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

JST to fund five research projects for the 4th call of AJ-CORE (Africa-Japan Collaborative Research) in the field of "Environmental Science"

The Japan Science and Technology Agency (JST) has made the decision to fund new international projects through AJ-CORE * (Attachment 1).

The fourth joint call for proposals in the field of "Environmental Science" was held by JST, the National Research Foundation (NRF) of South Africa, and organizations from member countries of the Science Granting Councils Initiative (SGCI) (Attachment 2).

A total of 19 proposals were submitted to the joint call. JST and the other participating funding agencies jointly made the decision to adopt five projects based on joint panel reviews and evaluations by experts from the participating countries (Attachment 3).

The research period is scheduled to be three years.

*) AJ-CORE (Africa-Japan Collaborative Research)

AJ-CORE aims to resolve issues important to both Africa and the world, including SDGs. It is designed to support international collaborative research conducted by researchers from Japan, South Africa, and at least one African country participating in Africa's Science Granting Councils Initiative (SGCI).

URL：https://www.jst.go.jp/inter/english/program_e/multilateral_e/aj-core.html

Attachments

1. Abstracts of the new projects
2. The countries and organizations participating in the joint call
3. Experts for evaluation (JST)

Annex: Abstract of the joint call for proposals

Contact

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Attachment 1

Abstracts of the new projects

	Project Title (Acronym)	Principal Investigators	Position and Institution	Research Project Abstract
1	Identification of Molecular Markers for Climate Change Adaptation in Beef Cattle (M2CA-BEEF)	OHKURA Satoshi (Japan)	Professor / Vice Dean, Graduate School of Bioagricultural Sciences, Nagoya University	This study aims to identify genetic markers for adaptability to climate change by comparing beef cattle from two African countries (South Africa [ZA] and Ethiopia [ET]), and Japan (JP), using genome-wide association studies (GWAS). Blood samples for DNA analysis will be collected from cattle herds of different pedigrees and regions in each country (JP: two breeds from two regions; ZA: three breeds from three regions; ET: two breeds from two regions), and information on each raising situation, productivity, and reproductive performance will be obtained. DNA extraction will be performed in each country, and subsequent GWAS will be led by Japanese and South African teams, with assistance from Ethiopian researchers. Through the present research, genetic markers that contribute to the adaptation of beef cattle to hot environments will be identified, as well as to reduce the environmental impact of cattle farming on a global level in the future.
		Bohani MTILENI (South Africa)	Associate Professor, Faculty of Science, Tshwane University of Technology	
		Mengistie Taye TEREFE (Ethiopia)	Associate Professor, College of Agriculture and Environmental Sciences, Bahir Dar University	

	Project Title (Acronym)	Principal Investigators	Position and Institution	Research Project Abstract
2	The impact of pre- and postharvest plant protection practices on decay in the tomato value chain in Botswana and South Africa under shifting global climatic conditions (PHTD)	SAKURAI Takeshi (Japan)	Professor, Graduate School of Agricultural and Life Sciences, The University of Tokyo	The objective of this study is to reduce food loss due to spoilage and the resulting greenhouse gas emissions in the tomato value chain in the southern African region. Specifically, of the African side, the South African team will collect molds that cause post-harvest rot of tomatoes in the study area in South Africa and Botswana, identify the fungal species at the DNA level, and identify effective fungicide agents against the species. In addition, a model will be operated to predict the occurrence of the causal species based on weather conditions. The African team will develop an integrated management approach that combines fungus identification, prediction of outbreak timing, and improved handling of tomatoes before and after harvest, and confirm its effectiveness in tomato fields at each study site. The Japanese team will design and conduct, in collaboration with the African team, a randomized controlled trial to evaluate the integrated management approach in small-scale tomato farmers. The evaluation of the methods will be based on the incidence of tomato spoilage and the profit margins of the growers. In addition, the impact on distributors, retailers, and consumers will be considered. The team's collaborative research is expected to reduce losses due to tomato spoilage and reduce greenhouse gas emissions in the southern African region, which has similar climatic conditions to those in South Africa and Botswana.
		Julia MEITZ-HOPKINS (South Africa)	Research Fellow, Division of AgriSciences, Stellenbosch University	
		Mosimanegape JONGMAN (Botswana)	Senior Lecturer, Faculty of Science, University of Botswana	

	Project Title (Acronym)	Principal Investigators	Position and Institution	Research Project Abstract
3	Water wise waste management: Two ends of the size scale, macro and nano augmentation for dry anaerobic digestion optimization (W3M-Dry AD)	Sasipa BOONYUBOL (Japan)	Specially Appointed Associate Professor (Lecturer), School of Environment and Society, Institute of Science Tokyo	Anaerobic digestion (AD), a process in which microorganisms convert organic waste into value-added products such as biogas and soil ameliorant, offers the advantage of simultaneously achieving waste management and renewable energy generation. Dry anaerobic digestion (dry AD) has benefits such as smaller reactor volume as well as less energy requirement for heating and mixing compared to conventional wet anaerobic digestion (wet AD). However, it has not been widely adopted due to several challenges, including lower biogas productivity. This study aims to develop and optimize nanoparticles (nano-biochar) to enhance dry AD efficiency and bulking agents to improve mass transfer within the digester. Nano-biochar, with its large surface area and porosity, is expected to promote the formation of microbial biofilms, increasing biogas yield in dry AD and absorb inhibitory compounds such as excess ammonium. The bulking agent is designed to improve the mass transfer within the digester and prevent the compaction issues associated with the high solid content in dry AD system. Through collaborative research, this study seeks to enhance agricultural productivity and economic stability for small-scale farmers while contributing to renewable energy access, food security, and job creation in South Africa, Mozambique, and Japan.
		Ashira ROOPNARAIN (South Africa)	Senior Researcher, Division of Natural Resources and Engineering, Agricultural Research Council	
		Custódio Efraim MATAVEL (Mozambique)	Researcher, Division of Rural Engineering, Universidade Lúrio	

	Project Title (Acronym)	Principal Investigators	Position and Institution	Research Project Abstract
4	Sustainability Challenge in Africa: Purification of Contaminated Soil Using Nano-Calcium and Its Recycling into Eco-Fertilizer and High-Strength Concrete (SCA-CEFC)	MITOMA Yoshiharu (Japan)	Professor, Faculty of Science and Engineering, Chuo University	This research focuses on the purification of soils contaminated by malaria control agents (mainly DDT) and heavy metals using nanoscale calcium reagents. The goal is to advance environmental purification while enhancing the value of the treated soil by recycling it into fertilizers or strengthened concrete. The Japanese team will prepare the reagents and provide guidance on various analytical methods. The South African team will handle the purification of pesticide-contaminated soils and heavy metal countermeasures. The Ethiopian team will focus on soil purification and soil acidification measures in cornfields. The Benin team will address soil purification in cotton fields, and the Indonesian team will develop high-performance concrete materials using palm fiber. Through multinational collaboration involving five countries, the teams aim to achieve resource and energy efficiency while reducing waste.
		Memory TEKERE (South Africa)	Research Professor, College of Agriculture and Environmental Sciences, University of South Africa	
		Gudina Terefe TUCHO (Ethiopia)	Professor, Institute of Health, Jimma University	

	Project Title (Acronym)	Principal Investigators	Position and Institution	Research Project Abstract
5	Sustainable Wastewater Treatment Using Algal-bacterial Consortia for Enhanced Resilience to Climate Change in Africa (SWATIA)	Zhongfang LEI (Japan)	Associate Professor, Institute of Life and Environmental Sciences, University of Tsukuba	Appropriate municipal wastewater treatment (MWT) is essential for environmental protection and sustainability. Conventional wastewater treatment systems are inefficient at removing nutrients such as nitrogen and phosphorus and have issues relating to high-cost electricity consumption for aeration in bioreactors and greenhouse gas emissions from organics decomposition/nutrients removal and energy-intensive mechanical aeration. Microalgae and algal-bacterial consortia present low-cost and low-energy MWT, but with high nutrient/energy recovery and carbon sequestration as they can fix carbon and supply oxygen to bacteria through microalgae photosynthesis. In this project, a pilot study will be conducted to evaluate the feasibility of native microalgae and granular consortia of native microalgae and bacteria for primary MWT in Africa. South Africa and Kenya teams mainly focus on physicochemical characterization of typical municipal wastewaters and native microalgae and bacterial species in their typical MWT systems; Japan team concentrates on biogranulation of the similar microalgae and bacteria as found in MWT in South Africa and Kenya. Their close collaboration will create a feasible and efficient technology for wastewater treatment, which can be rolled and translated to other African countries, contributing to strengthening Africa's resilience to climate change and sustainable development goals.
		Faizal BUX (South Africa)	Professor, Institute for Water and Wastewater Technology, Durban University of Technology	
		Laila ABUBAKAR (Kenya)	Professor, School of Applied and Health Science, Technical University of Mombasa	

Attachment 2

The countries and organizations participating in the joint call

Participating countries are Japan, South Africa and Science Granting Councils Initiative (SGCI) African countries (Botswana, Burkina Faso, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mozambique, Namibia, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Uganda, Zambia and Zimbabwe).
Organizations from Japan, South Africa, Botswana, Côte d'Ivoire, Ethiopia, Kenya, Mozambique, and Tanzania have declared their funding for the call.

Country	Funding Agency
Japan	Japan Science and Technology Agency: JST
South Africa	National Research Foundation: NRF
Botswana	Ministry of Communications, Knowledge and Technology: MCKT
Côte d'Ivoire	Fonds pour la Science, la Technologie et l'Innovation: FONSTI
Ethiopia	Ministry of Innovation and Technology: MinT
Kenya	National Research Fund: NRF
Mozambique	Fundo Nacional de Investigação: FNI
Tanzania	Tanzania Commission for Science and Technology: COSTECH

Attachment 3

Experts for the evaluation (Japan side)

Name	Position and Institution	Role
UMETSU Chieko	Professor Emeritus, Kyoto University / Professor, Faculty of Humanities and Social Sciences, Tohoku University of Community Service and Science	Program Officer
ARAKI Shigeru	Professor Emeritus, Kyoto University	Advisor
ISHIHARA Tatsumi	Professor, Faculty of Engineering, Kyushu University	Advisor
ITO Kasumi	Associate Professor, International Center for Research and Education in Agriculture, Nagoya University	Advisor
GOKON Nobuyuki	Associate Professor, Faculty of Engineering, Niigata University	Advisor
KOHARA Satoshi	CEO, Ecotribute, Inc.	Advisor
TSUBAKI Susumu	CEO / Representative Partner, AAIC Holdings, Pte. Ltd.	Advisor
NISHIBORI Masahide	Professor, Graduate School of Integrated Sciences for Life, Hiroshima University	Advisor
FUJINO Takeshi	Professor, Graduate School of Science and Engineering, Saitama University	Advisor
FUNAMIZU Naoyuki	Professor Emeritus, Hokkaido University	Advisor
HOSONO Kenji	Professor, Graduate School of Integrated Sciences for Life, Hiroshima University	Advisor
YATAGAI Akiyo	Professor, Graduate School of Science and Technology, Hirosaki University	Advisor

Annex

Abstract of the joint call for proposals

(1) Application requirements:
A multilateral research project composed by three (or more) countries: Japan, South Africa, and at least one SGCI African country.

(2) Applicant eligibility (Japan side):
Any independent researcher personally affiliated with (and actively conducting research at) a domestic Japanese research institution, regardless of nationality, is eligible to apply.

(3) Research period:
The scheduled research period is 3 years from April 2025.

(4) Amount of funding (JST):
Up to 18.2 million yen from JST to the researchers (Japan-based team) per project, inclusive of overhead costs (30 percent of direct costs).

(5) Evaluation methods:
Based on evaluation outcomes by experts from each country which declared their funding for the call, including Japan, and discussion by JST and other participating funding agencies.

(6) Evaluation criteria (JST):
The following were among the general criteria considered in the evaluation process:

1）Requirements for this call satisfied
2）Clear alignment with the thematic focus of this call
3）Scientific and technical perspective:
   a. Quality and originality of the project proposal
   b. Scientific and technical expertise of the team members
   c. Expected scientific outcomes and the potential to produce results
4）International collaboration perspective:
   a. Experience of primary investigators in the international collaboration
   b. New or the enhancement of the existing collaborative relationships
   c. Quality and the synergy effect of the collaboration by the participating organizations
5）Adequacy and feasibility of the research plan (budget, objectives, activity schedule)