

JIRCAS

2026-2027

Japan International Research Center for
Agricultural Sciences

Together for our food and planetary health





Together for our food and planetary health

Japan International Research Center for Agricultural Sciences

JIRCAS, a National Research and Development Agency under the Ministry of Agriculture, Forestry and Fisheries, plays a core role in international collaboration and contribution in the field of agricultural, forestry, and fisheries research.

As Japan's leading research institution in international agricultural, forestry, and fisheries sciences, JIRCAS advances research and innovation to address global environmental challenges and food security issues.

By enhancing agricultural technologies and leading international scientific discussions, JIRCAS contributes to strengthening food security and promoting the sustainable development of agriculture, forestry, and fisheries worldwide.



History

1970

▶ Establishment of the Tropical Agriculture Research Center (TARC) by the Ministry of Agriculture and Forestry

1977

▶ TARC Headquarters was transferred from Kita-ku, Tokyo, to Tsukuba City, Ibaraki

1993

▶ Reorganization of TARC into the Japan International Research Center for Agricultural Sciences (JIRCAS)

2001

▶ Restructured as an Incorporated Administrative Agency (IAA) [Formulation of the First Medium-Term Plan]

2006

▶ [The Second Medium-Term Plan]

2011

▶ [The Third Medium-Term Plan]

2015

▶ Restructured as a National Research and Development Agency (NRDA)

2016

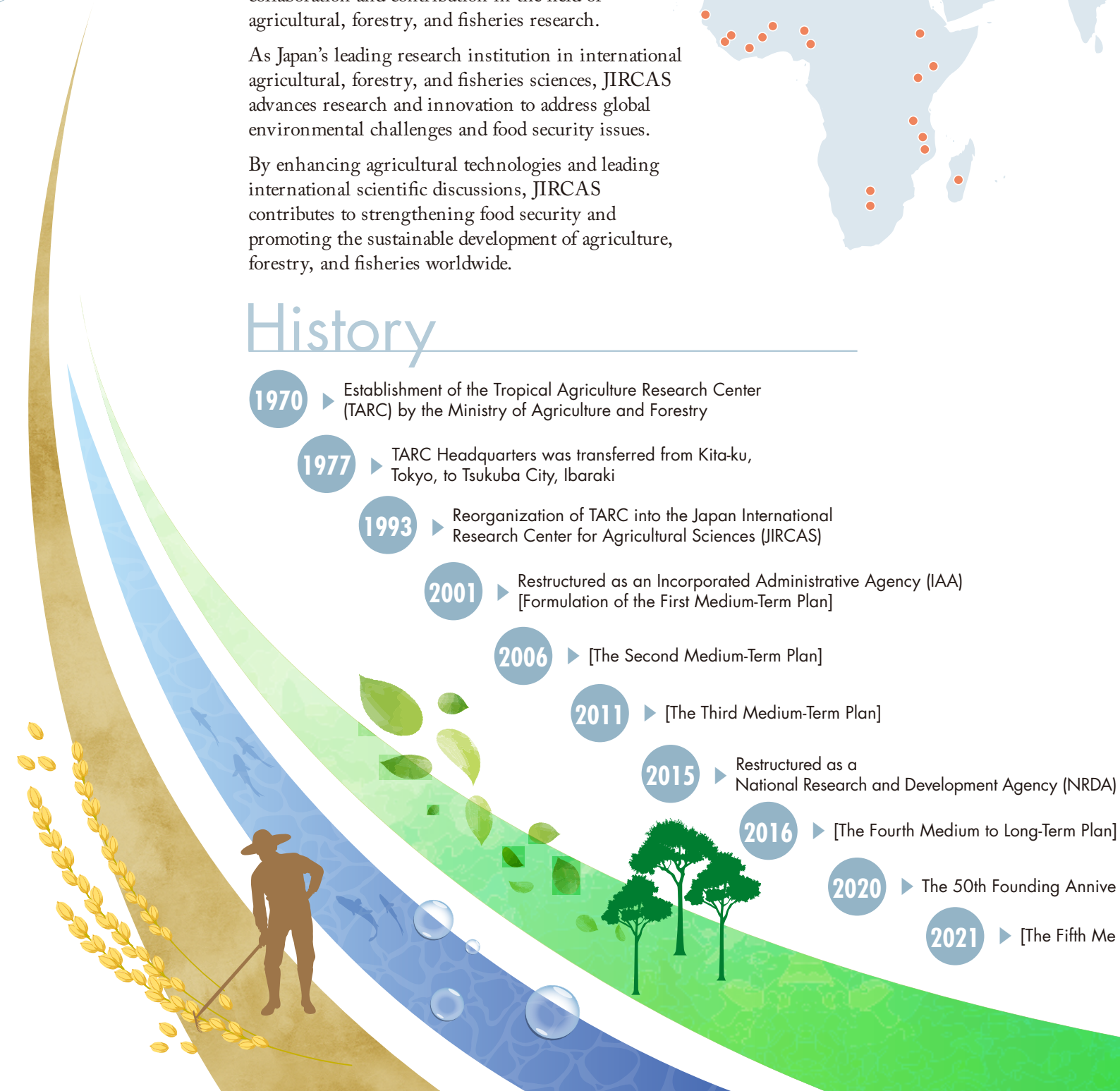
▶ [The Fourth Medium to Long-Term Plan]

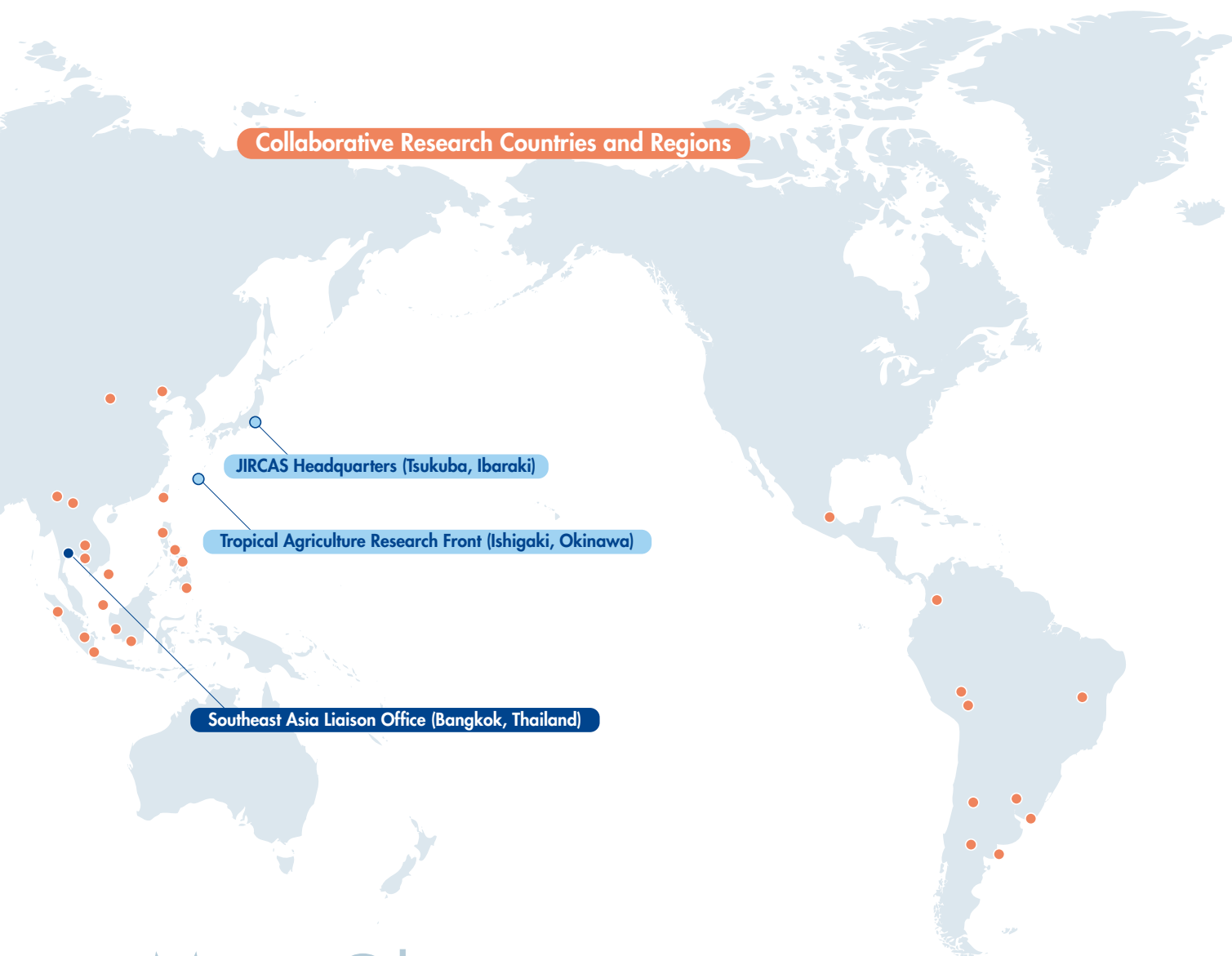
2020

▶ The 50th Founding Anniversary

2021

▶ [The Fifth Medium-Term Plan]





Collaborative Research Countries and Regions

JIRCAS Headquarters (Tsukuba, Ibaraki)

Tropical Agriculture Research Front (Ishigaki, Okinawa)

Southeast Asia Liaison Office (Bangkok, Thailand)

Main Objectives

- 1 To undertake comprehensive experimental research for technological advancement of agriculture, forestry, fisheries, and related industries in tropical/subtropical zones and developing regions;
- 2 To collect, analyze, and publish information of domestic and international researches which are relevant to agriculture, forestry, and fisheries;
- 3 To invest in and provide manpower and technical support to businesses that utilize the results of experimental research;
- 4 Through the above, to contribute solutions to global food and environmental problems as well as to the stable supply of agricultural, forestry, and fishery products and resources.

rsary of JIRCAS

dium to Long-Term Plan]

2026

► [The Sixth Medium to Long-Term Plan]

2030

► The 60th Founding Anniversary of JIRCAS

Basic Principles

Food Security and Global Challenges

JIRCAS contributes to strengthening food security and promoting the sustainable development of agriculture, forestry, and fisheries by addressing global challenges such as climate change, environmental degradation, and food and nutrition insecurity through science-based knowledge and innovative technologies.

International Center of Excellence in Agricultural, Forestry, and Fisheries Research

As Japan's leading research institution in the field of international agriculture, forestry and fisheries, JIRCAS strengthens global research networks, leads international scientific dialogue, and contributes to enhancing Japan's international presence while supporting sustainable development worldwide.

Operation Policies

Strategic Research and Innovation

JIRCAS will strategically focus its research efforts on priority challenges and promote the creation of innovative technologies through the development of research infrastructure, international research networks, and advanced scientific knowledge, thereby maximizing the impact of research and development.

Social Implementation of Research Outcomes

JIRCAS will promote the effective adoption and dissemination of research outcomes by working closely with extension organizations, government agencies, international organizations, research institutions, and private-sector partners, thereby accelerating the contribution of these outcomes to society.

Strengthening Intelligence and Strategic Functions

JIRCAS will enhance its capacity to collect, analyze, and disseminate information on international agricultural, forestry, and fisheries issues, including technological, environmental, policy, and socio-economic developments, and utilize this knowledge to support evidence-based strategies and decision-making.

Strengthening Domestic and International Collaboration and Cooperation

JIRCAS will provide opportunities for collaboration and cooperation among researchers, research institutions, administrative bodies, international organizations, development agencies, producers, and private companies, and promote innovation and human resource development in agriculture, forestry, and fisheries.

Providing a Safe, Inclusive, and Rewarding Work Environment

JIRCAS will provide a safe, inclusive, and rewarding work environment in which diverse personnel can fully demonstrate their capabilities. Through sound governance, compliance, security, and occupational health and safety management, JIRCAS will continue to pursue efficient and high-quality activities.

Top Message

“Together for our food and planetary health”

As JIRCAS embarks upon its Sixth Medium to Long-Term Plan, I am deeply honored to serve as its President.

For more than half a century, the Japan International Research Center for Agricultural Sciences (JIRCAS) has pursued its mission of contributing to the advancement of agricultural, forestry, and fisheries technologies and the sustainable development of developing regions, particularly in the tropics and subtropics. Through international collaborative research and human resource development, JIRCAS has worked alongside partners around the world to address challenges that transcend national borders. As Japan's leading international research institution in agriculture, forestry, and fisheries, we take great pride not only in the scientific achievements we have generated, but also in the role we have played in fostering intellectual exchange and international cooperation in pursuit of solutions to global challenges.

The world today stands at a critical crossroads. Climate change and increasingly frequent extreme weather events, geopolitical instability, biodiversity loss, and emerging infectious diseases are reshaping the global landscape, rendering the challenges surrounding food, agriculture, and the environment more complex and uncertain than ever before. Among these challenges, ensuring food security while safeguarding environmental sustainability has emerged as one of the defining issues of our time. Such challenges cannot be resolved by any single nation or institution. They demand sustained international cooperation, informed by sound science and reinforced by continuous innovation.

Throughout my career as a crop scientist and crop physiologist, I have devoted my efforts to understanding the impacts of climate change on agricultural production and to advancing adaptation strategies. I also had the privilege of serving as a Coordinating Lead Author of the chapter on food and ecosystem products in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Working together with researchers from across the world, I witnessed first-hand the indispensable role of science in shaping our collective future. Equally important, I came to appreciate the responsibility of research institutions to ensure that scientific knowledge informs both policy and practice in meaningful and lasting ways.

Under the Sixth Medium to Long-Term Plan, JIRCAS will advance its mission through three core programs: the Environment and Resources Program, the Food and Nutrition Program, and the Information and Strategy Program. Through these programs, we will address climate change, reduce environmental burdens, promote the sustainable circulation of resources, strengthen food and nutrition security, and enhance the collection, analysis, and dissemination of internationally relevant knowledge grounded in scientific evidence. We will further deepen collaboration with international organizations, government agencies, research institutions, private enterprises, producers, and many other partners to accelerate the uptake and implementation of research outcomes.



We recognize that no single solution exists for the increasingly complex challenges confronting humanity. Sustainable progress requires the effective integration of diverse elements, including genetic resources, technologies, natural resources, institutions, and policies, in ways that reflect the realities and aspirations of individual regions and communities. To this end, JIRCAS seeks to serve as a knowledge hub that links field-based research with international scientific discourse while functioning as an interface between science and society, and between research and policy.

JIRCAS is distinguished by its long-standing experience in international collaborative research, its multidisciplinary community of researchers, and its extensive network of partners spanning all regions of the world. Under the Sixth Medium to Long-Term Plan, we will further strengthen these assets and pursue two complementary objectives: advancing the social implementation of research outcomes and enhancing the global dissemination of knowledge. Through these efforts, we aspire to contribute not only to global food security but also to the sustainable development of agriculture, forestry, and fisheries in Japan and around the world.

At a time when uncertainty has become a defining feature of our age, confidence in the power of science is more important than ever. Guided by our commitment to “Together for Our Food and Planetary Health,” JIRCAS will continue working with diverse partners across the globe to address challenges shared by humanity and to create new value for future generations.

I sincerely invite your continued understanding, partnership, and support as we advance this endeavor together.

HASEGAWA Toshihiro
President

JIRCAS Medium to Long-Term Plan

FY 2026



2032



**Environment and
Resources**



**Food and
Nutrition**



**Information and
Strategy**

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- Developing Sustainable Agricultural Production Systems through Biological Nitrification Inhibition (BNI) **【BNI-Development】**
- Low-Carbon Agricultural Technologies and Pathways for Climate-Responsive Innovation **【Low-Carbon Agriculture】**
- Accelerating Agricultural Green Transformation (GX) through International Deployment of Next-Generation Biomass Upcycling Technologies **【Next-Generation Biomass】**
- Developing Climate-Resilient Technologies for Tropical Forestry **【Climate-Resilient Forestry】**
- Nature-Harmonized Agricultural and Natural Resource Conservation Technology Development for Tropical Island Robustness **【Tropical Island Robustness】**
- Resilient Water and Land Management for Overcoming Unstable Water Resource and Salt-Affected Soil **【Resilient Water and Land Management】**

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- Advancing Agricultural Resilience in Adverse Environments **【Agricultural Systems Resilience】**
- Transforming Smallholder Farming Systems for Resilience and Nutrition **【Smallholder Systems Transformation】**
- Managing Transboundary Pests and Diseases Sustainably **【Transboundary Pest-Disease Management】**
- Enhancing Productivity and Sustainability in Tropical Fisheries and Aquaculture **【Tropical Fisheries Systems】**
- Enhancing Agroecosystem Services for Sustainable Food Production in African Savanna **【Agroecosystem Services Africa】**
- Climate-Smart Rice Systems Integrating Forest Functions in Africa **【Rice Systems Africa】**

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- Global Information and Analysis for Transforming Food Systems **【Global Information】**
- Advancement of Strategic Networking of Research on Tropical Crop Genetic Resources Through Innovative Technologies **【Tropical Crop Genetic Resources Networking】**
- Building and Implementing Environmentally Harmonized Crop Production Technology Packages **【Environmentally Harmonized Crops】**
- Optimized Practices and Technologies for Inclusive Monsoon-region Agriculture in the Global South **【Green Asia+ (OPTIMA-GS)】**



Program A

Environment and Resources



The world is now confronting multiple, interconnected environmental crises, including climate change, biodiversity loss, and the degradation of water resources. In recent years, many of the planetary boundaries that define the Earth's safe operating space have been exceeded or are approaching critical thresholds, while in developing regions the environmental foundations that sustain agricultural production and resource use are becoming increasingly vulnerable. At the same time, shifts in the international landscape have heightened the importance of global cooperation in environmental conservation and natural resource management.

The Environment and Resources Program seeks to advance climate change adaptation and mitigation in a mutually reinforcing manner while promoting the sustainable management of natural resources and the development of environmentally harmonized agriculture, forestry, and fisheries. The program views agriculture, forests, water, biomass, and coastal and island resources as interdependent components of a single socio-ecological system and aims to reconcile improved productivity with resource use that remains within environmental limits. Recognizing that agriculture, land use, and resource management systems are among the principal drivers of planetary-boundary transgressions, the program promotes integrated approaches that address their complex interrelationships.

Specifically, the program will undertake research on the development of environmentally friendly crops and

production systems utilizing Biological Nitrification Inhibition (BNI); low-carbon agricultural technologies for rice-based systems, upland cropping, and livestock production; agricultural Green Transformation (GX) models based on the utilization of underused biomass resources; climate-resilient forestry technologies for tropical forests; environmentally harmonized agricultural and natural resource management technologies for tropical island regions; and resilient water and land management technologies that address increasing water insecurity and soil salinization. Through these efforts, the program seeks to generate co-benefits between climate change mitigation and adaptation while accelerating the transition toward sustainable resource use.

The program will also strengthen collaboration with national research organizations, international research institutions, government agencies, and local stakeholders to promote the implementation of research outcomes and support evidence-based policymaking. By contributing to international frameworks such as the Sustainable Development Goals (SDGs) and the ASEAN-Japan MIDORI Cooperation Plan, and through an integrated "agriculture-forestry-fisheries nexus approach" linking scientific knowledge, technological innovation, and policy processes, the program aims to promote sustainable resource management, environmental conservation, and climate-resilient communities throughout developing regions.

Environment and Resources Program

Building environmentally sound, sustainable, and resilient agriculture, forestry, fisheries, and food systems through sustainable resource management, while advancing climate change adaptation and mitigation in developing regions.



Contributing to regional climate action and collaboration with ASEAN countries through the ASEAN-Japan MIDORI Cooperation Plan

Contributing to the SDGs through collaboration with international research and development organizations

Working with stakeholders in partner countries to generate co-benefits from climate change **Mitigation** and **Adaptation** and to link research outcomes with national policies

Climate Change **Mitigation** Technologies

Preventing Further Deterioration and Restoring Environmental Quality



BNI-Development

Development of sustainable agricultural production systems using biological nitrification inhibition (BNI)-enhanced crops



Low-Carbon Agriculture

Development of low-carbon technologies for rice production, livestock systems, and upland cropping



Next-Generation Biomass

International deployment of next-generation biomass upcycling technologies

Climate Change Mitigation Technologies

BNI wheat, alternate wetting and drying (AWD), greenhouse gas reduction technologies for ruminant livestock, microbial saccharification technologies, multi-feedstock processing technologies, and others

Climate Change **Adaptation** Technologies

Enhancing Resilience and Regenerative Capacity



Climate-Resilient Forestry

Development of climate-resilient forestry technologies in tropical forests



Tropical Island Robustness

Development of technologies for environmentally harmonized agriculture and natural resource conservation



Resilient Water and Land Management

Development of resilient water and land management technologies for unstable water resources and salt-affected soils

Climate Change Adaptation Technologies

Genomic selection models for tropical tree species, deep sugarcane planting technologies, shallow subsurface drainage technologies using cut-soilers, and others

BNI-Development

The increasing dependence on chemical fertilizers has contributed to rising greenhouse gas emissions and growing pressures on aquatic environments, creating major sustainability challenges for global agriculture. At the same time, improving food productivity remains essential to meet the demands of a growing population and a changing climate. Reconciling agricultural productivity with environmental stewardship is therefore an urgent priority. This project aims to establish sustainable agricultural production systems that enhance nitrogen-use efficiency while reducing environmental impacts through Biological Nitrification Inhibition (BNI), a natural process in which crops suppress soil nitrification through root-derived compounds. Building on JIRCAS's pioneering achievements, the project will advance the practical deployment and dissemination of BNI-enhanced wheat while establishing breeding foundations for introducing BNI traits into globally important crops such as maize and sorghum. Through the BNI Consortium and related international research networks, the project will accelerate the development and implementation of innovative technologies that improve soil health, stabilize productivity, and reduce greenhouse gas emissions, thereby contributing to the realization of sustainable food production systems.



Field evaluation of BNI-enhanced wheat for sustainable crop production

Low-Carbon Agriculture

As climate change intensifies, there is an increasing need for technologies that simultaneously stabilize agricultural production and reduce greenhouse gas emissions. This challenge is especially pressing in ASEAN countries, where agriculture remains a critical sector and smallholder farmers play a central role in rural livelihoods.

This project aims to develop low-carbon agricultural technologies that enable adaptation to climate change while reducing carbon emissions from rice cultivation, upland cropping systems, and livestock production. Research will focus on the development and validation of technologies that reduce methane emissions from paddy fields, enhance soil carbon sequestration, and mitigate emissions from livestock systems. The project will also explore implementation pathways through incentive schemes such as carbon credits and the Joint Crediting Mechanism (JCM). In addition, economic and social impacts associated with technology adoption will be evaluated to support policymaking and institutional development. Through co-creation with research institutions and agricultural stakeholders in partner countries, the project seeks to generate green innovations that simultaneously enhance farmer livelihoods and contribute to agricultural decarbonization.



Field demonstration of low-carbon agricultural technologies for climate change mitigation

Next-Generation Biomass

Large quantities of underutilized biomass, including rice straw and cassava residues, are generated throughout Southeast Asia. Much of this biomass remains unused, despite its considerable potential for promoting resource circulation and reducing greenhouse gas emissions. At the same time, advancing Green Transformation (GX) that harmonizes decarbonization with economic growth has become an increasingly important development priority.

This project aims to establish integrated technology platforms centered on microbial saccharification for the high-value utilization of underused biomass resources beyond oil palm residues. Research efforts will focus on improving saccharification technologies for rice straw, cassava residues, and other feedstocks; diversifying biomass inputs; and standardizing utilization processes. The project will also develop technologies for producing fuels, industrial materials, and functional products with enhanced added value. By evaluating environmental and economic performance and developing models for practical implementation, the project seeks to establish scalable agricultural GX models that can be deployed across Southeast Asia, thereby contributing to sustainable resource utilization and regional industrial development.



Utilization of underused biomass resources for agricultural Green Transformation (GX)

Climate-Resilient Forestry

Tropical forests are increasingly threatened by rising temperatures, more frequent droughts, and expanding pest and disease outbreaks, all of which undermine forest productivity and ecosystem functions. At the same time, forests provide a broad range of benefits, including timber production, carbon sequestration, watershed protection, and biodiversity conservation. Ensuring the sustainable use of forest resources while maintaining these multiple functions is therefore of critical importance.



This project aims to establish forestry technologies that enhance adaptation to climate change. Research will focus on developing climate-resilient tree varieties and strengthening breeding platforms for forest genetic resources. The project will also develop silvicultural and forest management practices that improve both productivity and ecosystem functions in tropical forests while enhancing their carbon sequestration and environmental conservation capacities. Through close collaboration with research institutions across Southeast Asia, the project will facilitate the implementation of research outcomes and contribute to forestry models that reconcile the sustainable use of forest resources with adaptation to climate change.

Tropical Island Robustness

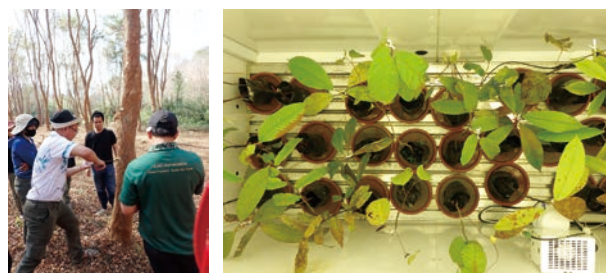
Tropical island regions are increasingly affected by extreme rainfall, droughts, sea-level rise, and other consequences of climate change. At the same time, deforestation, land degradation, and deterioration of coastal environments threaten rural livelihoods and the sustainable use of natural resources. Enhancing productivity while conserving the environment under conditions of limited land, water, forest, and coastal resources is a pressing challenge.

This project aims to establish sustainable rural systems for tropical islands through the development of integrated resource management approaches that link forests, agricultural lands, and coastal zones. In addition to developing technologies for natural resource conservation and restoration, the project will advance environmentally harmonized agricultural technologies and integrated assessment and management methodologies extending from watersheds to coastal ecosystems. Through partnerships with local communities and government agencies, the project will promote the implementation of research outcomes and contribute to the creation of climate-resilient and environmentally sustainable communities founded on sound natural resource management.

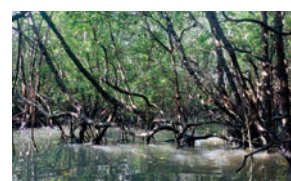
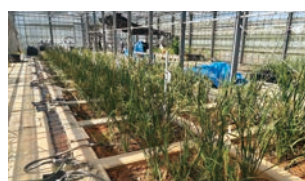
Resilient Water and Land Management

In irrigated agricultural regions throughout Asia and Africa, increasing instability in water resources and the expansion of soil salinization have become major constraints on agricultural productivity. As populations continue to grow and food demand rises, technologies that enable stable agricultural production while maximizing the efficient use of limited water and land resources are urgently needed.

This project aims to develop resilient water and land management technologies capable of addressing water-resource variability and soil degradation. Research will focus on water-saving irrigation technologies, improved drainage systems, and soil fertility management practices, together with management approaches that enhance water-use efficiency and reduce soil salinization. The project will also strengthen the operation of irrigation systems and the capacity of local user organizations, thereby establishing sustainable management models that integrate technological innovation with community-based resource governance. Through field validation in target regions, the project will demonstrate the effectiveness of these approaches and develop implementation models that contribute to improved water productivity, reduced land degradation, sustainable agricultural production, and enhanced food security.



Evaluation of climate-resilient tree species in tropical forests



Development of technologies for environmentally harmonized agriculture and natural resource management in tropical islands



Development and demonstration of sustainable water resource and soil management technologies in salinity-affected soil areas



Program B

Food and Nutrition



The global food security landscape is changing rapidly in response to climate change, population growth, and increasing geopolitical risks. Across many regions of the world, production systems are becoming more vulnerable due to drought, salinization, the spread of pests and diseases, and declining aquatic resources. At the same time, challenges such as undernutrition, micronutrient deficiencies, and food loss are becoming increasingly severe. Building resilient agriculture, forestry, fisheries, and food systems that simultaneously ensure stable food supplies and improve nutrition has therefore become an urgent global priority.

The Food and Nutrition Program promotes research that enhances productivity, sustainability, and resilience while maintaining a strong commitment to scientific excellence. The program addresses multiple dimensions of food systems, including climate-resilient crops and cultivation technologies, breeding materials adapted to adverse environments, sustainable management of transboundary pests and diseases, innovations in livestock and fisheries production, and technologies that improve food quality, preservation, processing, and value addition. Building on world-leading research achievements, including the elucidation of drought-response mechanisms, the program places particular emphasis on fundamental research utilizing genomics, molecular biology, omics technologies, and data science. Through these approaches, the program seeks to uncover

new biological principles and mechanisms while generating innovative technologies, breeding resources, and scientific knowledge.

The program also develops technologies and systems that address diverse challenges in developing regions, including stable production under environmental stress, climate-resilient farming systems for smallholder farmers, and rapid-response platforms for transboundary pests and diseases. Particular attention is given to agroecosystem services that underpin agricultural production, such as soil fertility, nutrient cycling, carbon sequestration, water use efficiency, and biodiversity conservation. Through these efforts, the program contributes to both environmental sustainability and enhanced food production.

Research outcomes will be translated into practical applications through international collaborative research and demonstration activities conducted with research institutions, international organizations, universities, and private-sector partners around the world. These outcomes will also support evidence-based policymaking and technology dissemination. By pursuing research and development that spans the entire spectrum from scientific discovery to social implementation, the program aims to contribute to global food security and improved nutrition while advancing sustainable and resilient agriculture, forestry, fisheries, and food systems under a changing climate.

Food and Nutrition Program

As food and nutrition challenges become increasingly complex due to geopolitical risks, widening income and regional disparities, and climate change, the program seeks to build **resilient agriculture, forestry, fisheries, and food systems** that simultaneously ensure **stable food supplies** and **improved nutrition**.



Capable of ensuring stable food supplies and improved nutrition
Resilient Agriculture, Forestry, Fisheries, and Food Systems

Stable Food Production

Production

Processing & Distribution

Consumption

Food and Nutrition Security

Technology Development Projects for Improving Productivity, Sustainability, and Resilience

Crop Production and Food Processing Technologies



Agricultural Systems Resilience

Creation of a research platform for developing resilience-enhancing agricultural technologies under adverse environmental conditions



Smallholder Systems Transformation

Transformation of farming systems to improve climate resilience and nutrition among smallholder farmers

Strengthening Environmentally Harmonized Production Foundations



Transboundary Pest-Disease Management

Development of sustainable management technologies for transboundary pests and diseases based on ecological and molecular approaches



Tropical Fisheries Systems

Development of technologies to enhance productivity and sustainability in tropical fisheries and aquaculture

Food and Nutrition Security in Africa



Agroecosystem Services Africa

Enhancement of agroecosystem services for stable food production in African savanna regions



Rice Systems Africa

Development of sustainable food production systems under climate change that balance rice agriculture and forest functions in Africa

Agricultural Systems Resilience

Increasing environmental stresses, including drought, heat, and salinity, are having profound impacts on global food production and are expected to intensify as climate change progresses. Ensuring stable food supplies in the future will require resilient agricultural systems capable of maintaining productivity under increasingly variable environmental conditions.

This project advances research on useful traits and adaptive mechanisms in crops and livestock through the application of advanced omics technologies and artificial intelligence. The knowledge generated will be used to strengthen the resilience of agricultural production systems. The project will also develop technologies that utilize beneficial microorganisms, resource-circulating crop-livestock systems, and alternative water resources to enhance productivity and resource-use efficiency. Through these efforts, the project seeks to establish agricultural production systems that are resilient to environmental change and to facilitate their application in farming systems around the world, thereby contributing to stable and sustainable food production under climate change.



Development of resilient agricultural production systems under climate change

Smallholder Systems Transformation

Smallholder farmers in developing regions face persistent challenges, including low productivity, unstable incomes, and limited access to diverse and nutritious foods. As climate change and population growth further complicate food and nutrition challenges, there is an urgent need to transform food systems from production through consumption.

This project develops climate-resilient cultivation and soil management technologies while advancing the development of crop varieties with improved nutritional quality and utilization value, together with technologies that enhance breeding efficiency. It also promotes value addition and nutritional improvement through food fermentation and processing technologies, creating integrated technological systems that connect production, processing, and consumption. Furthermore, the project establishes implementation and dissemination models for smallholder farmers that simultaneously improve productivity, incomes, and nutrition, contributing to the transformation of food systems toward greater sustainability and resilience.



Climate adaptation and nutrition improvement among smallholder farmers

Transboundary Pest–Disease Management

Climate change and the expansion of international trade and travel are increasing the risk of pest and disease invasions into new regions. Transboundary pests and diseases pose serious threats not only to affected countries but also to regional food production and food security, making strengthened international response systems essential.

This project seeks to elucidate the ecological characteristics, migration dynamics, and molecular mechanisms of major transboundary pests, pathogens, and vectors. Based on these findings, it develops sustainable management technologies targeting important threats such as desert locusts, rice planthoppers, fall armyworm, cassava mosaic disease, and fruit flies. The project also advances rapid diagnostic methods, surveillance systems, and forecasting technologies to establish effective early-warning systems. Through collaboration with international organizations, research institutions, and national plant protection agencies, the project promotes the social implementation of research outcomes and contributes to stable agricultural production and strengthened food security.



Monitoring and management of transboundary pests and diseases

Tropical Fisheries Systems

Global demand for fish and aquatic products is expected to continue increasing as populations grow and dietary preferences evolve. In Southeast Asia, fisheries and aquaculture are important sources of protein and income, yet declining resources, increasing environmental pressures, and stagnant producer incomes threaten their sustainability.

This project promotes the sustainable utilization of aquatic resources and the development of fisheries industries in tropical regions through improvements in seed production and aquaculture technologies. It also develops resource management approaches in collaboration with fishers and local communities while analyzing fisheries value chains to improve product quality, value addition, and market access. Through the implementation of these innovations, the project aims to increase producer incomes while ensuring sustainable resource use, thereby enhancing food and



Aquaculture development and fisheries resource management in Southeast Asia

nutrition security and supporting economic development across Southeast Asia.

Agroecosystem Services Africa

In Sub-Saharan Africa, growing food demand driven by population growth coincides with declining soil fertility and ongoing land degradation, creating major constraints on agricultural productivity. At the same time, sustainable food production requires not only increased yields but also the maintenance and enhancement of ecosystem services such as carbon sequestration, water regulation, nutrient cycling, and soil conservation.

This project develops sustainable soil and crop management technologies that simultaneously enhance agricultural productivity and agroecosystem services. Research focuses on increasing soil organic matter accumulation, improving nutrient cycling, enhancing carbon storage, and strengthening water conservation functions. The project also develops scientific methodologies for assessing these impacts and establishes location-specific technology packages and dissemination models. Through collaboration with local research institutions and farming communities, the project promotes implementation pathways that reconcile food production with environmental conservation and contribute to sustainable agricultural development in African savanna regions.



Management of water resources and agroecosystems to support rural livelihoods in African savannas

Rice Systems Africa

Rice demand in Africa is increasing rapidly as a result of population growth and urbanization, yet rice productivity remains low and many countries continue to depend heavily on imports. Climate change, deforestation, and land degradation are further weakening the foundations of agricultural production, underscoring the need for agricultural development pathways that simultaneously increase food production and conserve natural resources.

This project adopts a landscape-scale perspective that integrates rice agriculture and forest ecosystems to establish sustainable food production systems. Research focuses on developing improved cultivation practices, breeding materials, and water management technologies that support stable rice production, while also establishing resource management approaches that harness the watershed protection and soil conservation functions of forests. In addition, the project develops dissemination models and implementation strategies tailored to local conditions and promotes their adoption across African countries. Through these efforts, the project aims to improve rice productivity while conserving forest resources, thereby strengthening food security and supporting sustainable regional development.



Sustainable food production and natural resource conservation in Africa



Program C

Information and Strategy



The international environment surrounding global food security is becoming increasingly uncertain due to climate change, emerging infectious diseases, geopolitical risks, disruptions in logistics, and fluctuations in food supply and demand. In developing regions, where food systems and institutional foundations are often fragile, these risks directly affect livelihoods and nutrition security. Under such circumstances, advancing evidence-based policymaking and international cooperation while effectively translating research outcomes into practice and policy has become increasingly important. There is a growing need to strengthen intelligence functions capable of monitoring and analyzing changes in the external environment, international rules, and policy trends, and utilizing this knowledge to guide research strategies and partnership development.

The Information and Strategy Program promotes the social implementation of research outcomes and their incorporation into policy through the collection and analysis of international information, strategic planning, and the enhancement of intelligence functions. The program strengthens hub functions for tropical crop genetic resources information platforms, accelerates implementation activities based on the needs of the food industry and evolving institutional frameworks, and conducts field demonstrations of climate change adaptation and mitigation technologies as well as environmentally harmonized agricultural technologies. Through these activities, the program enhances the interface between scientific innovation and societal needs.

Building upon the collaborative platform established with

Asian and ASEAN partner countries during the Fifth Medium- to Long-Term Plan, the program develops a cross-disciplinary strategic platform that integrates information gathering, research and development, field demonstration, and communication. Through international conferences, research networks, and strategic partnerships, the program monitors and analyzes technological, environmental, socio-economic, and policy trends while developing information resources that support research prioritization, international collaborative research, and implementation strategies.

Working closely with research institutions in partner countries and with private-sector companies in Japan and abroad, the program advances demonstration projects that combine improved crop varieties with innovative production technologies and develops implementation pathways that bridge research outcomes with policy, practice, and business. Through Green Asia+, the program promotes the dissemination and adoption of Japanese agricultural, forestry, and fisheries technologies, particularly throughout the Asian monsoon region and the Global South. Furthermore, by utilizing international collaborative networks, digital technologies, and artificial intelligence for communication and outreach, the program enhances the visibility of research outcomes and societal impacts while feeding the resulting insights back into research planning and strategic communication. As a hub linking science and policy, research and implementation, the program contributes to addressing global challenges through informed action and international partnership.

Information and Strategy Program

Leveraging the **collaboration platform with Asian and ASEAN countries** established during the Fifth Medium to Long-Term Plan, the program promotes the analysis of international trends and the translation of research outcomes into social implementation and policy, while building **cross-disciplinary collaboration mechanisms** and enhancing JIRCAS's international presence.



Global Information

Global challenges such as food security, climate change, and biodiversity loss are becoming increasingly complex, while international discussions on transforming food systems are accelerating. In this context, effective research, development, and policymaking require a clear understanding of global trends and the realities facing developing regions, together with the timely provision of scientifically grounded information.

This project collects and analyzes the latest information on global challenges and research developments through international conferences and research networks while systematically organizing information on long-term global food supply and demand trends and agricultural and rural conditions in developing regions. By integrating field-based primary information with international statistics and other data sources, the project generates analyses that are disseminated through articles, policy briefs, academic publications, datasets, and workshops. Through strengthened collaboration with national and international research organizations, the project contributes to international dialogue on global challenges, supports research and policymaking, and enhances Japan's international presence in the field of food systems transformation.



Collection and dissemination of international information on global food and agriculture issues

Tropical Crop Genetic Resources Networking

As climate change progresses and concerns over food security intensify, the development of improved crop varieties and production technologies increasingly depends on the effective use of diverse genetic resources. However, throughout the Asian monsoon region and the Global South, information systems and technological foundations for the conservation, evaluation, and utilization of genetic resources remain insufficient, limiting their full potential. This project strengthens international hub functions for tropical crop genetic resource research through partnerships with national research institutions and gene banks. It supports the exploration, collection, conservation, and utilization of genetic resources while developing advanced technologies for their use, including genomics, flowering control, and image analysis. Research focuses on crops such as rice, sugarcane, tropical fruits, coffee, and vegetables and includes the evaluation of valuable traits, development of breeding materials, and field demonstrations. By building databases of genetic resource information and technologies, fostering international networks, strengthening capacity development, and disseminating research outcomes, the project contributes to food security and sustainable agricultural development across the Asian monsoon region and the Global South.



Conservation and utilization of tropical crop genetic resources

Environmentally Harmonized Crops

Climate change is causing increasingly severe impacts on agricultural production in the Asian monsoon region through extreme weather events such as high temperatures, droughts, and heavy rainfall. At the same time, reducing environmental burdens associated with excessive fertilizer and pesticide use has become a major challenge, creating a need for innovative technologies that balance productivity with environmental sustainability.

This project develops environmentally harmonized crop production technologies by integrating advanced breeding materials and crop management practices for rice, soybean, tomato, and amaranth. The project evaluates greenhouse gas emissions, fertilizer-use efficiency, heat and drought tolerance, and disease resistance while advancing UAV-based assessment methods and regional deployment models. Through field demonstrations, particularly in Indonesia, the effectiveness of integrated technology packages is validated under local conditions. In addition, the project supports varietal registration, develops implementation manuals and implementation strategies, and provides information that contributes to evidence-based policymaking. Through these efforts, it aims to establish sustainable and climate-resilient foundations for future food production systems.



Field demonstration of environmentally harmonized crop production technologies

Green Asia+ (OPTIMA-GS)

Japan's MIDORI Strategy for Sustainable Food Systems has emphasized the importance of simultaneously improving agricultural productivity potential and sustainability. Particularly in the Asia-Monsoon region and the Global South, where increasing food production while safeguarding the environment has become an urgent challenge, interest in Japan's scalable agricultural technologies is growing.

This project builds upon the achievements of Green Asia by



promoting the demonstration, implementation, and strategic dissemination of Japanese agricultural technologies that contribute to sustainable food systems. Key technologies include BNI-enhanced wheat, alternate wetting and drying irrigation, the International Differential System for Rice Blast, and deep planting technology for sugarcane cultivation. Field tests are conducted across ASEAN countries and other regions of the Global South, while the Technology Catalog, international conferences, reports, and other communication activities provide strategic outreach. The project also strengthens collaboration with international research organizations, government agencies, and private-sector partners to support pilot activities and implementation pathways for promising technologies. Through these efforts, Green Asia+ contributes to sustainable food systems that simultaneously enhance agricultural productivity potential and reduce environmental impacts.



Demonstration of Japanese agricultural technologies in the Global South

Southeast Asia Liaison Office

The Southeast Asia Liaison Office was established in Bangkok, Thailand, in 1972 as JIRCAS's regional base for activities in Southeast Asia. The office is currently located within the Department of Agriculture (DOA), adjacent to Kasetsart University. As Southeast Asia is a region of strategic importance for addressing global challenges such as climate change, food security, and biodiversity conservation, JIRCAS has promoted research collaboration with national research institutions and international organizations throughout the region for many decades.

The office conducts surveys of policy and research trends in agriculture, forestry, and fisheries, while collecting and analyzing information relevant to the region. It also supports collaboration with research institutions, universities, and international organizations throughout ASEAN member states. Through initiatives such as Green Asia+, the office contributes to the demonstration and dissemination of agricultural technologies originating in Japan and facilitates the social implementation and international deployment of research outcomes.

In addition, the office provides a wide range of services that support international research cooperation, including assistance in the formation and management of collaborative research projects, dissemination of research results, support for variety registration and intellectual property procedures, and the promotion of researcher exchanges. As a regional hub connecting JIRCAS with Southeast Asian countries, the Southeast Asia Liaison Office contributes to the development of international collaborative research and to the establishment of sustainable agricultural and food systems throughout the region.



Research exchange through international workshops



JIRCAS exhibition at the Thailand National Science and Technology Fair

Tropical Agriculture Research Front (TARF)

● Location

The Tropical Agriculture Research Front (TARF) is JIRCAS's research station located in Ishigaki City, Okinawa Prefecture, Japan. Ishigaki Island possesses a rich natural environment extending from Mt. Omoto, the highest peak in Okinawa Prefecture (526 m above sea level), to the surrounding coral reef ecosystems. Forests, agricultural lands, rivers, and coastal zones are closely connected, forming a unique subtropical island ecosystem. Located approximately 2,000 km southwest of Tokyo and in close proximity to Southeast Asia, TARF provides an excellent geographical base for promoting international collaborative research and scientific exchange within the Asian monsoon region.

The island experiences a warm and humid subtropical climate throughout the year and is exposed to diverse environmental stresses, including typhoons, heavy rainfall, droughts, and salt damage. These conditions make it an ideal field laboratory for assessing the impacts of climate change, developing adaptation technologies, and conducting research on the harmonious integration of agriculture and the environment in tropical and island regions.

● Roles

TARF promotes research aimed at achieving sustainable agriculture, forestry, and fisheries in tropical, subtropical, and island regions of the developing world. Research activities focus on the conservation and utilization of crop genetic resources, the development of environmentally harmonized agricultural technologies, production-environment management, and the effective use of regional resources. Utilizing approximately 21 hectares of experimental fields, greenhouses, research facilities, and open-laboratory infrastructure, TARF conducts fundamental and advanced studies that are difficult to implement at overseas research sites, as well as applied research on new technologies and crop varieties.

TARF also plays a central role in promoting collaborative research with institutions across the Asian monsoon region and the Global South. As a hub for tropical crop genetic resources research, TARF supports international networking, human resource development, and the dissemination of research outcomes while advancing technologies for environmentally harmonized agriculture and natural resource conservation. Through these activities, TARF contributes to food security, climate change adaptation, sustainable food systems, and the international deployment of JIRCAS research outcomes.



Research Exchange Programs

JIRCAS promotes international collaborative research with national research institutions and international organizations in developing regions while strengthening human networks and institutional capacities through researcher and research management exchanges. Through collaborative research invitation programs for researchers and research administrators from partner institutions, as well as the JIRCAS Visiting Research Fellowship Program for early-career researchers from developing countries, JIRCAS supports the enhancement of research capabilities and fosters the next generation of scientists who will contribute to future international collaborative research.

JIRCAS also operates a special researcher dispatch program that sends doctoral students and young researchers to overseas project sites and partner institutions. Through practical training and field research experiences, the program supports the development of future leaders in international agricultural research.

In addition, JIRCAS cooperates with the Ministry of Agriculture, Forestry and Fisheries (MAFF) in implementing the Japan International Award for Young Agricultural Researchers, which recognizes and encourages outstanding young researchers contributing to agricultural, forestry, fisheries, and related fields in developing regions.

Through these research exchange and capacity-development activities, JIRCAS strengthens collaborative foundations with the Asian monsoon region and the Global South while contributing to the dissemination of research achievements and the expansion of international research networks.



International Symposiums and Workshops

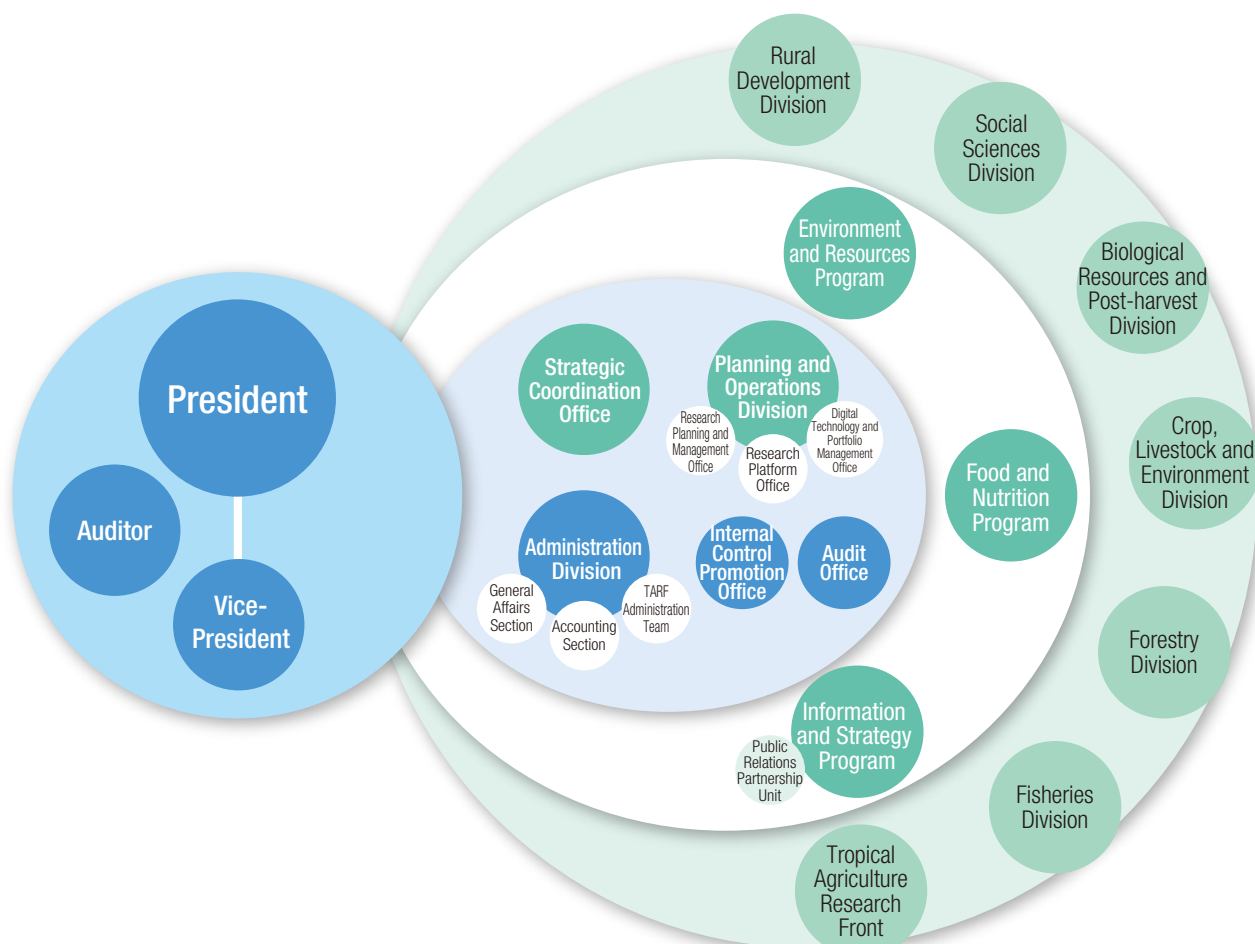
JIRCAS organizes international symposiums, workshops, and seminars to promote global dialogue on addressing key challenges facing humanity, including food security, climate change, biodiversity conservation, and nutrition improvement.

The annual JIRCAS International Symposium brings together researchers, universities, international organizations, policymakers, and other stakeholders from developing and developed countries to discuss the latest scientific advances and policy developments related to agriculture, forestry, fisheries, and food systems. In addition, JIRCAS organizes workshops and seminars both in Japan and at overseas research sites in conjunction with ongoing research projects, facilitating the exchange of research findings and the development of new collaborative initiatives.

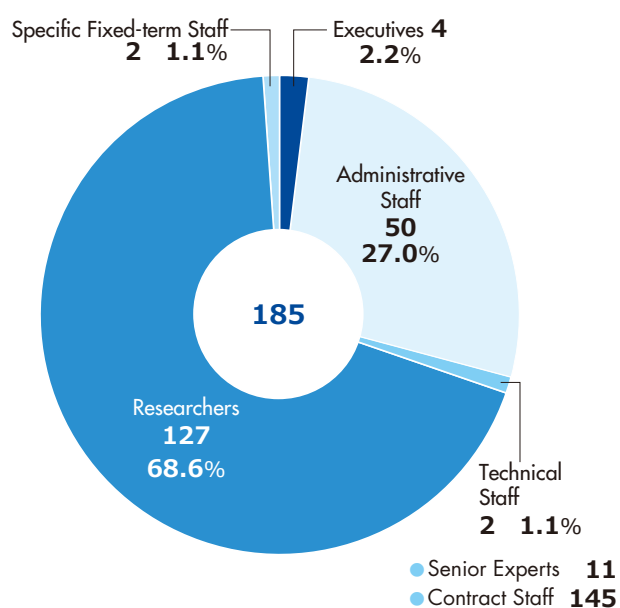
Through integrated face-to-face and online communication activities, JIRCAS promotes interaction among researchers, practitioners, policymakers, and development partners worldwide. By disseminating scientific knowledge and research outcomes, strengthening international research networks, and supporting the social implementation of research results, JIRCAS contributes to accelerating innovation and fostering international cooperation toward sustainable development.



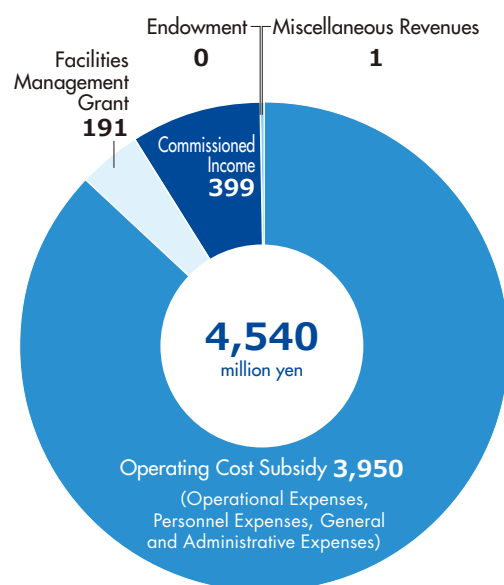
Organization



Personnel (As of April 1, 2026)

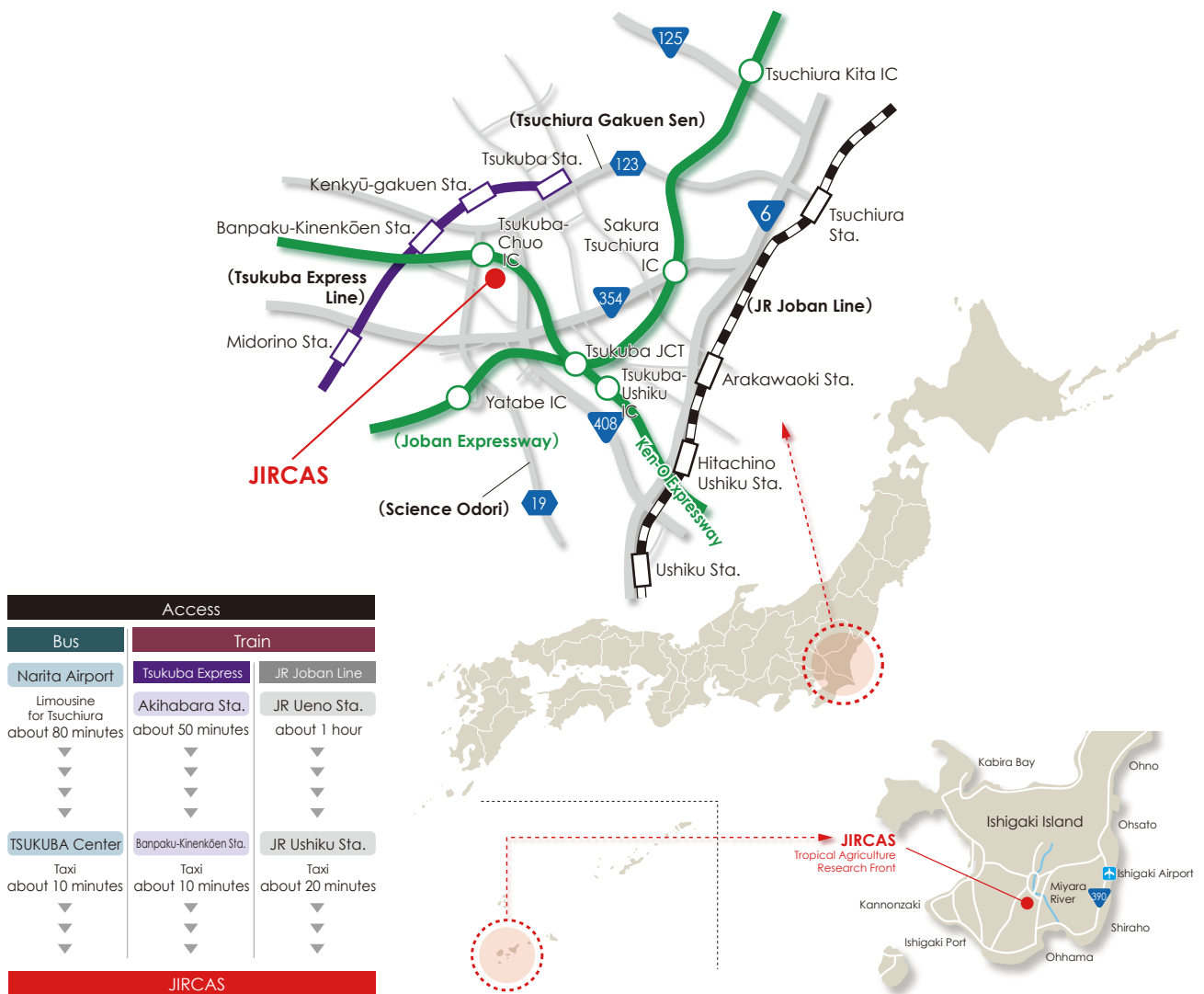


Budget (FY2026)



"Commissioned Income" is an estimated amount.

Transportation Guide





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