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In This Issue

JIRCAS
JAPAN INTERNATIONAL RESEARCH CENTER FOR AGRICULTURAL SCIENCES

New Direction of Sustainable Technology Development in Asia: Changing Rural Livelihood and Japanese Advantage

The year 2013 marked the 20th anniversary of Japan International Research Center for Agricultural Sciences (JIRCAS), which was created after its predecessor, the Tropical Agriculture Research Center (TARC), reorganized in 1993. JIRCAS has been conducting comprehensive research on agriculture, forestry and fisheries technology in developing areas of tropical and subtropical regions, and our activities cover a wide range of research areas, mainly in Asia and Africa.

Through the years, Japan has built close relationships with other countries in Asia. We have been able to obtain mostly excellent outputs on sustainable agricultural technologies as a result of our long-term partnerships with many counterpart organizations.

At the 20th JIRCAS International Symposium held in Tokyo last November 20-21, we reviewed our milestones over the past 20 years and sought the opinions of participants from related organizations on the future direction of research activities in Asia by JIRCAS and other Japanese researchers. We also tried to identify effective ways to share research results in the region and linked them with current strategies for sustainable development of Japanese agriculture and related industries.

Because of rapid economic development in Asia, it is important to ascertain the current situation in view of changes in food supply-demand systems and rural social structures, and to have a clear vision in addressing the challenges of developing new agricultural technologies. Japanese agriculture also has to find new ways to survive under the globalized circumstances.

In the opening session, a keynote speech titled "Outlook of global and regional food security, and its impact to Japan" was delivered by Mr. Hiroyuki Konuma, Assistant Director-General and Regional Representative for Asia and the Pacific, FAO. The symposium had four thematic sessions: first, changes in food demand and corresponding technologies of Lao PDR, China and Japan were reported; second, Japanese potential for new technology demands such as rice mechanization, controlled-release fertilizers and novel food processing were presented; third, sustainable rural income sources such as new technologies on prawn co-culture, teak timber production and biomass utilization, as well as the role of biomass utilization on recycling-based management of the resources, were introduced; and fourth, the role of research networks on food and agriculture technology development was discussed.

On the basis of these presentations, the panelists discussed strengthening Japanese agriculture's competitiveness through collaboration with Asia and creating a so-called win-win situation. It was noted that agriculture, forestry and fisheries should be positioned as new growth industries in Japan, with research and development acting as the driving force. Through research and development, Japan has produced numerous cutting-edge technologies in agriculture, and these technologies are also expected to contribute to rural development and in improving rural incomes in developing regions. We will use our learned knowledge and past experiences with JIRCAS to discuss effective methods which can be beneficial for promoting agriculture, forestry and fisheries not only in developing regions but in Japan as well. We also discussed a new research direction that will contribute to the resolution of global issues.

In this issue, we present an introduction to the proceedings of the international symposium, featuring session and discussion summaries. I would like to express my sincere hope that this issue can contribute toward strengthening partnerships among experts in various research areas and in achieving sustainable development in the region.

Masayoshi Saito
Program Director
Rural Development
JIRCAS

20 Years of JIRCAS

In October 1993, twenty years ago, the Japan International Research Center for Agricultural Sciences (JIRCAS) was established following the reorganization of the Tropical Agriculture Research Center (TARC), which was created in 1970. At the 2013 JIRCAS International Symposium, we looked back at our past in order to foresee into our future. Our 20-year history can be roughly divided into four periods.

1. The MAFF research center period (from October 1993 to March 2001)
2. The first Medium-term Plan period (from April 2001 to March 2006)
3. The second Medium-term Plan period (from April 2006 to March 2011)
4. The current Medium-term Plan period (from April 2011 to present)

(MAFF research center period)

For the first seven years, JIRCAS was a national institute directly under the jurisdiction of the Ministry of Agriculture, Forestry and Fisheries (MAFF). There were many challenges faced at the time of transition from TARC. Significant investments were made in new buildings and research facilities, and we had to develop new ways of implementing collaborative research. A comprehensive approach, or, in other words, a multi-disciplinary approach, was thought to be appropriate in order to solve problems at the field level. A number of comprehensive projects were financed and implemented. They formed a sound basis for JIRCAS's subsequent phase of research activity.

(First Medium-term Plan period)

In April 2001, JIRCAS was transformed into an Independent Administrative Agency through a government reform process and a new research evaluation system was introduced. At the same time, flexibility was given to the management. In 2004, the Japan Forum on International Agricultural Research for Sustainable Development (J-FARD) was organized, and JIRCAS was nominated to become the Consultative Group on International Agricultural Research (CGIAR) focal point institution in Japan. Its mandate as a pivotal center connecting various institutions inside and outside Japan was established during this period.

(Second Medium-term Plan period)

JIRCAS introduced complete project-based management, ahead of its sister MAFF organizations. All research activities were conducted in the form of 33 research projects, where goals and schedules were clearly specified. In 2008, JIRCAS took over several agricultural development projects from J-Green, an Independent Administrative Agency. Thirty-six new colleagues joined JIRCAS, and activities at the field level, particularly in Africa, were strengthened. In addition, the Africa liaison office was opened in Ghana in 2009. Research strategy for Africa was explored and JIRCAS included Africa as a priority target area.

(The current Medium-term Plan period)

In 2011, JIRCAS commenced its current Medium-term Plan, and continues to make real changes in the field in developing regions. Three research programs, namely, "Environment and natural resource management", "Stable food production" and "Rural livelihood", as well as an "Information analysis" program, are expected to make our research activities more relevant to the world's global research and development agenda.

Through steady efforts, JIRCAS has built trusted relationships with counterpart institutes. Researchers regularly publish articles and disseminate their findings, and these have been highly appreciated by the public. Basic research results such as the identification of stress-tolerant genes are now widely applied all over the world, and JIRCAS's global visibility has increased significantly over the past two decades. Capacity development programs for the next-generation researchers from developing countries and from Japan have been strengthened for future scientific collaborations.

During the past twenty years, our research activities have diversified and evolved. Molecular biology and information technologies have rapidly advanced, and the situation surrounding food and environment in target areas has significantly changed. However, our mission to improve agricultural technologies in developing regions remains unchanged. JIRCAS will seek more effective collaboration and continue to make major impact around the world including Japan in the coming decades, based on our gained knowledge and accumulated experiences over the past twenty years.

Slide show: 20 Years of JIRCAS

Osamu Koyama
Director
Research Strategy Office

Session 1: Changes in Food Demand and Corresponding Technologies

The rapid advance of economic globalization has facilitated closer relationships among countries. In Asia, newly industrialized economies and Southeast Asian countries, in addition to China, have remarkably developed their economies and are currently taking lead roles in driving global growth. These countries are economic rivals for world market share, but at the same time, they can help each other out, become good partners, and subsequently share the economic benefits. Speakers from three Asian countries -- Lao PDR, China and Japan, each representing various stages of economic development -- were invited to discuss their experiences.

Lao PDR, whose economic development has just begun, was represented by Dr. Linkham Douangsavanh, Deputy Director General of the National Agriculture and Forestry Research Institute. His speech, entitled "Food Security Related to Market-Oriented and Future Direction of Agriculture in Lao PDR," emphasized food security as their highest priority, and that commercialization of agriculture must be promoted in response to dramatically increasing market demand. He also discussed his country's need for more support and investments from developed countries in order to improve various kinds of technologies for agricultural production, processing, marketing and so on.

The People's Republic of China, which is on the way to achieving developed country status, was represented by Professor Yingheng Zhou of Nanjing Agricultural University. His presentation, entitled "The Evolution of Food Consumption and the Direction of Food Technology Development in China," showed that the change in food consumption depends mainly on income and urbanization growth. He also pointed out that migrant workers, i.e., those who move into the cities from the rural areas to work, exert great influence on the change. Consequently, modern food processing and refrigerated cold chain technologies as well as improved productivity techniques will be needed.

The last speaker, Professor Seiichi Sakurai of Chiba University, delivered a presentation entitled "Trend of Food Consumption, Marketing and Technological Development in Japan." He said that Japanese food consumption pattern is shifting toward "externalization of diet," as exemplified by home meal replacements (HMRs) and eating out. He also explained that the supermarket, which is the main food market channel, places importance on good grocery assortment. Product safety and quality are also ensured by using Good Agricultural Practices (GAPs), traceability systems, etc.

Finally, trade cooperation and import/export promotion schemes among Asian countries were discussed despite differences in their levels of consumption and technology development. As Dr. Sakurai mentioned, some technologies for temperature control and food inspection are available only in a few countries such as Japan. Moreover, these are limited only to large-scale companies, resulting to wide gaps in the quality of agricultural products and food among countries. Diffusion of these market-related technologies among Asian countries is necessary in order to standardize the quality and safety of agricultural products and foods. These technologies are more advanced in Japan than in other Asian countries, hence Japan has to perform the lead role in sharing these technologies, information, and systems in order to maximize benefits.

Chair: Masuo Ando

Linkham Douangsavanh

Yingheng Zhou

Seiichi Sakurai

Masuo Ando
Director
Social Sciences Division

Session 2: Japanese Potential for New Technology Demand in Asia

Japan's unique and superior technology could contribute to sustainable development of agriculture and food industry in Asia. In Session 2, relevant speakers presented advanced technologies which have been developed in Japan, particularly agricultural machineries, controlled-release fertilizers and food processing technologies. Some of these technologies have already expanded in Asia while others have shown great potential.

Dr. Joji Arihara, Technical Adviser to Kubota Corporation, gave a presentation titled "Rice mechanization in Asia." According to him, 89% of the world's total paddy area is situated in Asia, accounting for 90% of total rice production. Regional sales of tractors, combine harvesters and rice transplanters have increased very rapidly in the last 8 years because of rapid economic growth in most Asian countries. Agricultural labor shortage, widening income gap between cities and villages, and increased risk to food supply stability due to a rapidly-growing population have become serious concerns. Fortunately, transplanters developed in Japan meet the present demand of rice farmers, providing significant savings in labor and seedling costs as well as producing higher yields. Lightweight tractors with rotary tillers developed for paddy fields in Japan were also found suitable for mechanized operations in Asian paddy soils. Japanese advanced technology on the mechanization of rice farming has been expanding steadily in Asian countries, contributing to agricultural development.

Dr. Hitoshi Kanno, Assistant Professor at Tohoku University, delivered a lecture titled "Use of controlled-release fertilizers (CRFs) for sustainable crop production in Asia." Nitrogen (N) is an essential and a major limiting nutrient in most agricultural soils. However, recovery of N is only around 30-50% worldwide. Higher N use efficiency is required to increase crop yields, reduce cost of production, and minimize environmental pollution. Polyolefin-coated fertilizer (POCF), one of the CRFs, has been developed in Japan and its nutrient-release rates can be controlled by temperature. The accurate and slow nutrient release synchronizes crop demand for nutrients and enables large amounts of POCF to be placed with seeds or seedlings without causing salt damage. Field trial has shown that N recovery rate following a single application of polyolefin-coated urea with sigmoidal release to rice nursery box almost tripled to around 80%, compared to that of basal N applied by broadcasting soluble fertilizers to paddy field. Rapid economic development, which increases the demand for higher productivity of food crops and their sustainable production, would enable this technology to be used widely in Asian countries in the near future.

Dr. Akinori Noguchi, Professor at Ishikawa Prefectural University, explained his topic titled "Novel food technologies to provide better quality and value added foods for consumers in Asia." The last decade has seen tremendous development of novel food technologies such as membrane technology, extrusion cooking, high pressure cooking, ohmic heating (OH), and superheated steam (SHS) cooking, which enabled the production of new processed foods with a quality unrealized by existing techniques. For example, twin screw extruder has great potential for various food processing applications, especially better textured vegetable protein products and wet processes. High hydrostatic pressure can be applied for the purpose of sterilization, denaturation of proteins, and control of enzyme and chemical reactions at low temperature conditions. These recent advances in food science and technology could stimulate the growth of the food industry not only in Japan but also in other Asian countries.

Toward the end of the session, the speakers and participants discussed how to contribute to the sustainable development of agriculture in Asia using Japan's advanced technologies and build win-win relationships with neighboring countries.

Chair : Ryoichi Matsunaga (JIRCAS)

Joji Arihara

Hitoshi Kanno

Akinori Noguchi

Ryoichi Matsunaga
Director
Crop, Livestock and Environment Division

Session 3: Sustainable Rural Income Sources

Development of a Co-culture System for Giant Tiger Prawn and Unexploited Benthos: Approaches to Sustainability, Cost Reduction and Lowered Carbon Emissions in Production

In the years prior to Japan's economic prosperity, penaeid shrimp was considered a luxury seafood item that the Japanese eat only on special occasions. It has been enjoying widespread popularity in recent years, even becoming a daily luxury for consumers in industrialized countries like Japan. It can be found in supermarkets at discounted prices while fried prawn, a popular dish, has become a staple menu item in low-priced restaurants. Intensive shrimp cultivation and importation from Southeast Asian countries have supported this shift, and Japan has become the second largest importer of shrimp in the world, behind the United States. Intensive shrimp farming has supported the acquisition of foreign currency among shrimp-producing countries; however, it has also brought various problems such as the eutrophication of waters surrounding cultivation ponds, an increase in shrimp diseases and antibiotic contamination, and the destruction of mangrove forests. In addition, the use of chemicals as defense against recurrent diseases has threatened food safety in both producer and consumer countries. Accordingly, consumers need to strongly realize that many sacrifices have been made just to get inexpensive shrimp to reach their dining tables.

As a member of Japanese society that has benefited from shrimp farm products, JIRCAS feels that one of its greatest duties is to consider ways to address the problems that face shrimp farming and the people in the countries of production. JIRCAS (the authors of the study group) together with aquacultural researchers at the Faculty of Engineering in King Mongkut's Institute of Technology Ladkrabang (KMITL) located in Bangkok, Thailand, have collaborated to consider the development of a shrimp farming technology that could contribute toward ensuring food safety, from production to consumption stages, in both countries. This technology is aimed at benefiting small-scale shrimp farmers who are important contributors to Southeast Asian shrimp production. It incorporates the combined cultivation of shrimp and unexploited benthic flora and fauna (seaweed and small gastropods) to reduce costs, ease implementation, and provide a natural and functional supplementary food source. In this regard, it may be said that it differs greatly from other traditional co-culture technologies because it provides income diversity.

JIRCAS's studies have shown that seaweed gives co-cultured shrimp a deep reddish color when steamed and that it facilitates water purification. Also, shrimp reared in the seaweed and benthos co-culture experimental tanks have exhibited faster growth rates than those in the control pond, which were reared on artificial feed (equivalent to intensive farming methods). The shrimp grew more rapidly and harvest size could be attained up to about 20 days earlier. A decrease in the incidence of microbial diseases shortened the cultivation period, and reduced usage of artificial feed lowered both production costs and the carbon footprint. Because these benthos can tolerate a wide range of salinities, from very low (almost fresh water) to high (2.5 times seawater), it can therefore be applied to shrimp farms throughout the world.

This technology incorporates solar energy in tropical environments and carbon dioxide conversion to promote algal growth, thereby improving shrimp growth and quality. This is in great contrast to current intensive farming methods which require high levels of energy input. Not only is this technology suitable for even single-pond, small-scale shrimp farmers due to its ease of implementation and low running cost, it can also be said that it will provide great opportunities for both Southeast Asian countries and consumer countries to benefit from the improved production of higher-quality shrimp.

Photo: Giant tiger prawn crawling over *Chaetomorpha* sp.

Isao Tsutsui
Fisheries Division

Technology Development of Sustainable Teak Plantation Management and Timber Production for Thai Farmers

Teak (*Tectona grandis* L.) plantations have been developed in at least 36 countries worldwide including native habitats like Thailand. Teak accounted for 75% of the total area covered by fine quality tropical tree species as of year 2000. The timber is highly regarded for building premier quality furniture like wood cabinets. However, timber production has been declining as the natural resources are being exhausted. Renewing and developing this valuable resource require prudent management and one method is by establishing artificial culture in plantations. Planting teak can be profitable if done properly.

Thailand's remarkable economic development has resulted to a drastic decrease of its forest area due to conversion into agricultural lands. Forest areas, which accounted for 53% of the country's total in 1961, decreased to 26% in 1993, with the most sharp decrease (from 42% to 13%) noted in northeast Thailand. As a countermeasure to the critical forest situation (characterized by domestic timber shortage), the Royal Forest Department (RFD) started the subsidiary reforestation projects in 1994 in order to promote the reforestation of indigenous economic tree species such as teak in private farmlands. By 2001, teak plantations had increased to 45% or 150,000 out of 350,000 hectares of whole reforested areas. However, 56.8% of these whole reforested areas were converted to other land uses (i.e., for cultivating cash crops, para rubber, etc.) because some farmers were discouraged by the poorer-than-expected growth of teak while others felt that they were not benefiting while waiting out for the long harvest waiting period (at least 10 years). Many factors, including site, seedlings, etc., affect the success of teak planting programs, thus sustainable teak plantation management methods that could keep farmers motivated are required.

Since 2006, JIRCAS has been carrying out a joint research project with the RFD to support and encourage farm forestry and management involving teak and contribute to local livelihood improvement, taking advantage of forestry technologies in Japan and the attainment of Japan International Cooperation Agency (JICA) projects by the RFD (1981-2004). The JIRCAS - RFD joint research project focuses on the development of technologies for farmers such as future resource and profitability evaluation (including suitable site selection) and high productivity (including low-cost regeneration). A study site was set to northeast Thailand.

For future resource and profit evaluation, we developed two handbooks: the *Yield table for teak plantation in the Northeast of Thailand* as a tool for estimating future teak tree size and growing stock and the *Soil suitability map for teak plantation in Udon Thani and Nong Bua Lam Phu Provinces* (Fig.1). Farmers could estimate future yield by combination usage of the soil suitability map and the yield table. Both project outputs are available online at http://forprod.forest.go.th/forprod/ebook/e-book.html and http://www.jircas.affrc.go.jp/DB/DB09/index.html. The map currently covers only two provinces (1.5 million hectares) but the know-how will be made available in order to extend map coverage to other provinces. In fact, RFD has recently started activities to extend the maps.

In terms of low-cost regeneration method, coppicing was deemed effective based on the improved initial-year balance of payments by 50% or more through simulation studies. However, an experimental study on controlling sprouts from a stump, focusing on how many sprouts to keep and when to cut sprouts, etc., should be continued. Preliminary results showed that coppice sizes do not differ between treated sprouts (1 sprout and 2 sprouts) of up to 1.5 years old (Fig. 2). Further investigations on the

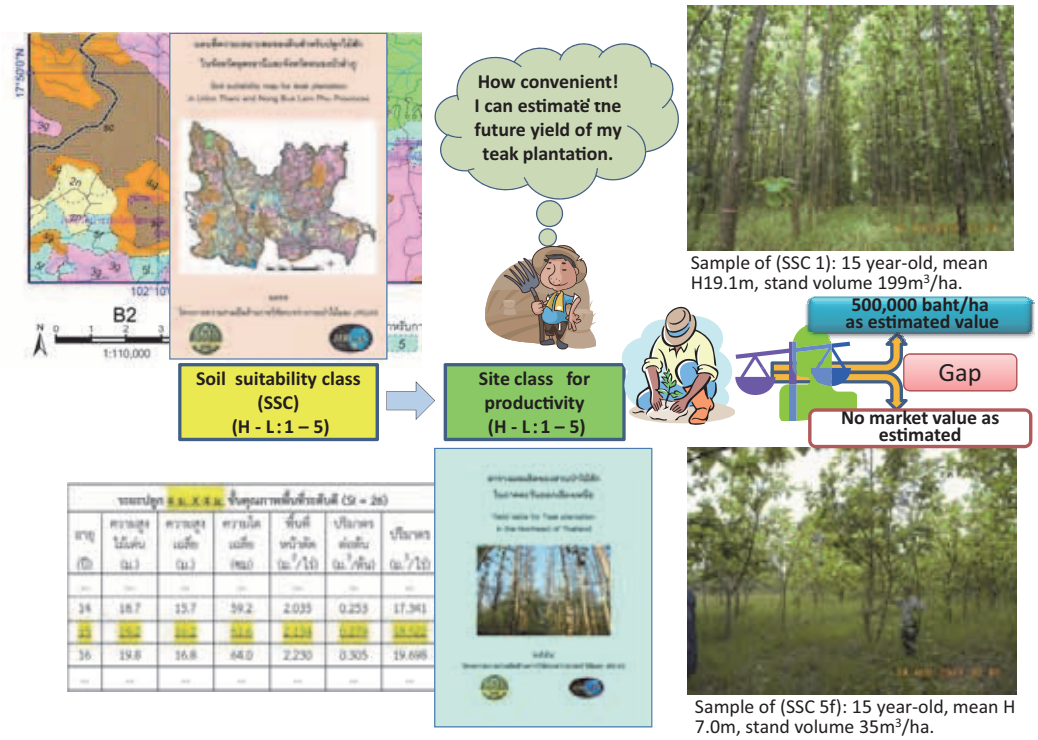

Fig. 1. Project outputs: *Soil suitability map for teak plantation* and *Yield table for teak plantation for Thai farmers*

growth performance of teak coppice on timber production are needed.

As for high profitability technology, thinning was found effective in controlling tree growth and stem quality. However, only a few studies on teak plantations have been done and these are not enough. An experimental study on the effects of thinning on teak growth according to density and timing is still ongoing and will take at least several years. Future outputs will include a revised yield table incorporating the effects of thinning.

A climate change mitigation solution called REDD-plus (Reducing Emissions from Deforestation and Forest Degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries) is becoming a more important mechanism in international framework discussions. A technology for evaluating the carbon accumulation capacity of popular indigenous tree species such as teak in Thailand is also being studied under the joint research project in the hopes of contributing toward motivating farmers or local people to manage their forests through the REDD-plus mechanism.

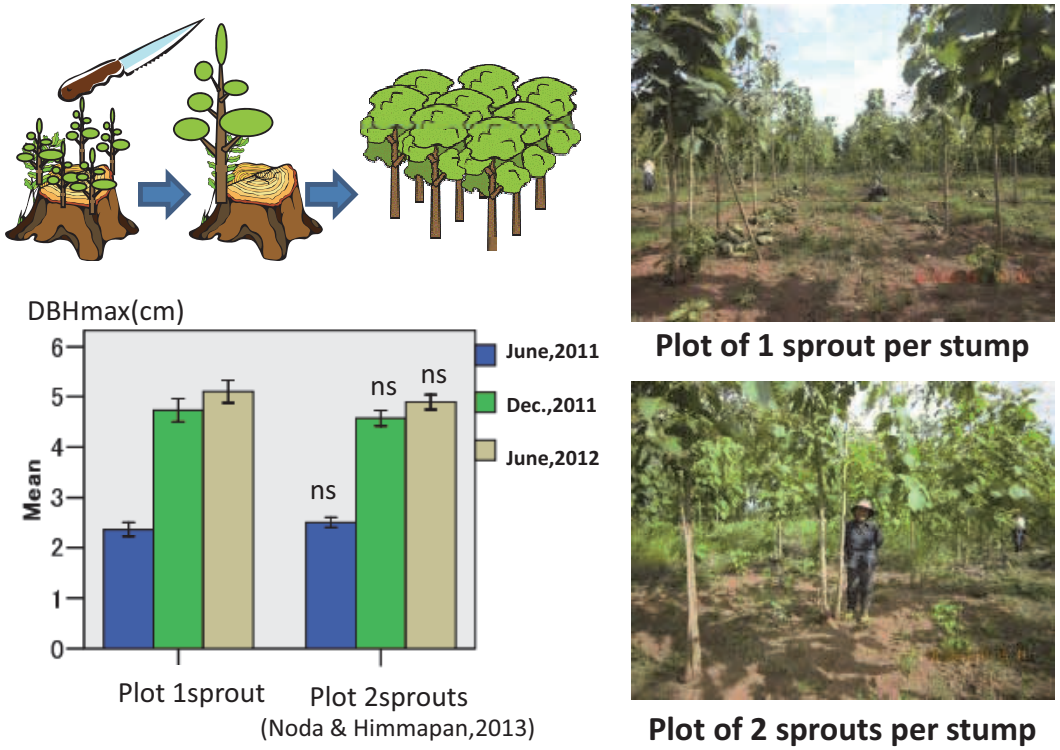

Fig. 2. An experimental study on the coppice method. DBHmax means the diameter at breast height (DBH) of a dominant sprout in the 2-sprout plot, and DBH of a sprout in the 1-sprout plot.

Iwao Noda
Director
Forestry Division

Sustainable Agricultural Production by Biomass Utilization Technology

In this article, we discuss the importance of biomass utilization technologies within the context of agricultural sustainability. The role of agriculture has become increasingly important in finding solutions for major global issues such as global warming, population-food problem, and depletion of natural resources. In order to contribute toward solving these global issues, rural activation programs such as rural livelihood improvement activities are required. Integrating the three pillars of agricultural development (productivity, economic efficiency, and sustainability) is necessary for rural activation. Biomass utilization technology may provide one solution to these problems, and the creation of a carbon-negative cycle is one idea being considered. For example, in the economical production of fuels and chemicals from agricultural biomass such as lignocellulose, the waste that remains after conversion and fermentation could subsequently be processed into biogas by anaerobic digestion, and any residual waste fractions could be converted into bio-oil or biochar by pyrolysis. The biogas, bio-oil and fermentation residues produced in this way could then all be used as an energy source. The biochar produced at the end of the process is both carbon and nutrient-rich and using the biochar to amend agricultural soil would also close the nutrient cycle and sequester atmospheric carbon. The resulting carbon-negative footprint gained through cascade

utilization of energy and nutrients could create a sustainable economy and society, which could be attained by focusing on the fundamental biological processes of photosynthesis (biomass production), conversion and fermentation (sugar platform), and waste management (agronomic benefit). Based on this idea, the JIRCAS biomass project focuses on the economical production of fuels and chemicals from biomass through two research developments such as lignocellulose conversion technology and bioresource utilization technology. Although the technical and economic aspects of production still require considerable research, the outcomes of the project will promote the development of sustainable social systems and improvements in rural livelihoods through biomass utilization technologies.

Figure: Development of biofuel and biomaterial production technologies using biomass resources in Southeast Asia

Akihiko Kosugi
Biological Resources and Post-harvest Division

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Chair : Masayoshi Saito (JIRCAS)

Isao Tsutsui (JIRCAS)

Iwao Noda (JIRCAS)

Akihiko Kosugi (JIRCAS)

Othman Sulaiman (Universiti Sains Malaysia)
Biomass Utilization of Waste Oil Palm

Session 4: The Role of Networks and Initiatives in Agriculture and Food Technology Development in Asia

The establishment of a sustainable production system and technology for effective utilization of regional and traditional food resources in Asia will be a powerful tool towards income improvement and rural development, taking into account the diversity of natural conditions and cultural backgrounds. For this reason, there is a heightened need for a system (network) to enable information-sharing on topics pertaining to food resources of each country, utilization technology development, and resolution of common issues and problems affecting the food processing industry. In Session 4, efforts to facilitate technological development across specific sectors in industry, government, and academia were presented. Furthermore, in consonance with the aim to foster unity and cooperation, the concept of an "Asian food resources research network" was proposed.

Dr. Robert Holmer, Regional Director of AVRDC-The World Vegetable Center, East and Southeast Asia, talked about the importance of vegetable production in home, local community and school gardens. He showed that non-communicable diseases caused by lack of vitamins have been increasing in large cities of developing countries as well as those of developed countries. He also explained why having a steady supply of fresh vegetables near consumption areas may help solve this problem.

The next speaker, Dr. Warunee Varanyanond, former Director of the Institute of Food Research and Product Development, Kasetsart University, presented Thailand's strategy of exporting food products and introducing its food culture overseas through its One Village One Product (OTOP) policy. OTOP has been implemented since 2002 to revitalize the rural economies and the agri-food industries of rural areas, successfully developing various products that have originated from traditional food around the country. Consequently, Thai restaurants, boosted by industry, government and academia support network, have been expanding internationally. She pointed out that the institutionalization of food standardization and quality assurance programs as well as the development of packaging and transportation technology are necessary for exporting traditional foods and food culture.

The third speaker, Dr. Masahiro Shoji, President of Morinaga Institute of Biological Science, Inc. (MIoBS), introduced data obtained from a collaborative study made by his company and Kasetsart University on the current situation of food allergy in Thailand. Their investigation found that some food products in Thailand contained allergens (substances causing allergy) in amounts higher than the regulation but were not indicated on the labels. Thus, establishing a proper and rapid inspection system is needed to prevent allergic accidents. In order to solve this problem, MIoBS and Kasetsart University, with the support of Japan's Ministry of Agriculture, Forestry and Fisheries (MAFF), developed several easy-to-use allergen detection kits. Food quality assurance service companies in Thailand have begun using the kits.

In the general discussion, the Chair proposed the concept of a food resources research network. Under this proposed network, JIRCAS will play a central role, with research institutes, universities in Asia, international organizations, and private companies joining in as members. The network will collect and share information about traditional food and food resources of each country using web-based database applications. The network will also aim to understand the type and characteristics of resources, explore the possibility of effective utilization, work in cooperation in solving technical problems, and jointly develop application technologies. Through cooperation between different countries and sectors, difficult problems will have better chances of getting solved, and the possibility of developing a new, never-before-seen technology can be expected.

Chair: Kazuhiko Nakahara

Robert J. Holmer

Warunee Varanyanond

Masahiro Shoji

Kazuhiko Nakahara
Biological Resources and Post-harvest Division

Panel Discussion: Strengthening Japanese Agricultural Competitiveness through Collaboration with Asia

Chair: ***Kazumi Yamaoka***, JIRCAS
Panelists:
Martin C.Th. Scholten, Wageningen University, the Netherlands
Yasuo Watanabe, Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan
Tokio Imbe, National Agriculture and Food Research Organization (NARO), Japan
Akinori Noguchi, Ishikawa Prefectural University, Japan
Masahiro Shoji, Morinaga Institute of Biological Sciences, Inc., Japan
Masa Iwanaga, JIRCAS

A panel discussion, themed "Strengthening Japanese Agricultural Competitiveness through Collaboration with Asia," was held to sum up the main points during the two-day JIRCAS symposium. A special speech by Prof. Martin C. Th. Scholten of Wageningen University, the Netherlands, preceded the panel discussion. His lecture, entitled "Feeding the World within the Carrying Capacity of Planet Earth: The Netherlands approach in smart agri-food business," offered valuable insights regarding the success of Dutch agriculture.

The Netherlands is the world's second largest exporter of agricultural and food products, valued at 114.8 billion dollars (after the United States, at 131.3 billion). Although it is a rather small country with a total land area equivalent to Japan's Kyushu Island (population exceeding Kyushu's by only 20 percent), the value of its agricultural exports surpasses those of major exporting countries such as Germany, Brazil, France (around 70 billion each) and China (54.2 billion). By comparison, Japan is ranked 52nd at 4.6 billion (only 4% of the Netherlands').

Total exports of the Netherlands amount to 666.2 billion dollars, with agricultural and food products accounting for 17.2 percent. Japan's total exports are higher at 822.6 billion but agri-food products account for only 0.6 percent. The Netherlands' ratio of 17 percent is akin to Japan's export ratio of passenger cars, trucks buses and chassis.

Although the contribution of the Dutch agri-food industry is similar to the Japanese automobile industry in terms of percentage share to total exports, there is no significant difference between the two countries in terms of ratio to the GDP, with the agriculture, forestry and fisheries sectors accounting for only 1.4 percent for the Netherlands and 1.1 percent for Japan. From these numbers, it can be inferred how much value has been added to Dutch agricultural and food products before export. Japan should not feel pessimistic that its agricultural sector constitutes only 1.1 percent of GDP, but instead focus on the possibility that it could be as powerful as its automobile industry.

Many agricultural exports of the Netherlands are processed products: the first in percentage terms is cut flowers at 12 percent, followed by cheese, tobacco, prepared foods and beer at 4.3, 4, 3.9, and 2.4 percent, respectively. Although food security is a top priority for Japanese people because Japan is a major food importing country, enhancing the Japanese food processing industry like that of the Netherlands will provide an opportunity to make Japanese agriculture strong because agriculture provides raw materials for the food processing industry.

Some domestic agricultural products are not eaten by the Japanese but have been value-added for the consumption of people living overseas. This is one option that should be considered, and if this strengthens agricultural production in Japan, then it should contribute toward achieving food security for the Japanese people.

The panelists argued on various aspects, such as: integrating the importance of public-private partnerships and the division of roles and strong engagement in international standardization such as CODEX, SPS, TBT including de facto standards; finding a coordinator who can design strategies on the future development of agriculture as the "6th industry"; reshaping conventional ODA; establishing win-win relationships between developed and developing countries; ensuring national food security by contributing to finding global solutions; increased focus of research activities on human resources development; defining governments' role in assisting food processing industries, 97% of which are SMEs, and so on.

After the Q&A session, the chair concluded by forwarding one idea, as illustrated in Fig. 1. The helical cycle starts by investigating (A) new needs followed by (B) developing a new technology while promoting agricultural production in Japan and (C) market development. So far, agricultural production in Japan receives the most benefits. Then, as the market expands, it is followed by (D) the development of new technology in parallel with (E) the promotion of agricultural production in neighboring countries in Asia and further expansion of markets, eventually making Asia the base of agricultural production for providing raw materials.

Lastly, the chair also brought up one scenario where Japan directly deals with Asian dynamism on food consumption systems. In light of the new knowledge gained from the Netherlands as an advanced country and the Dutch experience focusing on its aggressive agriculture strategies, Japan should likewise put agri-food processing SMEs as well as research forces at the forefront of finding larger markets abroad while raising the expertise of young researchers and opening up international agricultural research opportunities to be pursued in the future.

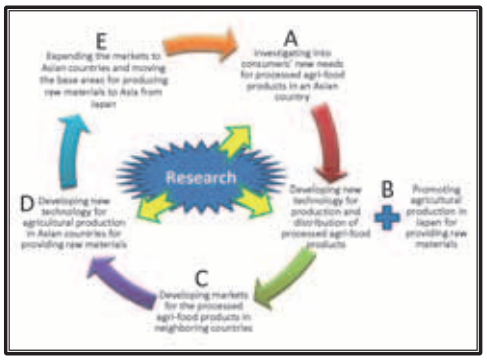

Fig. 1. Dynamic win-win promotion through a helical approach

Kazumi Yamaoka
Research Strategy Office

JIRCAS TODAY

○ 2013 Japan International Award for Young Agricultural Researchers

The commendation ceremony of the 2013 Japan International Award for Young Agricultural Researchers was held at U Thant International Conference Hall, United Nations University, Tokyo, Japan on November 20. The ceremony was attended by many participants, including members of the selection committee and embassy officials.

Awardees, members of the selection committee and other officials

This award, which commenced in 2007, is presented every year by the chairman of the Agriculture, Forestry and Fisheries Research Council to young foreign researchers in recognition of their outstanding achievements, with the aim of promoting research and development of agricultural, forestry, fishery and other related industries in developing regions.

○ Certificate of Appreciation from Kasetsart University, Thailand

On November 25, Kasetsart University in Thailand awarded JIRCAS a certificate of appreciation and souvenir for its long-term promotion of joint research projects and pursuit of human resources development through fellowship and academic research support programs.

JIRCAS has been implementing joint research with Kasetsart University since 1994 on a number of projects related to food science, microbiology, biomass utilization and aquaculture, among others. These projects have generated significant results, and both organizations are looking forward to a more fruitful relationship in the future.

JIRCAS Program Director Masayoshi Saito (left) receives the shield trophy from Kasetsart University Vice President Sornprach Thanisawanyangkura.

○ Certificate of Appreciation from King Mongkut's University of Technology Thonburi , Thailand

On November 29, King Mongkut's University of Technology Thonburi (KMUTT), Thailand presented JIRCAS a certificate of appreciation and commemorative trophy for its ongoing contributions to the university through joint research, and as proof of its friendly relations and for the future continuity of its collaborative activities.

JIRCAS and KMUTT have been working on Southeast Asia biomass utilization technology since 2002. Over this 11-year period, joint research projects aimed at developing microbial and enzyme-based technologies for academic and industrial applications have been implemented, resulting in positive outcomes.

Likewise, Project Leader Akihiko Kosugi personally received a certificate of appreciation and commemorative trophy from the KMUTT for his many years of participation in cooperative research and development activities.

On behalf of JIRCAS, Program Director Masayoshi Saito (right) accepts the trophy from KMUTT VP Bundit Thipakorn.

Project Leader Akihiko Kosugi (right) receives his trophy from KMUTT VP Solot Suwanayuen.

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Information and Public Relations Office
1-1 Ohwashi, Tsukuba, Ibaraki 305-8686, JAPAN
Phone: +81-29-838-6708 Fax: +81-29-838-6337 http://www.jircas.affrc.go.jp/