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Newsletter for

for INTERNATIONAL COLLABORATION



Children help in harvesting corn stover in a rural village near Arusha, Tanzania. (Photo by S.Tobita)



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FEATURE ARTICLE

Approaches of the Forestry Division towards the Sustainable Management of Tropical Forests

Forests, directly and indirectly, provide us with various services beneficial to our lives. For example, forests, often called as "green dams", conserve water to prevent flood and drought; besides, they bring us various blessings such as fuel, wood, food and medicinal herbs. Forests likewise nurture a wide variety of living creatures and are indispensable to their existence. Since the Statement of Principles for the Sustainable Management of Forests (Forest Principles) was adopted in the Rio World Summit on Sustainable Development in 1992, such forest functions have been recognized anew and deforestation has become a major issue relevant to food and energy security and climate change at international conferences. The Plan of Implementation adopted at the Johannesburg World Summit in 2002 urged the importance of sustainable forest management as "essential to achieving sustainable development and critical means to eradicate poverty, significantly reduce deforestation and halt the loss of forest biodiversity".

In recent years, from the perspective of global warming prevention, the value of forests as carbon sinks came into the spotlight. In the Asia-Pacific Economic Cooperation (APEC) Conference in 2007, a numerical target for increasing forest cover for carbon stock in the region was incorporated into the declaration as at least 20 million hectares of all types of forests by 2020. The 13th Session of the Conference of Parties to the UN Framework Convention on Climate Change (UNFCC COP13) held in Indonesia in December, 2007, focused on "reducing emissions from deforestation and forest degradation in developing countries" (REDD), and debates towards policymaking for REDD have just opened up. It should be expected that these new approaches shall shoulder an important role to promote sustainable forest management.

On the present forest situation, the State of the World's Forests (FAO, 2007) reported that deforestation continued at the alarming rate of 13 million hectares a year from 2000 to 2005. Severe decline of forest areas has especially occurred in the tropics. South America yearly lost 4.3 million hectares, Africa, 4 million hectares and Southeast Asia, 2.7 million hectares, pointing out that the primary forests rich in resources in these regions are rapidly disappearing. Human factors such as rapid increase in population, poverty and socio-economic changes are involved in deforestation. To prevent uncontrolled exploitation and to promote the conservation of ecosystems and sustainable forest management, cooperation and assistances in various fields from the international community are needed.

The JIRCAS Forestry Division has been involved mainly in developing technologies to restore forests by means of agroforestry in the grasslands which expanded due to shifting cultivation and to rehabilitate secondary forests degraded by excessive logging in the tropics. Presently, with regards to the primary forests, the research project on the improvement of the selective logging system in hill dipterocarp forests is ongoing in collaboration with the Forest Research Institute, Malaysia (FRIM), aiming at the successful natural regeneration and the conservation of biological diversity. So far, selective logging system based on tree size has been employed to provide for stable wood production, but successive regeneration has not always been achieved. Thus, we approach this situation from both aspects of genetic diversity and population dynamics in the regeneration process of target tree species, presuming that gene flow among parental population may be a key towards ensuring the production of sound offspring. In addition, the impact of selective logging on biological diversity will be evaluated. The research results of the project will be used for the sustainable management of dipterocarp forests.



For the man-made forests in the tropics, we are working on the development of technologies to convert the monoculture forests of introduced fast growing tree species into mixed forests with valuable indigenous tree species. This collaborative research project with the Royal Forest Department, Thailand (RFD) aims at the restoration of forests carrying various functions such as production of wood and bio-resources. Furthermore, the research on the combined management of agriculture and forestry is being conducted among small-scale farmers planting indigenous trees, with the purpose of increasing the farmers' income and the promotion of private forestry. In addition, to seek the effective use of resources in a recycling-oriented society, the project which is undertaking to convert masses of underused and unused woody resources in the tropics into bio-composite and functional materials is also being implemented collaboratively with the Science University of Malaysia (USM).

Through these collaborative researches, we intend to support the various approaches toward the sustainable management of tropical forests, expecting that they will lead to the better livelihood of the people and the certainty that the forests, as a legacy, will be succeeded to by the future generations.

Tadao Gotoh Director, Forestry Division, JIRCAS



A small-scale young teak plantation, managed by local farmers, is a popular scenery in northeast Thailand.(Photo by I. Noda) The farmers have a strong expectation towards the establishment of an efficient teak plantation management technique to get more benefits from it in the future.

A Strategic Study on Collaborative Research in Africa

In Africa, the targeted agricultural revolution leading to an increase in the productivity of staple crops, known as the "Green Revolution" in Asia, which provided the basis for the economic development in that region, has not been fully realized. Hence, the importance of further research and technology development is being stressed. A lot of emphasis has been placed on the reduction of hunger and poverty in Sub-Saharan Africa as contained in the UN Millennium Development Goals adopted in the year 2000. On the occasion of the Tokyo International Conference on African Development (TICAD) as well as in the G8 Summit, and other related events, Japan has repeatedly expressed its commitment towards the strengthening of support for African agriculture.

The majority of JIRCAS collaborative researches have been conducted in Asia, particularly in Southeast Asia. The first attempt in Africa was made in the uplands of Madagascar in as early as 1970, when the Tropical Agriculture Research Center (TARC), the predecessor of JIRCAS, has just been established. Full-fledged activities did not start before the establishment of continuous collaboration with CGIAR centers in the 1980s. At present, JIRCAS collaborates mainly with international research centers in the areas of rice breeding which includes NERICA and improvement of soil fertility, etc. However, it has been sought that JIRCAS should seek expansion into new research areas.

JIRCAS conducted a commissioned study, titled "Study on Key Technologies for Innovation of African Agriculture", sponsored by the Ministry of Agriculture, Forestry and Fisheries in Fiscal Year 2006 and 2007. The study which investigated the research needs and impacts targeted Sub-Saharan countries as well as the international organizations working in the region. It focused on soil and water resources management, productivity of legumes, root crops and coarse grains, technology dissemination and income generation, excluding those research areas which have already been dealt with, i.e. rice and irrigation. Then the following three priority research themes were identified from the viewpoints of 'priorities in international fora', 'comparative advantages of Japanese scientists' and 'sustainability of the impact', with the help of a workshop discussion with the experts.



A phosphate fertilizer factory in Niger which was shutdown. (Photo by F. Nagumo)

1. Development of guidelines for the dissemination of conservation agriculture (CA)

The success stories of the dissemination of CA will be quantitatively evaluated and while taking leguminous crops and the use of phosphate rocks into consideration, guidelines for scaling-up CA to the continental level will be established.

2. Land productivity enhancement through the introduction of leguminous crops

Technologies for the effective introduction of leguminous crops/plants will be developed and disseminated to conserve and improve soil fertility. Simultaneously, the distributionprocessing-consumption of high-valued products based on leguminous crops will be promoted for increase in income.

3. Productivity increase of yam

The productivity of yam, a major root crop in West Africa, will be significantly improved through the development of a seedling multiplication technology, improved production and distribution system of disease-free seedlings and new breeding technologies.

There is a trend towards institutional enhancement and strengthening of support through the establishment of the Forum for Agricultural Research in Africa (FARA) and the Coalition for a Green Revolution in Africa (AGRA), as well as the enhancement of crop-based network researches. At TICAD4, the Alliance for African Rice Development was launched by JICA and others, and JIRCAS will be a part of it. On the other hand, research foundation in terms of both facilities and human resources are still insufficient in the research organizations. Likewise, many problems have been pointed out, particularly in the aspect of the lack of effective utilization of research results. In this context, more detailed strategies, specifically designed for each research counterpart, should be examined closely in order to make the Japanese contribution more effective. Moreover, JIRCAS is planning to set-up a focal point-office in Africa this year for a more accurate grasp of research needs.

Osamu Koyama Director, Research Strategy Office, JIRCAS



Yam genetic resources at the International Institute of Tropical Agriculture (IITA) (Photo by H. Shiwachi)

Research and Development in Rice Breeding for Africa

In Sub-Saharan Africa, rice consumption has been increasing at the rate of 8% per annum¹, resulting in 16 million tons in 2006²). In contrast, although rice production has also been increasing mainly through expansion of cultivation areas, the rate is 6% per annum¹, reaching only 9.5 million tons in 2006²). The production-consumption gap is being filled by imports from Asian countries. Considering the vulnerability of the relatively thin world rice market, an increase of rice production in these regions is one of the most urgent tasks.

Total acreage of rice fields in West Africa, where most of the African continent's rice is produced, is about 57 million ha². And, the vast majority (ca. 80%)¹ of rice is grown under the rainfed ecosystem where drought is a common constraint for rice production.

Under these circumstances, the Africa Rice Center (WARDA) initiated breeding programs which aim at high productivity along with adaptability to the harsh environments of Africa through interspecific hybridization between *Oryza sativa* and *O. glaberrima*. In the early 2000s, 18 upland NERICA (New Rice for Africa) varieties have already been developed and released in a number of African countries. According to the African Rice Initiative (ARI), the total acreage of NERICA varieties in 2006 is estimated at around 200,000 ha³).

Since 1998, JIRCAS has been dispatching its scientists to WARDA to conduct collaborative research on various aspects of rice. It is now conducting the following research projects related to improvement of rice for Africa.

To facilitate the smooth dissemination of upland NERICA varieties, JIRCAS researchers have tried to acquire a set of DNA markers which can discriminate any specific NERICA variety. At this stage, DNA makers which can classify 18 varieties into 15 groups have been identified. At WARDA and ARI, a seed propagation system for NERICA is being established. These varietyspecific DNA markers can be used for purity check of a given batch of NERICA seeds.

In the quest for a new rice variety for the next generation, we have been conducting research on drought tolerance because drought is one of the major constraints to stable productivity in Sub-Saharan Africa. Realizing that drought tolerance is a very complex trait, we have evaluated a wide range of rice germplasms for deep rooting. Through many years of evaluations at WARDA's fields, a few candidate rice germplasms with deeper roots have been identified. Our research is extended to another water stress, submergence, which is observed in rain-fed lowland ecosystems. Out of rice germplasms covering not only *O. sativa* but *O. glaberrima*, submergence-tolerant lines have been identified under the African environments.

With regards to improvement of drought tolerance in rice, in parallel to the abovementioned conventional approach, we are exploring molecular approach as a long-term project. Through works on the elucidation of the molecular mechanism of abiotic stress tolerance of plants, we have identified and isolated candidate genes which confer abiotic stress tolerance upon over-expression. Now, these candidate genes are being evaluated for their efficacy in practical field conditions under an international collaborative project. To facilitate the application of the molecular approach to rice in Africa, we have recently developed a transformation system for upland NERICA varieties.

As stated above, on-going projects related to rice in Africa are targeting mainly water stresses. In the African rice ecosystems, many abiotic as well as biotic stress factors exist. Rice blast and problematic soil are also regarded as major constraints in African rice production. In JIRCAS, research projects involving rice blast, iron toxicity and phosphorus deficiency are being conducted. As far as the increase of productivity remains the most important target in rice research, these projects are candidates for future collaborative work with WARDA and other research institutes in Africa working on rice.

References:

- 1) NERICA[®]: the New Rice for Africa a Compendium (2008) Africa Rice Center (WARDA)
- 2) FAOSTAT (2006)
- 3) African Rice Initiative Home Page http://www.warda.cgiar.org/ARI

Takashi Kumashiro Director, Biological Resources Division,JIRCAS



Upland NERICA varieties cultivated in the Tropical Agriculture Research Front (TARF) of JIRCAS.

Turning Point of the Project for "Soil Fertility in Africa" —What is next after technology development?

Soil fertility degradation is a major agricultural problem in Sub-Saharan Africa and the generation of technologies to combat it has gained international recognition as one of the most prioritized issues after the turn of the millennium. We at JIRCAS, the focal point institution of the Consultative Group on International Agricultural Research (CGIAR) in Japan, started a research project in 2003 titled, "Improvement of Fertility of Sandy Soils in the Sahelian Zone through Organic Matter Management," in collaboration with the International Crops Research Institute for the Semi-arid Tropics - ICRISAT Sahelian Center (presently, West and Central Africa), based in Niamey, Republic of Niger. This project aims to develop and propose affordable technologies with efficient use of indigenous resources because villages and farmers in the region have very little access to agricultural materials from the outside, e.g. chemical fertilizers. Therefore, we studied the role of indigenous organic matters in the sandy soils and on the contribution of plant resources to the nutrient budget of agro-ecosystems in the Sahel. The project had so far attained several achievements to be proposed as technology options, ranging from intensive to extensive, which are listed below.

- 1. Combination of organic materials and inorganic fertilizers: A long-term (more than 25 years) field experiment showed that the effect of chemical fertilizers on yield/biomass production of pearl millet (*Pennisetum americanum* (L.) Leeke), staple grains in the Sahel, was substantial but transient when it was applied solely. Instead, the combination of inorganic fertilizers and returned crop residues as well as cowpea (*Vigna unguiculata* (L.) Walp.) rotation had synergistic effects both on the production and soil organic-C content in a more sustainable manner. The long-term sustainability of the combination practice could be proved by applying the data to a simulation model.
- **2. Identification of dual-purpose cowpea varieties:** Cowpea is one of the important leguminous crops in the Sahel, cultivated by sole cropping or by intercropping with pearl millet. According to the farmers' preferences, we have identified cowpea varieties with good yields both in terms of grain yield for human consumption and biomass production for animal fodder use. The Project will propose the best practical method of cultivation to improve yield and nutrient budgets (chiefly N and P) in the cropping systems into which these dual-purpose cowpeas are introduced.
- **3.** Adjustment of uneven distribution of organic matters to farms: From the survey in villages of the Sahel, the organic resources of indigenous origins (household wastes, threshing residues, animal feces, manures, etc.) tend to be deposited more in smaller areas of the farms at the vicinity of village centers as compared with very less input into relatively larger areas of the farms located at a longer distance from the center. Should this uneven distribution, sometimes one exceeds 500 times more than another in N basis, be adjusted, then the scarce indigenous organic matter will be utilized efficiently for greater areas of the farms.
- **4.** Characterization of hibiscus plant and its utilization: Being an annual plant in the Sahel, hibiscus (*Hibiscus sabdarifa* L.) is a cash crop with many kinds of usage, say, sources of the so-called bissap (hibiscus juice), sounbara (miso-like seasoning in the Sahel) and also fuel from dried stems. Although this crop is normally cultivated with less input in an extensive manner of management far from the village centers, they attain large amount of biomass with very

green tops even though the soil is infertile and dried-up. Therefore, the Project focused on the characteristics of the hibiscus plant, e.g., nitrogen source, for which associative nitrogen fixation with soil microorganisms is highly possible, as revealed by the natural abundance of ¹⁵N and molecular methods.

5. Prevention of wind erosion and fertility improvement with the use of fallow vegetation: On the sandy soils in the Sahel, wind erosion is one of the major causes of soil and fertility degradation. Our results from field observations with the use of a newly developed sediment catcher showed that the loss of N is significant through the dispersion of the top soil and relatively large-sized organic matters (plant debris, etc.) by wind erosion during the dry season. Therefore, to maintain/improve the soil fertility, a technology option to trap the wind-blown materials could be effective by all means. For catching of the materials, we proposed a so-called "fallow strip," which is an artificially made band-shaped un-weeded place in the cultivation fields. If the strip is placed at a right angle to the major wind direction, most of the wind-blown materials can be captured by the fallow band vegetation. During the next cropping season, the yield of pearl millet on the previous "fallow strip" was significantly improved as compared with that in conventionally "weeded" areas. The "fallow strip" method is excellent particularly in fields managed through extensive management because it does not require any additional investment or labor for farmers. As a supplemental option, we are interested in incorporating the leguminous herb, Cassia mimosoides, into the "fallow strip," as this annual plant was discovered to be superior in biological nitrogen fixation among the fallow flora in the Sahel.

For each technology option developed through Project activities in test fields, it is necessary to verify the positive effects on the soil fertility and on the stability/productivity of crop yield (mainly of staple pearl millet) in farmers' fields. Likewise, it is important to propose "affordable and adaptable" technology options for farmers, so the involvement of farmers in the process of fine-tuning of the options is highly necessary. Therefore, this stage of the Project can be termed as the transition phase from experimental fields to farmers' fields. We are expecting the contribution of the National Agricultural Research Institute in Niger (INRAN), the new partner of the Project since 2008, most especially in participatory studies with smoother approaches to the villages and farmers in the Sahel.

In the final stage of the Project, the verified and fine-tuned technology options will be integrated into different appropriate technology packages because the villages/farms are heterogeneous in the Sahel. So, we have targeted two major contrasting areas, say, intensive one (resource utilization area) and extensive one (ecosystem utilization area), according to the survey of the Fakara Region, the Project site located in the western part of Niger. It is noted that the technology options to be integrated in this process are not only the ones generated by the Project. These may also include fertility management technologies developed by ICRISAT, INRAN and other parties before the Project, as well as the traditional practices. Technology packages will be proposed for each target areas after the integration process, as the final products of the Project.

Satoshi Tobita Crop Production and Environment Division, JIRCAS

Past and Future of JIRCAS Research in Africa —Research on Cowpea as an Example—

Improvement of agricultural production can only be achieved through a comprehensive approach that includes strengthening of the ability of target genetic resources, improving the management technology of input resources for production, developing mobilization mechanism for resources and products and supporting farmers' organizations in agricultural fields and regional communities. In the African region where each of the three factors has not yet been developed well, the technology involved in each of these three should be introduced through closer coordination among them. Otherwise, the package of introduced technologies will not presumably become a deep-rooted driving force to improve productivity of the region.

From the above viewpoint, JIRCAS has been conducting research on a wide range of issues in Africa from both technological and socioeconomic aspects. The issues include clarification of drought tolerance and growth characteristics of cowpea, improvement of environmental stress resistance in rice, development of fertility management technology for sandy soils, genetic elucidation of endemic diseases of domestic livestock, and physiological and ecological characterization of the desert locust.

Environmental stress, including drought, is the most serious of all the problems involved in foods and agriculture in Africa. Hence, JIRCAS has been conducting research on tolerance of cowpea to environmental stresses, with focus on improving the crop's tolerance to drought.



Transport of cowpea harvests by a camel (Photo by S. Tobita)

Cowpea (*Vigna unguiculata* (L.) *Walp*) is native to Africa and is said to be a food in the semi-arid savanna region. It adapts well to the hot and dry environment, bears grains for human consumption, and provides stems and leaves for livestock feed as an important protein source. A certain amount of cowpea yield can be expected even in less fertile soil thanks to its biological nitrogen fixation ability.

Nigeria, Brazil, and Niger are responsible for 75% of the world's cowpea production. Although cowpea intrinsically has a high degree of tolerance to environmental stresses, it is currently grown only in relatively favorable places and periods. We have been conducting joint research with the International Institute of Tropical Agriculture (IITA) for stable production and expanded cultivation of cowpeas by identifying the cowpea genotypes with drought tolerance. The selection has focused mainly on identifying early maturing genotypes because it had been thought that the genotype that grows, flowers and bears grain in a short period should be effective for drought that occurs during the grain-filling period.

However, they are not effective for prolonged dry spells during the rainy season. Therefore, JIRCAS decided to work on research for developing genotypes with tolerance in this kind of drought conditions based on their physiological characteristics.

We focused on establishing the evaluation method for tolerance in the first stage and then, on selection and application of drought-tolerant cowpeas during the second stage. We confirmed that TVu-11979, identified as a resistant genotype, achieved a yield of nearly 1,000 kg while a susceptible genotype recorded a yield of only about 300 kg. This selected genotype could be put into practical use as animal feed, but it was not yet ready for human diet because of its long growing period and problems with the size of grain, color of seed coat, and pest resistance. In the meantime, the genotype has been incorporated into the IITA collection of cowpea germplasm with drought tolerance and further breeding activities are still going on.

Research on the cowpea was suspended temporarily, but it was resumed as a joint research with ICRISAT and IITA under the theme of "Selection of cowpea genotypes suitable for the Sahel region of West Africa", within the project for improving soil fertility that started in 2003. From the survey conducted among farming families in the

Fakara area of Niger covered by this project, the genotypes in great demand among farmers are not the ones for grain production alone or feed production alone, but the dualpurpose genotypes that are simultaneously suitable for grain and feed production. Although a negative correlation exists between grain yield and feed production, six genotypes have been selected as promising dual-purpose genotypes.



Cowpea intercropped with pearl millet

In Niger, cowpea is usually intercropped with pearl millet, but the low planting density poses the biggest problem which restricts or causes limited grain production. Through interview with farmers, we learned that sparse planting is preferred because it is good for cowpea growth and because dense planting makes weeding harder to perform. Many farmers in Niger recognize pest damage as another factor of the limited production, and mention coleopteran (*Mylabris spp.*) and shield bug (*Anoplocnemis curvipes*) as pests that damage grain. Farmers understand well that planting cowpeas is helpful for maintaining and improving soil fertility.

In crop-related research projects, JIRCAS has been focusing on how to establish a sustainable agricultural production system in hostile environments, and positioning the research activities within the cropping system based on farmers' needs, especially in relation to the sustainable production system through management of soil fertility that is vital in hostile environment areas. We can see the ongoing movement of an integrated approach to develop new breeds from the initial stages in close association with the system that accepts them, especially in consideration of environmental resources to which they will be exposed, in research institutes affiliated with the Consultative Group on International Agricultural Research (CGIAR). This movement has been tentatively named Integrated Genetic and Natural Resource Management (IGNRM). Technologies developed in the IGNRM approach that contribute to improving agricultural production in hostile environments are expected to be widely accepted by farmers in these problematic areas of Africa.

Africa's agricultural ecosystem is more diverse than we realize in Japan, and a few measures to increase agricultural production can not be truly effective unless the target agricultural ecosystem is clarified. JIRCAS has mainly been conducting research targeting for rainfed agriculture areas that prevail in the region from West Africa to East Africa. Even under these circumstances, we can find traditional wisdom and technologies developed by farmers to sustain agricultural activities, despite restrictions on input materials such as fertilizers and agrochemicals ,as well as crop marketing/distribution. We think that JIRCAS can contribute towards improving agricultural production in less favored regions in Africa by basing research on understanding the current situation, including scientific analysis of the existing farming methods, combining the approaches utilized by farmers with interdisciplinary research, and developing technologies through the IGNRM approach.

Osamu Ito

Director, Crop Production and Environment Division JIRCAS



Interaction with village children at a project site of Katanga, Niger



International Workshop on Mongolian Animal Husbandry

JIRCAS and the United Nations University jointly held an international workshop on the "Current Situation and Future Development of Mongolian Animal Husbandry under Changing Social and Environmental Conditions at the United Nations University in Tokyo on March 13, 2008. Eighty six people from universities, research institutes, private companies, NPOs, etc., participated during the workshop.

In the workshop, Mr. Ivirai Khanimkhan (Director General of the National Agricultural Extension Center) and Dr. Bataa Bynie (Head of the Strategic Planning Division) from the Ministry of Food and Agriculture, Mongolia, made keynote lectures on, "Current Situation of Animal Husbandry Policy in Mongolia" and "Land Use System and Laws Related to Animal Husbandry in Mongolia", respectively.

Following the lectures, a presentation regarding the re-search outline of the JIRCAS project, "Development of sus-tainable agro-pastoral system in dry areas of Northeast Asia project" was delivered by Dr. Kazunobu Toriyama (Project Leader, JIRCAS). Presentations regarding the research outputs of the project, namely, "Current Situation and Prob-lems of Dairy Farming in Mongolia" by Dr. Hiroshi Ko-miyama (Senior Researcher, JIRCAS) and "Pastoral Economy and Market Access in Mongolia" by Dr. Shunji Oniki (Senior Researcher, JIRCAS) were also rendered.

Lastly, presentations of relevant researches focusing on climate change and meteorological disasters, namely,

Annual G8 Summit in Japan

From July 7 through July 9, 2008, a G8 (Group of Eight) Summit will be held near Lake Toyako in Hokkaido. Eight political leaders from Japan, Canada, the French Republic, the Federal Republic of Germany, the Italian Repub-lic, Russian Federation, the United Kingdom and the United States of America as well as the chairperson of the European Union will participate in the summit.

The agenda for this summit will comprise of four issues, such as environment and climate change, development and Africa, global economy and political issues including non-proliferation. Ten affiliated meetings for ministers were held before the summit at several cities in Japan, including TICAD IV in Yokohama City in May, 2008.

PEOPLE

As of April 1, 2008, JIRCAS has the following new personnel

Mr. Osamu Nakamura, formerly General Administration Coordinator of the Department of Planning and General Administration, National Agricultural Research Center for Western Region, National Agriculture and Food Re-search Organization (NARO), was appointed as the new Director of the Administration Division.

Mr. Takeshi Ota, formerly Head of the Overseas Land Improvement Cooperation Office, Design Division, Rural Infrastructure Department, Rural Development Bureau, Ministry of Agriculture, Forestry and Fisheries (MAFF), was appointed as the new Director of Rural Development Planning Division.

"Early Monitoring Network for Climate Change Impacts in East Asia and Climate Change Impacts in Mongolia" from Dr. Qinxue Wang (Chief Researcher, Asian Water Environment Section, Asian Environment Research Group, National Institute for Environmental Studies (NIES)) and "Developing a Nationwide Early Warning System of Meteorological Disasters for the Mongolian Mobile Pastoralism' from Prof. Masato Shinoda (Arid Land Research Center, Tottori University) were presented.

Hot topics of the workshop were "promotion of inten-sive animal husbandry around the cities" and "consideration of grazing rights allotment to pastoralists". From the floor, many kinds of questions and opinions were exchanged during the presentations. There was ample opportunity to discuss from various viewpoints about the future direction of Mongolian animal husbandry, and mutual agreements were reached among the participants.

Hiroshi Komiyama **Development Research Division, JIRCAS**



Dr.Kenji Iiyama, President of JIRCAS, gave the Opening Remarks at the workshop.

The ten meetings are listed below:

- 1. Dialog on Climate Change, Clean Energy and Sustainable Development (March 14 - 16, Yokohama)

- Development (April 5 6, Tokyo)
 Labor (May 11 13, Niigata)
 Environment (May 24 26, Kobe)
 TICAD IV (May 28 30, Yokohama)
 Energy (June 7 8, Aomori)
- 7. Justice & Internal Affairs (June 11 13, Tokyo)
- 8. Finance (June 13 14, Osaka)
- 9. Science & Technology (June 15, Okinawa)
- 10. Foreign Ministers (June 26 27, Kyoto)

Naova Fuiimoto **Public Relations Office, JIRCAS**

Dr. Akira Sugimoto, formerly Research Manager of the National Agricultural Research Center for Kyushu Okinawa Region, National Agriculture and Food Research Organization (NARO), was appointed as the Principal Plant Breeder for Development of Tropical Crops of the Tropical Agricultural Research Front (TARF).





Mr. Ota

Dr. Sugimoto



Japan International Research Center for Agricultural Sciences (JIRCAS)

July 2008-No.54 Publication and Documentation Section 1-1 Ohwashi, Tsukuba, Ibaraki 305-8686, JAPAN Phone. +81-29-838-6340 Fax. +81-29-838-6656 letter@ml.affrc.go.jp http://www.jircas.affrc.go.jp/