



Document No: ICW/96/GF/02  
Distribution: General  
Date: October 20, 1996

International Centers Week 1996  
October 28 - November 2  
Washington, D.C.

*Toward Global Partnership in Agricultural Research*

**The Needs and Opportunities of International Agricultural  
Research From the Perspective of an Advanced Research  
Institution**

The attached paper is circulated as an input into the discussions leading to the *Declaration and Action Plan for Global Partnerships in Agricultural Research*.

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# **TOWARD GLOBAL PARTNERSHIP IN AGRICULTURAL RESEARCH**

## **THE NEEDS AND OPPORTUNITIES OF INTERNATIONAL AGRICULTURAL RESEARCH FROM THE PERSPECTIVE OF AN ADVANCED RESEARCH INSTITUTION**

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### **1. Objectives and main activities of JIRCAS**

The Japan International Research Center for Agricultural Sciences (JIRCAS) is one of the 29 research institutes belonging to the Ministry of Agriculture, Forestry and Fisheries (MAFF), the Government of Japan.

JIRCAS (formerly Tropical Agriculture Research Center) was established on October 1, 1993 (Appendix 1) to implement research programs pertaining to agriculture, forestry and fisheries in collaboration with various organizations and institutions located in all the developing regions in order to achieve sustainable development of agriculture, forestry and fisheries compatible with the preservation of the environment on a global scale.

The researchers are sent overseas on a long- or short-term basis to undertake collaborative projects or specific studies with the scientists of the respective countries while some remain at the Center to carry out basic advanced studies in the field of biotechnology, computer simulation or specific analyses requiring sophisticated equipment.

The Center holds an international symposium once a year on subjects related to the development of technology for agriculture, forestry, and fisheries in developing regions. Proceedings of the symposia are published. Reports and newsletters on research activities abroad are presented regularly. Informal seminars are held occasionally. The Center also issues various publications both in Japanese and in English.

JIRCAS is currently implementing programs to invite researchers and administrators from cooperating institutes and organizations located in various countries to promote the exchange of information and opinion concerning agriculture, forestry and fisheries and strengthen the relations with national and international research organizations. The fellowship programs aim at the training of researchers from developing regions to address problems confronting these regions, including sustainable food production and the preservation of the environment.

- 1) Invitation of Administrators
- 2) Invitation of Counterpart Researchers
- 3) Fellowship Programs

- A: JIRCAS Visiting Research Fellowship Program at Tsukuba  
Long-term Projects (2 years) (4 researchers)  
Short-term Projects (5 months) (2 researchers)

- B: JIRCAS Visiting Research Fellowship Program at Okinawa (10 researchers)

## **2. Research priorities identified by JIRCAS**

To achieve the objectives defined previously, JIRCAS selected 6 major themes listed below which are practically taken up in the form of research projects.

- I. Identification of socio-economic characteristics of agriculture, forestry and fisheries, and the technologies which should be adopted in the developing regions, and development of efficient network systems for exchange of information
- II. Development and improvement of technologies for the promotion of sustainable agriculture, forestry and fisheries activities in the developing regions
- III. Development and improvement of postharvest technologies for better utilization of agriculture, forestry and fisheries products in the developing regions
- IV. Conservation of biological resources and development of technologies for the enhancement of biological functions in the developing regions
- V. Development and improvement of technologies for the utilization and preservation of environmental resources in the developing regions, in relation to the effect on the global environment
- VI. Analysis of the trends of development in agriculture, forestry and fisheries in the developing regions, and development of integrated planning methods

## **3. Research strategy**

To address the priorities outlined above, JIRCAS is assisted by 28 research organizations affiliated to MAFF and implements the research projects in collaboration with NARS in various countries as well as the CGIAR centers, etc. (Appendices 2, 3, 4). For the research strategy, the following aspects are being emphasized.

### **1. Expansion of the areas targetted for research collaboration**

When TARC was reorganized into JIRCAS, the areas targetted for research collaboration expanded to cover all the developing regions, in addition to the tropical and subtropical regions. However, due to the constraints on the budget earmarked and on the research capability, it became necessary to set up priorities. Presently, research collaboration with the countries located in the Asian region accounts for 80% of the total, mainly due to geographical considerations and a certain similarity in culture. Although in the case of Africa and Latin America, research is implemented mainly in collaboration with the CGIAR centers, etc., in future, the relations with the countries located in these regions may gradually expand. In addition, since the research themes taken up vary mainly with the countries and regions, the strategy adopted must be adjusted accordingly.

2. Importance of research dealing with information systems and socio-economic aspects

For the selection of research themes relevant to the needs of the countries and for the effective implementation of the projects, it is necessary to collect, process and analyse in a comprehensive manner, information pertaining to agriculture, forestry and fisheries fields in various regions. In addition, it is essential to develop appropriate technology compatible with the socio-economic conditions of the respective regions. To achieve these objectives, it is important to promote information activities aimed at integrating social and natural sciences.

3. Multidisciplinary versus unidisciplinary approach

Due to the complexity of the agricultural ecosystems and of the social systems, in order to develop techniques for the promotion of sustainable development of agriculture, forestry and fisheries activities in harmony with the environment, it is more than ever necessary to adopt a systematic and integrated strategy instead of an isolated and fragmentary approach. Therefore efforts should be made to promote the implementation of comprehensive projects on a multidisciplinary basis in addition to specific studies. Research covering information sciences and socio-economic aspects, as mentioned previously (2), should place emphasis on the drafting and implementation of integrated projects.

4. Link between research carried out overseas and in Japan

The research strategy adopted since the establishment of TARC consisted of dispatching researchers to various countries to carry out collaborative research in the respective regions. In future, this system will be essentially maintained. However, in the case of basic advanced research fields requiring the use of sophisticated equipment and instruments, it is preferable to use the facilities available in Japan. Therefore, JIRCAS has set up its own research facilities in addition to utilizing the equipment and facilities available in other research institutes located in the Tsukuba Research Complex. As a result, in future, since the links between research carried out overseas and in Japan may become closer, a system whereby research carried out in Japan could alleviate the difficulties in the execution of research projects overseas could eventually evolve.

5. Development of collaboration on a multinational basis

Hitherto, research collaboration with the NARS had been implemented on a bilateral basis with the respective countries and organizations. However, for large scale problems common to several countries or regions, the implementation of research collaboration on a multilateral basis would be more effective and efficient. Therefore, in future, in order to promote collaboration on a multinational basis, it will be necessary to gain the understanding and cooperation of the related NARS.

#### **4. Development of human resources (training programs and fellowships)**

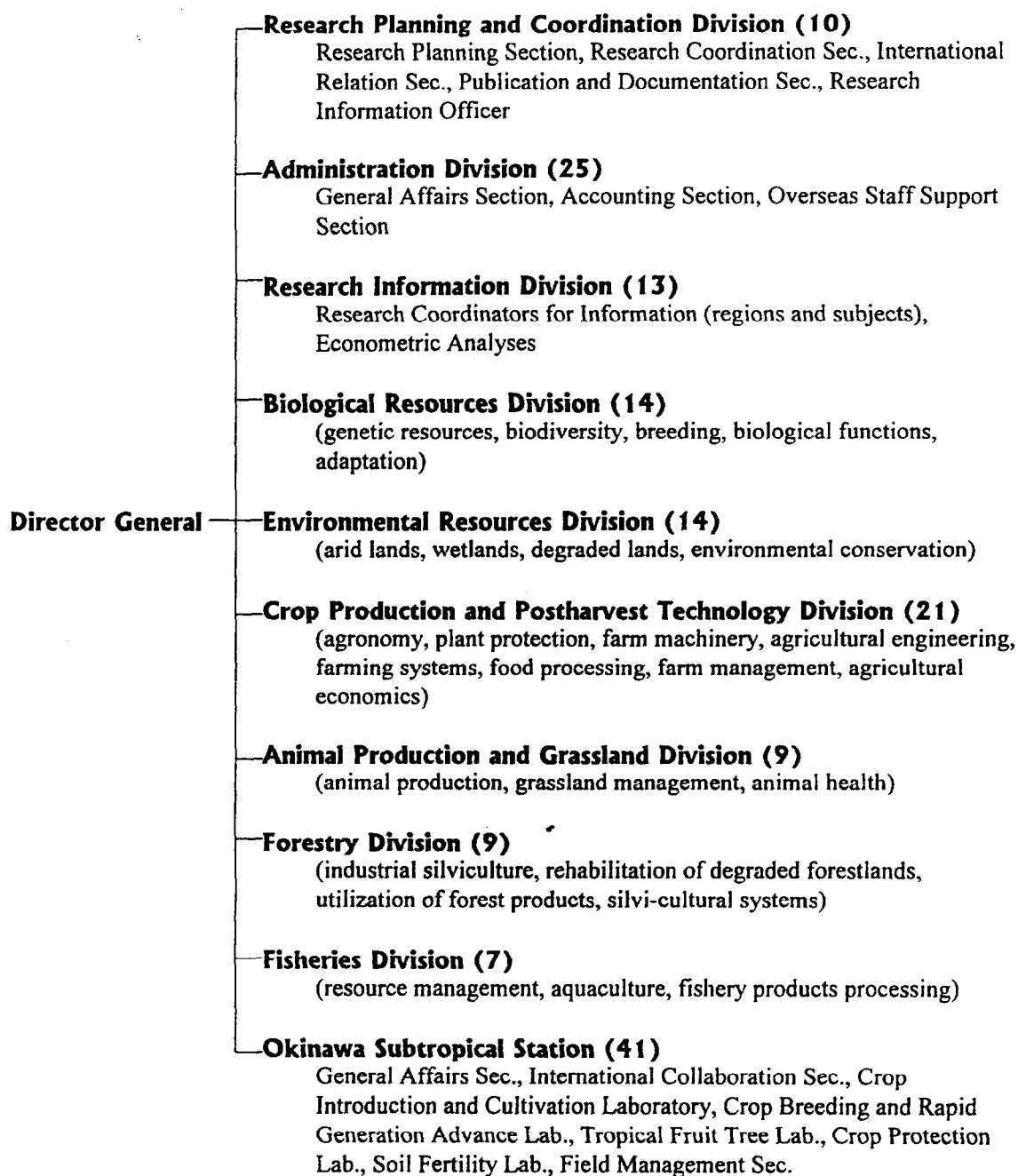
To contribute to the development of sustainable agriculture, forestry and fisheries activities, it is essential to promote research as a resource base, hence the need to train researchers who can fulfill such requirements. To achieve this objective, as mentioned previously, JIRCAS currently sponsors two types of fellowships. In either case, the studies selected by JIRCAS can be carried out at the JIRCAS Tsukuba Campus or at the JIRCAS Subtropical Station in Okinawa in making the best use of advanced facilities and of an environment conducive to research. These activities aim at enhancing the capability of the invited researchers while promoting research collaboration with the JIRCAS researchers. In addition, it is anticipated that when the recipients of the fellowship return to their respective countries, they will become the core partners for research collaboration with JIRCAS.

In conclusion, the collaboration on a partnership basis between JIRCAS and NARS, CGIAR Centers, etc. should enable to promote research for the preservation of the global environment and for the development of sustainable agriculture, forestry and fisheries activities, hence paving the way for global partnership.

## Appendix 1 Organization

(Total Staff: 164

The number of staff members is indicated in parenthesis)



Researchers: 118  
Other staff members: 46  
(as of Oct. 1, 1996)

## **Appendix 2 Major collaborative research projects between national agricultural research organizations and JIRCAS**

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1. Breeding of varieties resistant to diseases (China)
  2. Development of technology for the evaluation and utilization of soybean genetic resources in Northeast China (China)
  3. Integrated research on farming systems combining agriculture, animal husbandry and fisheries in the Mekong Delta (Vietnam)
  4. Comprehensive studies on sustainable agricultural systems in Northeast Thailand (Thailand)
  5. Development of sustainable aquaculture technology in Southeast Asia (Thailand)
  6. Productivity and sustainable utilization of brackish water mangrove ecosystems (Malaysia)
  7. Development of methods of control of biotic agents injuring rice plants under direct seeding culture in Malaysia (Malaysia)
  8. Rehabilitation of secondary degraded forestlands (Malaysia)
  9. Cultivation of soybean in cropping systems with low inputs (pesticides) in Indonesia (Indonesia)
  10. Econometric analysis of the structure of supply and demand in Southeast Asia (Thailand, Malaysia, Indonesia) and China
  11. Physiology of early growth of useful tree species in the Philippines (Philippines)
  12. Sustainable management of grasslands in Central Asia (Kazakhstan)
  13. Development of agropastoral systems in the subtropical area of Brazil (Brazil)
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### **Appendix 3    On-going collaborative research projects between CGIAR Research Centers and JIRCAS**

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CIAT (Colombia)	Eco-physiological studies on upland rice roots in relation to adaptability to savanna soil in South America Eco-physiological studies on the persistency of tropical pasture plants in the savanna of Latin America
CIMMYT (Mexico)	Improvement of high-yielding wheat varieties through biotechnological procedures
CIP (Peru)	Characterization, evaluation and utilization of genetic resources of local Andean root and tuber crops
ICRISAT (India)	Sustainable cultivation of upland crops in the semi-arid tropics Analysis of environmental changes in agricultural land after forest clearing in the tropics and development of sustainable land use systems
IITA (Nigeria)	Studies on eco-physiological characteristics of cowpea in the savanna area of West Africa
ILRI (Kenya)	Biochemical characterization of membranes of lymphocytes infected with <i>Theileria parva</i> schizonts
IRRI (Philippines)	Stabilization of rice culture under water stress in the tropics utilizing a broader spectrum of genetic resources

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**Appendix 4    On-going collaborative research projects between other international research centers and JIRCAS**

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AIT (Asian Institute of Technology, Thailand)

Mechanical Properties of Typical Soils in Northeast Thailand for Construction of Irrigation Facilities

ICIPE (International Centre of Insect Physiology and Ecology, Kenya)

Biorational Approaches to Long-Term and Sustainable Management of Desert Locust

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