

November 15, 2024 Japan Science and Technology Agency (JST) 5-3, Yonbancho, Chiyoda-ku, Tokyo 102-8666

JST and DOST (Philippines) jointly to fund five research projects in the "Water Security" field under the NEXUS program

The Japan Science and Technology Agency (HASHIMOTO Kazuhito, President) has approved funding for five new international joint research projects under the framework of Networked Exchange, United Strength for Stronger Partnerships between Japan and ASEAN (NEXUS)^{*1}, "Japan-Philippines international joint research" in the field of Water Security (Attachment 1).

NEXUS is a flexible and multi-layered cooperative framework, leveraged by the long history of science and technology cooperation between both sides with the opportunity of the "50th anniversary of friendship and cooperation between Japan and ASEAN." It is aimed to further strengthen the cooperative research relationship between Japan and ASEAN as partners in co-creating innovations in science and technology.

One of the initiatives, "International Joint Research," NEXUS supports international joint research in common priority challenges between Japan and ASEAN.

In collaboration with the Department of Science and Technology (DOST)^{*2}, JST has conducted a call for proposals for international joint research projects (Attachment 2).

We received fourteen applications for this call, and after evaluation by experts from both countries and consultations between JST and DOST, we have decided to select five projects for funding. The research period is planned for three years (36 months).

*1) NEXUS: https://www.jst.go.jp/aspire/nexus/en/index.html

*2) DOST: https://www.dost.gov.ph/

Attachments

- 1. Abstracts of selected projects
- 2. Abstracts of the joint call for proposals
- 3. Experts for the evaluation (JST side)

Contact

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	Title	Principal Investigator	- Research Abstract
		(Japan side)	
		Principal Investigator	
		(Philippine side)	
			New water desalination system powered by sustainable energy will
	Bio-based Pretreatment for Enhanced Seawater Desalination	OKUDA Tetsuji	be developed for seawater on the core technology of RO (reverse
		(Professor, Faculty of	osmosis) membranes with pre-treatment by bio-base materials, which is
		Advanced Science and	sustainable and guaranteed as a water source even in islands and in
		Technology, Ryukoku	times of big-disaster.
		University)	Specifically, based on their respective achievements, the Japanese
			side will develop pre-treatment technology for membrane using the
			adsorbents and coagulants from a plant "Moringa" and the filtration
1			system powered by biofuels will be developed. The Philippine side will
			focus on the fabrication of membranes and the utilization of agricultural
		Ramon Christian P. EUSEBIO	by-products to produce adsorbents, which will be used in enhancing the
		(Associate Professor, Department of Chemical Engineering, University of the Philippines Los Banos)	performance of the solar-powered desalination system with an improved
			pretreatment process.
			Through this joint research by these teams composed of researchers
			from both countries, a compact desalination system will be fabricated
			for a sustainable seawater desalination system that utilizes biological
			materials and can be used even in places without electricity supply.

Abstracts of selected projects

Title	i intelpar investigator	Research Abstract	
	(Japan side)		
	Principal Investigator	Research Abstract	
	(Philippine side)		
vnergistic Strategies for ustainable Water esources and Dam anagement under atreme Climate ariability	(Philippine side) KANTOUSH Sameh Ahmed (Professor, Disaster Prevention Research Institute, Kyoto University) Jeoffrey Lloyd BARENG (Professor, College of Engineering, Isabela State University)	This research integrates long-term ensemble rainfall predictions with ensemble climate prediction databases to forecast extreme floods linked to super typhoons and abnormal droughts caused by climate change. The goal is to enhance the operations of Magat dam for effective flood mitigation and create a web-based platform for the Cagayan River Basin to share research findings with the Philippine community. Specifically, the Japanese team will simulate dam operations using remote sensing data and satellite imagery while downscaling of global climate predictions to regional and basin levels. The Philippine team will then incorporate these findings into policy planning, which includes developing water security indicators and master plans for local governments in the Cagayan River Basin. Through the collaborative efforts of teams from both countries, we aim to establish new guidelines for water resource management based on hydrological predictions. Additionally, we will focus on developing human resources to implement these guidelines and strengthening adaptation measures to address the increase in extreme weather events	
/r a ct	Title nergistic Strategies for stainable Water sources and Dam nagement under reme Climate tability	(Japan side)Title(Japan side)Principal Investigator (Philippine side)KANTOUSH Sameh Ahmed (Professor, Disaster Prevention Research Institute, Kyoto University)hergistic Strategies for stainable Water sources and Dam nagement under rreme Climate tiabilityJeoffrey Lloyd BARENG (Professor, College of Engineering, Isabela State University)	

	Title	Principal Investigator	Descareb Abstract	
		(Japan side)		
		Principal Investigator	Research Abstract	
		(Philippine side)		
3	Systematic Monitoring Survey of Perfluorinated and Polyfluorinated Alkyl Substances (PFAS) in Laguna - from Water Source to Distribution End Point, Drinking Water	KUNISUE Tatsuya (Professor, Center for Marine Environmental Studies, Ehime University) Anna Karen Carrasco LASERNA (Academic Service Faculty, Central Instrumentation Facility, De La Salle University)	This collaborative research aims to assess human risks for exposure of perfluorinated and polyfluorinated alkyl substances (PFAS), which attract attention worldwide, via drinking water and provide scientific data useful for formulating future regulations and guidelines for PFAS in the Philippines, by elucidating residue levels of PFAS in water sources and drinking water from Laguna. The Japanese team conducts target analysis of 36 emerging PFAS compounds in addition to 3 PFAS compounds (PFOS, PFOA, PFHxS) which have been already registered in the Stockholm Convention on Persistent Organic Pollutants, while the Philippine team performs sampling and pretreatment/purification of spring, ground and well water as water sources and treated-/bottled water for PFAS analysis. Additionally, both teams conduct nontarget analysis cooperatively to verify the presence and behavior of unidentified PFAS in the above water samples, leading to novel study outcomes. Eventually, this collaborative research is expected to provide fundamental data useful for reduction and treatment measures of PFAS in the Philippines.	

	Title	Principal Investigator (Japan side) Principal Investigator (Philippine side)	Research Abstract
4	Strengthening Water Security and Resilience through Prioritization of Emerging Pollutants for Drinking Water and Protection of Aquatic Life in Laguna Lake, Philippines	KURISU Futoshi (Professor, School of Engineering, The University of Tokyo) Janice B. SEVILLA-NASTOR (Associate Professor, School of Environmental Science and Management, University of the Philippines Los Banos)	This collaborative research aims to prioritize hazardous chemicals to be monitored in water quality management in the Philippines. Specifically, the study will focus on Laguna Lake, which is a multi-use water resource including source of domestic water supply, aquaculture, irrigation water, recreation, etc. The Philippine team will conduct a survey of chemical substances to be considered based on analysis of statistical data on chemical imports, as well as information provided by local companies. Based on the information obtained, the Japanese team will conduct a screening analysis using a high-resolution mass spectrometer and evaluate whether they are present in concentrations that threaten human health and aquatic life. Through joint research by the two research teams, the project will develop a method for prioritization of emerging pollutants for monitoring and management, and monitoring methods will be presented to administrative sections to enable safe management of water resources.

	Title	Principal Investigator	Research Abstract
		Principal Investigator (Philippine side)	
	Assessment of Emerging Microbial Contaminants in the Aquatic	HARAMOTO Eiji (Professor, Graduate Faculty of Interdisciplinary Research, University of Yamanashi)	This collaborative research aims to clarify the occurrence of pathogens and antimicrobial resistance bacteria/genes in the aquatic environments in the Philippines and their reduction by water/wastewater treatment process, identifying new indicators to ensure the microbiological safety of water, and to establish a system for monitoring of the incidence of infectious diseases using wastewater-based epidemiology.
5	Environment and Water/Wastewater Treatment Systems to Enhance Water Security and Public Health in the Philippines	Marigold UBA (Full-time Senior Lecturer, Department of Biology, De La Salle University)	Specifically, the Japan team will provide technical guidance and transfer of methods for detection of pathogens, etc., and conduct measurements using state-of-the-art technologies for gene detection, such as digital PCR, and assess the risk of waterborne diseases. The Philippine team will conduct routine water sampling and establish a system for monitoring of microbial contaminants. It is expected that this international collaborative research will lead to the establishment of an efficient monitoring system for microbiological safety of water and the proposal of countermeasures to reduce the load of microbial discharges and the risk of infectious diseases.

Abstract of the joint call for proposal

(1) Partner funding agency

Organization name: Department of Science and Technology (DOST) URL: https://www.dost.gov.ph/

(2) Research field

Water security

(3) Researcher eligibility

Any independent researcher personally affiliated with a domestic Japanese research institution, including universities, independent administrative institutions, national/public testing and research institutions, specially authorized corporations, public-service corporations, and enterprises

- (4) Research duration Three years (36 months)
- (5) Funding amount (by JST, per project)
 - Direct expenses: up to 24 million Japanese Yen
 - Indirect expenses: 30% of direct expenses
- (6) Evaluation procedure
 - Evaluation by independent committees consisting of experts from both countries.
 - Discussion and decision by JST and DOST based on evaluation result.

(7) Evaluation criteria

- Relevance to the research field
 The proposal's alignment with the designated research area of the call and its potential to contribute to advancements in the field.
- Research leadership capacity
 Assessment of the capabilities and expertise of the research leaders involved, including their track record and ability to effectively lead the proposed project.
- Anticipated scientific outputs Evaluation of the expected scientific achievements resulting from the collaborative research effort.

- Synergistic impact of international collaboration
 Examination of the potential synergies and added value generated through the collaboration between international partners.
- Soundness of research and exchange plans
 Review of the validity and robustness of both the research and exchange plans outlined in the proposal.
- Anticipated economic and social benefits
 Consideration of the potential economic and societal impacts arising from the outcomes of the joint research initiative.
- Feasibility of implementation
 Assessment of the practical feasibility of implementing the proposed project, considering factors such as the proposed timeline, budgetary allocations, availability of facilities, and the mechanisms for cooperation among participating entities.

Name	Position and organization	Role
FURUMAI Hiroaki	Institute Professor, Research and Development	Program
	Initiative, Chuo University	Officer
OKABE Satoshi	Professor, Graduate School of Engineering,	Advisor
	Hokkaido University	
KANAE Shinjiro	Professor, School of Environment and Society,	Advisor
	Tokyo Institute of Technology	
TAKIZAWA Satoshi	AKIZAWA Satoshi Professor, Graduate School of Engineering, The	
	University of Tokyo	
TSURU Toshinori	Specially Appointed Professor, Graduate School	Advisor
	of Advanced Science and Engineering, Hiroshima	
	University	
FUKUSHI	UKUSHI Professor and Director, Institute for Future	
Kensuke	Kensuke Initiatives, The University of Tokyo	
FUJII Shigeo	UJII Shigeo Professor Emeritus, Kyoto University	
FUJIWARA Taku Professor, Graduate School of Global		Advisor
	Environmental Studies, Kyoto University	
MATSUI Yoshihiko	ATSUI Yoshihiko Research Visiting Professor, Research	
	Organization for Nano & Life Innovation, Waseda	
	University	

Experts for the evaluation (JST side)

(Advisors are listed in order of the Japanese syllabary.)

(Position and organization are as of the time of evaluation.)