeding Technique (CAB-Tech) during the project as a core center for accelerating the vegetable breeding process as well as a basis for promoting the use of new cultivars. The CAB-Tech will enable to develop various vegetable cultivars suitable for tropical environments in the future. Using Indonesia as a model country, we will contribute to sustainable vegetable production in the tropical regions of the world.

Research Institutions in Indonesia	Universitas Padjadjaran / National Research and Innovation Agency
Research Institutions in Japan	University of Tsukuba / Japan International Research Center for Agricultural Sciences (JIRCAS) / Miyagi University
Research Period	5 Years

Principal Investigator
Associate Prof.
KANG Seung Won

Institute of Life and Environmental Sciences, University of Tsukuba

Principal Investigator
Associate Prof.
Nono Carsono

Faculty of Agriculture, Universitas Padjadjaran

32 = The Establishment of an Immediate Rice Variety Development System using Anther Culture and Citizen Science =

Collaboration Between Farmers and Scientists Enables Rapid Development and Dissemination of Rice Varieties!

Adoption Fiscal Year (FY 2022)

Principal Investigator
Prof. KONDO Takumi

Research Faculty of Agriculture, Hokkaido University

Principal Investigator
Principal Agricultural Research Officer
Mr. Musika CHITAMBI

Zambia Agricultural Research Institute (ZARI)

Breeding high-quality rice

Building an Immediate Rice Variety Development System through Anther Culture and Citizen Science

Similar to other Sub-Saharan African countries, Zambia has a majority of its population residing in rural areas, with a significant portion living in poverty. The country is experiencing a rapid increase in rice demand, presenting an opportunity to enhance farm income through the promotion of rice cultivation. In agricultural technology development, sustainability and alignment with the local natural, social and economic environment are crucial. This research aims to establish a system for immediate rice variety development and dissemination that adapts to the local natural, social and economic conditions. By combining citizen science by active participation of farmers who are capable innovator, anther culture and basic technology of breeding, we seek to create a system that addresses the evolving needs of the local natural, social and economic conditions.

Test fields at the counterpart institution

Meeting with a rice-growing farmers' group

Contributing to the Establishment of a Short-Term Rice Breeding System in Africa

The immediate rice variety development system being established in the Republic of Zambia is expected to extend to other Sub-Saharan African countries. Through short-term rice variety breeding, promising breeding lines that qualify as candidates for variety registration will be consistently developed. This will also facilitate agricultural development and activities based on these breeding lines, contributing to poverty reduction in rural areas.

Collaborating with farmers

Research Institutions in Zambia	Zambia Agricultural Research Institute / University of Zambia
Research Institutions in Japan	Hokkaido University / University of Ryukyus/Tokyo University of Agriculture / Tohoku University / Rakuno Gakuen University / Japan International Research Center for Agricultural Sciences
Research Period	5 Years

33 = Creation of Beef Value Chain by Optimizing Ruminal Microbiota and Grassland Management on Digital Platform =

Enabling sustainable beef production by eliciting the power of cattle and grasslands on a digital platform!

Adoption Fiscal Year (FY 2021)

Principal Investigator
Prof. OHKURA Satoshi

Graduate School of Bioagricultural Sciences, Nagoya University

Principal Investigator
Dr. Lorena Aguayo Ulloa

AGROSAVIA

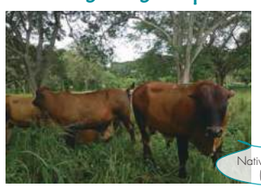
Develop smart livestock production technology using locally diverse livestock resources

In this study, we will provide smart livestock production technology to ranchers in Colombia, which has a competitive beef production industry, offering them a digital platform that small-scale farmers can use to increase their income to improve beef productivity in a tropical region with a dry season. Furthermore, we aim to utilize the genetic diversity of the ruminal microbiota and grassland diversity, which are closely linked to productivity, to enable the preservation and sustainable use of the pasture ecosystems where livestock is mainly let out to graze and to contribute to regional development through value-added livestock production.

Beef cattle grazing in a Colombian meat-cluster region

Creating a digital platform that contributes to beef production system optimization

A digital platform that provides traceability for Colombian beef will increase the productivity of local livestock communities and provide a digital certification of beef quality. Going forward, this will contribute to adopting the smart livestock regional model that supports the optimization of the beef production structure by utilizing regional characteristics.



Native Colombian beef cattle (Romosinuano cattle)

Consultation with ranchers in a Colombian meat-cluster region

Research Institutions in Colombia	AGROSAVIA / FEDEGAN / CIAT
Research Institutions in Japan	Nagoya University / Chubu University
Research Period	5 Years

34 = Development of Breeding and Water Management Technologies for Safe and Nutritious Rice Production =

Enabling the production of safe, nutritious rice in the world's most arsenic-polluted region!

Adoption Fiscal Year (FY 2021)

Principal Investigator
Associate Prof.
KAMIYA Takehiro

Graduate School of Agricultural and Life Sciences, The University of Tokyo

Principal Investigator
Prof. Md. Rafiqul Islam

Department of Soil Science, Bangladesh Agricultural University

Bangladesh Agricultural University test plot

Pump drawing up arsenic-containing groundwater for irrigation

Lay the foundations for breeding high nutritional value/low arsenic content rice and develop cultivation technology

Bangladesh is one of the world's leading growers and consumers of rice. This means that health damage caused by ingesting a poisonous element (arsenic) via rice consumption is a major social concern, as are deficiency diseases (hidden hunger) caused by the low levels of trace nutrients (iron and zinc) in rice. In this project, we are aiming to use breeding and water management technologies to establish technologies for the production of safe rice with a low arsenic content and rice with high nutritional value containing high levels of iron and zinc.

Making safe, healthy rice the norm!

Establishing technologies for breeding and cultivating safe, highly nutritious rice and encouraging their adoption in Bangladesh will improve the health of the population. The technologies obtained in the course of this project can also be used in other regions of the world facing similar problems.

Interviewing farmers in an arsenic-contaminated area

Research meeting at Bangladesh Agricultural University

Research Institutions in Bangladesh	Bangladesh Agricultural University (BAU) / Bangladesh Rice Research Institute (BRRI) / Bangladesh Institute of Nuclear Agriculture (BINA) / Department of Agricultural Extension (DAE)
Research Institutions in Japan	The University of Tokyo / The National Agriculture and Food Research Organization (NARO) / Akita Prefectural University
Research Period	5 Years

35 = Establishment of Nitrogen-efficient Wheat Production Systems in Indo-Gangetic Plains by the Deployment of BNI-technology =

Using the power of plants to reduce fertilizer waste and create a healthier global nitrogen cycle!

Adoption Fiscal Year (FY 2021)

Principal Investigator
Dr. TOBITA Satoshi

Specially Assigned Investigator, Japan International Research Center for Agricultural Sciences (JIRCAS)

Principal Investigator
Dr. Arun Kumar Joshi

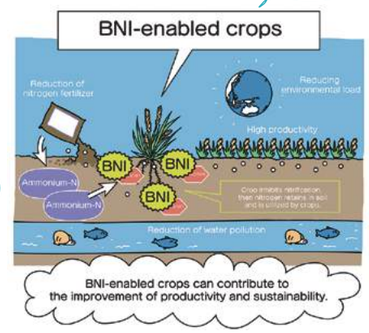
Managing Director of Borlaug Institute for South Asia (BISA)

Introduce BNI-enabled wheat varieties with improved nitrogen utilization to India

Start of BNI-enabled wheat system growth on a test wheat plot in the eastern Indo-Gangetic plain

Almost half of the nitrogen fertilizer used in crop production is lost to the environment, which causes water pollution and contributes to global warming. In crops with the improved ability of biological nitrification inhibition (BNI), BNI substances secreted from the roots inhibit the nitrification process in the soil, which improves the nitrogen utilization rate and enables a high yield maintained with the application of less fertilizer. We are raising wheat varieties with high BNI function and introducing them into the wheat cultivation systems of the Indo-Gangetic plain in India, where large amounts of fertilizer are currently applied, and will evaluate their effectiveness from environmental and economic perspectives.

Overview of BNI technology (©Science Manga)



Reducing the amount of fertilizer has a double benefit to the local economy and the global environment.

The reduction in fertilizer use as a result of the introduction of BNI-enabled wheat varieties should have a positive effect not only on the wheat cultivators of the Indo-Gangetic plain but also on the Indian economy, which pays out large amounts in fertilizer subsidies. It should also decrease N_2O gas emissions and nitrate leaching from agricultural land, creating a healthier global nitrogen cycle.

Even with low nitrogen, BNI-enabled wheat (left) exhibits better absorption and higher yield than the original variety (right). (Tsukuba)

Research Institutions in India	Borlaug Institute for South Asia (BISA) / Indian Institute of Wheat and Barley Research (IIWBR) / Indian Agricultural Research Institute (IARI) / Central Soil Salinity Research Institute (CSSRI)
Research Institutions in Japan	Japan International Research Center for Agricultural Sciences (JIRCAS) / Tottori University / National Agriculture and Food Research Organization (NARO)
Research Period	5 Years

36 = Eco-engineering for Agricultural Revitalization Towards improvement of Human nutrition (EARTH): Water Hyacinth to Energy and Agricultural Crops =

Use aquatic plant biomass as a valuable resource, and solve ecosystem, social, and health problems all at once

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. SATO Shinjiro

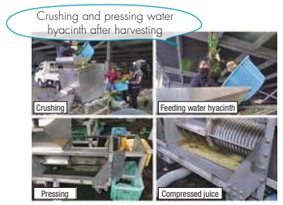
Department of Science and Engineering for Sustainable Innovation, Faculty of Science and Engineering, Soka University

Principal Investigator
Assoc. Prof.
Solomon Addisu Legesse

College of Agriculture and Environmental Sciences, Bahir Dar University

Development of technologies for converting water hyacinth to energy, nutrients and agricultural products

Utilizing remote sensing and AI technology, the project will develop a sustainable harvesting model for water hyacinth, which is partly choking Ethiopia's largest lake, Lake Tana. The aim is to use methane fermentation treatment to recover energy and nutrients from the harvested water hyacinth, use the recovered energy and nutrients for mass cultivation of microalgae (spirulina) that are attracting attention as a superfood, and develop nutritional supplements derived from spirulina together with local companies. Integrating interdisciplinary research conducted in Japan, we will work to establish technologies for the effective utilization of waste materials as valuable resources.



Help improve health and nutrition in Ethiopia to address the wide-ranging issue of "hidden hunger"

We aim to build a sustainable water hyacinth management system using ICT, providing a model for approaches using water hyacinth to eventually solve ecosystem and social problems. In addition, the development of spirulina-derived dietary supplements and adoption of such supplements in Ethiopia will help to alleviate the country's health and nutrition problems.

Research Institutions in Ethiopia	Bahir Dar University / Injibara University / Lake Tana and Other Water bodies Protection and Development Agency
Research Institutions in Japan	Soka University / The University of Shiga Prefecture / Lake Biwa Environmental Research Institute
Research Period	5 Years

37 = Project for Development of Complex Technologies for Prevention and Control of Rubber Tree Leaf Fall Diseases =

Protect rubber trees from leaf fall diseases by using a multifaceted scientific approaches

Adoption Fiscal Year FY 2020

Principal Investigator
Group Director
MATSUI Minami

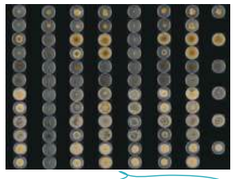
Center for Sustainable Resource Science, RIKEN

Principal Investigator
Dr. Suroso Rahutomo

Indonesian Rubber Research Institute Director

Connect rubber-producing countries and consuming countries through early-stage measures against rubber tree leaf fall diseases

Infection of rubber leaf fall diseases has been widely spread in Southeast Asian countries and causes serious damage to rubber production. Through cooperation with Indonesian Rubber Research Institute and Universitas Indonesia, we aim to exterminate the disease by chemical and microbial pesticides, establish a genome-assisted breeding technology, and detect infected areas in the early stages by using images from satellites and drones, and prevent leaf blight and control the spread of infections.Through this link between Japan and a resource-producing country, we will also produce research leaders who can contribute to breeding that takes advantage of modern science and technology as well as local resources.



Enabling stable supply of natural rubber that meets growing global demand

Southeast Asia supplies more than 90 percent of the world's natural rubber. Because Southeast Asian rubber trees are reproduced by clonal propagation, they end up being infected with the same diseases. By sharing the technology we develop with countries that produce natural rubber, the project will contribute to realizing stable supplies of natural rubber that meet the world's demand and stable livelihoods for rubber farmers.

Research Institutions in Indonesia	Indonesian Rubber Research Institute / Universitas Indonesia
Research Institutions in Japan	RIKEN Center for Sustainable Resource Science / Gifu University / RIKEN Center for Advanced Photonics(RAP) / Maebashi Institute of Technology
Research Period	5 Years

38 = Development of Novel Disease Management Systems for Banana and Cacao =

Bring new ideas to the fight against intractable banana and cacao crop diseases!

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. WATANABE Kyoko

College of Agriculture, Tamagawa University

Principal Investigator
Dr. Parsons N. Hail

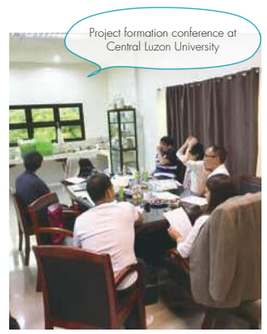
Associate Professor of Communication and Development Studies, Director of International Affairs Ofiice, Central Luzon State University (CLSU)

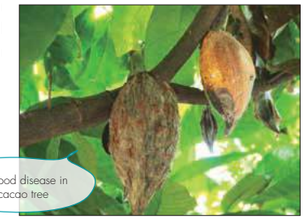
Development of new technological systems that control major diseases affecting bananas and cacao

Bananas and cacao are important crops for food security and economic development in developing countries, but they are subject to intractable diseases for which control methods have not been established. In order to rein in these diseases, we propose to introduce comprehensive disease control management systems by developing diagnostic kits and disease outbreak prediction apps, and by optimizing methods of biological soil disinfestation, fertilizer management and cultivation management. In addition, we intend to collect various fungi, including pathogens, from banana and cacao plantations, to construct a microbe library and make effective use of microbial resources.

Contribute to sustainable banana and cacao production by developing disease management systems

The Philippines is a major producer of bananas for export, and is also focusing on cacao production. By preventing diseases in these crops, which are both considered important crops throughout the world, and by achieving sustainable production, we aim to prevent economic losses stemming from decreased crop yields. In addition, we aim to help reduce environmental pollution and damage to the health of the local population resulting from improper application of agricultural chemicals.





Research Institutions in Philippines	Central Luzon State University (CLSU)
Research Institutions in Japan	Tamagawa University / Tokyo University of Agriculture and Technology
Research Period	5 Years

39 = Restoration of Pastureland by Effective Usage of Wild Forage Plants based on Traditional Knowledge of Nomadic Mongolians =

Boost the sustainability of Mongolian livestock farming using traditional knowledge of nomadic Mongolians

Adoption Fiscal Year FY 2019

Principal Investigator
Project Researcher
ASAMI Tadao

Graduate School of Agricultural and Life Sciences, The University of Tokyo

Principal Investigator
Prof. Javzan BATKHUU

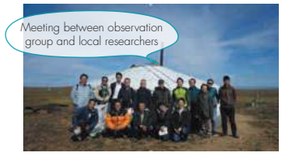
National University of Mongolia, School of Engineering and Applied Science

Using traditional knowledge of nomadic Mongolians to maintain the health of livestock and restore Mongolia's degraded grasslands

This project gathers the rich knowledge and oral traditions of nomadic Mongolians regarding Mongolian grassland flora's effectiveness in restoring livestock health and degraded grasslands, selects useful grassland flora, and scientifically demonstrates their usefulness by investigating the chemical compounds and new genes that give them their restorative effectiveness. It also preserves grasslands and livestock health using grassland flora that grows well and is effective in maintaining good health by 'diagnosing' exhausted Mongolian grasslands and 'treating' them by establishing and deploying methods of cultivation for the selected flora.

Improving livestock farming productivity through more extensive use of pasture that is resistant to climate change and maintains good health

This project will develop the pastoral livestock farming industry through restoration of degraded Mongolian grasslands that have been improved through the scientific use of traditional knowledge of nomadic Mongolians and the spread of grassland flora that improves the productivity of grasslands degraded by overgrazing and contributes to livestock health. The application of this methodology will contribute to the revitalization of nomadic pastoral industries facing similar issues around the world.



Research Institutions in Mongolia	National University of Mongolia / Mongolian University of Life Sciences (Research Institute of Animal Husbandry / Institute of Veterinary Medicine (IVM) / Center for Ecosystem Studies (CES)) / Ministry of Food, Agriculture and Light Industry / SHINE ANGIRT Co., Ltd / MONOS Group Company
Research Institutions in Japan	The University of Tokyo / Kyoto University / Tohoku Medical and Pharmaceutical University / National Agriculture and Food Research Organization
Research Period	5 Years

40 = Strengthening of Resilience in Arid Agro-Ecosystems Vulnerable to Climate Change, Through Research on Plant Resources and Technological Applications =

Address climate change with quinoa, a highly nutritious crop that withstands harsh environments

Adoption Fiscal Year FY 2019

Principal Investigator
Dr. FUJITA Yasunari

Program Director, Food Program, Japan International Research Center for Agricultural Sciences (JIRCAS)

Principal Investigator
Prof. Giovanna Rocío Almanza Vega

Chemical Research Institute, Universidad Mayor de San Andrés

Developing and disseminating sustainable quinoa production technology to cope with climate change

Quinoa is highly nutritious, and it is the only crop that can be cultivated in the highlands of Bolivia that lie at an elevation of approximately 4,000 meters, an extremely unfavorable environment with saline soil, droughts, and frost. However, quinoa production is currently at risk due to issues such as soil erosion caused by frequent extreme weather and the expansion of farmlands. This project develops and introduces sustainable quinoa production technology through the establishment of genetic resources for quinoa, development of new breeding lines with enhanced resilience, management of fallow land, and coordinated crop-livestock production.

Contributing to global food security with a superfood native to the Andes

This project will contribute to stable food production and improved national income in Bolivia through the development and spread of sustainable quinoa production technology. Global food security is expected to be enhanced through the application of technology developed in this extremely adverse environment to other arid regions throughout the world at risk of desertification, as well as to a wide variety of farming environments.

Research Institutions in Bolivia	Universidad Mayor de San Andrés (UMSA) / Fundación PROINPA
Research Institutions in Japan	Japan International Research Center for Agricultural Sciences (JIRCAS) / Kyoto University / Tokyo University of Agriculture and Technology / Obihiro University of Agriculture and Veterinary Medicine
Research Period	5 Years

41 = The Acceleration of Livestock Revolution in Thailand aiming to be the Kitchen of the World through the Development of Novel Technologies for Stable Livestock Production and Food Safety =

Achieve sustainable livestock production by a new infectious disease control technology

Adoption Fiscal Year FY 2019

Principal Investigator
Specially Appointed Prof. MISAWA Naoaki

Center for Animal Disease Control (CADIC), University of Miyazaki

Principal Investigator
Dr. CHINTAPITAKSAKUL Lerdchai

Director, National Institute of Animal Health (NIAH), Department of Livestock Development, Ministry of Agriculture and Cooperatives, Thailand

Establishing a new system for infectious disease control in livestock and developing a safe meat production technology

Foot-and-mouth disease (FMD) and other major livestock infectious diseases are causing export restrictions and decline of livestock productions. This project, in Thailand who aims to be the Kitchen of the World, applies experiences learned from controlling FMD outbreak in Miyazaki Prefecture. In cooperation with government agencies and veterinary universities, a multi-diagnostic system for major infectious livestock diseases and a food poisoning bacteria elimination technology from the poultry are to be developed, and an epidemic prevention system based on the disease dissemination mathematical model is to be established. Through these research and training programs, this project strives to foster experts who can contribute to livestock epidemic prevention in the globalized era.

Promoting a stable and sustainable livestock production and a safe meat supply

This project establishes technology for controlling livestock infectious diseases such as FMD in Thailand. Thailand, who plays a leading role in ASEAN, will influence the neighboring countries after implementing this technology that consequently contributes to a stable and safe livestock supply worldwide.

Research Institutions in Thailand	Department of Livestock Development, Ministry of Agriculture and Cooperatives, Thailand / Chulalongkorn University / Mahidol University / Chiang Mai University / King Mongkut's University of Technology Thonburi / National Institute of Animal Health
Research Institutions in Japan	University of Miyazaki / Tokyo University of Agriculture and Technology / Hokkaido University / Kaijo Corporation / Nipponham Foods Ltd. / Kanematsu Corporation
Research Period	5 Years

42 = Development of Climate Change Resilient Innovative Technologies for Sustainable Wheat Production in the Dry and Heat Prone Agro-ecologies of Sudan and Sub-Saharan Africa =

Contribute to resolving food shortages by developing heat-tolerant wheat

Adoption Fiscal Year FY 2018

Principal Investigator
Specially Appointed Prof. TSUJIMOTO Hisashi

Arid Land Research Center, Tottori University

Principal Investigator
Associate Prof. Izzat Sidahmed Ali Tahir

Wheat Research Program, Agricultural Research Corporation, Sudan

Quickly breed high-quality wheat lineages adaptable to Africa's climate

Demand for wheat is on the rise in Sub-Saharan Africa, but production is failing to meet demand. This project employs heat-tolerant lineages derived from wild relatives, identifying their quantitative loci and developing selection markers, and then developing lineages with no quality degradation. It will also develop technology for tolerance selection using metabolites as indicators, and growth models matching future climate change scenarios. To achieve this, the project will set up molecular breeding facilities and an innovation platform in Sudan.

Contribute to resolving food scarcity in Africa by creating varieties that can withstand harsh climates

The project will develop highly accurate selection technology at the molecular breeding facilities that are established, and enable speedy dissemination of new varieties through an innovation platform. It is expected to contribute to food security by developing varieties of wheat suited to the dry and heat-prone agro-ecologies of Sub-Saharan Africa, which are expected to experience even harsher conditions in the future.

Research Institutions in Sudan	Agricultural Research Corporation, Sudan / Sudan Meteorological Authority
Research Institutions in Japan	Tottori University
Research Period	5 Years

43 = Utilization of Thailand Local Genetic Resources to Develop Novel Farmed Fish for Global Market =

Build Thailand's status as the Kitchen of the World by farming local fish and shellfish

Adoption Fiscal Year FY 2018

Principal Investigator
Prof. HIRONO Ikuo

Faculty, Department of Marine Biosciences, Tokyo University of Marine Science and Technology

Principal Investigator
Ms. Montakan Tamtin

Director, Coastal Aquaculture Research and Development Division, Department of Fisheries, Ministry of Agriculture and Cooperatives, Thailand

Select useful groups from fish and shellfish native to Thailand for breeding and preservation

Production of food resources from fish farming is important because half the marine products used for food that are consumed in the world come from fish farming. This project will conduct genome-based breeding to select for useful traits in Asian sea bass and banana prawn, which are indigenous to Thailand. The aim is to make these species into major farmed marine products that can hold a top position in the international market, as well as to develop infectious disease prevention methods, fortified feed, and all-female prawn production technology. The project will also develop technology for preserving diverse genetic resources in perpetuity and for regenerating the species from these resources at any time.

Contribute to food security by developing farming methods, including domestication!

The project will develop production technologies (genome-based breeding and vaccines, etc.) for Asian sea bass and banana prawns, including domestication, in order to make both species into major marine products on the international market. It will be possible to preserve gene resources in perpetuity on the cellular and tissue level. The project aims to lead to a stable supply of highly nutritious fish and shellfish farmed in a way that has a low impact on the natural ecosystem.

Research Institutions in Thailand	Department of Fisheries, Ministry of Agriculture and Cooperatives, Thailand / National Center for Genetic Engineering and Biotechnology, Thailand National Science and Technology Development Agency / Kasetsart University / Chulalongkorn University / Walailak University / Suranaree University of Technology /Prince of Songkla University
Research Institutions in Japan	Tokyo University of Marine Science and Technology / Japan International Research Center for Agricultural Sciences / Japan Fisheries Research and Education Agency / Kanagawa University / Mie Prefectural Fish Farming Center
Research Period	5 Years

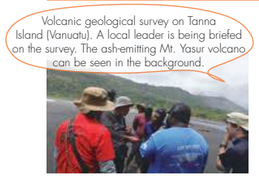
SATREPS 2024

Disaster Prevention and Mitigation

44 = Disaster Risk Reduction of Widespread Volcanic Hazards in Southwest Pacific Countries =

Volcanic island nations working together to reduce the risk of eruption and tsunami disasters!

Adoption Fiscal Year FY 2023



Mitigating disasters through knowledge of past and present volcanic activity in the southwest Pacific Ocean

The January 2022 eruption of a submarine volcano in the Kingdom of Tonga and the following tsunami had a global impact, and highlighted the importance of monitoring, forecasting, and countermeasures for volcanic activity in the ocean areas around islands. This project aims to elucidate the history and characteristics of volcanic eruptions and tsunamis in the southwest Pacific Ocean, and to develop techniques for understanding current volcanic activity. Tonga, Fiji, and Vanuatu will collaborate to utilize these technologies to mitigate disasters. The island countries work together, discussing and building improvement measures on the problems of human resource shortages and disaster countermeasures.

The establishment of a trilateral collaboration platform to mitigate the risk of wide-area volcanic eruptions and tsunami disasters

New knowledge and observation technologies will be created concerning volcanic eruptions in island and sea areas where observation data and understanding are limited. The outputs will be applicable to volcanoes in island and sea areas in Japan and the world. In addition, the issue of limited human resources in island countries will be overcome through regional collaboration, and a sustainable human resource development system will be built.

Research Institutions in Tonga, Vanuatu, Fiji	Tonga Geological Services / Vanuatu Meteorology and Geo-hazards Department / Mineral Resource Department of Fiji
Research Institutions in Japan	The University of Tokyo, Tohoku University, Mount Fuji Research Institute Yamanashi Prefectural Government
Research Period	5 Years

45 = Compound Disaster Risk Reduction associated with Large Earthquakes and Tsunamis =

Protecting international port cities from compound disasters with domino-style chains of destruction!

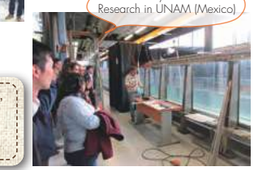
Adoption Fiscal Year FY 2023

Science, engineering, and the social sciences come together to reduce the risk of compound disasters in international port cities caused by earthquakes and tsunamis

When international port cities are hit by earthquakes and tsunamis, in addition to direct damage, there are compounding effects such as tsunami fires, hazardous material spills, and economic stagnation from the disruption to logistics networks. In this research project, earthquake scenarios are developed based on seafloor, land-based, and geodetic observations, and compound disaster risks are evaluated based on earthquake and tsunami simulations. Infrastructural countermeasures, risk management and evacuation strategies are then proposed with the aim of implementing these in society through communication with relevant organizations and residents.

The development of risk assessment methods and proposal of risk reduction measures

The project will develop a comprehensive compound disaster risk assessment methodology together with counterpart researchers, propose risk reduction measures, and promote investment in disaster risk reduction by national and local governments as well as the private sector through communication efforts. In the long run, the developed methodology will contribute to the disaster risk reduction of international ports in Japan and around the world.



Research Institutions in El Salvador	University of El Salvador / Centroamerican University José Simeón Cañas / General Direction of Hazard Observation, Ministry of Environment and Natural Resources / General Direction of Civil Protection, Ministry of Internal Affaires
Research Institutions in Mexico	National Autonomous University of Mexico / National Disaster Prevention Center
Research Institutions in Japan	Kyoto University / University of Tokyo / Kobe University
Research Period	5 Years

46 = Establishment of a Research and Education Complex for Developing Disaster-resilient Societies - MARTEST =

Use disaster mitigation science to reduce the damage from massive active-fault earthquakes!

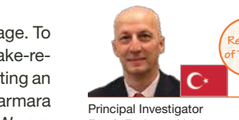
Adoption Fiscal Year FY 2022

Building a resilient society through earthquake-resistance technology and earthquake risk assessments

Türkiye has many vulnerable structures, and has experienced severe earthquake damage. To mitigate this earthquake damage, in this project we are conducting research on earthquake-resistance technology, developing an earthquake and tsunami scenario platform, conducting an earthquake risk assessment for the anticipated North Anatolian Fault earthquake (Marmara earthquake) through observational and measurement studies, and promoting earthquake-resistance measures. We are also working to encourage disaster mitigation education using simulation studies and the visualization of disaster images by means of information technology, and enabling the adoption of procedures for proposing recovery plans based on these disaster images.

Preparing for the anticipated Marmara earthquake through disaster mitigation science

Through AFAD (the Turkish disaster management agency), we are contributing to the creation of an earthquake-resilient society by promoting earthquake-resistance technology and training earthquake engineers. This is raising awareness of the risk of the anticipated Marmara earthquake and encouraging the formulation of reconstruction plans by the government. These research outcomes will be extended to Japan, Türkiye, and neighboring countries, helping to build resilient societies.



Research Institutions in Türkiye	Gebze Technical University / Middle East Technical University / Hacettepe University / Yildiz University / KOERI, Bogazici University / Istanbul University-Cerrahpaşa / AFAD (Ministry of Interior Disaster and Emergency Management Presidency / Türkiye Earthquake Foundation / Turkish Red Crescent (TURKKIZILAY).
Research Institutions in Japan	Kagawa University / Nagoya University / The University of Tokyo / Chuo University / University of Hyogo
Research Period	5 Years

47 = Real-Time Lightning 3D Imaging and Forecasting Project for Sustainable and Reliable Supply of Energy and Storm Disaster Early Warning =

Mitigating the damage caused by 200 lightning days a year by nowcasting with advanced observation network

Adoption Fiscal Year FY 2022

3D imaging of the electric charge distribution in thunderclouds in real time

We are conducting lightning observations on various frequencies of electromagnetic waves, and establishing an observation network to image whole lightning channel development in detail from the micro-discharge in clouds that are precursors of lightning discharge start, how they develop, and where they terminate. We can estimate the locations and the amount of neutralizing charge inside thunderclouds. We are verifying the results of these estimations and improving their accuracy by using the lightning return-stroke current waveforms measured from lightning strikes on tall buildings and in rocket-triggered lightning experiments, to enable the nowcasting of lightning activity.

Use sophisticated lightning data to enable a stable electric power supply and an early warning system for severe weather disaster

Use highly accurate lightning observations and short-term prediction data to switch to a backup power source in places where an outage or voltage fluctuations cannot be permitted, or to maintain power and communications equipment. Investigate the association between lightning activity and rainfall, leading to early warning of heavy precipitation that may cause flood and other damage. Extend these results from the Malacca Strait coastline to neighboring regions.

Research Institutions in Malaysia	Universiti Teknikal Malaysia Melaka / Universiti Tenaga Nasional
Research Institutions in Japan	Kindai University / Chubu University / OTOWA ELECTRIC CO., LTD. / The University of Electro-Communications / Gifu University / University of Fukui
Research Period	5 Years

48 = Numerical Weather Prediction and Warning Communication System for Densely Populated and Vulnerable Cities =

Protecting people against disaster by predicting intense rainstorms and flooding!

Adoption Fiscal Year FY 2021

Disaster mitigation education at a school close to the San Roque dam, near Córdoba.

Principal Investigator
Chief Scientist
MIYOSHI Takemasa

Prediction Science Laboratory, RIKEN Cluster for Pioneering Research

Argentine Republic

Principal Investigator
Dr. Yanina García Skabar

Researcher, National Meteorological Service

Develop a total package to protect cities against flooding caused by intense rainstorms

Natural disasters caused by intense rainstorms and flooding are related to climate change, and their risk is increasing on a global scale. Regions where the infrastructure and buildings may not be built to global standards and densely populated cities are particularly vulnerable. In this study, we are developing a total monitoring, prediction, warning, utilization, and behavioral package for natural disasters caused by intense rainstorms and flooding, and putting it to use in the major conurbations of Buenos Aires and Córdoba. We are organizing a meteorological and hydrological observations network and computers, developing a prediction and warning system, and conducting disaster mitigation education for the general public while training specialist staff.

River flowing through the city of Quilmes near Buenos Aires

Transmitting and utilizing warnings on intense rainstorms and flooding leads to disaster mitigation behavior

The reduction in damage in the participating areas will become clear, and the scheme will be extended throughout Argentina. Its success in Argentina will lay the foundations for, and mark the beginning of, disaster mitigation for intense rainfall and flooding that is globally applicable. Going forward, by developing this package on a global scale while continuing to increase its sophistication, we will contribute to tackling this issue worldwide.

Seminar at the University of Buenos Aires

Visiting the Argentine National Meteorological Service

Research Institutions in Argentine	National Meteorological Service / National Hydrological Service / University of Buenos Aires / National North Eastern University / National University of Cordoba / Risk Management and Civil Protection – Córdoba Province / Risk Management and Civil Protection – Buenos Aires Province
Research Institutions in Japan	RIKEN / Osaka University / International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI)
Research Period	5 Years

50 = Development of Integrated Expert System for Estimation and Observation of Damage Level of Infrastructure in Lima Metropolitan Area =

Use sensors to create a system that immediately assesses damages from earthquakes and tsunamis!

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. KUSUNOKI Koichi

Earthquake Research Institute, The University of Tokyo

Republic of Peru

Principal Investigator
Prof. Carlos Zavala

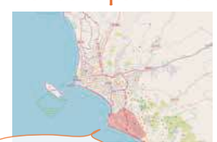
Japan Peru Center for Earthquake Engineering Research and Disaster Mitigation (CISMID), National University of Engineering

Speed up decision-making related to earthquake disaster response in Lima

Structures Laboratory of the Japan-Peru Center for Earthquake Engineering Research and Disaster Mitigation (CISMID)

Earthquake and tsunami disasters occur suddenly, and their effects are widespread. In order to respond effectively to a disaster, it is important to get an overall picture of the damage as soon as possible. However, people usually gather information about the status of earthquakes or tsunamis, and about damage to buildings and infrastructure, etc. by checking each aspect separately, mainly using visual inspection and manual processes. By making full use of modern sensor technology, we intend to develop a system that can grasp the whole picture of the scope of the damage as quickly as possible after the occurrence of a disaster and rapidly integrate the findings into a geographical information system with display capabilities.

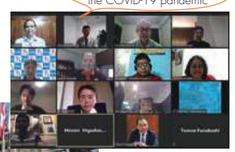
Immediately grasping the full extent of damage caused by an earthquake or tsunami makes it possible to take appropriate measures



Geographical area subject to study

Development of a disaster information integration system—capable of quickly grasping information about the occurrence of earthquake and tsunami disasters and about ensuing damage to buildings and infrastructure, integrating that information, and displaying it in real time to people in charge of implementing disaster countermeasures—could contribute to a significant reduction in the number of people harmed or killed because they failed to flee in time, and would likely be adopted in earthquake-prone countries around the world.

Conferencing online enables the project to continue despite the COVID-19 pandemic



Ceremony welcoming Japanese Ambassador at CISMID

Research Institutions in Peru	Peru National University of Engineering / Geophysical Institute of Peru / Direction of Hydrography and Navigation / Ministry of Housing, Construction and Sanitation / Service of Water and Sewerage of Lima / Ministry of Transportation and Communication / Aerospatial National Comission / National Center of Estimation, Prevention and Disaster Risk Reduction / National Institute of Civil Defense / Ministry of Education / Ministry of Health / Lima Metropolitan City Office
Research Institutions in Japan	The University of Tokyo / The National Institute of Advanced Industrial Science and Technology / Tohoku University / Chiba University / Institute of Science Tokyo / Nagoya University
Research Period	5 Years

49 = Building Sustainable System for Resilience and Innovation in Coastal Community =

Protecting Indonesia's coastline with green infrastructure

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. MORI Nobuhito

Disaster Prevention Research Institute, Kyoto University

Republic of Indonesia

Principal Investigator
Dr. Mohammad FARID

Head of Center for Coastal and Marine Development, Bandung Institute of Technology

Kuta beach on the island of Bali.

Anti-erosion measures on Bali

Scientific evidence-based improvements to the defensive capabilities of coastal areas and their social implementation

The Indonesian coastline is subject to severe damage due to coastal erosion and submersion by waves and tsunamis, and this hampers the development of coastal areas. We are organizing coastal monitoring networks using the latest technology, carrying out simulations, and transferring technologies for coastal preservation utilizing sandy beaches and mangrove forests, in order to conduct scientific evidence-based improvements to the defensive capabilities of coastal areas and create approaches for their social implementation. Our aim is to create coastal communities that can achieve a balance between disaster prevention, environmental preservation, and economic development.

Disaster prevention and mitigation using green infrastructure

Damage from the Sulawesi earthquake and tsunami in 2018

We will conduct standardization of the optimum natural environment-oriented coastal defense technology, combining monitoring for coastal disaster mitigation with green-gray infrastructure taking account of improvements in monitoring and modeling technology and changes over time. We will establish the technology thus developed as Indonesia's standard technology, with the aim of extending it to other areas and encouraging its adoption in Southeast Asia and Pacific island nations.

Mangrove forest (Iriomote-jima)

Research Institutions in Indonesia	Bandung Institute of Technology / National Disaster Management Agency / Gadjah Mada University / University of Indonesia / The Ministry of Public Works and Housing / Indonesian Agency for Meteorology, Climatology and Geophysics / National Research and Innovation Agency
Research Institutions in Japan	Kyoto University / Tohoku University / Port and Airport Research Institute /Chuo University
Research Period	5 Years

51 = The Project for Technology Development on Life Time Management of Road and Bridge for Strengthening Resilience in Thailand =

Harmonious balance between people and technology to ensure the safety of road networks

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. SATO Yasuhiko

Department of Civil and Environmental Engineering, School of Creative Science and Engineering, Waseda University

Kingdom of Thailand

Principal Investigator
Prof. WANCHAI Yodsudjai

Vice Dean for Research, Faculty of Engineering, Kasetsart University

Develop technologies and human resources that can make roads and bridges last a long time

This project aims to develop technologies for properly assessing the effects of salt damage, scouring, and heavy loads on road structures, and technologies that provide strong protection for bridges against salt damage, scouring, and heavy loads. Additionally, we will establish an educational curriculum for cultivating highly capable road management engineers who have a solid command of said technologies, and we will invest a good deal of energy in developing human resources. Taking into account harmony between technology and people, this research will eventually result in an infrastructure maintenance method that is effective for the road structures of Thailand.

Flood damage

Overloaded truck

Help solve the worldwide problem of aging road infrastructure!

Bridge pier deterioration due to salt exposure

The technology developed through this project will extend the life of roads and bridges that make up the Asian Highway Network,which in turn will contribute to improving the safety and reliability of the ASEAN road network. Moreover, we are confident that the results of this research will contribute greatly to streamlining maintenance methods for decrepit infrastructure in Japan.

Practicum in bridge surveying led by a bridge engineer, before starting SATREPS project

Group that conducted survey of bridges prior to starting SATREPS project

Research Institutions in Thailand	Kasetsart University / Department of Highway / Chulalongkorn University
Research Institutions in Japan	Waseda University / Hokkaido University / Kansai University / Nihon University / NIPPON STEEL Chemical & Material Co., Ltd. / KAJIMAROAD CO., LTD. / KYOWA ELECTRONIC INSTRUMENTS CO., LTD. / KSK CO., LTD. / HIKARI CO., LTD. / Hanwa Co., Ltd.
Research Period	5 Years

52 = Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change =

Predict sustainable local economic development scenarios based on interdisciplinary assessment of water-related disaster risk

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. OHARA Miho

Center for Integrated Disaster Information Research, Interfaculty Initiative in Information Studies, The University of Tokyo

Republic of the Philippines

Principal Investigator
Prof. Fernando C. Sanchez, Jr

University of the Philippines Los Baños (UPLB)

Hybrid water-related disaster risk assessment combining climatic, hydrological, agricultural, and economic models

It is feared that frequent water-related disasters in the Republic of the Philippines brought on by future climate change will hinder sustainable development of regional cities and exacerbate overconcentration in Metro Manila. This project creates hybrid water-related disaster risk assessment models that combine future climate change, hydrological, agricultural, and economic models and conducts an objective assessment of the effectiveness of investing in disaster prevention measures in the Pampanga River basin and the Pasig-Marikina River and Laguna Lake basins in the environs of Metro Manila.

Field survey on the Pasig-Marikina River system

Contributing to sustainable economic development through policy recommendations based on water-related disaster risk assessment

Utilizing hybrid water-related disaster risk assessment models for these river basins, this project will predict future economic development scenarios in line with disaster prevention measures formulated in advance and present policy recommendations for enhanced resilience to water-related disasters caused by climate change and sustainable economic development through balanced national development.

Farmland survey in the Pampanga River basin

Research Institutions in Philippines	University of the Philippines Los Baños (UPLB) / University of the Philippines Diliman (UPD) / University of the Philippines Mindanao (UPMin)
Research Institutions in Japan	The University of Tokyo / International Centre for Water Hazard and Risk Management (ICHARM), Public Works Research Institute (PWRI) / Tohoku University / Kyoto University / The University of Shiga Prefecture / Nagoya University
Research Period	5 Years

53 = Development of Early Warning Technology of Rain-Induced Rapid and Long-Travelling Landslides =

Predict catastrophic landslides a day in advance

Adoption Fiscal Year FY 2019

Principal Investigator
Dr. Konagai Kazuo

Principal Researcher, Research Division, International Consortium on Landslides

Democratic Socialist Republic of Sri Lanka

Principal Investigator
Dr. Asiri Karunawardena

Director General
National Building Research Organisation

Developing a system for transmission of early warning information about long-travelling landslides and support of risk assessment

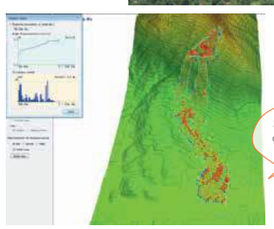
Landslides occur frequently in Sri Lanka, where there has been a marked increase in torrential rainfall with the onset of climate change. In order to make it possible to predict a day in advance the occurrence and range of rapid and long-travelling landslides, which are particularly severe, this project develops a system for early transmission of information predicting landslides and for supporting risk assessment, incorporating cutting-edge technology that predicts maximum accumulated rainfall within a 500-meter grid. It takes into consideration the influence of orographic turbulence in mountainous areas, and predicts the occurrence, spread, and range of landslides due to unsaturated seepage in highly weathered soil on hillsides in tropical forests.

Contributing to disaster prevention in monsoon region countries subject to frequent disasters due to torrential rainfall

A project strategy meeting with delegates from Sri Lankan Institutions

The technology developed in this project, which predicts rainfall and the occurrence and range of landslides, is expected to be used in various fields, such as in mitigation of rapid and long-travelling landslides, flood control, and disaster prevention in rural and urban areas in Sri Lanka, as well as in other Southeast Asian nations in monsoon regions, where similar disasters are common.

The Aranayake landslide in 2016



Simulation of rainfall and landslides in the Aranayake disaster

Research Institutions in Sri Lanka	National Building Research Organisation
Research Institutions in Japan	International Consortium on Landslides / Kyoto University / Institute of Science Tokyo / Forestry and Forest Products Research Institute
Research Period	5 Years

54 = Development and Operation Model of Plant-derived Soil Additives for Road Disaster Reduction on Problematic Soil =

Constructing passable, maintainable, and affordable roads in rural Ethiopia

Adoption Fiscal Year FY 2018

Principal Investigator
Prof. KIMURA Makoto

The Center for African Area Studies, Kyoto University

Federal Democratic Republic of Ethiopia

Principal Investigator
Assistant Prof.
Fitsum Tesfaye Berhe

Civil Engineering Department, Addis Ababa Science and Technology University

Roads with deep ditches damaged during rainy seasons in South Omo

Developing methods for constructing roads on expansive soil by using soil additives derived from local plants

Many parts of Ethiopia remain hardly accessible due to a lack of well-maintained rural roads. Expansive soil, a typical problematic soil spread across Africa, makes it difficult to construct and maintain rural roads. This project will identify physical mechanisms of the expansive soil and develop soil additives made from local plants to improve the stability of unpaved roads. The goal is to find simple and convenient methods to construct roads without relying on expensive machinery and to develop an operational model in collaboration with local governments and communities.

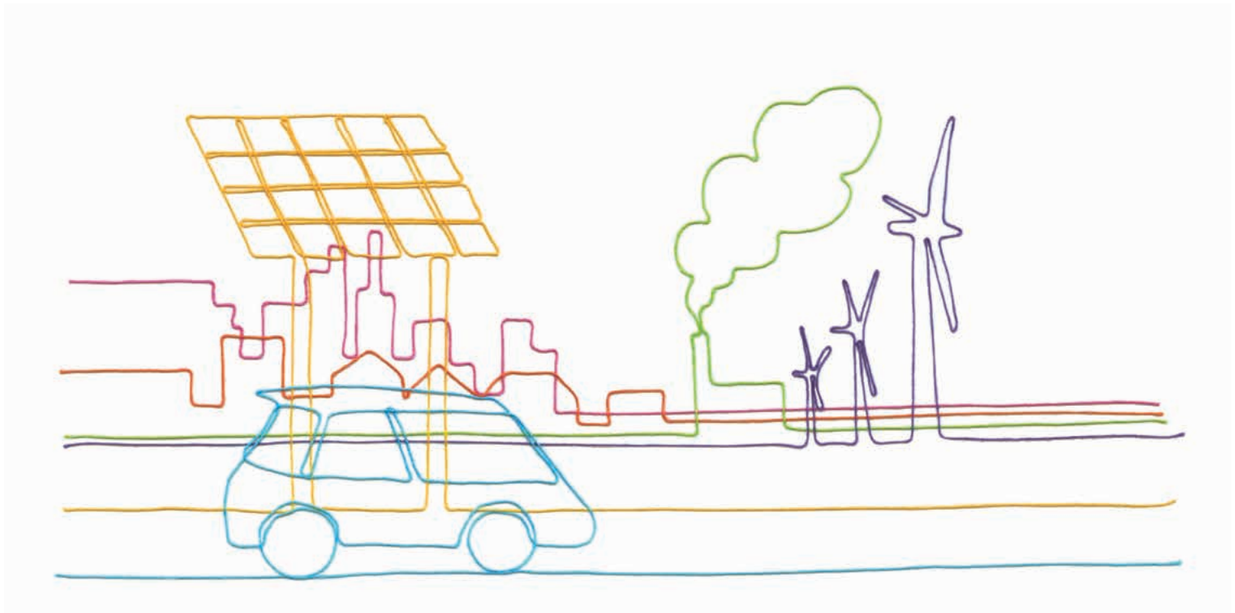
Improving year-round accessibility in rural areas of sub-Saharan region

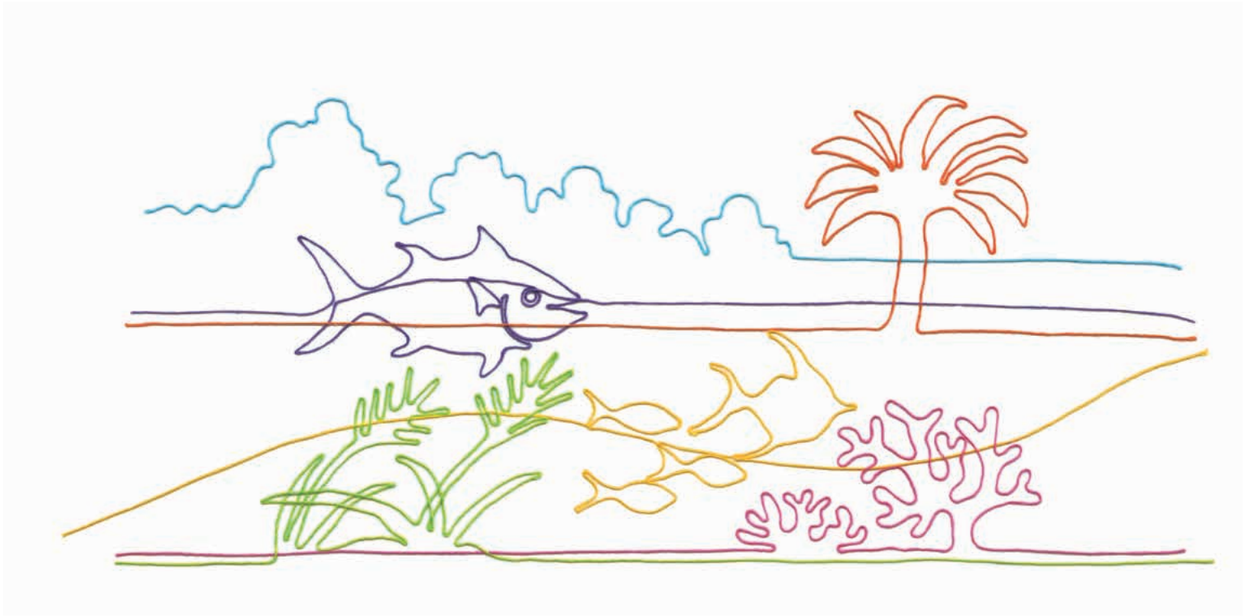
The project seeks to identify local plants that can be used for soil additives and apply them to the expansive soil in constructing rural roads. In the future, this road maintenance method can solve problems of the expansive soil found all over Africa. By incorporating different local conditions and improving the method as a comprehensive operational model, this project can increase accessibility to all-weather roads in sub-Saharan Africa.

Group photo at the kick-off meeting in Addis Ababa

Testing soil additives on the expansive soil with local students

Research Institutions in Ethiopia	Addis Ababa Science and Technology University(AASTU) / Jinka University(JKU) / Ethiopian Roads Authority(ERA)
Research Institutions in Japan	Kyoto University / University of Miyazaki
Research Period	5 Years

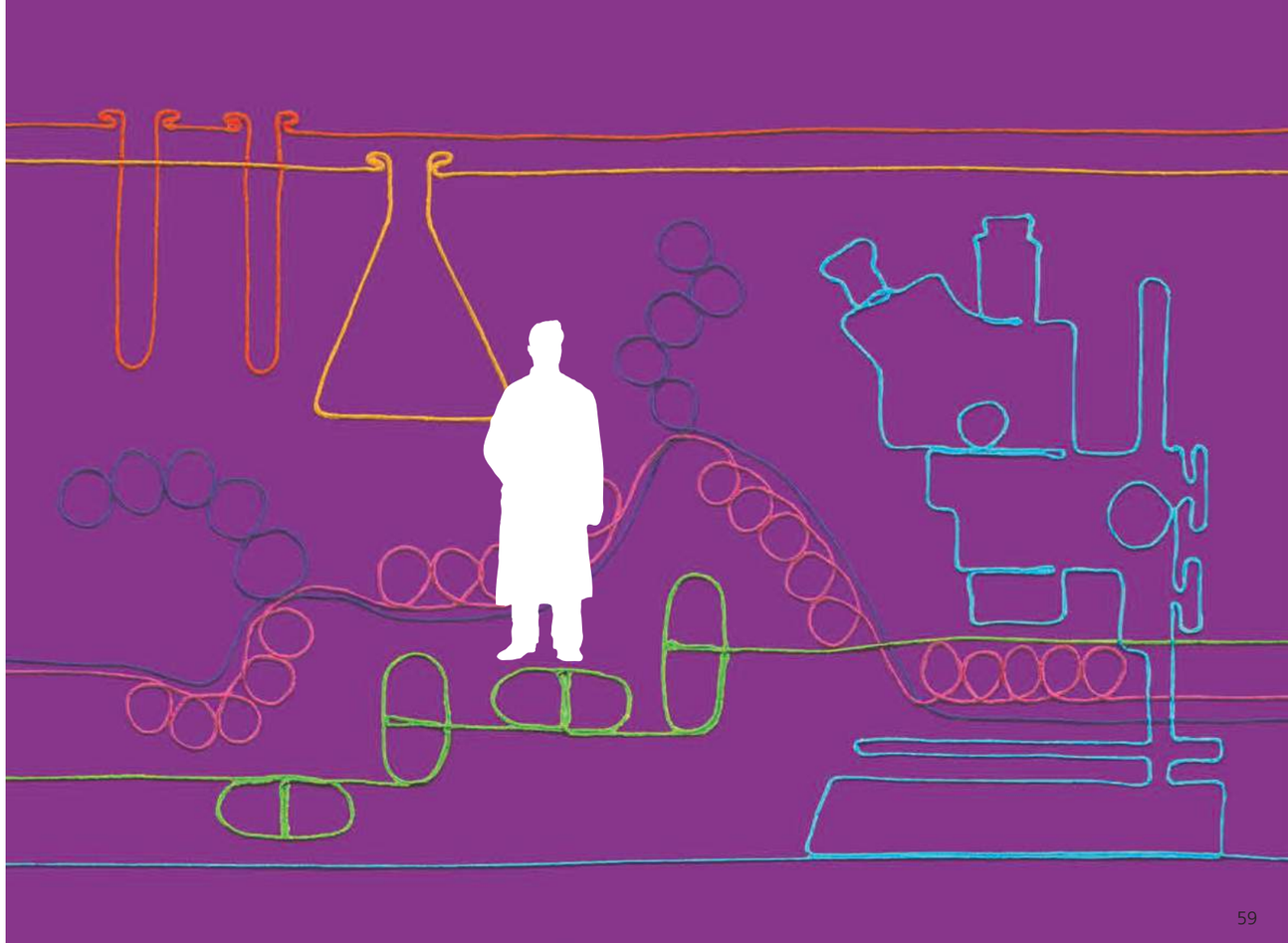




SATREPS 2024

Infectious Diseases Control

SATREPS projects in the field of Infectious Diseases Control have been transferred to AMED - the Japan Agency for Medical Research and Development.
(The transfer took place on April 1, 2015. Projects that finished before that date were not transferred.)



55 = The project for co-designing neglected zoonosis intervention through One Health, education, and public-private partnership =

Reducing uncontrolled zoonoses through a combination of One Health, education, and public-private partnerships!

Adoption Fiscal Year FY 2023

Principal Investigator
Prof. MAKITA Kohei

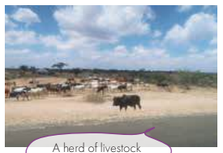
School of Veterinary Medicine, Rakuno Gakuen University

United Republic of Tanzania

Principal Investigator
Dr. MATHEW Coletha

Senior Lecturer, School of Veterinary Medicine and Biomedical Sciences, Sokoine University of Agriculture

Problem solving with local residents based on models of socioeconomic and infectious disease transmission systems



A herd of livestock on the move

Brucellosis and zoonotic tuberculosis are widespread among humans and livestock in Tanzania. This project will promote data sharing and improved understanding of both diseases in the health and veterinary sectors. With the participation of stakeholders, system dynamics models of socioeconomic and infectious disease transmission systems will be used to find the conditions for successful control of infectious diseases, including a gender perspective. Based on the results, different sectors will collaborate to educate the public on infectious diseases and plan and implement public-private partnerships with residents to control infectious diseases.

Local government doctor and veterinarian (center) surrounded by project members

By the collaborative infectious diseases control between health/veterinary, and public-private sectors, high-risk behaviors will be reduced

Knowledge of brucellosis and zoonotic tuberculosis and their prevention will be improved among herders and residents. The number of farmers implementing infectious disease control measures in livestock will increase, while high-risk behavior among people will be reduced. One Health, education, and public-private partnerships based on systems modeling for infectious disease control are expected to become widely adopted around the globe.

Discussing infectious disease control with the Maasai

Research Institutions in Tanzania	Sokoine University of Agriculture, Tanzania National Institute of Medical Research, Muhimbili University of Health and Allied Sciences
Research Institutions in Japan	Yamaguchi University, Obihiro University of Agriculture and Veterinary Medicine, University of Tokyo
Research Period	5 Years

57 = Project for Integrated Research and Development towards Control and Elimination of Schistosomiasis =

Develop essential tools for the control and elimination of schistosomiasis!

Adoption Fiscal Year FY 2022

Principal Investigator
Prof. HAMANO Shinjiro

Vice Dean and Head of the Department of Parasitology, Institute of Tropical Medicine, Nagasaki University

Republic of Kenya

Principal Investigator
Prof. NJENGA Sammy

Lead Scientist, ESACIPAC laboratory, Kenya Medical Research Institute

Create transmission monitoring tools, behavior change communication models, and novel drugs

Schistosomiasis is a parasitic disease that affects 250 million people in 78 countries worldwide. The larvae are released from freshwater snails and enter the mammalian body through the skin, which cause various chronic symptoms. There is no vaccine. The eggs are released into the environment with feces and urine, and contribute to the transmission of the infection. Diagnosis by egg detection is low-sensitive and inadequate for monitoring. The only effective drug is praziquantel, but even this, reportedly, does not work well in some cases. This project aims to overcome these issues.

Collecting the intermediate host (freshwater snails) of *Schistosoma mansoni* (Homa Bay, on the shore of Lake Victoria)

The highly endemic region of *Schistosoma mansoni* infection

Promote transmission monitoring, behavior change communication and drug discovery

A highly sensitive method for monitoring infection transmission in people and water environments alongside behavior change communication models will contribute to a program for controlling and eliminating schistosomiasis and other infections. Discovering new drug lead compounds will accelerate drug discovery research not only for schistosomiasis but also for other types of helmintic infections.

Area where *Schistosoma mansoni* is transmitted

At Maseno University (Kisumu, on the shore of Lake Victoria)

Research Institutions in Kenya	Kenya Medical Research Institute / Maseno University / Ministry of Health
Research Institutions in Japan	Kobe University / National Research Center for Protozoan Diseases, Obihiro University of Agriculture and Veterinary Medicine / Tokyo Women's Medical University
Research Period	5 Years

56 = Project for malaria and neglected parasitic diseases control and elimination using advanced research technique, communication tools and eco-health education =

Use the LAMP method to detect malaria patients and identify endemic areas from environmental DNA!

Adoption Fiscal Year FY 2022

Principal Investigator
Dr. IWAGAMI Moritoshi

Chief, Department of Tropical Medicine and Malaria, Research Institute, National Center for Global Health and Medicine (NCGM)

Lao People's Democratic Republic

Principal Investigator
Dr. Philippe BUCHY

General Director, Institut Pasteur du Laos (IPL) Ministry of Health

Develop technology for the diagnosis and prevention of parasitic disease, and spread eco-health education

In Laos, the poorest country in southeast Asia, parasitic diseases including malaria, Mekong schistosomiasis, and Thai liver fluke are impediments to both human health and economic development. To decrease the number of patients with these parasitic diseases and promote economic development in the country, we are using the LAMP method and environmental DNA for the accurate identification of patients and endemic areas. We are also using pulse current technology to develop technology to deactivate the Thai liver fluke in the fish on which it is parasitic, and laying the foundations for the practical use of these scientific technologies in society.

Diagnosing malaria by the LAMP method

Environmental DNA survey to detect parasite DNA from the water system

Deactivation of fish parasites by pulse current technology

Help eliminate and suppress malaria, Mekong schistosomiasis, and Thai liver fluke!

If we can prove that the LAMP method will accelerate the elimination of malaria from Laos, this will have a ripple effect on malaria prevention measures in other countries. Identifying at-risk areas by using environmental DNA will contribute to effective control measures and education for infection prevention. Pulse current technology will enable fish to be supplied safely for eating raw, and will also contribute to measures for dealing with parasites in meat for human consumption in future.

A poor Laotian village where eco-health education is needed

Research Institutions in Lao People's	Institut Pasteur du Laos / Center of Malariology, Parasitology and Entomology / Lao Tropical and Public Health Institute / University of Health Sciences / Laos National University / Ministry of Education and Sport
Research Institutions in Japan	Nippon Bunri University / Niigata University / Niigata University of Pharmacy and Medical and Life Sciences / University of the Ryukyus / Kumamoto University / Shinshu University / Nagano College of Nursing
Research Period	5 Years

58 = The project for One Health approach to control of Neglected Tropical Diseases with special attention on sandfly and mosquito borne infections in Türkiye =

Halt the spread of arthropod-borne infectious diseases!

Adoption Fiscal Year FY2021

Principal Investigator
Associate Prof.
SANJOBA Chizu

Laboratory of Molecular Immunology, Graduate School of Agricultural and Life Sciences, The University of Tokyo

Republic of Türkiye

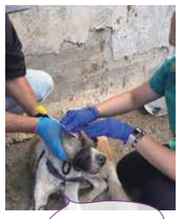
Principal Investigator
Prof. OZBEL Yusuf

Department of Parasitology
Ege University Faculty of Medicine

Formulate guidelines and develop an infection monitoring and warning system

Changes in the biota due to warming and socioeconomic activity are facilitating the spread of infectious diseases carried by arthropods. In Türkiye, in addition to mosquito-borne viral infections, leishmaniasis, which is carried by sandflies, is a threat to human health that is causing economic loss. In this project, our aim is to ascertain the transmission cycle of these infections and formulate guidelines for their control based on scientific findings. We will also build a monitoring and warning system covering the entirety of Türkiye.

Sandfly insecticide resistance experiment



Pathogen detection test in a dog

Help minimize the spread of infection and build a system that can be used worldwide

Establish technology for efficient pathogen detection and contribute to infection control measures. This will help develop technology that will contribute to new infection control measures in Japan as arthropod populations change. The monitoring and warning system and guidelines established in this project will provide a model case that can be adapted for use worldwide, as leishmaniasis is a global problem.

Collecting insects using a light trap

Sandflies, the Vectors of leishmaniasis

Research Institutions in Türkiye	Ege University / Turkish Ministry of Health
Research Institutions in Japan	Graduate School of Agricultural and Life Science, The University of Tokyo / The Institution of Medical Science, The University of Tokyo / National Institute of Infectious Diseases,Japan
Research Period	5 Years

59 = The project for institutional capacity building for eliminating *Helicobacter pylori* related death =

Establishing a sustainable testing and treatment system to free humanity from gastric cancer!

Adoption Fiscal Year FY 2021

Principal Investigator
Prof. YAMAOKA Yoshio
Department of Environmental and Preventive Medicine, Oita University Faculty of Medicine

Kingdom of Bhutan
Principal Investigator
Dr. Kinzang P. Tshering
President, Khesar Gyalpo University of Medical Sciences of Bhutan

Toward a national H. pylori study using rapid testing and endoscope technology

The Kingdom of Bhutan has the world's third-highest mortality rate from gastric cancer. Many cases of gastric cancer are caused by *Helicobacter pylori* infection, and it is thought that more than half of the Bhutanese population in all age groups is infected. With the goal of controlling *H. pylori* infection and eradicating associated deaths, including those from gastric cancer, we have established a rapid testing method for *H. pylori* and are taking measures to counter drug resistance, which is a matter of concern. We are also working to improve the endoscopic skills required for gastric cancer treatment, and are planning a national *H. pylori* survey.

Endoscopy training at Jigme Dorji Wangchuck National Referral Hospital

Testing for H. pylori infection at the Bhutan Ministry of Health Royal Centre for Disease Control

Helping eradicate H. pylori-related deaths with improved techniques for diagnosis and treatment

We are working toward the domestic production of *in vitro* diagnostics that enable inexpensive, rapid *H. pylori* diagnosis. We are laying the foundations for genomic analysis, and will implement personalized eradication therapies. We are establishing a society of gastrointestinal endoscopy in Bhutan, and will improve the board-certification system. In collaboration with the government, we will conduct a national survey, and lay out the path toward eradicating *H. pylori*-associated deaths.

Epidemiological survey of H. pylori infection and educational activities for local residents

Research Institutions in Bhutan	Khesar Gyalpo University of Medical Sciences of Bhutan / Royal Center for Disease Control / Jigme Dorji Wangchuk National Referral Hospital
Research Institutions in Japan	Oita University
Research Period	5 Years

61 = Interdisciplinary Research for an Integrated Community-directed Strategy for Sustainable Freedom from Malaria =

Eliminate malaria in tropical Africa through integrated social and biomedical science research in collaboration with endemic community members

Adoption Fiscal Year FY 2019

Principal Investigator
Specially Appointed Professor KANEKO Akira
Graduate School of Medicine Osaka Metropolitan University

Republic of Kenya
Principal Investigator
Dr. GITAKA Jesse
Senior Researcher, Directorate of Research and Innovation, Mount Kenya University

Local people putting up Olyset®Plus ceiling mosquito net, Mfangano Island

Developing an integrated elimination strategy through field testing and multi-disciplinary monitoring

To address issues such as asymptomatic infection, insecticide-resistant malaria vector mosquitoes, and inappropriate prevention behavior, this project verifies the effectiveness of new vector mosquito control methods and behavioral economic interventions to induce change human behaviors. The immediate aim is eliminating malaria along the Lake Victoria basin in Kenya, where malaria is highly endemic. Drawing on diverse perspectives from multiple disciplines including molecular epidemiology, genetics, serology, vector entomology, and socio-economics, this project will monitor the infection and onset of malaria and explore the true nature of asymptomatic infection and heterogeneity of transmission.

At a meeting with the National Malaria Control Program

Deployment of the integrated strategy over extended area contributes to malaria elimination and breaks the pernicious cycle of poverty and malaria

This project will develop a community-directed strategy based on an understanding of the mechanism of malaria transmission at the individual and community levels and field-proven interventions to reduce the transmission of malaria in the targeted areas. The strategy will be rolled out over extended areas in the "malaria belt" of tropical Africa and contribute to the demise of the pernicious cycle of poverty and malaria.

Intervention study using behavioral economics, Suba South, Homa Bay

Malaria prevention education, Suba South, Homa Bay

Research Institutions in Kenya	Mount Kenya University / Kenya Medical Research Institute / Homa Bay County Government
Research Institutions in Japan	Osaka Metropolitan University / Nagasaki University / Tohoku University
Research Period	5 Years

60 = The trilateral collaboration project for anti-infectious disease drug development: from lead optimization to preclinical testing =

Enable discovery and development of medicines to fight infectious diseases in low- and middle-income countries

Adoption Fiscal Year FY 2020

Principal Investigator
Prof. NOZAKI Tomoyoshi
Graduate School of Medicine, The University of Tokyo

Malaysia
Principal Investigator
Prof. Noorsaadah Abd Rahman
Chemistry Department, University of Malaya

Indonesia
Principal Investigator
Prof. Dr. Eng. Agus Haryono, M.Sc
Deputy Chairperson for Facilitation of Research and Innovation, National Research and Innovation Agency (BRIN)

Use native biological resources to create medicines for tropical infectious diseases

This project will explore the natural microbial resources of Southeast Asia to discover compounds that might serve as new drugs to fight infectious diseases that cause problems on a global scale, like malaria or tuberculosis. Moreover, it will alter the structure of such compounds to improve their therapeutic effectiveness and safety, and develop them as pharmaceuticals intended for human use. In addition to transferring technologies that are essential for drug discovery and development—including technologies for maintaining and using microbial resources, searching for compounds, synthesizing chemical compounds, and testing for safety—the project will develop relevant human resources and aim for project outcomes to be applied so that middle- and low-income countries can conduct drug discovery that makes use of microbial resources.

Monkey Experiment Facility in Indonesia

High-throughput screening in Indonesia

Establish technologies and construct societies capable of using abundant biological resources to develop medicines

This project will establish an international network and a basis for drug development using each country's own resources together with other Southeast Asia partner countries. The drug discovery platform will also be available for use by Japan to develop new remedies for various ailments. It is expected that new drugs for fighting infectious diseases will be adopted for use in society after undergoing clinical trials.

Chemical synthesis optimization in Malaysia

Research Institutions in Indonesia & Malaysia	Indonesia: National Research and Innovation Agency (BRIN) / IPB University Malaysia: University of Malaya / Universiti Teknologi Mara / Universiti Putra Malaysia
Research Institutions in Japan	The University of Tokyo / Nagoya Institute of Technology / Bozo Research Center
Research Period	5 Years

62 = Control of Tuberculosis and Glanders =

Collaboration between medical and veterinary sciences to control bacterial zoonotic diseases

Adoption Fiscal Year FY 2019

Principal Investigator
Prof. KIMURA Takashi
Faculty of Veterinary Medicine, Hokkaido University

Mongolia
Principal Investigator
Dr. Buyankhishig Burneebaatar
Consultant, TB Surveillance and Research Department, National Center for Communicable Disease

Conducting epidemiological surveys and developing rapid diagnostic methods for tuberculosis and glanders in Mongolia

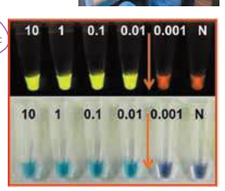
Mongolia is one of the countries where tuberculosis flourish seriously in the world. However, little is known about the epidemiology of tuberculosis in animals in Mongolia and the spread of drug-resistant strains among humans has become a serious public health concern. Recently, there is an increasing incidence of glanders, a contagious disease that causes respiratory infection in horses. This project conducts epidemiological surveys and development of rapid diagnostic methods for tuberculosis and glanders, both of which are zoonotic bacterial diseases in Mongolia, through collaboration between veterinary and medical researchers.

Collecting blood from horses on the Mongolian steppe

Enhancing the efficiency of laboratory diagnosis for the control of tuberculosis or glanders in animals and humans

The project will develop simple and highly sensitive molecular diagnostic methods for *Mycobacterium bovis* and *Burkholderia mallei*, serological diagnosistic methods for *Burkholderia mallei*, and will establish a method for rapidly and comprehensively detecting drug-resistance-related genetic mutations of *Mycobacterium tuberculosis*, and will evaluate their effectiveness in Mongolia. Implementation of the newly developed methods is expected to improve both animal hygiene and public health.

Characterization of the tubercle bacilli isolated from human specimens



Developing simple, rapid and highly sensitive diagnostic method

Epidemiological assessment of drug-resistant tuberculosis using a molecular genetic assay

Research Institutions in Mongolia	National Center for Communicable Disease / Institute of Veterinary Medicine, Mongolian University of Life Science
Research Institutions in Japan	Hokkaido University / Research Institute of Tuberculosis, Japan Anti-tuberculosis Association
Research Period	5 Years

Environment /Energy (Global-scale Environmental Issues)

Using remote sensing for more efficient damage assessment of wet-field rice

Republic of Indonesia

Help enhance crop insurance as a climate change mitigation measure

Crop insurance, which is expected to be a useful measure for dealing with climate change, is operated as an element of social infrastructure that is important for food security, but faces many problems in Indonesia, which has little experience of its operation. The greatest problems are speeding up damage assessment, which is at the heart of crop insurance, and the objectivity of the assessment results. Our aim in this project was to develop a fast, highly objective damage assessment procedure for wet-field rice affected by drought, pest and disease, and flooding, all of which are covered by insurance, and to implement it in West Java and Bali provinces.

Conventional damage assessments consist of a visual inspection conducted by an assessor, but in this project we created an assessment process utilizing spatial information from sources including UAVs and satellite data, which was integrated with the current method to develop a new damage assessment method. Validation confirmed that this method required less time and labor for objective assessments, and that it is an effective method of damage assessment in crop insurance. It was summarized in guidelines, and an approach to the central government with a view to its operation resulted in a favorable appraisal. Its use is expected to be expanded inside and outside West Java in future

The damage assessment procedure that we developed enables crop growth status to be evaluated field by field rapidly and across a wide area, and as the information required for the assessment can also be used for other purposes, we anticipate that in future it will be applied to a range of pest and disease and crops other than rice, and that it will be useful across a wide range of other needs in the agricultural sector in addition to crop insurance. Young people leaving the agricultural sector is a serious problem in Indonesia, and the use of high-tech sources such as UAVs and satellite images in this project may not only help modernize agriculture but could also offer a new path into agriculture for young people.

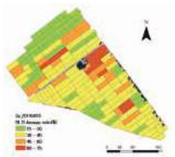


Figure 1. Damage assessment map of bacterial leaf blight of rice assessed from UAV data (evaluation results by field)

Figure 2. UAV training for damage assessors

"Development and Implementation of New Damage Assessment Process in Agricultural Insurance as Adaptation to Climate Change for Food Security"
Principal Investigator: Associate Prof. HONGO Chiharu Adoption Fiscal Year FY 2016

Disaster Prevention and Mitigation

Prevent tsunami damage through a seafloor observation network and disaster education

United Mexican States

Establish a disaster education program and extend it to Central and South America

Mexico's Pacific coastline has suffered from numerous earthquakes and tsunamis over the past 250 years, but the coastal part of Guerrero Province last experienced a major earthquake in 1911. This is because of repeated "slow slip" every few years, which releases some of the interplate distortion without a tremor occurring. However, not all the distortion is released through slow slip, and as the accumulated distortion between the plates is highly likely to cause a massive earthquake in the near future, the creation of a seabed observation network for tsunami-causing seabed earthquakes is an urgent task.

We therefore introduced Japanese knowledge and seafloor observation technology to create a seafloor observation network, and investigated interplate locking in the interaction between slow slip and massive earthquakes. We also prepared and validated hazard risk maps, and established a disaster education program taking account of the local social, economic, and cultural environment as a measure to prevent tsunami damage. Using this program, we have been spreading everyday disaster preparations through the region as a whole, in collaboration with local disaster-prevention agencies.

The results of this project received a good response in Mexico, and there are hopes that these research activities will be continued in the country. Moves are now underway to extend the tsunami disaster education program in particular to other parts of Mexico and to countries in Central and South America and the Caribbean.

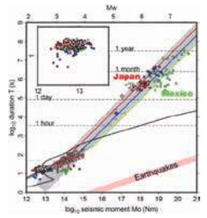


Figure 1.
Diagram showing the difference in slow slip between Japan and Mexico in terms of earthquake size (moment) and duration. The green points are in Mexico, and the red, pink, and white points are in Japan. The Mexican points are systematically to the right of those in Japan.

Figure 2.
Warning signs in a shopping street and at the coast.

"Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation"
Principal Investigator: Associate Prof. ITO Yoshihiro Adoption Fiscal Year FY 2015

Environment /Energy (Carbon Neutrality)

Relieve congestion and reduce CO_2 emissions by increasing traffic visibility

India

Solution for transportation and environment challenges by smart mobility

The negative impacts of the increased road traffic, environmental destruction, and fatal accidents by imbalance between them and Indian's rapid economic development are becoming a major social problem. Their resolutions will require understanding the actual situation of urban traffic, which has been difficult to assess before. Our aim was to use big-data analysis based on the latest sensing technology and traffic theory to assess the actual situation, establish shared methods for its resolution, and build a system that enables model shifts.

In this project, we accurately measured traffic by using artificial intelligence (AI) image technology, and developed a system that displays appropriate choice of transport by mobile devices and variable message signboards (VMSs), which are already widely used, to enable the use of multiple modalities including public transportation. In metropolitan activity rerocation simulation covering the entire city, this was predicted enable a reduction in CO_2 emissions of up to 7.1% in 2035. We also actively publicized this technology through workshops and handbook publication and distribution.

The Indian Institute of Technology Hyderabad (IITI) has been continuing to use technology to analyze traffic in the city of Ahmedabad. The lead research institution has focused on the development of urban Intelligent Transport Systems (ITSs) in Bengaluru, and is due to install India's first Japanese-type signal controls. The results of this project will be utilized in social infrastructure, which should both resolve traffic congestion and reduce CO_2 emissions.

Figure 1.
Outcomes (technologies) for main study items introduced in Handbook Part II

"Smart Cities Development for Emerging Countries by Multimodal Transport System Based on Sensing, Network and Big Data Analysis of Regional Transportation"
Principal Investigator: Dr. TSUBOI Tsutomu Adoption Fiscal Year FY 2016

Infectious Diseases Control

Rapid diagnosis of rabies and a new information-sharing app to be introduced nationwide in the Philippines

Philippines

Quick, convenient detection of rabies allowing swift response and outbreak control

Rabies is a serious problem in the Philippines, where it causes 200 to 300 deaths and more than 1 million people to receive preventive treatment with vaccines and rabies globulin following animal bites every year. A large factor that has made it difficult to control rabies in the region is the complexity of rabies testing procedures and limited testing facilities available. As a result, many rabid animals go undetected, posing a risk of disease spread. A technology that would allow rabies testing to be conducted anywhere and the introduction of rapid local control measures was needed.

Owing to a rapid diagnostic kit developed by Oita University and a local company, combined with a simplified specimen collection technique, it is now possible to diagnose rabid animals anywhere. Furthermore, an app was developed by the project to share information and provide alerts to responding personnel and residents after rabid animals have been diagnosed, enabling rapid coordination among various departments through the One Health approach. This innovative method has been implemented in 32 provinces across the Philippines, and used to identify more than 300 rabid animals in the field, contributing to rapid local containment and control of rabies.

The method is still being applied in many areas of the Philippines even after the project's completion, helping to combat rabies. Future expansion to areas where the method has not yet been introduced is planned, with the goal of controlling rabies country-wide. Furthermore, it is hoped that this initiative will be introduced to other countries in Asia and Africa where rabies is a problem, further contributing to international rabies control.

Figure 1. Rapid diagnosis of rabies

Figure 2.
Project method introduction results: In 32 provinces across 10 regions, the method has been used to detect more than 300 rabid animals (as of project end in August 2023)

"The Establishment of the One Health Prevention and Treatment Network Model for the Elimination of Rabies in the Philippines"
Principal Investigator: Prof. NISHIZONO Akira Adoption Fiscal Year FY 2017

Biosources

Popularization of fertilizing technology for increasing rice yield with less fertilizer

Republic of Madagascar

Help resolve issues of poverty and nutrition in Africa

Madagascar is a major rice-producing country, with rice consumption per person in over twice that in Japan, and more than half the population is engaged in rice cultivation. However, farmers' poverty means that they are unable to buy much fertilizer, and because much of the soil is weathered and unable to supply phosphates, which are essential for crop growth, the rice yield remains stubbornly low. There is thus a need for rice production techniques that efficiently improve production despite a low nutrient supply from fertilizers and soil.

Taking inspiration from Japanese rice cultivation techniques used in the late 19th and early 20th centuries, we developed a phosphate immersion treatment that can efficiently improve wet-field rice yield with the application of a small amount of fertilizer even in weathered soils that lack nutrients. This technique is a simple procedure that involves coating the roots of wet-field rice plants with a slurry made from a mixture of phosphate fertilizer and paddy-field soil before they are transplanted, and has been shown to double the efficiency of fertilizer use compared with regular methods. Repeated investigations in local farmers' fields showed that this technique shortened cultivation time and improved initial growth, making it useful under a range of environmental stresses such as cold-induced sterility.

Our results attracted interest from the government and civil society. We have begun marketing it a a new technique that can be used even by poor farmers, and it is now spreading among farming communities in the country. Based on a four-year study of household finances, the increased rice yield generated by this project had a positive effect on both farmers' income and their nutritional intake, and the spread of this technique should contribute to a stable rice supply and lead to reducing poverty and improving nutritional intake in farming communities.

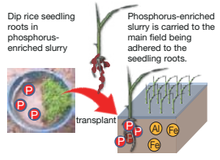


Figure 1. P-dipping method

Phosphorus is placed around the root system which enhances fertilizer use efficiency of rice

"Breakthrough in Nutrient Use Efficiency for Rice by Genetic Improvement and Fertility Sensing Techniques in Africa"
Principal Investigator: Dr. TSUJIMOTO Yasuhiro Adoption Fiscal Year FY 2016

Environment/Energy (Global - scale Environmental Issues)

2024	❀	Next-generation Smart Mining Plus for Sustainable Resources Development	Prof. KAWAMURA Yohei	Faculty of Engineering, Hokkaido University	Kazakhstan	—
	❀	Development of a Satellite Data- and a Regional Chemical Transport Modeling-based Air Pollution Assessment System and Formation of a Research Center for Air Pollution Studies	Associate Prof. NAWA Nobutoshi	Graduate School of Medical and Dental Sciences, Institute of Science Tokyo	Kyrgyz	—
	❀	Utilization of Agricultural Wastes for Plastic Alternative Productions to Establish a Circular Economy	Prof. YAMAMOTO Mitsuo	Graduate School of Agricultural and Life Sciences, The University of Tokyo	Egypt	—
2023	❀	Securing the Sustainability of Oasis Societies Associated with Water and Land Use in the Western Desert	Prof. IWASAKI Erina	Faculty of Foreign Studies, Department of French Studies, Sophia University	Egypt	—
	1	Utilization Technology of Rubber Seeds for Green Products to Mitigate Global Warming and Plastic Pollution	Associate Prof. KANEHASHI Shinji	Graduate School of Engineering, Tokyo University of Agriculture and Technology	Thailand	p24
	2	Risk-based Participatory WASH Planning and Citizen-data WASH Statistics for African Peri-urban Settlements	Associate Prof. HARADA Hidenori	The Center for African Area Studies, Kyoto University	Zambia	p24
2022	3	Establishing Sustainable Water Supply System Resilient to the Contamination of Drinking Water Sources	Prof. FUJIOKA Takahiro	Graduate School of Engineering, Nagasaki University	VietNam	p25
	4	Development of Easy-operation High-tech Analytical Devices and Human Resource for Food Safety and Environmental Quality Control	Prof. MAWATARI Kazuma	Graduate School of Information, Production and Systems, Waseda University	VietNam	p25
	5	Development of Palm Oil Mill Effluent (POME) Treatment System for Sustainable Energy Production and Resource Recovery based on Material Innovation	Associate Prof. YOSHIDA Naoko	Graduate School of Engineering, Nagoya Institute of Technology	Malaysia	p26
2021	6	Strengthening Tropical Forest Resilience Based on Management and Utilization of Genetic Resources Capable of Climate Change Adaptation	Prof. Dr. TANI Naoki	Senior Researcher, Forestry Division, Japan International Research Center for Agricultural Sciences (JIRCAS)	Indonesia	p26
	7	Establishment of Risk Management Platform for Air Pollution in Cambodia	Prof. FURUUCHI Masami	Faculty of Geosciences and Civil Engineering, Institute of Science and Engineering, Kanazawa University	Cambodia	p27
	8	Innovation of Science and Technology on Natural Rubber for Global Carbon Process	Prof. YAMAGUCHI Takashi	Graduate School of Engineering, Nagaoka University of Technology	VietNam	p27
2020	9	Development of Innovative Climate Resilient Technologies for Monitoring and Controlling of Water Use Efficiency and Impact of Salinization on Crop Productivity and Livelihood in Aral Sea region	Prof. TANAKA Kenji	Disaster Prevention Research Institute, Kyoto University	Uzbekistan	p28
	10	Establishment of Integrated Forest Management System Model for Conservation of Mountain Forest Ecosystems in the Andean - Amazon	Re-employed Research Specialist HIRATA Yasumasa	Forest Research and Management Organization, Forestry and Forest Products Research Institute	Peru	p28
2019	11	Formation of a Center of Excellence for Marine Plastic Pollution Studies in the Southeast Asian Seas	Prof. ISOBE Atsuhiko	Center for Oceanic and Atmospheric Research, Research Institute for Applied Mechanics, Kyusyu University	Thailand	p29
	12	Development of Management Systems for Multiple Utilization of Biodiversity in the Tropical Rainforests at the Producted Areas in Sarawak	Prof. ITIOKA Takao	Graguate School of Global Environmental Studies, Kyoto University	Malaysia	p29
	13	Establishment of a Sustainable Community Development Model based on Integrated Natural Resource Management Systems in Lake Malawi National Park	Distinguished Prof. SATO Tetsu	SDGs Promotion Office, Ehime University	Malawi	p30
2018	14	Sustainable Replantation of Oil Palm by Adding Value to Oil Palm Trunk through Scientific and Technological Innovation	Dr. KOSUGI Akihiko	Project Leader, Biological Resources and Post-harvest Division, Japan International Research Center for Agricultural Sciences	Malaysia	p30
	15	Advanced and Sustainable Methods on Water Utilization Associated with Greening Potential Evaluation	Prof. SHIMADA Sawahiko	Department of Bioproduction and Environment Engineering, Faculty of Regional Environment Science, Tokyo University of Agriculture	Djibouti	p31

Environment/Energy (Carbon Neutrality)

2024	❀	Transforming the Cassava Production System in Vietnam by Establishing Regenerative Farming and Smart Starch Supply Chain Management	Prof. SHINANO Takuro	Graduate School of Agriculture, Hokkaido University	VietNam	—
	❀	Data Driven Dynamic Transport Management in Emerging Metropolis for Climate Change Mitigation	Prof. FUKUDA Daisuke	Graduate School of Engineering, The University of Tokyo	Thailand	—
	❀	Valorization of Disposal Biomass for Chemical Production Based on Biorefinery Concept	Prof. YOKOI Toshiyuki	Institute of Integrated Research, Institute of Science Tokyo	Thailand	—
2023	16	Development and Social Implementation of Greenhouse Gas Emission Reduction Technologies in Paddy Fields of West Tonle Sap Lake by Establishing a Large Paddy Area Water Management System	Project Leader IZUMI Taro	Rural Development Division, Japan International Research Center for Agricultural Sciences	Cambodia	p34
	17	Development of Integrated Bio-circular Economy from Food and Energy Estate Waste Fraction to Biofuel and Bio-chemicals	Prof. OGINO Chiaki	Department of Chemical Science and Engineering, Graduate School of Engineering, Kobe University	Indonesia	p34
	18	Development of Innovative Technologies for Efficient Generation of Green/Blue Hydrogen for Realization of Carbon-neutral Society with Consideration of Industrial and Environmental Characteristics in the Region	Prof. SUGAI Yuichi	Faculty of Engineering, Kyushu University	Uzbekistan	p35
2022	19	Integrated Sustainable Energy and Food Production from Microalgae-based Carbon Capture and Utilization	Team Leader MOCHIDA Keiichi	Center for Sustainable Resource Science, RIKEN	Indonesia	p35
2021	20	Development of New Ammonia Synthesis System using Renewable Energy and Hydrogen	Prof. AIKA Ken-ichi	National Institute of Technology (KOSEN), Numazu College	South Africa	p36
	21	Development of a Decarbonized Heat Energy Supply System using Ground Heat Source	Prof. INAGAKI Fumiaki	Graduate School of International Resource Sciences, Akita University	Tajikistan	p36
2020	22	Development of a Carbon Recycling System toward a Decarbonised Society by using Mineral Carbonation	Prof. IIZUKA Atsushi	Graduate School of Environmental Studies, Tohoku University	South Africa	p37
	23	Development of the Duckweed Holobiont Resource Values towards Thailand BCG Economy	Prof. MORIKAWA Masaaki	Faculty of Environmental Earth Science, Hokkaido University	Thailand	p37
2019	24	Development of Low-Carbon Affordable Apartments in the Hot-Humid Climate of Indonesia towards Paris Agreement 2030	Prof. KUBOTA Tetsu	Graduate School of Advanced Science and Engineering, Hiroshima University	Indonesia	p38
	25	Comprehensive Solutions for Optimum Development of Geothermal Systems in East African Rift Valley	Prof. FUJIMITSU Yasuhiro	Faculty of Engineering, Kyushu University	Kenya	p38
2018	26	Development of Advanced Hybrid Ocean Thermal Energy Conversion (OTEC) Technology for Low Carbon Society and Sustainable Energy System: First Experimental OTEC Plant of Malaysia	Prof. IKEGAMI Yasuyuki	Director, Institute of Ocean Energy, Saga University	Malaysia	p39
	27	Development and Dissemination of Innovative Oil-Extracting Technology from Crop Process Residue for Rural Electrification and Value Addition of By-products	Research Prof. / Emeritus Prof. SAKO Takeshi	Energy System Section, Graduate School of Science and Technology, Shizuoka University	Tanzania	p39

Bioresources

2024	❀	Establishment of Research and Disease Control Systems for Eradication of Dourine	Prof. INOUE Noboru	Director General, National Research Center for Protozoan Diseases, Obihiro University of Agriculture and Veterinary Medicine	Mongolia	—
	❀	Creating Sustainable and Diversified Rice Farming System that Simultaneously Achieves Zero-hunger and Zero-emission	Project leader TSUJIMOTO Yasuhiro	Crop, Livestock and Environment Division, Japan International Research Center for Agricultural Sciences	Madagascar	—
2023	28	Development of Sustainable Seaweed Based Functional Products for Promoting Blue Economy	Prof. ICHIKAWA Sosaku	Institute of Life and Environmental Sciences, University of Tsukuba	Indonesia	p42
	29	Establishment of an Alert System for Fusarium oxysporum f. sp. cubense, the Banana and Plantain Wilt Pathogen, and Mitigation Strategy of the Disease	Prof. ARIE Tsutomu	Institute of Agriculture, Tokyo University of Agriculture and Technology	Peru	p42
	30	Recovering High-Value Bioproducts for Sustainable Fisheries in Chile (ReBiS)	Prof. ONODA Akira	Faculty of Environmental Earth Science, Hokkaido University	Chile	p43
2022	31	Breeding Innovation in Chili Pepper and Tomato to Accelerate Sustainable Vegetable Production in Tropical Regions	Associate Prof. KANG Seung won	Faculty of Life and Environmental Sciences, University of Tsukuba	Indonesia	p43
	32	The Establishment of an Immediate Rice Variety Development System using Anther Culture and Citizen Science	Prof. KONDO Takumi	Research Faculty of Agriculture, Hokkaido University	Zambia	p44
2021	33	Creation of Beef Value Chain by Optimizing Ruminal Microbiota and Grassland Management on Digital Platform	Prof. OHKURA Satoshi	Graduate School of Bioagricultural Sciences, Nagoya University	Colombia	p44
	34	Development of Breeding and Water Management Technologies for Safe and Nutritious Rice Production	Associate Prof. KAMIYA Takehiro	Graduate School of Agricultural and Life Sciences, The University of Tokyo	Bangladesh	p45
	35	Establishment of Nitrogen-efficient Wheat Production Systems in Indo-Gangetic Plains by the Deployment of BNI-technology	Dr. TOBITA Satoshi	Specially Assigned Investigator, Japan International Research Center for Agricultural Sciences (JIRCAS)	India	p45
2020	36	Eco-engineering for Agricultural Revitalization Towards improvement of Human nutrition (EARTH): Water hyacinth to energy and agricultural crops	Prof. SATO Shinjiro	Department of Science and Engineering for Sustainable Innovation, Faculty of Science and Engineering, Soka University	Ethiopia	p46
	37	Project for Development of Complex Technologies for Prevention and Control of Rubber Tree Leaf Fall Diseases	Group Director MATSUI Minami	Center for Sustainable Resource Science, RIKEN	Indonesia	p46
	38	Development of Novel Disease Management Systems for Banana and Cacao	Prof. WATANABE Kyoko	College of Agriculture, Tamagawa University	Philippines	p47
2019	39	Restoration of Pastureland by Effective Usage of Wild Forage Plants based on Traditional Knowledge of Nomadic Mongolians	Project Researcher ASAMI Tadao	Graduate School of Agricultural and Life Sciences, The University of Tokyo	Mongolia	p47
	40	Strengthening of Resilience in Arid Agro-Ecosystems Vulnerable to Climate Change, Through Research on Plant Resources and Technological Applications	Dr. FUJITA Yasunari	Program Director, Food Program, Japan International Research Center for Agricultural Sciences (JIRCAS)	Bolivia	p48
	41	The Acceleration of Live-stock Revolution in aiming to be the Kitchen of the World: Development of Novel Technologies Yielding Stable Livestock Production and Food Safety	Specially Appointed Prof. MISAWA Naoaki	Center for Animal Disease Control (CADIC), University of Miyazaki	Thailand	p48
2018	42	Development of Climate Change Resilient Innovative Technologies for Sustainable Wheat Production in the Dry and Heat Prone Agro-ecologies of Sudan and Sub-Saharan Africa	Specially Appointed Prof. TSUJIMOTO Hisashi	Arid Land Research Center, Tottori University	Sudan	p49
	43	Utilization of Thailand Local Genetic Resources to Develop Novel Farmed Fish for Global Market	Prof. HIRONO Ikuo	Faculty, Department of Marine Biosciences, Tokyo University of Marine Science and Technology	Thailand	p49

Disaster Prevention and Mitigation

2024	❀	Development of End-to-End Earthquake Early Warning and Response System	Researcher INOUE Hiroshi	Disaster Prevention Research Institute, Kyoto University	Indonesia	—
	❀	Development of Integrated Sediment and Environmental Management towards Sustainable Conservation, Disaster Risk Reduction, and Livelihood Improvements in Coastal Areas	Prof. TAJIMA Yoshimitsu	Department of Civil Engineering, Graduate School of Engineering, The University of Tokyo	Ghana	—
2023	44	Disaster Risk Reduction of Widespread Volcanic Hazards in Southwest Pacific Countries	Associate Prof. ICHIHARA Mie	Earthquake Research Institute, The University of Tokyo	Tonga / Vanuatu / Fiji	
	45	Compound Disaster Risk Reduction associated with Large Earthquakes and Tsunamis	Assistant Prof. NAKANO Genta	Disaster Prevention Research Institute, Kyoto University	El Salvador / Mexico	
2022	46	Establishment of a Research and Education Complex for Developing Disaster-resilient Societies – MARTEST	Designated Prof. / Vice Director of IECMS KANEDA Yoshiyuki	Institute of Education, Research and Regional Cooperation for Crisis Management Shikoku (IECMS), Kagawa University	Türkiye	p52
	47	Real-Time Lightning 3D Imaging and Forecasting Project for Sustainable and Reliable Supply of Energy and Storm Disaster Early Warning	Prof. MORIMOTO Takeshi	Faculty of Science and Engineering, Kindai University	Malaysia	p52
2021	48	Numerical Weather Prediction and Warning Communication System for Densely Populated and Vulnerable Cities	Chief Scientist MIYOSHI Takemasa	Prediction Science Laboratory, RIKEN Cluster for Pioneering Research	Argentina	p53
	49	Building Sustainable System for Resilience and Innovation in Coastal Community	Prof. MORI Nobuhito	Disaster Prevention Research Institute, Kyoto University	Indonesia	p53
2020	50	Development of Integrated Expert System for Estimation and Observation of Damage Level of Infrastructure in Lima Metropolitan Area	Prof. KUSUNOKI Koichi	Earthquake Research Institute, The University of Tokyo	Peru	p54
	51	The Project for Technology Development on Life Time Management of Road and Bridge for Strengthening Resilience in Thailand	Prof. SATO Yasuhiko	Department of Civil and Environmental Engineering, School of Creative Science and Engineering, Waseda University	Thailand	p54
2019	52	Development of a Hybrid Water-Related Disaster Risk Assessment Technology for Sustainable Local Economic Development Policy under Climate Change	Prof. OHARA Miho	Center for Integrated Disaster Information Research, Interfaculty Initiative in Information Studies, The University of Tokyo	Philippines	p55
	53	Development of Early Warning Technology of Rain-Induced Rapid and Long-Travelling Landslides	Dr. KONAGAI Kazuo	Principal Researcher, Research Division, International Consortium on Landslides	Sri Lanka	p55
2018	54	Development and Operation Model of Plant-derived Soil Additives for Road Disaster Reduction on Problematic Soil	Prof. KIMURA Makoto	The Center for African Area Studies, Kyoto University	Ethiopia	p56

Infectious Diseases Control*

2024	❀	The project for assessing genetic diversity of Vibrio cholerae using cloud computing and developing potential therapeutics against cholera	Prof. IIDA Tetsuya	Research Institute for Microbial Diseases, Osaka University	India	—
	❀	Project for the Sustainable Control of Zoonotic Malaria through an Integrated Approach	Prof. KANEKO Osamu	Institute of Tropical Medicine, Nagasaki University	Malaysia	—
2023	❀	Implementation of KITASATO-drug discovery and development in schistosomiasis endemic areas for its eradication	Prof. TSUJI Naotoshi	Kitasato University School of Medicine, The Kitasato Institute	Republic of Ghana	—
	55	Co-designing neglected zoonosis intervention through One Health, education, and public-private partnership	Prof. MAKITA Kohei	School of Veterinary Medicine, Rakuno Gakuen University	United Republic of Tanzania	p60
2022	56	Project for malaria and neglected parasitic diseases control and elimination using advanced research technique, communication tools and eco-health education	Dr. IWAGAMI Moritoshi	Chief, Department of Tropical Medicine and Malaria Research Institute, National Center for Global Health and Medicine (NCGM)	Laos	p60
	57	Project for Integrated Research and Development towards Control and Elimination of Schistosomiasis	Prof. HAMANO Shinjiro	Department of Parasitology, Institute of Tropical Medicine, Nagasaki University	Kenya	p61
2021	58	The project for One Health approach to control of Neglected Tropical Diseases with special attention on sandfly and mosquito borne infections in Türkiye	Associate Prof. SANJOBA Chizu	Laboratory of Molecular Immunology, Graduate School of Agricultural and Life Sciences, The University of Tokyo	Türkiye	p61
	59	The project for institutional capacity building for eliminating Helicobacter pylori related death	Prof. YAMAOKA Yoshio	Department of Environmental and Preventive Medicine, Oita University Faculty of Medicine	Bhutan	p62
2020	60	The trilateral collaboration project for anti-infectious disease drug development: from lead optimization to preclinical testing	Prof. NOZAKI Tomoyoshi	Department of Biomedical Chemistry, Graduate School of Medicine, The University of Tokyo	Indonesia / Malaysia	p62
2019	61	Interdisciplinary Research for an Integrated Community-directed Strategy for Sustainable Freedom from Malaria	Specially Appointed Prof. KANEKO Akira	Graduate School of Medicine, Osaka Metropolitan University	Kenya	p63
	62	Control of Tuberculosis and Glanders	Prof. KIMURA Takashi	Faculty of Veterinary Medicine, Hokkaido University	Mongolia	p63

❀ New projects

* SATREPS projects in the field of Infectious Diseases Control have been transferred to AMED – the Japan Agency for Medical Research and Development.
(The transfer took place on April 1, 2015. Projects that finished before that date were not transferred.)

Finished Projects

Environment/Energy (Climate Change)

2009	Carbon Dynamics of Amazonian Forests	Dr. ISHIZUKA Moriyoshi	Forestry and Forest Products Research Institute (FFPRI)	Brazil
	Study on the Impact of Glacier Retreat on Water Resource Availability for the Cities of La Paz and El Alto	Prof. TANAKA Hitoshi	Graduate School of Engineering, Tohoku University	Bolivia
	Prediction of Climate Variations and its Application in the Southern African Region	Dr. YAMAGATA Toshio	Japan Agency for Marine-Earth Science and Technology (JAMSTEC)	South Africa
	Climate Variability Study and Societal Application through Indonesia - Japan "Maritime Continent COE" - Radar-Buoy Network Optimization for Rainfall Prediction	Dr. YAMANAKA Manabu	Japan Agency for Marine-Earth Science and Technology (JAMSTEC)	Indonesia
2008	Wild Fire and Carbon Management in Peat-forest in Indonesia	Prof. OSAKI Mitsuru	Graduate School of Agriculture, Hokkaido University	Indonesia
	Integrated Study Project on Hydro-Meteorological Prediction and Adaptation to Climate Change in Thailand (IMPAC-T)	Prof. OKI Taikan	Institute of Industrial Science, The University of Tokyo	Thailand
	Eco-technological Management of Tuvalu against Sea Level Rise	Prof. KAYANNE Hajime	Graduate School of Science, The University of Tokyo	Tuvalu
	Research on Ethanol Production from Sugarcane Wastes	Director, Dr. HIRATA Satoshi	Biomass Refinery Research Center, National Institute of Advanced Industrial Science and Technology (AIST)	Brazil

Environment / Energy (Global-scale Environmental Issues)

2017	Establishment of Environmentally Sound Management of Construction and Demolition Waste and Its Wise Utilization for Environmental Pollution Control and for New Recycled Construction Materials	Prof. KAWAMOTO Ken	Graduate School of Science and Engineering, Saitama University	VietNam
	Co-creation of Innovative Forest Resources Management Combining Ecological Methods and Indigenous Knowledge	Associate Prof. YASUOKA Hirokazu	The Center for African Area Studies, Kyoto University	Cameroon
2016	Development of Next-Generation Sustainable Land Management (SLM) Framework to Combat Desertification	Prof. TSUNEKAWA Atsushi	Arid Land Research Center, Tottori University	Ethiopia
	Comprehensive Assessment and Conservation of Blue Carbon Ecosystems and Their Services in the Coral Triangle (Blue CARES)	Specially Appointed Prof. NADAOKA Kazuo	School of Environment and Society, Tokyo Institute of Technology	Philippines / Indonesia
	Strengthening of the Environmental Radiation Control and Legislative Basis for the Environmental Remediation of Radioactively Contaminated Sites	Prof. NANBA Kenji	Faculty of Symbiotic Systems Science / Institute of Environmental Radioactivity at Fukushima University	Ukraine
	Development and Implementation of New Damage Assessment Process in Agricultural Insurance as Adaptation to Climate Change for Food Security	Associate Prof. HONGO Chiharu	Integrated Research Field of Remote Sensing Division, Center for Environmental Remote Sensing, Chiba University	Indonesia
2015	Visualization of Impact of Chronic / Latent Chemical Hazard and Geo-Ecological Remediation	Prof. ISHIZUKA Mayumi	Graduate School of Veterinary Medicine, Hokkaido University	Zambia
	Advancing Co-design of Integrated Strategies with Adaptation to Climate Change	Prof. OKI Taikan	Institute of Industrial Science, The University of Tokyo	Thailand
	Establishment of Environmental Conservation Platform of Tonle Sap Lake	Associate Prof. YOSHIMURA Chihiro	School of Environment and Society, Tokyo Institute of Technology	Cambodia
2014	Research on the Integration System of Spatial Environment Analyses and Advanced Metal Recovery to Ensure Sustainable Resource Development	Prof. ISHIYAMA Daizo	Graduate school of International Resource Science, Akita University	Serbia
	Hydro-microbiological Approach for Water Security in Kathmandu Valley, Nepal	Prof. KAZAMA Futaba	Interdisciplinary Research Centre for River Basin Environment, Graduate Faculty of Interdisciplinary Research, University of Yamanashi	Nepal
2013	Biodiversity Conservation in Amazon based on a New Concept of "Field Museum"	Prof. KOHSHIMA Shiro	Wildlife Research Center, Kyoto University	Brazil
	Development of Clean and Efficient Utilization of Low Rank Coals and Biomass by Solvent Treatment	Specially Appointed Prof. MIURA Koichi	Institute of Advanced Energy, Kyoto University	Thailand
2012	Sustainable Management of Coral Reef and Island Ecosystems: Responding to the Threat of Climate Change	Associate Prof. NAKAMURA Takashi	Faculty of Science, University of the Ryukyus	Palau
	Development of the Atmospheric Environmental Risk Management System in South America	Prof. MIZUNO Akira	Institute for Space-Earth Environmental Research, Nagoya University	Argentina / Chile
2011	Enhancing Resilience to Climate and Ecosystem Changes in Semi-Arid Africa: an Integrated Approach	Director, Prof. TAKEUCHI Kazuhiko	Integrated Research System for Sustainability Science(IR3S), The University of Tokyo	Ghana
2010	Development of Pollution Control and Environmental Restoration Technologies of Waste Landfill Sites Taking into Account Geographical Characteristics in Sri Lanka	Prof. TANAKA Norio	International Institute for Resilient Society, Saitama University	Sri Lanka
	UASB - DHS Integrated System — A Sustainable Sewage Treatment Technology	Prof. HARADA Hideki	New Industry Creation Hatchery Center, Tohoku University	India
	Establishment of Carbon-Cycle-System with Natural Rubber	Prof. FUKUDA Masao	School of Engineering, Nagaoka University of Technology	VietNam
	Joint Research Project on Formation Mechanism of Ozone, VOCs, and PM2.5 and Proposal of Countermeasure Scenario	Prof. WAKAMATSU Shinji	Faculty of Agriculture, Ehime University	Mexico
2009	Research Partnership for the Application of Low Carbon Technology for Sustainable Development	Director General, Prof. SUZUKI Yutaka	Kansai Research Centre, Institute for Global Environmental Strategies (IGES)	India
	Improving Sustainable Water and Sanitation Systems in Sahel Region in Africa: Case of Burkina Faso	Prof. FUNAMIZU Naoyuki	Graduate School of Engineering, Hokkaido University	Burkina-Faso
2008	Sustainable Systems for Food and Bio-energy Production with Water-saving Irrigation in the Egyptian Nile Basin	Prof. Emeritus SATOH Masayoshi	Faculty of Life and Environmental Sciences, University of Tsukuba	Egypt
	Conservation of Biodiversity in Tropical Forest through Sustainable Coexistence between Human and Wild Animals	Prof. YAMAGIWA Juichi	Graduate School of Science, Kyoto University	Gabon
	Research and Development for Water Reuse Technology in Tropical Regions	Prof. YAMAMOTO Kazuo	Environmental Science Center, The University of Tokyo	Thailand

Environment / Energy (Carbon Neutrality)

2017	Thermoluminescence Techniques in Geothermal Exploration and Integrated Evaluation System of Geothermal Reservoir	Prof. Emeritus / Visiting Prof. TSUCHIYA Noriyoshi	Graduate School of Environmental Studies, Tohoku University President of National Institute of Technology (KOSEN), Hachinohe College	El Salvador
	Smart Transport Strategy for Thailand 4.0	Distinguished Prof. HAYASHI Yoshitsugu	Center for Sustainable Development and Global Smart City, Chubu University	Thailand
2016	Comprehensive Conversion of Biomass and Waste to Super Clean Fuels by New Solid Catalysts	Prof. TSUBAKI Noritatsu	Faculty of Engineering, Academic Assembly, University of Toyama	Thailand
	Smart Cities Development for Emerging Countries by Multimodal Transport System Based on Sensing, Network and Big Data Analysis of Regional Transportation	General Manager TSUBOI Tsutomu	Global Business Development Office, Nagoya Electric Works Co., Ltd.	India
2015	Producing Biomass Energy and Material through Revegetation of Alang-alang (*Imperata Cylindrica*) Fields	Prof. UMEZAWA Toshiaki	Research Institute for Sustainable Humanosphere, Kyoto University	Indonesia
	Production of Biofuels Using Algal Biomass	Assistant Prof. KANDA Hideki	Graduate School of Engineering, Nagoya University	South Africa
2014	Technology Development of Steam-spot Detection and Sustainable Resource Use for Large Enhancement of Geothermal Power Generation in Indonesia	Prof. KOIKE Katsuaki	Graduate School of Engineering, Kyoto University	Indonesia
	Sustainable Development of Rural Area by Effective Utilization of Bio-wastes with Highly Efficient Fuel Cell Technology	Associate Prof. SHIRATORI Yusuke	Faculty of Engineering, Kyushu University / International Research Center for Hydrogen Energy, Kyushu University	VietNam
2013	Development of a Model System for Fluidized Bed Catalytic Gasification of Biomass Wastes and Following Liquid Fuel Production in Indonesia	Associate Prof. NODA Reiji	Graduate School of Science and Technology, Gunma University	Indonesia

Environment / Energy (Carbon Neutrality)

2012	Promotion of Green Economy with Palm Oil Industry for Biodiversity Conservation	Prof. SHIRAI Yoshihito	Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology	Malaysia
2011	Information-based Optimization of Jatropha Biomass Energy Production in the Frost- and Drought-prone Regions of Botswana	Prof. AKASHI Kinya	Faculty of Agriculture, Tottori University	Botswana
	Multi-beneficial Measure for Mitigation of Climate Change in Vietnam and Indochina Countries by Development of Biomass Energy	Visiting Researcher MAEDA Yasuaki	Graduate School of Humanities and Sustainable System Sciences, Osaka Prefecture University	VietNam
	Pilot Study for Carbon Sequestration and Monitoring in Gundih Area, Central Java Province, Indonesia	Specially Appointed Prof. MATSUOKA Toshifumi	Center for the Promotion of Interdisciplinary Education and Research, Kyoto University	Indonesia
2010	Sustainable Jatropha Biofuel Production in Mozambique	Prof. IMOU Kenji	Graduate School of Agricultural and Life Sciences, The University of Tokyo	Mozambique
	Sahara Solar Energy Research Center	Visiting Prof. KOINUMA Hideomi	Graduate School of Frontier Sciences, The University of Tokyo	Algeria
	Development of Low Carbon Society Scenarios for Asian Regions	Prof. MATSUOKA Yuzuru	Graduate School of Engineering, Kyoto University	Malaysia
	Development of New Biodiesel Synthesis in Thailand	Prof. ASAMI Kenji	Faculty of Environmental Engineering, The University of Kitakyushu	Thailand

Bioresources

2017	Strengthening Rice Breeding System based on Genomic Technology and Information in Myanmar	Prof. YOSHIMURA Atsushi	Faculty of Agriculture, Graduate School of Kyushu University	Myanmar
	Development of Harmful Algal Bloom Monitoring Methods and Forecast System for Sustainable Aquaculture and Coastal Fisheries in Chile	Prof. MARUYAMA Fumito	Office of Academic Research and Industry-Academia-Government and Community Collaboration, Hiroshima University	Chile
2016	Developing Countermeasures Against Striga to Conquer Poverty and Improve Food Security	Prof. SUGIMOTO Yukihiro	Graduate School of Agricultural Science, Kobe University	Sudan
	Breakthrough in Nutrient Use Efficiency for Rice by Genetic Improvement and Fertility Sensing Techniques in Africa	Dr. TSUJIMOTO Yasuhiro	Project Leader, Crop, Livestock and Environment Division, Japan International Research Center for Agricultural Sciences	Madagascar
	Project on Establishment of the Model for Fertilizing Cultivation Promotion Using Burkina Faso Phosphate Rock	Dr. NAGUMO Fujio	Senior Researcher, Crop, Livestock and Environment Division, Japan International Research Center for Agricultural Sciences	Burkina-Faso
	Optimizing Mariculture based on Big Data with Decision Support System	Prof. WADA Masaaki	School of Systems Information Science, Future University Hakodate	Indonesia
2015	Valorization of Bio-resources based on Scientific Evidence in Semi- and Arid Land for Creation of New Industry	Prof. ISODA Hiroko	Director, The Alliance for Research on the Mediterranean and North Africa / Faculty of Life and Environmental Sciences, University of Tsukuba	Tunisia/ Morocco
	Project for Development of Sericulture Research by Applying Biological Resources and Molecular Genetics	Group Leader KAMEDA Tsunenori	National Agriculture and Food Research Organization	Kenya
	Development and Dissemination of Sustainable Production System Based on Invasive Pest Management of Cassava in Vietnam, Cambodia and Thailand	Prof. TAKASU Keiji	Faculty of Agriculture, Kyushu University	VietNam/ Cambodia/ Thailand
	Continuous Operation System for Microalgae Production Optimized for Sustainable Tropical Aquaculture (COSMOS)	Prof. TODA Tatsuki	Department of Science and Engineering for Sustainable Innovation, Faculty of Science and Engineering, Soka University	Malaysia
2014	Establishment of Cryo-bank System for Vietnamese Native Pig Resources and Sustainable Production System to Conserve Bio-diversity	Advanced Researcher, Dr. KIKUCHI Kazuhiro	Institute of Agrobiological Sciences, NARO (National Agriculture and Food Research Organization) (NIAS)	Vietnam
	Development of Aquaponics Combined with Open Culture Adapting to Arid Regions for Sustainable Food Production	Prof. YAMADA Satoshi	Faculty of Agriculture, Tottori University	Mexico
2013	Development and Adoption of Latin American Low-input Rice Production System through Genetic Improvement and Advanced Field-management Technologies	Prof. OKADA Kensuke	Graduate School of Agricultural and Life Sciences, The University of Tokyo	Colombia
2012	Innovative Bio-production in Indonesia (iBioI): Integrated Bio-refinery Strategy to Promote Biomass Utilization using Super-microbes for Fuels and Chemicals Production	Prof. OGINO Chiaki	Graduate School of Engineering, Kobe University	Indonesia
	The Project on Rice Research for Tailor-made Breeding and Cultivation Technology Development in Kenya	Prof. YAMAUCHI Akira	Graduate School of Bioagricultural Sciences, Nagoya University	Kenya
	Diversity Assessment and Development of Sustainable Use of Mexican Genetic Resources	Prof. WATANABE Kazuo	Gene Research Center, University of Tsukuba	Mexico
2011	Flood- and Drought-Adaptive Cropping Systems to Conserve Water Environments in Semi-arid Regions	Prof. IIJIMA Morio	Faculty of Agriculture, Kindai University	Namibia
	Development of Aquaculture Technology for Food Security and Food Safety in the Next Generation	Research Prof. OKAMOTO Nobuaki	Tokyo University of Marine Science and Technology	Thailand
2010	Establishment of Sustainable Livelihood Strategies and Natural Resource Management in Tropical Rain Forest and its Surrounding Areas of Cameroon: Integrating the Global Environmental Concerns with Local Livelihood Needs	Prof. ARAKI Shigeru	The Center for African Area Studies, Kyoto University	Cameroon
	Comparative Studies of the Reproductive Biology and Early Life History of Two Tuna Species (Yellowfin Tuna and Pacific Bluefin Tuna) for the Sustainable Use of These Resources	Prof. SAWADA Yoshifumi	Fisheries Laboratory, Kindai University	Panama
	Development of Internationally Standardized Microbial Resource Center to Promote Life Science Research and Biotechnology	Acting Director-General, Dr. SUZUKI Ken-ichiro	Biological Resource Center, National Institute of Technology and Evaluation (NITE)	Indonesia
	The Project for the Development of Wheat Breeding Materials for Sustainable Food Production in Afghanistan	Prof. BAN Tomohiro	Kihara Institute for Biological Research, Yokohama City University	
	Development of Crop Genotypes for the Midlands and Mountain Areas of North Vietnam	Prof. YOSHIMURA Atsushi	Faculty of Agriculture, Kyusyu University	VietNam
2009	Innovation on Production and Automotive Utilization of Biofuels from Non-food Biomass	Dr. YOSHIMURA Yuji	Department of Energy and Environment, National Institute of Advanced Industrial Science and Technology (AIST)	Thailand
	Valorization of Bio-resources in Semi Arid and Arid Land for Regional Development	Prof. ISODA Hiroko	The Alliance for Research on North Africa, University of Tsukuba	Tunisia
	Sustainable Integration of Local Agriculture and Biomass Industries	Prof. SAKODA Akiyoshi	Institute of Industrial Science, The University of Tokyo	VietNam
	Development of Genetic Engineering Technology of Crops with Stress Tolerance against Degradation of Global Environment	Project Leader, Dr. NAKASHIMA Kazuo	Japan International Research Center for Agricultural Sciences (JIRCAS)	Brazil
	Improvement of Food Security in Semi-arid Regions of Sudan through Management of Root Parasitic Weeds	Prof. SUGIMOTO Yukihiro	Graduate School of Agricultural Science, Kobe University	Sudan
	Integrated Coastal Ecosystem Conservation and Adaptive Management under Local and Global Environmental Impacts	Prof. NADAOKA Kazuo	Graduate School of Information Science and Engineering, Tokyo Institute of Technology	Philippines

Disaster Prevention and Mitigation

2017	Regional Resilience Enhancement through Establishment of Area-BCM at Industry Complexes in Thailand	Prof. WATANABE Kenji	Graduate School of Engineering, Nagoya Institute of Technology	Thailand
2016	Project for Evaluation and Mitigation of Seismic Risk for Composite Masonry Buildings in Bhutan	Prof. AOKI Takayoshi	Graduate School of Design and Architecture, Nagoya City University	Bhutan
	Development of Extreme Weather Monitoring and Information Sharing System in the Philippines	Prof. TAKAHASHI Yukihiro	Faculty of Science, Hokkaido University	Philippines
2015	Hazard Assessment of Large Earthquakes and Tsunamis in the Mexican Pacific Coast for Disaster Mitigation	Associate Prof. ITO Yoshihiro	Disaster Prevention Research Institute, Kyoto University	Mexico
	Integrated Research on Great Earthquakes and Disaster Mitigation in Nepal Himalaya	Emeritus Prof. KOKETSU Kazuki	The University of Tokyo	Nepal
	Technical Development to Upgrade Structural Integrity of Buildings in Densely Populated Urban Areas and its Strategic Implementation towards Resilient Cities	Prof. NAKANO Yoshiaki	Institute of Industrial Science, The University of Tokyo	Bangladesh

Disaster Prevention and Mitigation

2014	Application of State of the Art Technologies to Strengthen Research and Response to Seismic, Volcanic and Tsunami Events, and Enhance Risk Management	Prof. KUMAGAI Hiroyuki	Graduate School of Environmental Studies, Nagoya University	Colombia
2014	Development of a Comprehensive Disaster Resilience System and Collaboration Platform in Myanmar	Prof. / Director MEGURO Kimiro	International Center for Urban Safety Engineering, Institute of Industrial Science, The University of Tokyo	Myanmar
2013	Integrated Study on Mitigation of Multimodal Disasters caused by Ejection of Volcanic Products	Prof. IGUCHI Masato	Sakurajima Volcano Research Center, Disaster Prevention Research Institute, Kyoto University	Indonesia
2013	Research Project on Disaster Prevention/Mitigation Measures against Floods and Storm Surges in Bangladesh	Prof. / Director NAKAGAWA Hajime	Research Center for Fluvial and Coastal Disasters, Disaster Prevention Research Institute, Kyoto University	Bangladesh
2012	Earthquake and Tsunami Disaster Mitigation in the Marmara Region and Disaster Education in Türkiye	Principal Research Scientist, Dr. KANEDA Yoshiyuki	Japan Agency for Marine-Earth Science and Technology	Türkiye
2011	Development of Landslide Risk Assessment Technology along Transport Arteries in Viet Nam	Executive Director, Dr. SASSA Kyoji	International Consortium on Landslides (ICL)	VietNam
2011	Research Project on Enhancement of Technology to Develop Tsunami-resilient Community	Deputy Director-General, Managing Director, Dr. TOMITA Takashi	Asia-Pacific Center for Coastal Disaster Research, Port and Airport Research Institute	Chile
2010	Magmatic Fluid Supply into Lakes Nyos and Monoun, and Mitigation of Natural Disasters through Capacity Building in Cameroon	Prof. OHBA Takeshi	School of Science, Tokai University	Cameroon
2010	Research and Development for Reducing Geo-Hazard Damage in Malaysia caused by Landslide and Flood	Prof. TOSAKA Hiroyuki	Graduate School of Engineering, The University of Tokyo	Malaysia
2009	Enhancement of Earthquake and Volcano Monitoring and Effective Utilization of Disaster Mitigation Information in the Philippines	Principal Senior Researcher, Dr. INOUE Hiroshi	Disaster Risk Research Unit, National Research Institute for Earth Science and Disaster Prevention	Philippines
2009	Observational Studies in South African Mines to Mitigate Seismic Risks	Prof. OGASAWARA Hiroshi	College of Science and Engineering, Ritsumeikan University	South Africa
2009	Information Network for Natural Disaster Mitigation and Recovery in India	Prof. MURAI Jun	Faculty of Environment and Information Studies, Keio University	India
2009	Project for Enhancement of Earthquake and Tsunami Disaster Mitigation Technology in Peru	Prof. YAMAZAKI Fumio	Graduate School of Engineering, Chiba University	Peru
2008	Multi-disciplinary Hazard Reduction from Earthquakes and Volcanoes in Indonesia	Prof. SATAKE Kenji	Earthquake Research Institute, The University of Tokyo	Indonesia
2008	The Study on GLOFs (Glacial Lake Outburst Floods) in the Bhutan Himalayas	Prof. NISHIMURA Kouichi	Graduate School of Environmental Studies, Nagoya University	Bhutan
2008	Project on Risk Identification and Land-use Planning for Disaster Mitigation of Landslides and Floods in Croatia	Director, Prof. MARUI Hideaki	Research Institute for Natural Hazards & Disaster Recovery, Niigata University	Croatia

Infectious Diseases Control

2018	Establishment of the "Bench-to-Bedside" Feedback System for Sustainable ART and the Prevention of New HIV Transmission in Vietnam	Director-Emeritus OKA Shinichi	AIDS Clinical Center, National Center for Global Health and Medicine	VietNam
2018	Epidemiology of Zoonotic Virus Infections in Africa	Prof. TAKADA Ayato	Division of Global Epidemiology, Research Center for Zoonosis Control, Hokkaido University	Zambia / DR Congo
2017	Integrated Research and Develomment Towards Chagas Disease Control	Prof. SHIMADA Junko	Department of Molecular and Cellular Parasitology, School of Health Sciences, Gunma University	El Salvador
2017	The Establishment of the One Health Prevention and Treatment Network Model for the Elimination of Rabies in the Philippines	Prof. NISHIZONO Akira	Department of microbiology, Faculty of Medicine, Oita University	Philippines
2016	Establishment of a Research and Reference Collaborative System for the Diagnoses of Fungal Infections including Drug-Resistant Ones both in Brazil and Japan	Associate Prof. WATANABE Akira	Medical Mycology Research Center, Chiba University	Brazil
2015	Surveillance and Laboratory Support for Emerging Pathogens of Public Health Importance	Specially Appointed Prof. KIYONO Hiroshi	The Institute of Medical Science, The University of Tokyo	Ghana
2015	Establishment of Laboratory Surveillance System for Viral Diseases of Public Health Concern	Prof. YASUDA Jiro	Institute of Tropical Medicine, Nagasaki University	Gabon
2014	Integrative Application of Human and Pathogen Genomic Information for Tuberculosis Control	Prof. TOKUNAGA Katsushi	Graduate School of Medicine, The University of Tokyo	Thailand
2014	Searching Lead Compounds of Anti-malarial and Anti-amebic Agents by Utilizing Diversity of Indonesian Bio-resources	Prof. NOZAKI Tomoyoshi	Graduate School of Medicine and Faculty of Medicine, The University of Tokyo	Indonesia
2014	Ecological Studies on Flying Foxes and Their Involvement in Rabies-related and Other Viral Infectious Diseases	Prof. HONDO Eiichi	Graduate School of Bioagricultural Sciences, Nagoya University	Indonesia
2013	Epidemiological Studies on Animal Protozoan Diseases in Mongolia and Development of Effective Diagnostics Measures	Prof. YOKOYAMA Naoaki	Obihiro University of Agriculture and Veterinary Medicine	Mongolia
2013	Development of Innovative Research Technique in Genetic Epidemiology of Malaria and Other Parasitic Diseases in Lao PDR for Containment of Their Expanding Endemicity	Director, Dr. KANO Shigeyuki	Department of Tropical Medicine and Malaria, Research Institute, National Center for Global Health and Medicine	Laos
2013	Establishment of an Early-warning System for Infectious Diseases in Southern Africa Incorporating Climate Predictions	Prof. MINAKAWA Noboru	Institute of Tropical Medicine, Nagasaki University	South Africa
2012	Surveillance of Viral Zoonoses in Africa	Prof. TAKADA Ayato	Research Center for Zoonosis Control, Hokkaido University	Zambia
2012	Comprehensive Etiological and Epidemiological Study on Acute Respiratory Infections in Children: Providing Evidence for the Prevention and Control of Childhood Pneumonia in the Philippines	Prof. OSHITANI Hitoshi	Graduate School of Medicine, Tohoku University	Philippines
2011	Determine the Outbreak Mechanisms and Development of a Surveillance Model for Multi-Drug Resistant Bacteria	Guest Prof. YAMAMOTO Yoshimasa	Osaka University Graduate School of Pharmaceutical Sciences	VietNam
2011	Development of Rapid Diagnostics and the Establishment of an Alert System for Outbreaks of Yellow Fever and Rift Valley Fever in Kenya	Prof. MORITA Kouichi	Institute of Tropical Medicine, Nagasaki University	Kenya
2010	Research and Development of Prevention and Diagnosis for Neglected Tropical Diseases, especially Kala-Azar	Associate Prof. NOIRI Eisei	The University of Tokyo Hospital	Bangladesh
2009	The Project for New Diagnostic Approaches in the Management of Fungal Infections in AIDS and Other Immunocompromised Patients	Prof. KAMEI Katsuhiko	Medical Mycology Research Center (MMRC), Chiba University	Brazil
2009	Identification of Anti-Hepatitis C Virus (HCV) Substances and Development of HCV and Dengue Vaccines	Prof. HOTTA Hak	Graduate School of Medicine/ School of Medicine, Kobe University	Indonesia
2009	The Studies of Anti-viral and Anti-parasitic Compounds from Selected Ghanaian Medicinal Plants	Prof. YAMAOKA Shoji	Graduate School of Medical and Dental Sciences, Tokyo Medical and Dental University	Ghana
2009	Prevention and Control of Leptospirosis in the Philippines	Prof. YOSHIDA Shin-ichi	Faculty of Medicine Sciences, Kyushu University	Philippines
2008	Research and Development of Therapeutic Products against Infectious Diseases, especially Dengue Virus Infection	Prof. IKUTA Kazuyoshi	Research Institute for Microbial Diseases, Osaka University	Thailand
2008	Establishment of Rapid Diagnostic Tools for Tuberculosis and Trypanosomiasis and Screening of Candidate Compounds for Trypanosomiasis	Prof. SUZUKI Yasuhiko	Research Center for Zoonosis Control, Hokkaido University	Zambia

Official Website / SNS

For more information, search for SATREPS on the internet!

Official Website
https://www.jst.go.jp/global/english/

SATREPS on Social Media

Follow SATREPS on social media to keep up-to-date with the latest news and research highlights!

Official Facebook
@ Friends of SATREPS
https://www.facebook.com/Friends.of.SATREPS

Official X
@ SATREPS
https://x.com/SATREPS

Japan Science and Technology Agency

Japan Science and Technology Agency
Department of International Affairs
SATREPS
K's Gobancho Building, 7, Gobancho, Chiyoda-ku,
Tokyo, 102-0076
Tel: +81-3-5214-8085
https://www.jst.go.jp/global/english/index.html

Japan Agency for Medical Research and Development

Japan Agency for Medical Research and Development
Headquarters
Yomiuri Shimbun Bldg. 1-7-1 Otemachi, Chiyoda-ku,
Tokyo 100-0004
Tel: +81-3-6870-2216
https://www.amed.go.jp/en/program/list/20/01/001.html

Japan International Cooperation Agency

Japan International Cooperation Agency
Headquarters
Nibancho Center Building 5-25,
Niban-cho, Chiyoda-ku, Tokyo 102-8012
Tel: +81-3-5226-6660
https://www.jica.go.jp/english/our_work/science/satreps.html