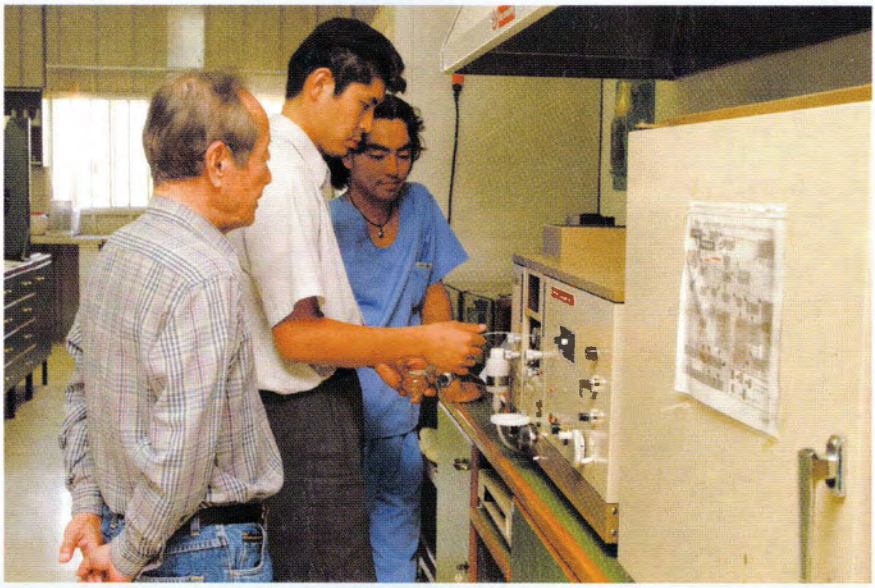
Japan and ICARDA

Ties that Bind

JAPAN



ICARDA

International Center for Agricultural Research in the Dry Areas

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in the Dry Areas (ICARDA)

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Cover: Japanese scientists conducting research in the Orita Animal Health and Nutrition Laboratory at ICARDA. Left to right: Dr G. Orita, Mr T. Takahashi, and Dr S. Kobayashi.

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Japan and ICARDA

Japan is one of the largest donors of overseas official development aid. In recent years, Japan has contributed, on average, around US$370,000 directly to ICARDA's core funding annually. Indeed, the direct contribution of Japan to the Center's core funding has been increasing–from US$311,000 in 1992 to US$705,000 in 2000. It also gives support to specific projects and considerable in-kind contributions, such as scientific equipment. Many Japanese scientists from Japan International Cooperation Agency (JICA), Tropical Agricultural Research Center (TARC), and Japan International Research Center for Agricultural Sciences (JIRCAS) seconded to work at ICARDA have made significant contributions to the Center's work.

On the occasion of its 20th Anniversary in 1997, ICARDA built a new Animal Health and Nutrition Laboratory and dedicated it to Dr Giro Orita (fourth from right) in recognition of his research contributions. Several dignitaries, including the Syrian Minister of Agriculture and Agrarian Reform, H.E. Mr Assad Mustapha (fourth from left), attended the dedication ceremony. Dr H. Nishikawa played a key role in obtaining support from the Government of Japan to equip this laboratory.

ICARDA's association with Japan dates back to the Center's establishment in 1977, when Dr Giro Orita, a JICA expert, initiated research here in sheep and goat diseases and parasites and helped develop effective control measures.

Sustainable agricultural development in Central and West Asia and North Africa—the challenges

Most of ICARDA's research is concerned with Central and West Asia and North Africa, or the CWANA region. The CWANA region is unique because of its history as the center of origin of the world's major food crops. The region is still rich in wild progenitors and relatives of globally important field crops—wheat, barley, lentil, chickpea, pea, and a number of forage legumes—as well as horticultural crops, including olive, grape, and other fruit trees. Japan's association with the region dates back to at least the mid-1950s when a Japanese collection mission, led by Dr Hitoshi Kihara, toured the region, affirming the importance of conserving and using wild relatives. The germplasm collected is now held by the University of Kyoto and shared with ICARDA. The material is an invaluable resource.

However, the CWANA region has gone from being a net exporter of food some 40 years ago to being the largest food-importing region in the developing world. The annual food gap in 1995 for 27 CWANA countries (excluding Turkey) was about 54 million tonnes. This could reach 114 million tonnes by 2020. About 271 million people in CWANA, or 42% of the population, are in the grip of severe poverty. In addition, the climate is harsh and highly variable. Water scarcity is a major problem. Where water is available, irrigation is the main option for increasing productivity, but inappropriate irrigation is a major natural-resource management problem in the region. Others include unsustainable livestock production practices in the rangelands and cereal production on the steppe, both of which have been termed environmental disasters.

Japan—supporting the restoration and rehabilitation of degraded land

Japan has made an important contribution to restoring and rehabilitating degraded land in CWANA through its support to ICARDA's work on the improvement of native pastures and rangelands, and the nutrition and management of small ruminants. Not only are sheep and goats important to the economy, but also overgrazing is a serious problem in the region because of its link to soil erosion.

Production of small ruminants in the dry areas

In 2000, Japan provided financial assistance and posted scientists at ICARDA for a research project on small-ruminant health and nutrition.

The contribution of Japan to research on livestock production in the dry areas has been substantial. Part of this contribution was through the work of Dr Giro Orita, who headed ICARDA's animal health research component for nearly 10 years (1983–1990). In view of his contributions and long experience in the dry areas, and after working for more than 36 years in Syria on animal health research, Dr Orita continues in an honorary capacity to promote the relationship between ICARDA and Japanese organizations. After Dr Orita's retirement, Dr Hiroaki Nishikawa of JICA took over leadership of the laboratory. These scientists have made extensive contributions to information on animal health in the region.

So, when ICARDA named its new animal-health and nutrition research laboratory after Dr Orita, it was in recognition of his personal

contribution to ICARDA and agricultural research in CWANA, and in recognition of Japan's contribution to ICARDA's research. Japan contributed valuable equipment to this laboratory for research on forages and milk, small-ruminant nutrition, diseases and parasites.

In 2000, a project on small-scale livestock production targeting sheep milk producers in northern Syria was started with Japanese funding. Ms Azusa Fukuki serves as a Research Associate in socioeconomics research within the project. Two Japanese associate experts in the field of small ruminant production also joined this project as part of the JICA volunteers program, started in 2000 at ICARDA. The two experts, Dr Sota Kobayashi and Mr Tsuyoshi Takahashi, who work in animal health and nutrition, respectively, are contributing effectively to ICARDA's research agenda.

Improvement of native pastures and rangelands

Japan made a vital contribution to the setting-up of ICARDA's Geographic Information Systems (GIS) and remote-sensing laboratory, both in terms of equipment and scientific expertise.

The contribution of Dr Haruhiro Fujita of JIRCAS to ICARDA's GIS work was particularly important. Dr Fujita was involved in a collaborative project between ICARDA and JIRCAS that collected

In a cooperative project between ICARDA and Japan, a video-monitoring camera takes photographs from a balloon 200 meters above ground in Syria. Vegetation maps developed from the photogrpahs are verified against LANDSAT satellite images to determine species distribution and the changes caused by overgrazing.

information on steppe degradation, digitized it, and produced models that represented the condition of the steppe land and the potential 'hot spots' prone to further degradation. The project also involved Drs Hitoshi Sinjo and Masahiro Hirata, JICA volunteers. The work focused on the Abdal Aziz mountain range in northeastern Syria, where overgrazing and unsustainable barley production combine to threaten the soil and vegetation.

In a cooperative project between the Tropical Agricultural Research Center of Japan and ICARDA, Dr Shigeru Takahata conducted research at ICARDA on developing vegetation maps, made from aerial photographs taken from a balloon. The maps were verified against LANDSAT satellite images to determine species distribution and changes in landscape caused by overgrazing.

As well as using GIS applications to identify current resource degradation and change (particularly with other external models), GIS is also a useful tool for evaluating future resource hazards, through the development of simulation models.

Japan's contribution in this field has helped to ensure that ICARDA is at the forefront of work on natural-resources management in CWANA.

Biotechnology research

Japan has also made a major contribution to ICARDA's biotechnology research program. Japan provided equipment and the services of Dr Masanori Inagaki, who worked closely with ICARDA's plant breeders to produce doubled-haploid (DH) lines of barley and wheat. When breeding crops, it is important that the lines produced are homozygous—i.e. that they breed true to their characteristics in every generation. Doubled-haploid breeding achieves this by isolating one half of the chromosomes and then replicating them by treatment with the chemical colchicine.

Dr Inagaki's work at ICARDA led to the development of promising spring bread-wheat lines, which combine resistance to Hessian fly (a menace to crops in the Maghreb region) and good agronomical performance. These lines have been evaluated by the national program

in Morocco, and have been released there. About 2500 DH lines are produced at ICARDA every year for spring and winter bread wheat and are evaluated by ICARDA at its Aleppo headquarters; the major objective now is the management of yellow rust, a lethal, fast-mutating pathogen of global significance.

In cooperation with the laboratory of Professor Shinozaki, JIRCAS, Tsukuba City, ICARDA is planning to assess the value of a drought resistant gene in food legumes (lentil and chickpea).

The genetic characterization of wild relatives *(Aegilops* spp.) of wheat has been undertaken by Dr Tsuneo Sasanuma of Kyoto University, who spent more than six months in the Genetic Resources Unit of ICARDA in 2000–2001.

Mr Takahiro Sato began work on "water relations of plant drought tolerance of spring wheat" at ICARDA in May 2001.

Table 1. Japanese scientists at ICARDA (excluding short visits)

Name	Sponsoring agency	Duration of stay
Giro Orita	JICA	1983–1990
	ICARDA	1990–
Tshuguhiro Hoshino	JIRCAS (TARC)	Jan–April 1986
Naoyuki Ishikawa	JIRCAS (TARC)	Nov 1986–Feb 1987
Naoyuki Kawada	JIRCAS (TARC)	Dec 1987–Mar 1988
Masanori Inagaki	JIRCAS (TARC)	Nov 1987–Nov 1990
Shigeru Takahata	JIRCAS (TARC)	Feb 1990–Mar 1992
Hiroaki Nishikawa	JICA	May 1991–May 1996
	ICARDA	May 1996–
Haruhiro Fujita	JIRCAS (TARC)	Mar 1992–Sept 1995
Hisao Eguchi		Feb–Mar 1993
		Mar–Apr 1994
Hitoshi Sinjo	JICA	Jan 1994–Dec 1996
Masahiro Hirata	JICA	Jan 1994–Dec 1996
Azusa Fukuki	ICARDA	From Apr 1998
Sota Kobayashi	JICA	From May 2000
Tsuyoshi Takahashi	JICA	From Aug 2000
Takahiro Sato	JICA	From May 2001

Strengthening ties

Dr Orita retired in 1990 but he retains an advisory role in ICARDA's affairs as a Senior Consultant. Dr Tomio Yoshida, Professor of Soil Science at Chiba University in Japan, served on ICARDA's Board of Trustees from 1992 to 1996. He still maintains close contacts with ICARDA. Professor Iwao Kobori of United Nations University, Tokyo, joined as a member of the Board in 1997, after the retirement of Dr Yoshida, and is currently Vice-Chair of ICARDA's Board of Trustees.

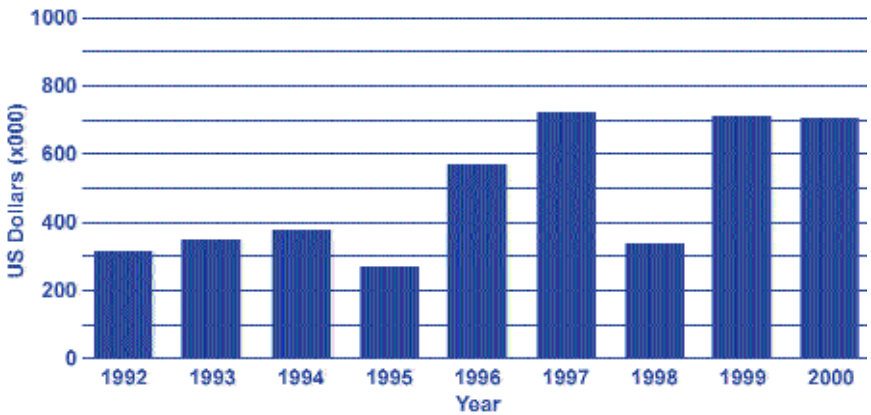
Japanese Ambassador to Syria, H.E. Mr Kishichiro Amae (right), discuss research links and further collaboration with ICARDA Board Chair, Mr Robert Havener (left), and the Director General, Prof. Dr Adel El-Beltagy, during his visit to the Center on Presentation Day in April 2000.

ICARDA is eager to further strengthen its links with Japanese institutions through collaborative research projects. This would benefit both the Center and Japan; ICARDA would benefit from Japan's advanced research technology, and Japan would benefit from ICARDA's partnerships with national programs in the region and from the Center's gene bank, which now holds more than 124,000 accessions. Increased financial support and collaboration would help strengthen research in natural resources management, crop improvement and protection, and animal science and nutrition in dry areas of the developing world, all of which are of mutual concern to Japan and ICARDA.

ICARDA is grateful to the Government of Japan for its ongoing support to the Center through the services of Japanese scientists, its contribution to the Center's budget, and donation of equipment.

An international workshop on "New Approaches to Water Management in Central Asia" was jointly organized by the United Nations University (UNU), Japan and ICARDA at the Center's headquarters in Aleppo in November 2000. Prof. Motoyuki Suzuki (right), Vice-Rector of UNU, in the company of ICARDA Board Vice-Chair, Prof. Dr Iwao Kobori (left), discuss with the Center's Director General, Prof. Dr Adel El-Beltagy, the avenues for strengthening ICARDA's ties with UNU and Japan.

Japan's contribution to ICARDA's annual budget 1992–2000.



About ICARDA and the CGIAR

Established in 1977, the International Center for Agricultural Research in the Dry Areas (ICARDA) is governed by an independent Board of Trustees. Based at Aleppo, Syria, it is one of 16 centers supported by the Consultative Group on International Agricultural Research (CGIAR).

ICARDA serves the entire developing world for the improvement of lentil, barley and faba bean; all dry-area developing countries for the improvement of on-farm water-use efficiency, rangeland, and small-ruminant production; and the Central and West Asia and North Africa region for the improvement of bread and durum wheats, chickpea, and farming systems. ICARDA's research provides global benefits of poverty alleviation through productivity improvements integrated with sustainable natural-resource management practices. ICARDA meets this challenge through research, training, and dissemination of information in partnership with the national agricultural research and development systems.

The results of research are transferred through ICARDA's cooperation with national and regional research institutions, with universities and ministries of agriculture, and through the technical assistance and training that the Center provides. A range of training programs is offered, from residential courses for groups to advanced research opportunities for individuals. These efforts are supported by seminars, publications, and specialized information services.

The CGIAR is an international group of representatives of donor agencies, eminent agricultural scientists, and institutional administrators from developed and developing countries who guide and support its work. The CGIAR receives support from many country and institutional members worldwide. Since its foundation in 1971, it has brought together many of the world's leading scientists and agricultural researchers in a unique South–North partnership to reduce poverty and hunger.

The mission of the CGIAR is to promote sustainable agriculture to alleviate poverty and hunger and achieve food security in developing countries. The CGIAR conducts strategic and applied research, with its products being international public goods, and focuses its research agenda on problem-solving through interdisciplinary programs implemented by one or more of its international centers, in collaboration with a full range of partners. Such programs concentrate on increasing productivity, protecting the environment, saving biodiversity, improving policies, and contributing to the strengthening of agricultural research in developing countries.

The World Bank, the Food and Agriculture Organization of the United Nations (FAO), and the United Nations Development Programme (UNDP) are cosponsors of the CGIAR. The World Bank provides the CGIAR System with a Secretariat in Washington, DC. A Technical Advisory Committee, with its Secretariat at FAO in Rome, assists the System in the development of its research program.

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