

JIRCAS Newsletter

for
INTERNATIONAL COLLABORATION



Elementary School children attending the tree nursery training class
(Koka Village, Olomia Region, Ethiopia / Photo by K. Hasada)

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Regarding Change as a Golden Opportunity - A Turning Point for New Challenges -

As part of an administrative reform, the Japan Green Resources Agency (hereinafter referred to as J-Green) was abolished in April, 2008. Consequently, the organization and budget for overseas agricultural and rural development research projects, which were being conducted by J-Green, had been transferred to the Japan International Research Center for Agricultural Sciences. The “Rural Development Planning Division” was newly established to take charge of the implementation of these projects.

The projects, which had been transferred, are being introduced in the “Research Highlight” pages of this current issue of the JIRCAS Newsletter. J-Green started its overseas activities about 25 years ago, that is ten years before the restructuring of the former JIRCAS from the Tropical Agriculture Research Center (TARC). Since then, we have been trying to develop basic technologies and methods based on rural development with farmers’ participation by using technologies, know-how and personnel resources which were accumulated both in Japan and overseas countries. These apply not only to the global environmental problems, such as desertification prevention measures in Africa, farmland loss and soil erosion control activities in Latin America but also to the reconstruction assistance efforts in rural areas (Sri Lanka, etc.) that were damaged by natural disasters. In terms of desertification prevention, we often cannot avoid imagining the greening countermeasures as equivalent to tree planting activities in the desert. However, in this context, these actually refer to the activities which seek to prevent the progress of desertification through the establishment of sustainable agriculture and promotion of rural areas in the early stages of desertification.

One of the successful cases is the desertification prevention measures project in Mali, Africa, which was selected by the United Nations Convention to Combat Desertification (UNCCD) as one of the best practices in the world and currently well-recognized as a model activity. Moreover, in Paraguay in Latin America, activities to establish the rural development method based on Clean Development Mechanism (CDM) as a countermeasure against global warming are proceeding. We are now aiming at the first UN registration of the clean development mechanism in the world in this field (Carbon dioxide or CO₂ sink measures through agroforestry).

In retrospect, we have experienced many successful outcomes and many failures as well. Generally speaking, there had been many cases wherein the seemingly easy introduction of new technologies or methods resulted in failures. One of the factors we considered was our way of thinking, which was based on the assumption that the inhabitants can easily understand and accept such new technologies. It had been recognized as important that in terms of the development and introduction of new technologies and methods, we should also make use of

traditional knowledge and make the local people and farmers recognize the necessity and effects of such new technologies on their own.

The population in developing countries accounts for approximately 80% of the world’s total population. On top of this, three-quarters of the poor people in developing countries live in rural areas. We assume that activities related to developing basic technologies and methods to promote agricultural and rural areas for the purposes of poverty reduction, promotion of stable supply of food, and improvement of living environments will continue to increase in importance under the background circumstances. Basic concepts for agricultural and rural development cooperation should also be shifted and revised from the “participatory approach” taken so far to “independent or initiative-driven and voluntary approach”. This new approach places importance on sustainability or “circulation of local resources”, which takes the environment into serious consideration. It is necessary for us to correspond to various needs under this approach. We would also like to make positive use of the research outcomes from local sites in developing countries, which JIRCAS has accumulated so far or will be creating in the future, in the fields of agriculture, forestry and fisheries

In addition, we would like to make a significant effort to contribute towards the expansion of research activities through the reinforcement and strengthening of mutual cooperation with other divisions.

Takeshi Ota
Director, Rural Development Planning Division, JIRCAS



With support from the Japanese team, problems were analyzed and countermeasures decided by rural residents through PRA (Participatory Rural Appraisal).

(Segou Region, Mali / Photo by K. Horita)

Rural Development Based on the Clean Development Mechanism

The Clean Development Mechanism (CDM), adopted in the Kyoto Protocol (KP) in 1997, is one of the additional strategies for the reduction of greenhouse gas (GHG) emission, otherwise also known as the Kyoto Mechanism.

In the KP, the countries listed in Annex I include industrial countries and transition economies which promised to meet the GHG emission reduction target of bringing down emissions to below the 1990 level between 2008 and 2012. The quantified reduction commitment, for example, is 8% of the base year for EU countries and 6% for Japan. Emission reduction is implemented primarily through national measures, however. The market-based mechanism, by creating what is known as the carbon credits, takes into account the emission reduction achieved in developing countries through development projects that reduce or absorb emissions with the help of Annex I countries and is introduced as a supplemental measure to domestic action. This is the background of CDM.

Since the KP took effect in 2005, CDM projects have been promoted full-scale especially in the sectors of power generation, energy industry and manufacturing plants whose emissions are significant. On the other hand, there are only a few CDM projects located in the rural areas of developing countries where a greater part of the population lives and there exists high potentiality to be able to make use of existing biomass stock and degraded lands for forestation.

The objective of this study, which started from 2006, is to contribute to the emission reduction of GHG in rural areas of developing countries and to use the credits generated by CDM for sustainable rural development by verifying the potential of introducing two types of CDM activities, such as increase of absorption (forestation) and reduction of GHG (substitution of non-renewable fuel by renewable energy). For the GHG absorption type project, the Department of Paraguar in Paraguay, where a number of small-scale and low-income farmers reside, was selected as the project area and reforestation by agro-forestry technology was implemented to absorb carbon dioxide or CO₂. In low income Mekong Delta area, Vietnam, the study will focus on introducing a measure to reduce the use of firewood and fossil fuel (petroleum and coal) by using methane produced from livestock biomass in each household.

In the study area in Paraguay, the productivity of the land seriously decreased due to soil erosion and degradation from unsustainable cultivation and lack of fertilizer application ever since the conversion of forests to croplands which occurred more than 100 years ago. First, the restoration of soil fertility with the use of green manure and introduction of soil



Photo1. Forestation training for farmers in Paraguar , Paraguay (Photo by J. Ogasawara)

conservation measures were implemented. Then, a reforestation project aimed at about 250 ha of degraded croplands and grasslands possessed by around 200 farm households was formulated as one of the rural development measures. In the project, farmers participated voluntarily and planted the seedlings provided by the study on parts of their lands by themselves. However, few farmers had experience or knowledge in planting trees; therefore, a series of demonstration training for participating farmers in the forestation activity was implemented in demonstration farms established by JIRCAS and model parcels owned by leader farmers (Photo1.). All the planting activities are scheduled to be finished in 2008. As for turning the reforestation into a CDM project, a basic survey was conducted and the project design document for CDM was prepared according to the methodologies approved by the United Nations Framework Convention on Climate Change (UNFCCC). In March, 2008, the on-site validation of the project was completed by a designated inspection organization registered with the UN. Aggregate volume of CO₂ absorption by the reforestation is estimated at more than 100 kilotons within 20 years. JIRCAS is currently continuing its efforts to obtain UN registration of this CDM project till the end of 2008.

In Vietnam, the study which is in collaboration with Can Tho University (CTU) and located in the center of the Mekong Delta, is geared towards adding household biogas digesters to traditional farming system in the study area (so called VAC system), which is a combination of hog-raising, pisciculture and orchard or fruit cultivation, in order to produce methane by using waste from the pigsty as a feeder for the digester. The methane produced by the biogas digester (Photo2.) will be used as fuel and substitute for firewood and fossil fuel that have been traditionally used by the households. The digester has a simplified structure made of plastic or concrete and is one of the subjects of the joint research project between JIRCAS and CTU implemented from 1994 to 2003 (Mekong Delta Project). This study aims to contribute to rural development through the extension of the CTU-JIRCAS technical package comprising of past and recent research achievements, and is expected to result in the formulation of a CDM project based on biogas digesters. The study commences in 2008 with the conduct of fundamental data collection and survey as the initial stages.

The results of the study will be published in technical guidelines to be prepared at the final stage and scheduled to be disseminated or extended to other areas through seminars and onsite trainings.

Eiji Matsubara
Rural Development Planning Division, JIRCAS



Photo2. Plastic type biogas digester set up by a farmer in Can Tho City ,Vietnam (Photo by E. Matsubara)

Approaches towards the Efficient Use of Water Resources in Atoll Islands

In the year 2007, the Intergovernmental Panel on Climate Change (IPCC) announced its latest report (the Fourth IPCC Assessment Report) after an interval of six years, which is predicting various negative influences of global warming and sea-level rise, etc. In particular, many small islands among the Caribbean or the Pacific Ocean islands are very vulnerable to climate change, sea-level rise and extreme decrease in rainfall. It is predicted that they will not have enough water resources during the dry seasons to satisfy their water demand by the middle of the 21st century.

Because of these circumstances, the Rural Development Planning Division has been conducting a research in the Republic of the Marshall Islands in the South Pacific, aimed at utilizing precious water resources efficiently and sustainably; thus, minimizing the adverse effects of climate change.

The Republic of the Marshall Islands is one of the countries that are strongly affected by climate change because of its low-lying and flat atoll landform. Recently, intense heavy rains or droughts have been happening frequently. Moreover, there is the possibility of saline seawater intrusion into wells because of the anticipated sea-

level rise. There is a serious concern of damage to agricultural production due to the lack of water resources.

Coral reef islands, like the Republic of the Marshall Islands, are formed and made up of limestone with high permeability. So, rainwater seeps into the underground and floats in the shape of a lens atop the seawater which has intruded in from the ocean (hereinafter called "a freshwater lens"). In the Laura district on Majuro Atoll of the Republic of the Marshall Islands, a freshwater lens of about two million tons under the storage area of about 1.4 km² is used for drinking water and irrigation water. The freshwater lens is very fragile that, once depleted by excessive water withdrawal from wells, it will not recover as it was before. Likewise, when the sea-level rises, the lens will become thinner which will lead to a corresponding decrease in the amount of available freshwater (Fig. 1).

On the other hand, in the Republic of the Marshall Islands, in addition to the traditional production of taro or coconut palms (Fig. 2), vegetable cultivation and livestock-raising were established through technical assistance from Taiwan in recent years.

This research tries to stabilize and increase agricultural production, together with the conservation of the freshwater lens and reduced dependence on groundwater by increasing the number of water storage tanks and by the establishment of integrated techniques such as, dissemination of environment-friendly cultivation methods with less usage of manure and pesticides, etc.

This is the second year of the research and we have been conducting a survey on the farming situation and monitoring the freshwater lens by periodically observing the wells. Next step will be a verification survey on agricultural techniques, which will emphasize the conservation of the freshwater lens, aiming at the establishment of methodologies for the efficient use of freshwater resources.

I hope that the targeted new methodologies will be useful for many other atoll islands that are likewise adversely affected by global climate change.

Ryo Miyazaki
Rural Development Planning Division, JIRCAS

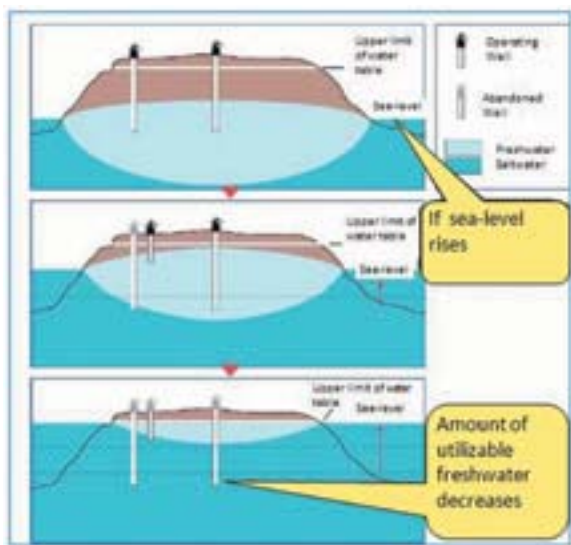


Fig. 1 Effect of rising sea level on the freshwater lens (Ministry of the Environment, Japan)

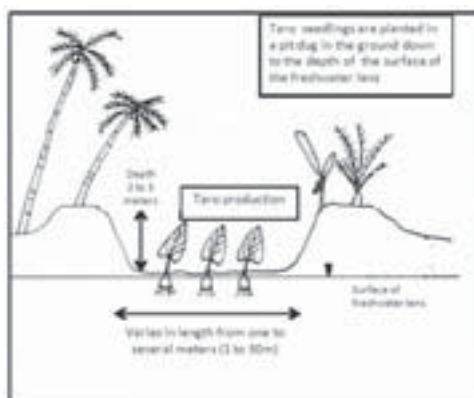


Fig. 2 Traditional taro production (right) and diagram showing taro cultivation (left)

Efforts to Develop Water Resources in Niger

The amount of annual water use in the world has increased by 150% over the past 30 years. The demand for water is expected to further increase due to population and economic growth as well as improvement in living standards in developing countries. Since the world is facing a tight water supply situation, addressing water problems is essential for sustainable development in the 21st century, as recognized at the 4th World Water Forum held in Mexico in March, 2007.

In developing countries, the efficient use and recycling of water resources are not well developed. With the aim of addressing water resource problems and reducing poverty and hunger in these countries, we will conduct a survey, based on our experiences and knowledge as well as local technologies, to identify methods for efficient water use in accordance with natural and social conditions in the community.

Niger, located across the southern edge of the Sahara desert, is one of the poorest countries in the world (Fig. 1). Besides the financial difficulties with an annual population growth rate of 3.3%, the country is now facing low levels of food safety, healthcare, education, and many other serious problems. Therefore, a stable food supply and increased agricultural productivity are immediate priorities for Niger.

A traditional agricultural technique in Niger, called the “Flood Recession Farming” (Fig. 2), employs seasonal

streams which remain dry except during the rainy season of the Niger River - an international river, and utilizes periodic reduction in the water levels of lakes and ponds. Using none or little irrigation water, the “Flood Recession Farming” is an extensive cultivation method, in which the farmers plant crops in wet fields that emerge immediately after the rainy season due to reduction in the water levels of seasonal streams and ponds.

In Niger, there are still many areas, even where water resources are available, where the “Flood Recession Farming” technique has not yet been introduced.

In addition to identifying problems with regards to existing methods of water resource utilization, we will focus on “Flood Recession Farming”, a traditional technique of efficient water use. In the survey, with the aim of increasing food self-sufficiency and residents’ incomes in the community, we will work together to determine problems with this traditional method and develop/implement measures to address them.

In 2007, we established general policies for the survey, and selected a site for the verification study. In 2008, we will conduct an analysis to determine what is preventing the efficient use of water resources in about 40 villages. We are also planning to determine the total area of lands in the country suitable for “Flood Recession Farming”, by analyzing satellite images. From 2009, we will conduct a verification study on the farmers’ organizations, the introduction of efficient irrigation systems and improvement in cultivation and agricultural management techniques as well as in productivity. The research results will be incorporated into the guidelines and announced in a workshop.

Kimio Osuga
Rural Development Planning Division, JIRCAS

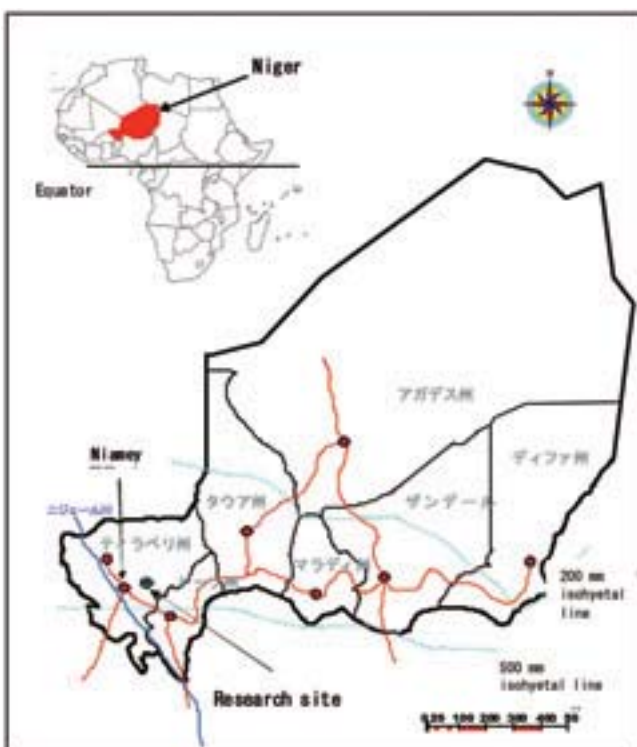


Fig. 1 Research site



Fig. 2 Flood Recession Farming utilizing changes in water levels

Initiative to Promote Rice Cultivation in Africa

It is necessary to substantially increase agricultural productivity, like what happened in the Green Revolution in Asia, to eliminate food shortages and poverty in Africa, where population growth rates are higher than in any other region in the world. In Sub-Saharan Africa, especially in Western African countries, where the demand for rice has been growing since the 1970s, a sharp increase in imported rice has caused a foreign exchange shortage since the late 1990s and has led to a serious economic crisis. Moreover, a recent global rise in cereal prices has caused food supply uncertainties, most of all among the poor.

Being a tropical crop that grows in most areas of Africa, requiring nothing but water, rice plays a very important role in eliminating hunger and poverty in Africa, especially in Sub-Saharan regions.

Japan has provided extensive support for Africa in experimental studies of Nerica (New Rice for Africa) and its seed production and other research projects. At the Fourth Tokyo International Conference on African Development (TICAD IV) held in Yokohama in May, 2008, it was agreed as a major support effort for Africa, to help improve rice productivity in the region. With the goal of doubling the production of rice from 14 to 28 million tons (of unmilled rice) over the next ten years in Sub-Saharan African countries, we established a strategic initiative body, the “Coalition for African Rice Development (CARD)”, to implement policies for promoting rice cultivation in Africa.

In this context, this year we will conduct the “Study on the development of improved infrastructure and technologies for rice production in Africa”, a project supported by the Ministry of Agriculture, Forestry and Fisheries of Japan.

We will conduct this study to “establish efficient and effective methods for developing a foundation for socially and environment-friendly rice cultivation and improve rice productivity in Africa”, by examining the infrastructures for rice production, such as farmland and irrigation facilities and conducting verification studies of lands suitable for rice fields”.

Rainfed upland paddy fields account for 38% of the total area of rice fields, and irrigated paddy fields and rainfed lowland paddy fields comprise 20 and 42%, respectively. The study we will perform is designed to identify factors constraining productivity improvement in each type of rice cultivation and discuss what improvements should be made. In Western Africa, of 20 million hectares or more of rainfed lowlands suitable for paddy fields, only 10 to 25% is being utilized. Therefore, we will focus on rainfed paddy fields and discuss ways to develop these fields most efficiently.

The research to be conducted will cover a wide range of items, such as the introduction of the most suitable varieties and cultivation techniques, access to the markets, forms of land ownership, farming organizations and experiences in rice production, to be able to produce as comprehensive a manual as possible.

We hope that the instruction manual based on the study will be utilized by a wide variety of relevant organizations, thereby contributing to the improvement of rice productivity in Africa.

Kunihiko Naito
Rural Development Planning Division, JIRCAS



Farmers preparing paddy fields in rainfed lowland (Ghana)



Cultivated paddy fields in rainfed lowland (Uganda)

Establishment of Methodology for the Reconstruction of Agriculture and Rural Communities through Participatory Approach in Sri Lanka

Since the Asian Tsunami disaster in December 2004, short-term emergency relief services were provided on a large scale in Sri Lanka. However, these relief and support services are now coming to an end and it is time to carry out medium and long-term reconstruction activities.

JIRCAS is conducting the study to strengthen the villagers' community organizations affected by the tsunami and to enhance capacity building for the local agricultural administrative sector. This may enable them to conduct recovery actions by themselves.

The method of implementation of the survey is by assembling the farming villagers and allowing them to identify their own problems which are prevalent in the villages. Then the farmers are asked for means on how to overcome their problems and finally they tend to come up with their own action plan. When it comes to the matter of implementing activities as they appear in the action plan, the type of support activities which need to be extended by the survey team and the relevant government officers are clarified. The selected activities of the particular action plan will be implemented with the participation of the residents of such farming villages. All activities performed by the villagers are obtained free of charge or on a voluntarily basis. It seemed so easy, if these outputs can be realized through mere words; but, actually the enforcement of such action plans come along with so many difficult obstacles.

Due to the subdivision of properties from their forefathers which made paddy lands smaller in terms of sizes generation after generation, farming communities in Sri Lanka can not depend only on cultivation or agriculture, but have to engage in other livelihood too. Especially with the Tsunami tragedy, most of the damaged seawater protection sluice gates let in the seawater to the paddy fields almost everyday which made cultivation difficult and further drove farmers away from cultivation. They were forced to choose or go searching for alternative ways of earning such as daily paid labor work for their day to day existence. The most important thing is to analyze ways on how to get them to participate in such tasks and how to enhance their proficiency and capability and for them to realize the importance of their roles.



Participants listened attentively to the lecture of the ARPA during the home gardening training (Godauda Village, Sri Lanka / Photo by S. Shiraki)

In Sri Lanka, the agricultural division in every district operates under an Agrarian Service Centre (ASC) which caters to agriculture as well as to farmers' welfare as a whole. The employees called ARPA (Agricultural Research Production Assistants) are attached to the centre. The ARPAs are each assigned to one or some villages, conduct fact-finding activities in the cultivation areas and help to disseminate more widely the activities of AIs (Agricultural Instructors). The majority of the ARPAs are living in the village under their charge or in nearby villages and are well-known to the inhabitants as they are the closest government servants for agricultural concerns.

This particular survey and study targeted to train ARPAs as facilitators to enable the farming villagers to acquire participatory skills and increase their willingness to do so. Up to last year, reconstruction of seawater protection sluice gates in two villages, retrieval of abandoned paddy lands, rehabilitation of agricultural roads and development of home gardens were implemented. One ARPA carried out some special strategies to obtain the people's participation. While males were out for labor work during daytime, females participated instead. In the evening, males after their day's work took up the opportunity of changing shifts with the females. This was a special system adopted by the above ARPA. Another way was to get the participation of deserving families who are entitled to receive 'Samurdhi', (a government ration subsidy for poor families) to also offer their contribution as a collective group.

This year, to examine the capability of ARPAs, 12 ARPAs were selected to implement home gardening development activities in their specific villages. For sustainable involvement, we introduced a compulsory payment scheme as shared contribution of the participants from the village. We intend to focus on how each concerned ARPA explains sufficiently to villagers the techniques of implementation of the activity and what kind of issues arise during the task. Again, we believe that the methods of finding solutions to such issues, in collaboration with government agricultural officers, will be a major point to consider.

Takeru Higashimaki,
Rural Development Planning Division JIRCAS



Explanation of three ARPAs in the center to trainees on how to make a seedbed (Batheegama West Village, Sri Lanka / Photo by S. Shiraki)

JIRCAS Contribution to TICAD IV

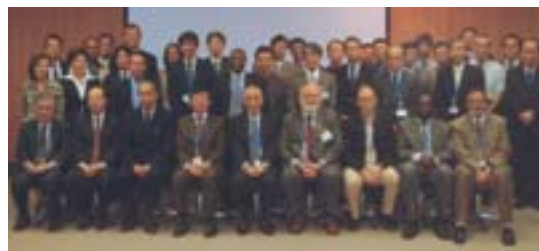
At the Fourth Tokyo International Conference on African Development (TICAD IV) held in Yokohama at the end of May, 2008, the issues on food and agriculture drew special attention from the participants. So far, JIRCAS has been making active contributions to this process through such related activities, wherein it organized an international symposium on priority-setting for African agricultural research and development in 2005 following the previous TICAD conference. This year also, it held a "Round Table Meeting on Agricultural Research for African Development", jointly with the CGIAR (Consultative Group on International Agricultural Research) Secretariat at Tokyo University on the 27th of May, a day before the start of TICAD IV. Besides Dr. Wang, the Consultative Group on International Agricultural Research or CGIAR Director and Dr. Ziegler, Director General of IRRI (International Rice Research Institute), many participants from CGIAR Centers in Africa as well as many Japanese experts from the Ministry, universities and research institutes gathered and exchanged or debated ideas and issues with so much enthusiasm and interest.

At the meeting, many constructive suggestions were made, particularly with regards to the ideal approaches of contributing to rice cultivation in Africa, strategic cooperation between research and related organizations, the need to appeal to the administration and the public, matching between the needs of international research centers and the interests of Japanese researchers, and opportunity or occasion for

consultation on concrete proposals. At the end of the meeting, Mr. Azuma, President of J-FARD stressed the significance of the meeting which renewed the importance of agricultural research for African development.

JIRCAS also presented an exhibit of its research activities in Africa at the main conference venue. In addition, Dr. Iiyama, President of JIRCAS, made an announcement at the meeting for the "Coalition for African Rice Development (CARD)", about this new framework initiated by Japan in support of the efforts to double rice production in Africa, stating that "JIRCAS would make an active contribution to CARD".

Osamu Koyama
Research Strategy Office, JIRCAS



Participants of the Round Table Meeting

Symposium on Global Climate Change: Imperatives for Agricultural Research in Asia-Pacific

Date: October 21-22, 2008

Venue: Tsukuba International Congress Center

Climate change on a global scale especially affects the Asia-Pacific region since it holds more than half of the global population with its ever-increasing food demand, while having vulnerable regions such as delta areas and islands. The Asia-Pacific Association of Agricultural Research Institutions (APAARI) and JIRCAS are jointly organizing this Symposium in order to provide a venue for prominent researchers and experts from both international and national

organizations to debate the key issues and exchange ideas on climate change adaptation. Its final objective is to be able to formulate appropriate recommendations for researchers to enhance the adaptive capacity and mitigation potential of agriculture, while ensuring the continued agricultural growth and development in the region. We would like to invite your valuable participation in this Symposium.

Tamao Hatta
Public Relations Section, JIRCAS

JAPAN-CGIAR Fellowship Program 2008-2009

JIRCAS has been commissioned by MAFF of Japan to implement the JAPAN-CGIAR Fellowship Program since 2004. So far, a total of 51 Japanese young researchers have been dispatched to 13 CGIAR Centers in 17 countries. For this year, the participating CGIAR Centers proposed 28 research themes for which 28 researchers from 12 universities and one institute applied. The selected eight applicants are listed below.

Japan-CGIAR Fellows 2008-2009 and their Host CGIAR Centers

Fellow (Affiliation)	Country	CGIAR Center
T. Onishi (Tokyo Univ. of Agric. & Tech.)	Benin	Africa Rice Center
T. Kotegawa (Kochi Univ.)		
M. Okubo (The Univ. of Tokyo)	Kenya	Bioversity International
T. Tsujimoto (Kyoto Univ.)		
N. Hijikata (Hokkaido Univ.)	Colombia	CIAT
H. Kunori (Tokyo Univ. of Agriculture)	Nicaragua	
Y. Kato (The Univ. of Tokyo)	Philippines	IRRI
R. Fuchiyama (National Agric. Research Center)		

The fellows are expected to learn from their host institutes' research activities, to develop good relationship with other researchers under an international working environment, and to broaden their views about foreign cultures. It is hoped that this fellowship program would serve as an initial step towards the fellows' active involvement in international research activities.

Kunimasa Kawabe
International Relations Section, JIRCAS



Fellows attending the pre-dispatch orientation program.