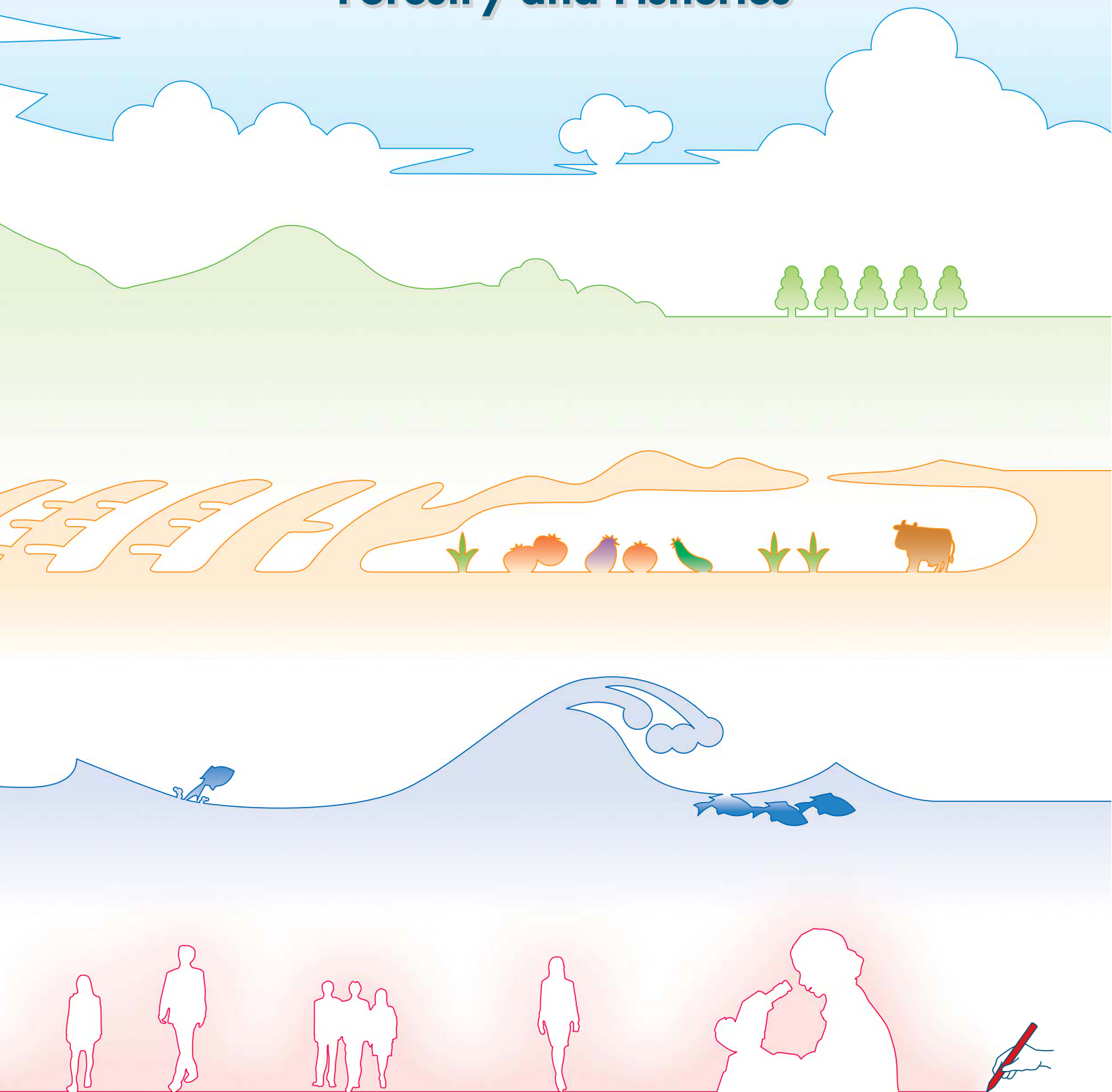


Research and Development on Agriculture, Forestry and Fisheries



<http://www.s.affrc.go.jp/docs/e/>
Secretariat of the Agriculture, Forestry and Fisheries Research Council

The 21st century is called the “century of life”. People are expecting food and environmental problems to be solved through deep understanding of life. They have the same expectation from agriculture, forestry and fisheries and their related industries. Under the growing movement of globalization we are highly expecting the development of creative and advanced technology for leading to highly efficient and effective technologies in future and the creation of new industries as well as technology development for solving issues faced at production sites.

In March 2005, the new “Basic Plan for Food, Agriculture and Rural Areas” was approved by the Cabinet. The Agriculture, Forestry and Fisheries Research Council, as a national authority, accordingly set up the “Basic Plan for Agriculture, Forestry and Fisheries Research,” subsequently revised in March 2007, providing research policies for the government, incorporated administrative agencies, public research institutions, universities and private sector.

This booklet introduces the outline of the Agriculture, Forestry and Fisheries Research Council and research institutions/incorporated administrative agencies of the Ministry of Agriculture, Forestry and Fisheries which actively tackle with research development of new technology, with aim to further development of agriculture, forestry, fisheries, their related industries and rural area, and the assurance of safe and high quality life of people as well as to solving the problems of food, population and the global environmental issues.

Outline of the Agriculture, Forestry and Fisheries Research Council

The Agriculture, Forestry and Fisheries Research Council is a special organization established in the Ministry of Agriculture, Forestry and Fisheries.

■ Main Duties

1. Formulating the basic objectives and other fundamental matters for agricultural, forestry and fishery research activities
2. Liaison and coordination between the experimental and research institutions and administrative sections
3. Investigating the status and achievements of the research and development activities
4. Transacting matters concerning incorporated administrative agencies, such as the National Agriculture and Food Research Organization
5. Subsidizing research and development activities conducted by the prefectural governments and private sector
6. Improving the quality of researchers

The Agriculture, Forestry and Fisheries Research Council is a collegiate body composed of a chairman and six members. The chairman and members are appointed by the Minister of Agriculture, Forestry and Fisheries from among individuals with relevant knowledge and experience in the research of agriculture, forestry, livestock and fisheries or from the MAFF staff.

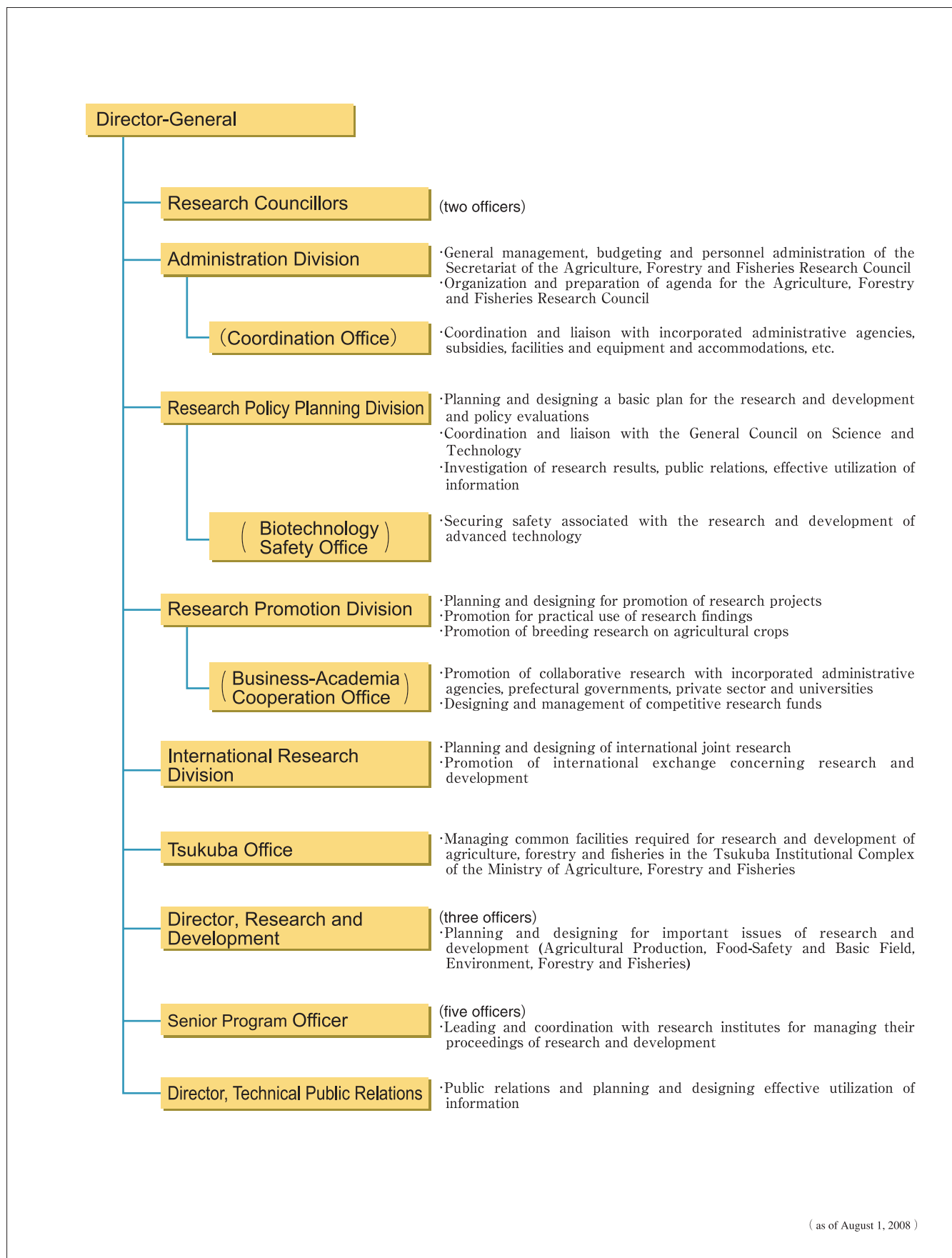
■ Organization

Chairman:	Eitaro Miwa	(Professor, Tokyo University of Agriculture)
Member of Council :	Yoshiyuki Sakaki	(President, Toyohashi University of Technology)
Member of Council :	Toru Yamamoto	(President, (Foundation) Japan Meat Trading Center)
Member of Council :	Yoshifumi Nishino	(Managing Director, Asahi Breweries, Ltd.)
Member of Council :	Masaru Hashimoto	(Governor, Ibaraki Prefecture)
Member of Council :	Ayako Ehara	(Professor, Tokyo Kasei-Gakuin University)
Member of Council :	Yoshihiro Hayashi	(Professor, Graduate School of Agricultural and Life Sciences, The University of Tokyo)

(as of April 20, 2008)

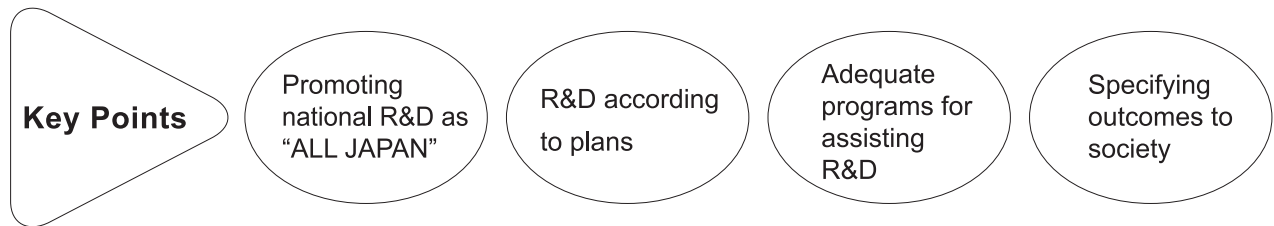
Outline of the Secretariat of the Agriculture, Forestry and Fisheries Research Council

The Agriculture, Forestry and Fisheries Research Council has a secretariat with various divisions, offices, staffs, besides Research Councillors under the Director-General.

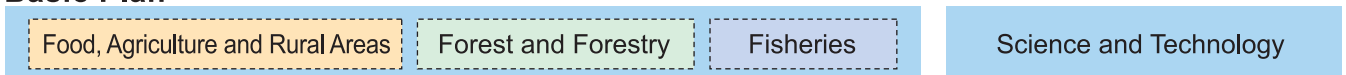


Future direction of agriculture, forestry and fisheries research

The Council directs our national research and development (R&D) on agriculture, forestry and fisheries, according to the “Basic Plan for Agriculture, Forestry and Fisheries research” determined in March 2005 and revised in March 2007, in cooperation with incorporated administrative agencies, private sector, universities and local governments.



Basic Plan



Basic plan for agriculture, forestry and fisheries research

I Principle

Problems we face

- Globalization and international competition
- Low level of food self sufficiency
- Aged society with low level of birth rate
- Shrinking work force in rural areas and declining rural function
- Growing interests in food safety
- Increasing global issues (e.g. food and environment)

Developing science and technology

- Life science
- Information technology
- Robot technology
- Nanotechnology

Resolving problems through R&D

Final outcome

- Enhancing competitiveness and adequate development of agriculture, forestry and fisheries
- Securing food safety and healthy dietary habit
- Conserving beautiful natural land and environment toward pleasant people's living
- Resolving the global issues such as unstable food supply and global warming

How to tackle with?

- Beneficiaries of R&D: Small farmer, fisheries, small scale private industries
→ Public research institutions should take initiative
- Close link to natural environment, plants and animals
→ R&D under mid- or long-term principles
- Regional issues
→ more generalized R&D in collaboration with researchers having different expertise
- To adopt advanced R&D resulted from other sectors than agriculture, forestry and fisheries, and to bring the outcomes to our society

II Main target in decade

1. Key themes- R&D for resolving current problems and stepping up to the next stage

- (1) Improving productivity and sustainable development
- (2) Development of value added products
- (3) Food safety
- (4) Utilization of regional resources in rural areas
- (5) To maintain and increase multifunctionality including rural environment
- (6) Global issues including food and environment
- (7) To create innovative technology toward the next generation (e.g. research on biomass)

2. Basic research— extending possibilities in future

- (1) Resolving phenomena in life for the breakthrough for functional improvement of organisms in agriculture, forestry and fisheries
- (2) Resolving structure and function on eco-system in agriculture, forestry and fisheries, for the purpose of making the best use of natural circulation system
- (3) Fundamental research supporting the resolution of function of organism and ecosystem
- (4) Research on the trend of agricultural, forestry and fishery section and rural community and policies on these sectors

Deadline

JFY 2010 → **JFY 2015**
(after 5 yrs) (after 10 yrs)

III Programs on R&D

1. Reform of R&D system

- Strengthening research planning functions
- Efficiency in financial system
- Human resource development
- Effective and efficient evaluation system

2. Strengthening the linkage between private sector, universities and the government

3. Strengthening international research

4. Protecting and utilizing intellectual properties

5. Collection and provision of basic information on research

6. Dissemination and commercialization

7. Two-way communication with public

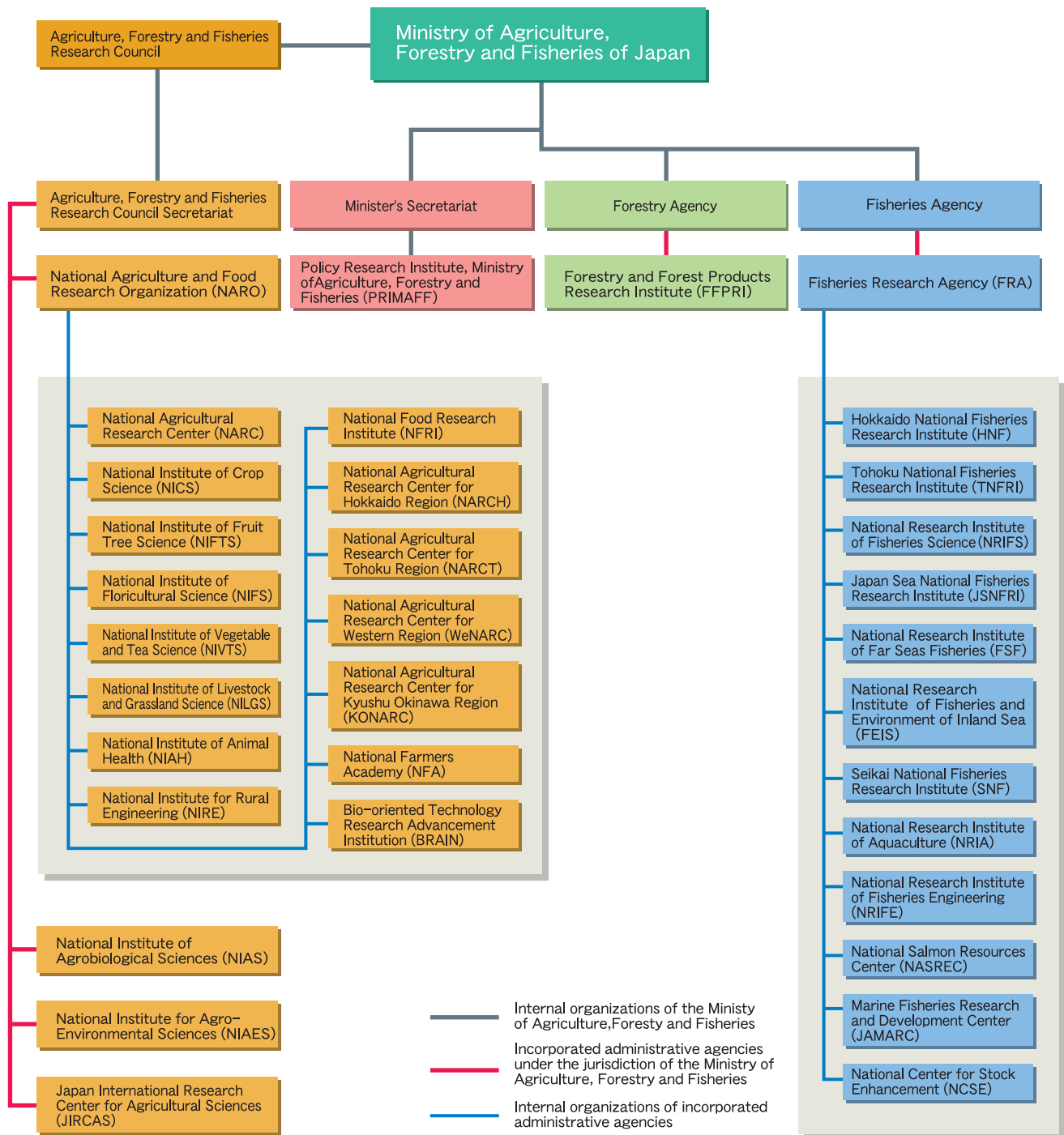
Research institutions under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries

The Agriculture, Forestry and Fisheries Research Council draws up the basic plan for research concerning all research and development for agriculture, forestry and fisheries including research institutions under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries as well as prefectural governments, private corporations, universities and other institutions, and tries to comprehensively promote research and development.

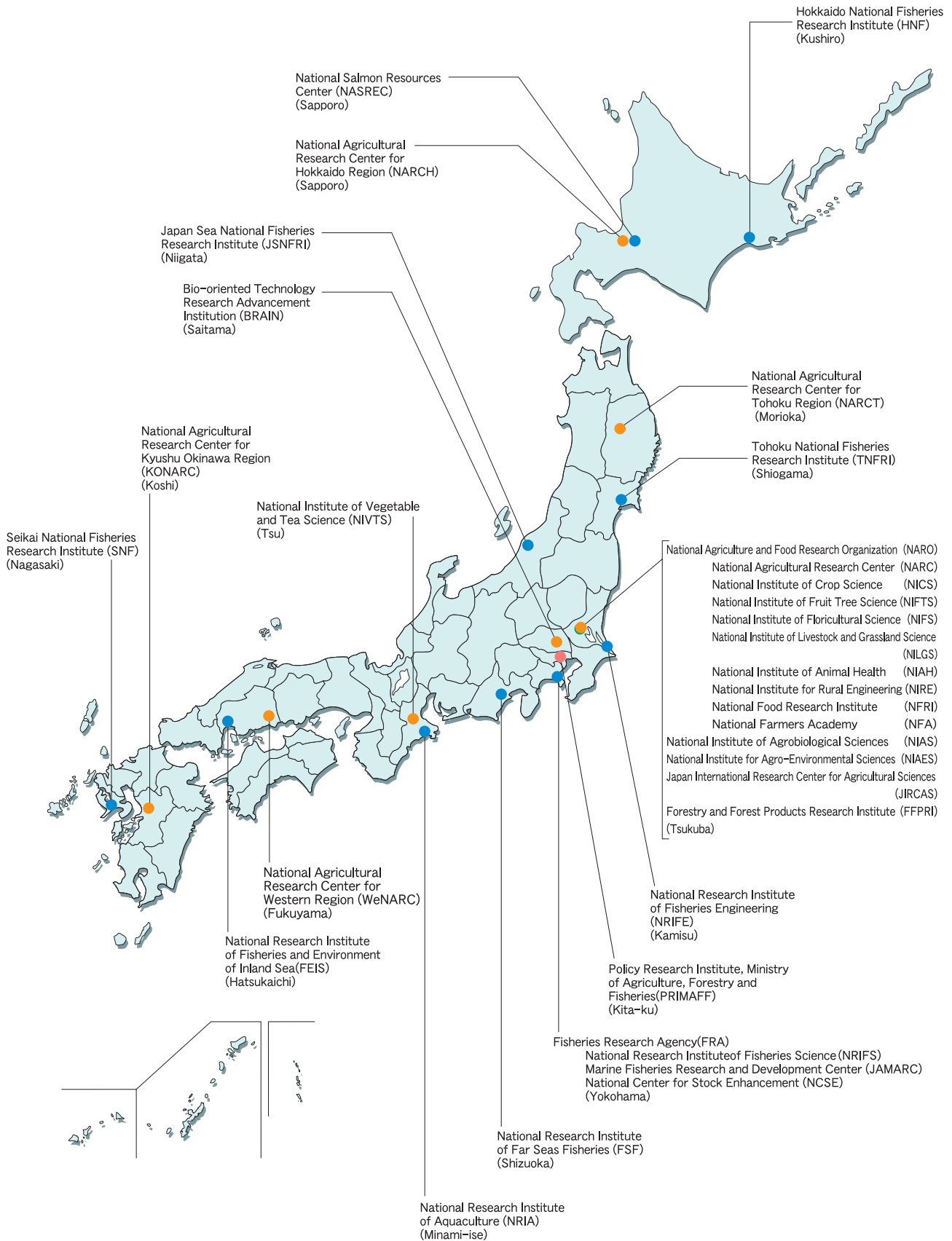
Incorporated administrative agencies engaging in research and development comprise a total of six corporations: four agricultural corporations, one forestry corporation, and one fishery corporation.

The national research institution also has one institution, the Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries.

In addition, the Secretariat of the Agriculture, Forestry and Fisheries Research Council oversees public interest corporations such as the Agriculture, Forestry and Fisheries Technical Information Society (AFFTIS) and the Society for Techno-innovation of Agriculture, Forestry and Fisheries (STAFF).



Location Map



National Agriculture and Food Research Organization (NARO)

3-1-1 Kannondai, Tsukuba, Ibaraki, 305-8517 Japan
TEL: 81-29-838-8988 URL <http://www.naro.affrc.go.jp/>

The National Agriculture and Food Research Organization (NARO) is the largest research organization addressing "agriculture, food, and rural communities" in Japan. It is engaged in wide-range of research and innovation activities, which cover the whole processes from agricultural infrastructure to production of agriculture crops, to processing, to crop distribution, to food making, and finally to consumption by consumers. Technological developments contributing to promotion of rural villages or food industries are also inevitable mission in this Organization. The NARO is further providing education activities for high-level agriculture technologies, and supporting researches carried by researchers belonging to private industries or other institutes. The NARO promotes collaborations among universities, private companies and the institutes belonging to this Organization to aim to practical use of the research findings as well as products that the researchers in NARO have developed.

Research directions

- Establishing technological systems, for sustainable gain in overall productivity and quality of products in Japan's agriculture, by developing efficient and effective techniques regarding crop rotation on paddy fields, livestock production by domestic fodder, raising healthy livestock, high margin horticultures and those continuous supplies.
- Doing researches necessary to vitalize of rural villages, such as on maintenance and management of agricultural infrastructure and living environment of rural villages, on preservation management of local resources such as farm lands and agricultural irrigation, and on improvement of rural communities to make the most of multifunctionality of agriculture.
- Developing technologies to supply safe, healthy, and/or functional food, and carrying out research on clarification of the function or effectiveness of food processing to ensure full healthy life.
- Fostering the next generation of farmers by teaching the programs for technological advances, high-level engineering expertise, business administration, and field trainings in agriculture.
- Supporting research and development of agriculture-related technologies conducted by groups composed of private companies, universities, incorporated administrative agencies, and so on, to accelerate technological innovation in agriculture, forestry and fisheries.
- Development and improvement of high-performance agriculture machines to facilitate agricultural mechanization, and inspection of agricultural machineries.
- Promoting researches on biomass energy production and functional food by setting up lateral research centers in the Organization.

□ National Agricultural Research Center (NARC)

3-1-1 Kannondai, Tsukuba, Ibaraki, 305-8666 Japan
TEL: 81-29-838-8481 URL <http://narc.naro.affrc.go.jp/>

For the improvement of agricultural productivity and sustainable development in the Kanto, Tokai and Hokuriku regions, innovative technologies leading next generation agriculture, technologies for food safety and reliability, and the utilization of local resources in rural villages, the Center conducts the following activities: (1) the development of highly productive crop rotation system in the paddy field, technology development concerning agricultural management, marketing, climate and wildlife, which support the development of local agriculture; (2) technology development concerning soil nutrients, pests and diseases, weed control and environmental impact assessment for an agricultural production system that is sustainable and conservation oriented; and (3) research and development on precision farming and automatization of agricultural work, the use of information technology, bio-mass resources recycling, and on the analysis of rice genome.



Field server to measure environmental conditions in a soybean field



Autonomous rice transplanter using long-mat-type hydroponic seedlings



Rotary tilling, ridge-making and seedling implement of soybean

National Institute of Crop Science (NICS)

2-1-18 Kannondai, Tsukuba, Ibaraki, 305-8518 Japan
 TEL: 81-29-838-8819 URL <http://nics.naro.affrc.go.jp/>

In order to increase the domestic self-sufficiency rate in food supply through the genetic improvement of paddy and upland field crops, the National Institute of Crop Science conducts the following projects: (1)breeding of highly productive rice varieties for forage use and low cost rice varieties for industrial use; (2)the elucidation of yield and quality physiology based on rice genome analysis; (3)the development of gene recombination technology and DNA marker-assisted selection technology for rice; (4)genome research for the breeding of wheat with pre-harvest sprouting resistance; (5)breeding of noodle-quality wheat varieties and development of technique for quality stabilization; (6)breeding of high-quality barley varieties for food or tea; (7)breeding of high-yielding soybean varieties with high processing suitability and improvement of the water logging injury tolerance; and (8)breeding of high quality sweetpotato varieties suitable for fresh (vegetable) and food processing.



High yielding feed rice cultivar 'Momiroman'



Bread-quality wheat cultivar 'Yumeshiho'



Soybean cultivar for soy milk 'Nagomimaru'



Sweet potato cultivar 'Purple Sweet Lord' (Baked)

National Institute of Fruit Tree Science (NIFTS)

2-1Fujimoto, Tsukuba, Ibaraki, 305-8605 Japan
 TEL: 81-29-838-6416 URL <http://fruit.naro.affrc.go.jp/>

In order to promote fruit tree agriculture and to support healthy, varied dietary habits, the Institute carries out research and development on the following: (1) the establishment of labor-saving cultivation systems through the improvement of tree training techniques and other efforts, the development of variety responding to consumer needs, such as easy to peel citrus, the enrichment of genome information for efficient breeding; (2) the elucidation of factors causing unstable production in fruit tree as a result of global warming and the development of technology to cope with them, the elucidation of fruit functionality and the development of assessment techniques, the development of quality preservation techniques, which enable long distance transportation; and (3) the development of fruit tree pest management techniques by inducing and establishing indigenous natural enemies, and techniques for biological control against serious diseases using microbiological agents.



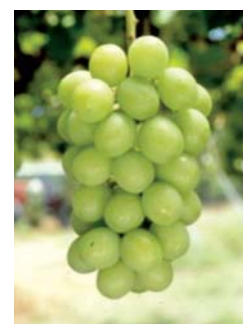
Chestnut'Porotan'



Japanese pear 'Akizuki'



Citrus'Harumi'



Grape'Shine Muscat'

National Institute of Floricultural Science (NIFS)

2-1 Fujimoto, Tsukuba, Ibaraki, 305-8519 Japan
 TEL: 81-29-838-6801 URL <http://flower.naro.affrc.go.jp/>

In order to develop the floriculture industry and to respond to the expectations of people who seek elegance and take refuge in flowers, the Institute carries out basic, fundamental research and development concerning flowers, such as the following: (1) the elucidation of growth and flowering properties and the development of stable and high yielding production techniques for cut flowers, such as chrysanthemums; (2) the development of new character creation techniques, such as changing the colors of flowers; and (3) the elucidation of quality expression mechanism of flowers and the development of quality maintenance techniques adjusted to bucket distribution system (a system that transports cut flowers in a container containing water).

New carnation variety which can last three times (about 21 days) longer than the standard



'Miracle Rouge'



'Miracle Symphony'



Cut flowers shipped to a market by wet transport

National Institute of Vegetable and Tea Science (NIVTS)

360 Kusawa, Ano, Tsu, Mie, 514-2392 Japan
 TEL: 81-59-268-1331 URL <http://vegetea.naro.affrc.go.jp/>

In order to contribute to the development of the vegetable and tea industry and the healthy, desirable life of people, the Institute carries out basic and fundamental research and development on the following: (1) low cost, labor saving and stable production techniques by developing varieties, which are suitable for labor saving and highly resistant to pests and diseases; (2) environmentally conscious production techniques by the elucidation of fertilizer absorption properties and ecology of pests and diseases; (3) the development of quality and safety enhancing techniques meeting needs of consumers and processing industry; and (4) the development of DNA markers and elucidation of physiological mechanisms to support the technological developments.



'Benifuuki' green tea rich in O-methylated catechin, which has physiological functions



'Anominori', a parthenocarpic eggplant variety

Super low-cost, high-eaves, large greenhouse



National Institute of Livestock and Grassland Science (NILGS)

2 Ikenodai, Tsukuba, Ibaraki, 305-0901 Japan
TEL: 81-29-838-8600 URL <http://nilgs.naro.affrc.go.jp/>

In order to contribute to the stable supply of safe and high quality livestock products and to the realization of healthy dietary habits, the Institute carries out research and development on the following: (1) Technical development of livestock production system based on domestic feed; (2) Development of techniques and their systematization for the establishment of an environmentally conscious livestock industry; (3) Clarification of qualitative characteristics and development of evaluation techniques concerning high-quality animal products; and (4) Innovative research to make a further contribution to the future of the livestock industry.



Feeding pigs with fermented liquid feed



Beef fed whole crop rice silage



Six heads of somatic cell cloned cattle
(The donor beef cattle is closest to the camera)

National Institute of Animal Health (NIAH)

3-1-5 Kannondai, Tsukuba, Ibaraki, 305-0856 Japan
TEL: 81-29-838-7713 URL <http://niah.naro.affrc.go.jp/>

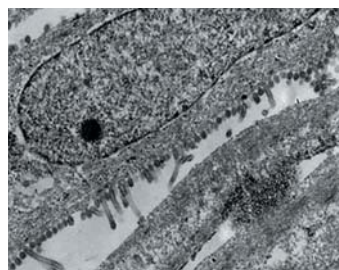
For the improvement of prevention techniques for animal diseases and zoonoses, the Institute conducts the following: (1) the development and research of diagnosis and preventive methods by elucidating a mechanism causing diseases by pathogen and toxic substances; (2) the research and development of prevention and control of diseases with vaccination by elucidating animal immune responses; (3) the production of diagnostics and vaccine exclusively for livestock which are essential for the promotion of domestic livestock industry and difficult to supply through the private sector and the supply of those to appropriate institutions; (4) the organization of lecturing and training sessions and the international technical assistance concerning animal health in response to domestic and international requests from abroad; and (5) disease diagnosis which requires advanced specialized knowledge and techniques.



Automatic protein amplification apparatus



Handling of infected animal samples

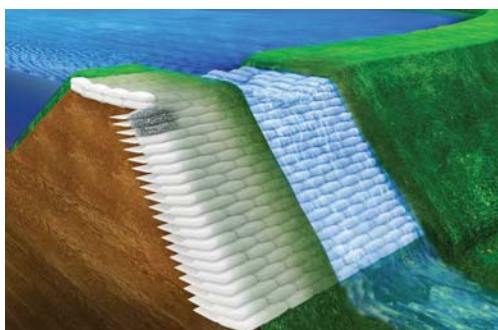


Electron microscope photograph of
Avian Influenza Virus

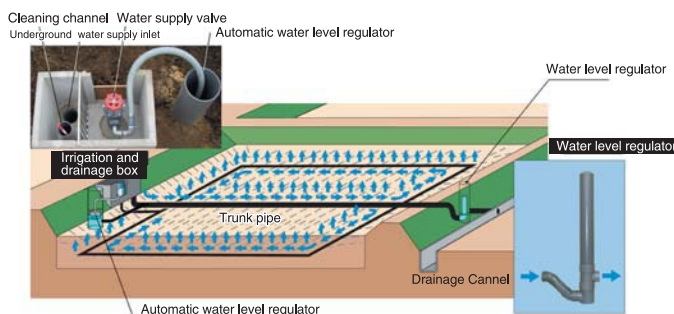
□ National Institute for Rural Engineering (NIRE)

2-1-6 Kannondai, Tsukuba, Ibaraki, 305-8609 Japan
 TEL: 81-29-838-7513 URL <http://nkk.naro.affrc.go.jp/>

Setting the achievement of policy objectives aiming at rural development as the mission, and in order to materialize "beautiful country, rich environment and well-provided life of people", the Institute carries out research and development on the following: (1) maintenance and renewal of facilities and farmland and disaster prevention and mitigation; (2) the development of rich environment and the improvement of multifaceted functions; (3) regional management for enhancing regional vitality; (4) the development of recyclable use systems of organic resources; (5) infrastructure development corresponding to field crop rotation; and (6) wind resistant structure and integrated environment control of agricultural facilities.



New reservoir engineering method resistant to heavy rain



Underground water level controlling system" FOEAS"

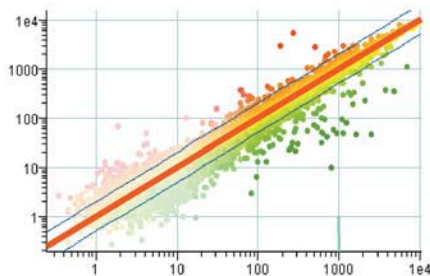
□ National Food Research Institute (NFRI)

2-1-12 Kannondai, Tsukuba, Ibaraki, 305-8642 Japan
 TEL: 81-29-838-7971 URL <http://nfri.naro.affrc.go.jp/>

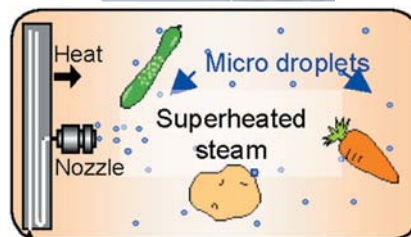
For safety and reliability of food, consumer confidence, realization of healthy dietary habits and promotion of the food industries, NFRI carries out research and development on the following: (1) elucidation of functionality and the development of utilization techniques of agricultural products and foods; (2) development of quality maintenance techniques and processing and utilization techniques of agricultural products and foods; (3) development of techniques for risk analysis concerning agricultural products and foods safety; (4) development of contamination prevention techniques and hazard mitigation techniques in the process of production, processing and distribution; (5) development of techniques for agricultural products and foods reliability.



Prepared certified reference material of GM soybean



Gene expression analysis using a DNA microarray (The figure shows the analysis of growth suppressive effect of colon adenocarcinoma cells by a mushroom component)



Providing of high quality & safety food material by Aqua-gas (superheated steam containing micro droplets of hot water)

□ **National Agricultural Research Center for Hokkaido Region (NARCH)**

1 Hitsujigaoka, Toyohira, Sapporo, Hokkaido, 062-8555 Japan
 TEL: 81-11-851-9141 URL <http://cryo.naro.affrc.go.jp/>

For the development of agriculture in Hokkaido characterized by large scale infrastructure based on vast land and low temperature, the Center carries out research and development on the following: (1) the establishment of large scale paddy-upland crop rotation system, which fosters highly motivated next generation farmers and aims to improve productivity; (2) the development of dairy production systems based on regional fodder; (3) the establishment of environmental preservation oriented agriculture in cold regions; (4) the elucidation of low temperature tolerance of crops using advanced technology, the development of cultivation techniques for cold region by elucidating the plant-microbe layer in rhizosphere environment; (5) the development of supporting techniques for agricultural work and farm management using information technology; and (6) the development of specialty crops in cold regions.



Colorful potatoes



Transformed rice resistant to low temperatures (right)



Intensive grazing

□ **National Agricultural Research Center for Tohoku Region (NARCT)**

4 Akahira, Shimo-kuriyagawa, Morioka, Iwate, 020-0198 Japan
 TEL: 81-19-643-3433 URL <http://tohoku.naro.affrc.go.jp/>

In order to contribute to the development of regional agriculture through making better use of various resources and cold/cool climate of Tohoku region, the Center carries out following research and development: (1) the breeding of cultivars, such as paddy rice, wheat, soybeans, rape and strawberries suitable for cold regions; (2) highly productive rotation system of paddy crops; (3) production techniques for beef cattle, mainly the Japanese Shorthorn; (4) the mitigation of damage caused by environmental change, such as climate warming and Yamase and furthermore crop production management techniques utilizing cool climate; (5) the analysis and utilization techniques of functional ingredients of crops and beef; (6) resource saving and environmental conservation type farm management techniques; and (7) revitalization of the rural economy of Tohoku region.



Forage rice variety for Middle to Northern Tohoku region 'Bekogonomi'



Investigation of effects of feeding whole-crop rice silage to beef cattle



"Natsuakari"



"Dekoruju"

New cultivars of everbearing strawberry

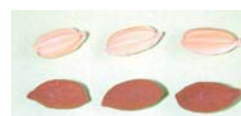


Rice direct seeding on well-drained paddyfield using grain drill

□ **National Agricultural Research Center for Western Region (WeNARC)**

6-12-1 Nishifukatsu-cho, Fukuyama-shi, Hiroshima, 721-8514 Japan
 TEL: 81-84-923-4100 URL <http://wenarc.naro.affrc.go.jp/>

For the promotion of labor saving production of agricultural and livestock products, which is environment friendly, high quality and rich function, and regional society in harmony with natural environment in a hillside area in close proximity to the urban area and in the hilly area both of which characterize the Kinki, Chugoku and Shikoku region, the Center carries out research and development on the following: (1) production, distribution and farm management systems for agricultural and livestock products aiming to establish regional brand; (2) efficient preservation management and multifaceted recycling techniques of various regional resources concerning semi-mountain and hill agriculture; and (3) environmentally conscious agricultural production techniques using the biological function that aims to reduce environmental load in the Seto Inland Sea area.



Normal rice seed (above) and iron coated rice seed suitable for direct sowing (below)



Drip irrigation and liquid fertilization system with year-round plastic mulching

National Agriculture and Food Research Organization (NARO)

□ National Agricultural Research Center for Kyushu Okinawa Region (KONARC)

2421 Suya, Koshi, Kumamoto, 861-1192 Japan
TEL: 81-96-242-1150 URL <http://konarc.naro.affrc.go.jp/>

In order to solve various technical issues faced by agriculture in the Kyushu and Okinawa region, the Center carries out research and development on the following: (1) the development of new variety and processing and utilization techniques towards high value addition of agricultural products in warm regions; (2) crop rotation system in warm regions, which improves profitability and stable productivity; (3) cultivation techniques with reduced environmental load utilizing new agricultural materials and effective microorganisms; (4) pest and disease control techniques for establishing sustainable agriculture production; (5) highly profitable and stable production techniques for vegetables and flowers in warm regions; (6) utilization system in the region by developing fermented TMR production techniques for fodder rice; (7) stable production techniques of crop and livestock under high temperature conditions; and (8) sustainable, stable production techniques of agricultural products in the Nansei Islands.



'Nikomaru' Medium maturing variety with superior palatability and grain appearance



Sweetpotato variety 'Suioh' for leafy greens and its ice cream



Sweetpotato variety 'Ayamurasaki' and its processed products

□ National Farmers Academy (NFA)

2-1-12 Kannondai, Tsukuba, Ibaragi, 305-8523 Japan
TEL: 81-29-838-1025 URL <http://farmers-ac.naro.affrc.go.jp>
Tama campus (only 2008 of the school year)
3-23-1 Renkoji, Tama, Tokyo, 206-0021 Japan
TEL: 81-42-375-8511

A mission of this academy is to foster farmers who think globally or universally and act locally taking a hold upon the region, and are able to buckle down to unseasing innovation in their operation. The location of the academy was moved in Tsukuba Institutional Complex of the Ministry of Agriculture, Forestry and Fisheries, in April, 2008. Then, a new curriculum of two years making the best use of that the academy belongs to and is managed by the NARO was established and started.



Ceremony of the 40th anniversary



Scene of a lecture



Scene of a seminar

□ Bio-oriented Technology Research Advancement Institution (BRAIN)

○ Saitama Headquarters

(Agricultural Mechanization Promotion Group)

Nisshin-cho 1-40-2, Kita-ku, Saitama-City, Saitama, 331-8537 Japan
TEL: 81-48-654-7000 URL <http://brain.naro.affrc.go.jp/iam/>

○ Tokyo Office

(private sector research promotion activities, basic research activities)

Toranomon-Marine Bldg.10F, 3-18-19 Toranomon, Minato-ku, Tokyo, 105-0001 Japan
TEL: 81-3-3459-6565 URL <http://brain.naro.affrc.go.jp/tokyo/>

For the advancement of research on bio-oriented technology and the promotion of agricultural mechanization, which is essential for the structural reform of agriculture in this country, the Institution conducts the following: (1) the promotional activities of experimental research for putting bio-oriented technology of businesses to practical use (private sector research promotion activities); (2) basic research activities and experimental research activities to create new industries concerning bio-oriented technology using proposal based program (basic research activities); and (3) experimental research on high performance agricultural machinery based on the law for promoting mechanized agriculture and consequent basic and fundamental research for utilization of information technology and robot, biomass utilization and material cost reduction (promotion of agricultural mechanization activities).



Conventional Nozzle



Drift reduction type Nozzle

National Institute of Agrobiological Sciences (NIAS)

2-1-2 Kannondai, Tsukuba, Ibaraki, 305-8602 Japan
TEL: 81-29-838-7406 URL <http://www.nias.affrc.go.jp/>

The National Institute of Agrobiological Sciences is a leading agricultural research institute of basic life science on crops, insects and animals in Japan. The Institute conducts basic studies to develop innovative agricultural biotechnologies with great potential for improving crop productivity and creating new demand, and to promote the creation of new bioindustries.

Research directions

- Improvement, diversity and use of agrobiological resources
- Research on, and development of, innovative agricultural technologies using biological and genome information
- Research and development aimed at creating new biotechnology-based industries



Fiber with fluorescent protein (GFP) using transgenic silkworm Fiber with GFP glows green under UV light.

Isolation of a gene (qSH1) involved seed shattering using the rice genome data
A japonica variety "Nipponbare" (left)
An indica variety "Kasalath" (right)

National Institute for Agro-Environmental Sciences (NIAES)

3-1-3 Kannondai, Tsukuba, Ibaraki, 305-8604 Japan
TEL: 81-29-838-8148 URL http://www.niaes.affrc.go.jp/index_e.html

In order to contribute to overcoming issues on environment and food, the Institute carries out research and development in the following areas: the development of risk assessment and risk management technology for harmful chemical substances, such as cadmium and POPs, and for invasive alien species in agricultural environment; the elucidation of biodiversity in agro-ecosystems; the elucidation of changes of agro-ecosystems caused by global warming and the development of countermeasure techniques; fundamental studies to support the researches on agro-ecosystem, such as long-term monitoring of environment and construction of database.

Research directions

- Research and development aiming at risk assessment and management of agricultural environment
- Elucidation of structure and function of agricultural ecosystem aiming at utilizing natural circulatory function
- Fundamental research supporting the elucidation of agricultural ecosystem functions



Long-term observation of carbon dioxide in a paddy field

Japan International Research Center for Agricultural Sciences (JIRCAS)

1-1 Ohwashi, Tsukuba, Ibaraki, 305-8686 Japan
TEL: 81-29-838-6313 URL <http://www.jircas.affrc.go.jp/>

In order to contribute to the advancement of agriculture, forestry and fisheries of developing countries through the promotion of research on food and the environment in developing regions in collaboration with international agricultural research institutions, the Center conducts the following: (1) Development of technologies to utilize biological resources for stable production and multi-purpose applications under adverse environments; (2) Development of management technologies of environmental resources and production systems for sustainable agriculture, forestry and fisheries; (3) Elucidation of the impact of global environmental changes on agriculture, forestry and fisheries and development of mitigating technologies; (4) Collection, analyses and dissemination of information to grasp trends related to international food, agriculture, forestry and fisheries and rural areas.

Research directions

- Research and development on agricultural, forestry and fisheries technology geared towards providing solutions to international food and environmental problems
- Collection, analyses and dissemination of information to grasp trends related to international food, agriculture, forestry and fisheries and rural areas.



Visiting researchers



Wild type DREB1 transgenic
Drought tolerance of DREB1 transgenic rice

Forestry and Forest Products Research Institute (FFPRI)

1 Matsunosato, Tsukuba, Ibaraki, 305-8687 Japan
TEL: 81-29-873-3211 URL <http://www.ffpri.affrc.go.jp/>

In order to contribute to the sustainable development of the world by building a circulating-type society utilizing rich and diverse forest resources, the Institute conducts the followings: (1) research on global warming, (2) research on the creation of safe, reliable and comfortable environments by utilizing forests and wood, (3) research on new forestry and wood utilization responding to social changes, (4) research on functional elucidation of forest bio-resources toward the development of new materials, (5) research on the structural and functional elucidation of forest ecosystem and (6) tree breeding projects.

Research and project directions

- Development research for the solution of issues and new evolution in forest, forestry and forest products
- Basic research toward the functional elucidation of forest biomaterials and dynamics of forest ecosystem
- Breeding projects, such as development of superior wood varieties, propagation and distribution



Global warming projection
(development of measuring methods)



Increase of CO₂ absorption by artificial forests

Fisheries Research Agency (FRA)

15F Queen's Tower B, 2-3-3 Minatomirai, Nishi-ku, Yokohama, Kanagawa, 220-6115 Japan
TEL: 81-45-227-2600 URL <http://www.fra.affrc.go.jp/>

In order to contribute to "securing the stable supply of fishery products" and "the sound development of the fishery industry", the Agency conducts research and development for fishery from basic to application and verification, and the hatching and release of salmon and trouts for the maintenance on their populations. The Agency has nine research institutes nationwide to carry out comprehensive research on fisheries. National Salmon Resources Center, Marine Fisheries Research and Development Center and National Center for Stock Enhancement were also placed for hatching and release of salmon and trouts to maintain their populations, for the survey for development and sustainable utilization of marine fishery resources, and for the development of techniques for stock enhancement, are conducted, respectively.

Research directions

- Research and development for securing the stable supply of fishery products
- Research and development for the sound development of the fishery industry to the safe and reliable supply of fishery products
- Basic and advanced research and development, and monitoring that serve as the bases for research and development

Hokkaido National Fisheries Research Institute (HNF)

116 Katsurakoi, Kushiro, Hokkaido, 085-0802 Japan
TEL 81-154-91-9136 URL <http://hnf.fra.affrc.go.jp/>

Oyashio and the subarctic waters around Hokkaido are highly productive, providing one of the best fishing grounds in the world. Research activities of the Institute include: (1) physical and biological oceanography; (2) stock assessment of major fisheries resources, the improvement of technical measures of fisheries management such as Acceptable Biological Catch (ABC), which is the basis of TAC (Total Allowable Catch), and fisheries oceanography for sustainable use; and (3) molecular biology, biochemistry, ecology and genetic studies of coastal organisms for stock enhancement, and the development of techniques such as seedling production for increasing biomass of the coastal resources.



Collection of plankton



Induced spawning of barfin flounder, *Verasper moseri*

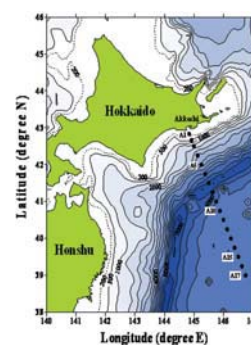
Tohoku National Fisheries Research Institute (TNFRI)

3-27-5 Shinhamacho, Shiogama, Miyagi, 985-0001 Japan
TEL: 81-22-365-1191 URL <http://tnfri.fra.affrc.go.jp/>

In order to contribute to the resource management and the promotion of fishery and aquaculture in the coastal and offshore waters of the North Pacific Ocean off Tohoku district (Mixed Water Region) with abundant fisheries resources, the Institute conducts the following: (1) research on the characteristics of marine environments and the ecology and reproduction mechanism of zooplankton, phytoplankton and micronekton in the Mixed Water Region; (2) research on ecology and stock variation mechanism of coastal resources (flatfishes, abalone, brown algae, etc.); (3) research on origin identification of oysters and brown algae and on shellfish toxins to guarantee the safety and reliability of regional fishery products; and (4) research and development on ecology and resource management of economically important fish species (saury, tanner crab, etc.) offshore of the Mixed Water Region.



Placement of mooring systems to fix observation equipment

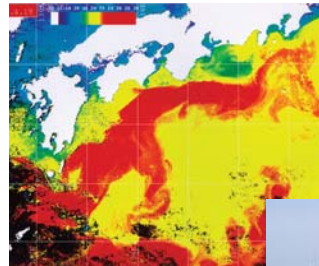


Location of a line of routine observation points southeast of Akkeshi, HOKKAIDO

National Research Institute of Fisheries Science (NRIFS)

2-12-4 Fukuura, Kanazawa, Yokohama, Kanagawa, 236-8648 Japan
TEL: 81-45-788-7615 URL <http://nrifs.fra.affrc.go.jp/>

For the proper management of fishery resources in the Kuroshio Current region, the Institute conducts the following: (1) understanding and analysis for trends in important fishery resources, such as Japanese pilchard and chub mackerel; (2) the survey and analysis of the marine environment; and (3) research and development for the recovery and enhancement of coastal resources, such as abalones and Japanese littleneck clams. For the economic development of inland water fisheries, the fish processing industry as well as the whole fishery industry of the country, it also carries out studies as follows: (4) preservation and recovery of freshwater ecosystems; (5) to make the people eat fishery products good for health at ease; (6) vitalization measures for the fishery industry including processing and products distribution; and (7) research and development on the genomic analyses of aquatic organisms.



Surface temperature distribution of Japanese waters from the satellite (red stripe in the south of Japanese Archipelago shows the Kuroshio Current)



Research vessel (Soyo-Maru)

Japan Sea National Fisheries Research Institute (JSNFRI)

1-5939-22 Suido-cho, Chuo-ku, Niigata, 951-8121 Japan
TEL: 81-25-228-0451 URL <http://jsnfri.fra.affrc.go.jp/>

In order to promote fisheries in the coastal waters and offshore of the Sea of Japan from Aomori to Yamaguchi Prefectures, the Institute conducts the following: (1) research on resources and ecology of the salmon in the Sea of Japan, and diffusion program of the results obtained; (2) stock assessment of the commercially important fisheries species and research on the mechanisms of their stock fluctuations; (3) research to clarify the relation between marine environment and fisheries resources through long-term investigations of the physical environment and food organisms; and (4) research on the physiology and ecology of the species useful for aquaculture and stock enhancement, and on the ecosystem of coastal fishing grounds.



Giant jellyfish causing serious damages to fisheries



Shore swimming crab has been found to be a predator of the Japanese flounder seedlings

National Research Institute of Far Seas Fisheries (FSF)

5-7-1 Orido, Shimizu, Shizuoka, 424-8633 Japan
TEL: 81-54-336-6000 URL <http://fsf.fra.affrc.go.jp/>

Toward the sustainable use of marine living resources mainly distributed in the open sea, the Institute engages in the following: (1) studying ecological behavior with advanced techniques and elucidating factors of the mortality during the early stages for highly migratory species (e.g. tunas) and oceanic squids; (2) conducting stock assessment/trend analysis for management of international fisheries resources, (3) developing management procedure of rational utilization of cetaceans for domestic small-type coastal whaling and for the International Whaling Commission; (4) studying ecology of other important species in the marine ecosystem and by-catch species.



The installation of a movement-recording device for striped marlin



Survey of coastal minke whale

National Research Institute of Fisheries and Environment of Inland Sea (FEIS)

2-17-5 Maruishi, Hatsukaichi-shi, Hiroshima, 739-0452
 TEL: 81-829-55-0666 URL <http://feis.fra.affrc.go.jp/>

In order to promote fishery and to provide advice on administrative policy of the fishery by inspecting scientifically fishing ground environment and trends of fishery resources in the Seto Inland Sea, the Institute conducts the following: (1) the estimate of productivity in the Seto Inland Sea, the accurate stock assessment, the elucidation of relation between stock variation and marine environment, the function assessment and rehabilitation of seaweed bed and tidal flats, the survey and research aiming at the stock recovery and origin identification of short-necked clams; (2) the development of techniques on seed production and marker of released seeds of useful fishery resources ; and (3) research and development on ecology, prediction and prevention of harmful and toxic phytoplankton blooms covering nationwide waters and on the impact of toxic chemical substances on environment and marine organisms.



Under water survey of the seaweed bed



Chattonella ovata Hara et Chihara
 (Raphidophyceae) (A harmful phytoplankton species)

Seikai National Fisheries Research Institute (SNF)

1551-8 Taira-machi, Nagasaki-shi Nagasaki, 851-2213 Japan
 TEL: 81-95-860-1600 URL <http://snf.fra.affrc.go.jp/>

In order to present a scientific basis and provide advice to the administration for the management and utilization of fisheries resources in the East China Sea, the Yellow Sea, and the coastal and offshore water of the western and northern Kyushu and the western area of the Sea of Japan, and to support aquaculture and stock enhancement in the area, the Institute carries out research and development on : (1) the stock management for sustainable use of horse mackerel, mackerel, and sardines; (2) the habitation environment of fish and shellfish by investigating ocean current, water temperature and water quality; (3) the collection, management and quality assessment of laver stock, the prediction of oxygen-deficient water mass, and the propagation of shellfish, etc.; and (4) the conservation of the marine ecosystem and its use for fisheries and aquaculture around the Nansei Islands.



Incubation of hawksbill turtle

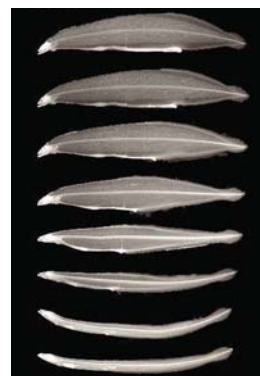


Trawl survey and catch

National Research Institute of Aquaculture (NRIA)

422-1 Nakatsuhama-ura, Minami-ise, Watarai, Mie, 516-0193 Japan
 TEL: 81-599-66-1830 URL <http://nria.fra.affrc.go.jp/>

In order to contribute to the sophistication and systematization of techniques supporting "aquaculture and stock enhancement", the Institute carries out research and development aiming at (1) the establishment of stable and efficient production and supply techniques of seedling; (2) the establishment of evaluation methods for stock enhancement; (3) the establishment of the system for aquaculture and stock enhancement that is highly productive, safe and sustainable; (4) the establishment of disease prevention techniques for fish and shellfish; and (5) the establishment of reproducible and accurate disease diagnostic methods.



Artificially bred and cultured eel



■ Fisheries Research Agency (FRA)

□ National Research Institute of Fisheries Engineering (NRIFE)

7620-7 Hasaki, Kamisu, Ibaraki, 314-0408 Japan
TEL: 81-479-44-5929 URL <http://nrife.fra.affrc.go.jp/>

In order to contribute to securing stable supply of fishery products and to the development of solid fisheries from engineering aspects, the Institute carries out research and development on : (1) civil engineering technology to propagate and cultivate fishery resources in an environmentally friendly manner; (2) fishery catch techniques that take proper, safe and efficient care of fishery resources; and (3) survey and measurement techniques to accurately estimate fishery resources and obtain marine information.



Design and construction methods of high-rise artificial fish reef



Chicken grunt gathering around high-rise artificial fish reef

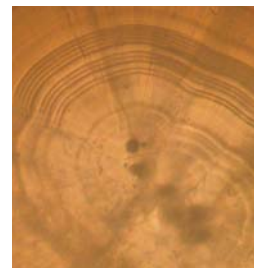
□ National Salmon Resources Center (NASREC)

2-2 Nakanoshima, Toyohira-ku, Sapporo, 062-0922 Japan
TEL: 81-11-822-2131 URL <http://salmon.fra.affrc.go.jp/>

In other to achieve a stable supply of Pacific salmon and respond to the international responsibility for conservation of anadromous stocks in the North Pacific Ocean and Bering Sea, the Center conducts: (1) the implementation of salmon fry release for Japanese stock conservation and stock assessment; (2) the studies and monitoring for stock assessment of returning fish, genetic structure and genetic diversity of Japanese salmon populations, and conservation of river ecosystem. The Center also carries out the development and dissemination of some effective techniques for increase of Japanese salmon resources.



Salmon hatching



A marked-otolith of salmon by the thermal otolith marking techniques

□ Marine Fisheries Research and Development Center (JAMARC)

15F Queen's Tower B, 2-3-3 Minatomirai, Nishi-ku, Yokohama, Kanagawa, 220-6115 Japan
TEL: 81-45-227-2723 URL <http://jamarc.fra.affrc.go.jp/>

In order to contribute to the improvement of technologies concerning fisheries, the Center carries out: (1) the development of rational utilization technologies of fishery resources, such as efficient fishing operation patterns by fishing ground selection according to the changes of level and distribution of target fishery resources; and (2) the development of efficient fishery catch technologies, such as fishery production technologies necessary for the improvement of fishery management efficiency by saving energy and costs and other measures.



Operation of Adjacent sea tuna longlining



Operation of Far seas purse seining

□ National Center for Stock Enhancement (NCSE)

15F Queen's Tower B, 2-3-3 Minatomirai, Nishi-ku, Yokohama, Kanagawa, 220-6115 Japan
TEL: 81-45-227-2600 URL <http://ncse.fra.affrc.go.jp/>

For securing a stable supply of fishery production, the Center engages in the following: (1) the development of stable techniques of seed production for fish and shellfish and the development of efficient cultivation techniques of food organisms; (2) the quantitative analyses and the development of evaluation methods of stock enhancement, and the development of stock enhancement techniques considering the genetic diversity of natural populations; and (3) the development of cultivation techniques of fish and shellfish difficult to produce seedlings.



Japanese spiny lobster larva



Japanese flounder larva

Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries (PRIMAFF)

2-2-1 Nishigahara, Kita-ku, Tokyo, 114-0024 Japan
TEL: 81-3-3910-3946 URL <http://www.maff.go.jp/primaff/>

The PRIMAFF conducts policy-related researches on domestic and international situations on foods and agriculture, forestry and fisheries as well as rural communities, in order to assist the Ministry of Agriculture, Forestry and Fisheries to plan policies which will contribute to the development of agriculture, forestry and fisheries in Japan.



Symposium



Major publications

Science Hall for Food and Agriculture

3-1-1 Kannondai, Tsukuba, Ibaraki, 305-8517 Japan
URL <http://trg.affrc.go.jp/>

The Science Hall is exhibiting recent researches as well as novel technologies relating to Agriculture, Forestry and Fisheries, which have been developed by the funds of MAFF. Since we organizes various kinds of events including hands-on experiments, all members of your family can surely experience as well as enjoy "Agricultural Sciences in Japan" at the hall. We are waiting for your coming soon. Thank you in advance.

Outline of facilities

Open days : everyday except the periods
at the end as well as
the beginning of the year.

Open hours : 9:00 a.m. ~ 4:00 p.m.

Admission : Free

For reservations : Phone 81-29-838-8980
Fax 81-29-838-8982

Front entrance



Event scene



Display booth of results



Tsukuba Institutional Complex of the Ministry of Agriculture, Forestry and Fisheries (TICA)

TICA is located in Tsukuba Science City.

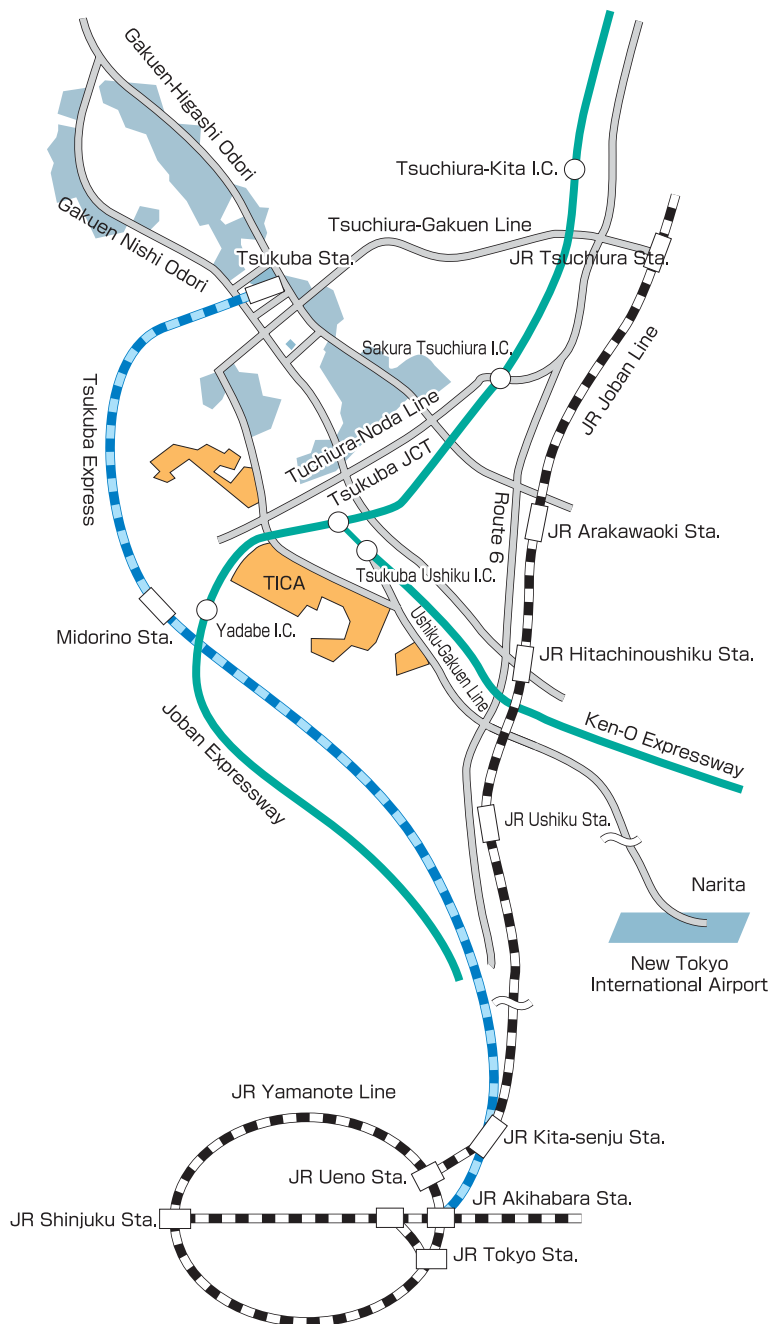
This has a total area of 421 hectares and ranges approximately 8 kilometers from south to north.

Directions

- Through JR Joban line: Exit from Ushiku station; then take Kanto-Tetsudo bus (approximately 1 hour 20 minutes from Ueno station)
- Through Tsukuba Express line: Exit from Midorino station; then take Kanto-Tetsudo bus (approximately 1 hour from Akihabara station).
No buses on Saturday or Sunday.



ALOS/AVNIR-2 © JAXA



Location Map of TICA

