

JIRCAS Newsletter

for
INTERNATIONAL COLLABORATION



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Why “Quality” Matters in International Agriculture Research?



JIRCAS International Symposium 2015 under the title “Why ‘Quality’ Matters in International Agriculture Research?” was held on October 28, 2015 in Tokyo. The symposium was co-sponsored by the United Nations University - Institute for the Advanced Study of Sustainability (UNU-IAS) and supported by the Agriculture, Forestry and Fisheries Research Council Secretariat of the Ministry of Agriculture, Forestry and Fisheries (AFFRC, MAFF), Japan International Cooperation Agency (JICA), Japanese Society of Regional and Agricultural Development, and Japan Forum on International Agricultural Research for Sustainable Development (J-FARD).

On September 25, about a month before the JIRCAS symposium, the United Nations (UN) Summit 2015 was held in New York. Japanese Prime Minister Shinzo Abe attended the summit, where the “2030 Agenda for Sustainable Development”, which includes 17 Sustainable Development Goals (SDGs) and 169 targets, was announced and adopted. Specific measures that can contribute to achieving the SDGs, including a novel idea focusing on “質 (quality)”, were forwarded. Japan, for its part, will pursue various initiatives to achieve an inclusive, sustainable, and resilient “quality growth” for all.

As agriculture researchers, we should always keep in mind the messages from Rachel Carson’s “Silent Spring” (1962) and The Club of Rome’s “The Limits to Growth” (1972), which still resonate today. According to them, we may have our doubts about growth but we should carry on with our efforts to increase food production through Green Revolution technologies and eradicate poverty through economic development so we can further cope with the global challenges caused by climate change toward the end of the 20th century.

However, despite the UN adopting the new 15-year development goals mentioned above, many challenges remain, and these issues are not resolved by name change alone. On the other hand, we need to supply safe and nutritious food, thus we have to keep our ecosystem healthy by adapting to extreme weather events. Moreover, the increasing pressures to maintain our production systems and further requirements to reduce congestion and improve the quality of land and soil have also made the challenges more complex.

While research expectations have continuously increased, the allotted funds and resources have steadily

decreased, reflecting Japan’s economic downturn in recent years. For example, CGIAR funds from Japan was USD 37 million in 1996, but has since fallen to below USD 2 million in 2015.

Under such circumstances, we must change our thinking to something that goes against traditional research designs and approaches, and find a breakthrough to fulfill our responsibilities as agricultural researchers. The term “high quality” was therefore chosen as the theme of this year’s JIRCAS symposium to correspond to this situation.

During the symposium, several multifaceted, diverse, and high quality research results were presented in the opening keynote speeches and the following sessions. It was pointed out that project settings should start from the food table and then be related to their output functions. Based on the presentations, the symposium was bookended by a wrap-up session discussing the importance of attitudes when aiming at sustainable and resilient research outcomes, bearing in mind the final beneficiaries and users and the need to bring reforms in agriculture, forestry, and fishery industries.

According to Dr. Shizuka Shirakawa, a scholar of Chinese literature, the Chinese character “質” is a combination of “斤” (an abbreviation of “斧” which means “axe”) above and “貝” (an abbreviation of “鼎”) below. Hence, the traditional explanation for the character “質” is that “an important contract must be carved with an axe,” which means that the terms of a contract (the important part) are the “essence” of a contract. Now you often hear people refer to “質問 (*shitsu•mon* or question)” when they ask others if there are any questions. The “質” in “質問” also has the same meaning.

As researchers, we should always be aware of and impose “質 (quality)” on ourselves, and we must make efforts to continuously contribute toward producing high quality, diverse, and ready-to-use research results.

Kunihiro Doi
Director
Research Strategy Office

Keynote Speech: Harnessing agricultural biodiversity for improved nutritional quality, more effective climate change adaptation and better rural livelihoods

In accordance with the theme (Quality), the tone of the 2015 JIRCAS International Symposium was set by keynote speeches delivered by two distinguished guests and expressed from the viewpoint of research and development. Ms. M. Ann Tutwiler, director general of Bioversity International, delivered the first presentation titled “Harnessing agricultural biodiversity for improved nutritional quality, more effective climate change adaptation and better rural livelihoods”. She enumerated three initiatives that explained how Bioversity International, a research center of the Consultative Group of International Agricultural Research (CGIAR), addressed global challenges such as malnutrition, climate change, and land degradation.

The first initiative was the promotion of “healthy diets from sustainable food systems”. She described rural-urban agri-food value chains and local agri-food systems, which integrate nutrient values into crop yield measurements, as two research components that utilize agricultural and tree biodiversity for diet diversity and food production systems. A new metric of food supply, termed “nutritional yield”, was developed through these components. She also explained how this indicator clarified the importance of crop diversity (e.g., iron content in millet is twice that of rice; zinc content in oats is 4x that of wheat). She stressed further that research findings indicating a negative relationship between diversity of diet and stunting among children underscore the benefit of diversity on health.

The second initiative was the development of “productive and resilient farms, forests and landscapes”, achievable through ecological intensification/ diversification and landscape restoration/ management practices, leading to higher productivity and livelihood benefits from agricultural and tree products. She reported that in Uganda, bean fly damage on traditional varieties was reduced by planting with randomly arranged resistant varieties. In Ethiopia, the superiority of durum wheat landraces in terms of protein content, yield, and maturity period compares well with improved varieties, suggesting that biodiversity can be an option toward improving agricultural productivity in marginal areas. Furthermore, a protocol to restore tropical dry forest in Colombia was created. She said that this



M. Ann Tutwiler, Director General, Bioversity International

protocol recommends the most appropriate combination of species and seed resources, taking into account site adaptability and genetic diversity.

The third initiative was the promotion of “effective genetic resources conservation and use”. This initiative provides seed, information, strategies, and support policies and institutions to curb crop loss and increase tree biodiversity. She mentioned that global long-term conservation and use strategies for cacao, banana, and coconut genetic resources have been formulated and disseminated, and that a new business model involving the private sector has also been developed. Based on the crops’ growth responses, the model recommends a combination of varieties appropriate for each producer’s environment. She concluded her speech by discussing Bioversity International’s contribution to the formulation of a national policy and international framework for the utilization of germplasm by collecting and disseminating these information and by offering diverse sets of planting materials to small farmers through seed multipliers and suppliers.

Eiichi Kusano
Research Strategy Office

Keynote Speech : Why the Quality of Growth Matter? – from JICA’s experiences

“Quality Growth” is a priority issue both in the “Development Cooperation Charter (a revision of the Official Development Assistance Charter)” approved by the Japanese Cabinet in February 2015, and in the post-2015 development agenda which include “Sustainable Development Goals (SDGs)” adopted at the United Nations Summit in September 2015. In line with the symposium theme, which focused on “Quality”, the second keynote speech, titled “Why the Quality of Growth Matter? - from JICA’s experiences”, was delivered by Director Ichiro Tambo of the Japan International Cooperation Agency (JICA) Research Institute.

In his speech, Director Tambo presented the current trends in the development landscape and pointed out some development challenges we are facing. He stated that although there is a steady decline in absolute poverty and in the number of low-income countries, poverty in sub-Saharan Africa is rising and the concentration of extreme poverty is growing in fragile states and in middle-income countries. He said that there are still more than one billion people living in extreme poverty and domestic and global economic disparity is widening. He stated further that development problems are increasingly complex and global. He also addressed the differences between the SDGs and the Millennium Development Goals (MDGs), whose target achievement date of 2015 is about to pass. He reported that not only developing countries but all U.N. member states had pledged their commitment to achieve the 17 SDGs and 169 targets by 2030.

He underlined the importance of four key concepts to explain quality growth. Three of them were included in the Development Cooperation Charter, namely, *inclusiveness* (reduced disparity, empowerment of women, governance), *sustainability* (environment, climate change), and *resilience* (disaster risk reduction). In addition, he suggested *innovation* (knowledge & technology), the driver of economic growth, as the fourth key component to ensure quality in growth.

He presented some examples of Japan’s development cooperation implemented through JICA. Examples of *inclusiveness* included the rehabilitation of a feeder road in the Democratic Republic of the Congo, which paid special attention to community participatory process, as well as the provision of vocational training to ex-soldiers with disability in Rwanda. As an example of *sustainability*, he cited activities at Brazil’s tropical savanna region (known as the Cerrado) as a pioneering sustainability initiative via transformation of unused lands into fertile agricultural lands. The government especially pursued a balance between agricultural development policies and environmental conservation policies, and the increase in



Ichiro Tambo, Director, JICA Research Institute

agricultural production was made possible by yield growth rather than by expansion of the planted areas. In order to illustrate how JICA had been tackling *resilience* issues, he cited as an example the seamless cooperation in the aftermath of Typhoon Yolanda, which hit the Philippines in 2013, ranging from emergency aid to disaster recovery and formulation of a restoration plan. Finally, the automobile industry in the industrial zone along Thailand’s Eastern Seaboard was introduced as a case that comprehensively achieved all four concepts including *innovation*. Thailand’s annual automobile exports were less than half a billion US dollars in 1995. By 2008, exports approached 28 billion US dollars, making Thailand the largest automobile exporter in the ASEAN region. At present, the automobile industry is the principal engine for growth in Thailand’s economy.

“Quality” of growth is critically important for overcoming development challenges in the post-2015 era. Regarding the relationship between “Quality” and “Quantity”, Director Tambo emphasized that it is not about a trade-off and that we must aim for a balance of both quantity and quality at the same time. He further said that the Development Cooperation Charter advocates “Quality Growth” that maintains growth and quality, and poverty eradication through such growth.

Towards the end, he stressed that the agricultural sector plays a key role and that agriculture is the basis for the economy and a driver of quality growth. He added that agriculture is an important sector in developing countries especially in post-conflict situation as it creates jobs for demobilized soldiers. He concluded by saying that more research efforts are needed for better implementation of agricultural projects and that in this regard, the research outcomes of JIRCAS can be counted upon.

Sakiko Shiratori
Research Strategy Office

Session A: Researches for climate-resilient and sustainable agriculture

Research projects aimed at coping with climate change have been conducted under the Environment and Natural Resource Management Program of JIRCAS, guided by keywords such as genetic resources, nitrogen, carbon, water, and soil. The program has been implemented since 2011 in Asia, Africa, Latin America, and the Pacific Islands using sustainable resource management techniques, and we are currently making plans for the implementation of new research projects for the next five years (from 2016).

Session A of the symposium focused on “resilient and sustainable agriculture”. In the first half of the session, Dr. Yasukazu Hosen, project leader of the climate change project (the program’s flagship project), showed examples of adaptation strategies to mitigate the effects of climate change in Mekong Delta, Vietnam (Please see next page). In the latter half of the session, Dr. Yuji Niino, land management officer of FAO Regional Office for Asia and the Pacific, explained “conservation agriculture (CA)” as a climate change-resilient option in Asia and Africa.

Dr. Niino began with extreme weather events that have occurred frequently in Asia and the Pacific region in recent years. He also introduced CA as an effective countermeasure to extreme weather events. He described CA as a planting concept that consists of the following principles: 1) no till or minimum tillage, 2) mulching with crop residue or cover crop, and 3) diversified cropping system such as crop rotation or intercropping. Using the results of experiments, he justified why climate-smart agriculture is a necessity and how its advantageous effects extend to many other aspects such as enhanced yields, reduced costs, and increased resilience against climate change through higher water use efficiency. He mentioned that the introduction of CA largely decreased working hours (based on his experiments in Timor) and that it doubled the yield of maize in Indonesia.

He presented an overview of the extension of CA and reported that an FAO group in Africa has been spreading CA through a number of extension projects and frameworks for extension. He also explained that extension of CA practices is more widespread among large-scale mechanized farmers but less among small-scale farmers due to various constraints such as access to agricultural equipment.



Chair : Akinori Oshibe (left), Vice Chair : Fujio Nagumo (right)



Yuji Niino, Land Management Officer, FAO Regional Office for Asia and the Pacific

Furthermore, he emphasized the importance of comprehensively improving the systems and policies related to agricultural extension. He described the establishment of the Conservation Agriculture Alliance for Asia-Pacific (CAAAP) through FAO’s initiative and called for greater participation. The outputs obtained in the past five years were reviewed as described above, and valuable information related to activities that will be conducted in the next five years were likewise gained from the session.

Akinori Oshibe

Program Director

Environment and Natural Resource Management

Fujio Nagumo

Crop, Livestock and Environment Division

To establish an agricultural system which harmonizes human life with the environment through smart use of rural resources in a regional environment – JIRCAS’s climate change initiatives for the Mekong Delta, Vietnam

“We create our future,” as the saying goes. The question is, “How do we build it?”

JIRCAS and Can Tho University (CTU), in collaboration with other institutions, have been carrying out several research activities in the Mekong Delta, Vietnam, three of which aim directly at mitigating greenhouse gas (GHG) emissions from agricultural activities and furthering farmers’ interests.

One of the three activities is conducted in rice paddies, which are widely stretched over the Mekong Delta. Rice farming in this area alone was reported to have yielded 21 Mt of rough rice in 2008, equivalent to twice the total production of Japan. The activity involved the introduction of a water-saving irrigation technology, which resulted in a reduction of over 50% in GHG emissions and higher grain yields.

The second research activity is related to livestock raising, a sector that is expected to flourish in the region. The objective is to mitigate methane (CH₄) emissions from beef cattle by developing and utilizing total mixed rations (TMRs) that provide adequate nourishment to cattle. Compared with cattle on forage-only diets, cattle on TMR diets gained body weight at higher rates, thus effectively reducing CH₄ emissions per unit of beef produced.

The last activity involves the development of a local project in line with Clean Development Mechanism (CDM), an international effort that helps disseminate mitigation measures against GHG emissions. Under this project, titled “Farm Household Biogas Project Contributing to Rural Development in Can Tho City”, biogas digesters (BDs) that convert livestock excrement to CH₄ fuel for household use, e.g., for cooking, were distributed. The emission reduction achieved through this project resulted in the issuance of Certified Emission Reductions (CERs or carbon credits) by the CDM Executive Board under the rules of the Kyoto Protocol.

The results individually obtained from each of these research activities, namely, on rice, beef cattle, and BDs, can be linked up together to enhance the efficiency of utilization of local materials/nutrients available in the Mekong Delta. For example, the large amount of rice straw, estimated to be 24 Mt y⁻¹ (in dry weight of the total aboveground biomass), derived from the huge rice production volume in the Mekong Delta, needs to be tapped. With an integrated approach, it is possible to realize



an environmentally-friendly, profitable agriculture in the region. Underutilized or inefficiently utilized materials/nutrients in the region could be used efficiently by linking up the three components as follows: 1) rice straw, only 21% of which is estimated to be positively utilized in the region, can be utilized as feed in cattle raising instead of burning them; 2) cattle excrement can be utilized for CH₄ generation by using BDs; and 3) BD effluent, i.e., waste fluid from BDs, can be utilized as fertilizer for rice cultivation instead of discharging them into water systems. Through this linkage approach, rice and beef/milk production may be increased without the need to increase the application rate of fertilizer and forage, respectively; and additionally, CH₄ fuel from BDs would be available for household use. On the contrary, increasing rice and beef/milk production following the conventional way, i.e., without integrating the said three components, would require increased fertilizer and forage input from external sources, consequently increasing local environmental loads. The combined use of the above-mentioned research results is expected to exert a positive impact on GHG emission reduction efforts not only at the regional level but also globally.

The linking up of the technologies that we have already developed in the Mekong Delta will serve as our next challenge in our pursuit to establish an agricultural system which harmonizes human life with the environment.

Yasukazu Hosen
Crop, Livestock and Environment Division

Session B: Approaches to enhance stable food production and consumption in Africa

The title of Session B, “Approaches to enhance stable food production and consumption in Africa”, was selected because we recognized the importance of farmers’ choice of varieties in crop cultivation and consumers’ preference in the market, and we assumed that these would be the key issues for agricultural research in the next stage of research and development in JIRCAS. JIRCAS strengthened existing research activities and even implemented new ones relating to crop production technologies in Sub-Saharan Africa after the Tokyo International Conference on African Development (TICAD IV) in 2008. Since then, several significant achievements have been accomplished. However, most research and development activities of JIRCAS are in the area of breeding and genetics as well as agricultural engineering and agronomy, with the aim of increasing crop production. Thus, we invited Dr. Satoru Muranaka of JIRCAS and Dr. Rose Edwige Fiamohe of Africa Rice Center (AfricaRice), both of whom have vast research experience in Africa, as session speakers so they could share their insights about farmer choices and consumer preferences in African markets.

Dr. Muranaka, a cowpea research specialist, is a member of the JIRCAS project titled “Evaluation and Utilization of Diverse Genetic Materials in Tropical Field Crops (EDITS)”. He presented an activity of the project, one which aimed at using genetic diversity to improve value-added-cowpea production (Please see next page). The project team is composed of several experts on breeding, agronomy, food science, and social science and the outcome of their activities is expected to contribute toward strengthening the value of cowpea in West Africa.

Dr. Fiamohe is an agricultural economist at AfricaRice. She introduced the importance of consumer preference in terms of quality and branding of rice. She also cited the dissemination of a new technology on rice processing (i.e., parboiled rice) as an example of improved post-harvest technology that adds value to the product. The following is a brief summary of her presentation.

AfricaRice conducted a baseline survey to have a global picture of the rice varieties grown in Africa since 2013. The survey focused on rice sector development hubs, which are the main rice-growing environments where research products are integrated along the value chain, to achieve development outcomes and impacts. The survey revealed that local rice is not frequently found in the markets in major African towns and even when it appears in the market, it is generally sold in bulk and not branded to attract consumers. To address this problem, AfricaRice, in collaboration with its National Agricultural Research Institute (NARI) partners, conducted the following activities: 1) developed tools to analyze consumer buying decision process and identified the popular types of rice sold in the market, 2) evaluated the quality of rice using an experimental approach to elicit the willingness of consumers in urban markets to pay for the most preferred products, 3) strengthened the capacity of innovation platform (IP)



Rose Edwige Fiamohe (AfricaRice)

actors in the rice value chain, including women processors and youth agripreneurs, through improvement/development of business skills in order to master market-oriented rice production, 4) developed a woman-friendly parboiling technology and management option to increase post-harvest yield of local rice, with grain quality that is comparable to the standard of imported rice, and 5) supported the value chain actors in innovation platforms to improve the attractiveness and image of locally produced rice.

There was an active discussion after her presentation regarding various key points, such as the feedback/response of breeders to the research outputs and ways to collaborate with them, consistency between the output and rice markets as observed in Africa by participants, and means of maintaining the brand (brand management).

As described in the beginning, most of JIRCAS’s rice research activities for Africa are related to breeding, agricultural engineering, and agronomy. Thus, the symposium was a good opportunity for recalling the importance of consumer research in determining market value and in understanding the concept of value chains toward improving and stabilizing small scale farmer households in Africa.

Takeshi Kano
Program Director
Stable Food Production

Seiji Yanagihara
Biological Resources and Post-harvest Division



Packaging and branding of locally produced rice (Photo by AfricaRice)

A way to strengthen the role of cowpea in West Africa

Agricultural diversification and innovation should be defined and suited for each location to achieve sustainable production and food security. From this viewpoint, regionally important crops are worthy of attention because of their tight linkage with people's livelihoods and culture and eminent suitability to the agricultural environment. There are rational reasons and advantages in cultivating these crops traditionally and continuously. Cowpea [*Vigna unguiculata* (L.) Walp.], a major grain legume originating in West Africa, is an important "regional crop" that has tremendous potential to improve the livelihoods of the poor and benefit local communities in Africa.

Cowpea's importance in the region is attributed to its favorable agronomic characteristics such as tolerance to drought and low soil fertility, nitrogen (N)-fixing ability, and adaptability to different cropping systems. The crop exhibits resilience in agricultural systems under severe and unstable growth environments, particularly areas where farmers have limited land resources and equipment. As grain legume, cowpea is also rich in protein and micronutrients, and it can potentially supplement staple crops (cereals and tubers) in the region for more nutritionally balanced diets, especially for the poor who cannot afford to buy animal proteins. According to FAO (2007-2009 data), cowpea generated an estimated 2 billion USD in annual revenue in West Africa. At the same time, we should not forget to mention cowpea's wide diversity in both agronomic traits (e.g. maturity, plant type etc.) and grain quality related traits (e.g. color, size, taste, cooking property etc.), which allow farmers and consumers to have a wider choice.

Considering the recent rapid economic growth in Africa, the "quality" of its agricultural products could be the key to the future agricultural development of the continent. In addition to improving "quantity" in crop production, more attention should be placed on "quality" to enhance production and consumption, and promote utilization on the basis of a crop's role in its regional production system and value chain. To drive further innovation in cowpea production, we should effectively utilize the crop's wide diversity both in agronomic and quality aspects, which in turn would strengthen its role as a regional crop and eventually contribute in improving the livelihoods of the people in the region.

However, the fundamental scientific information that form the basis for innovation and breeding strategies, such as "consumers' preferences", "farmers' needs and diverse cropping systems", "diversity in agronomic and quality traits", and "effective evaluation tools", is currently lacking. Realizing this challenge, JIRCAS initiated the "EDITS-Cowpea" project focusing on "grain quality" to verify the possibility of improving the quality of cowpea through variety development to meet the preferences of consumers and markets in the region.

Under the project, we have identified wide genetic diversity in physical, nutritional/antinutritional, and functional properties of cowpea grains, and found weak associations among these properties. This finding suggests the possibility of introgressing favorable characteristics from genetic resources to develop new varieties that match market and consumer preferences, thus enhancing the nutritional and commercial values of the grain. In addition to the identified potential genetic resources, the following outputs were also obtained from the EDITS-Cowpea project: the creation of analytical protocols/tools for rapid

evaluation of grain physical characteristics and protein contents; the identification of grain characteristics that influence market price; and the determination of environmental factors that affect grain quality.



These outputs will link the primal elements needed to improve grain quality for value-addition and to develop breeding and innovation strategies for this particular crop.

To respond to the growing market-oriented requirements on cowpea arising from economic growth in Africa, specific emphasis only on market demand is not enough to boost production and further develop the value chain of this regional crop. It is also essential to identify appropriate cropping systems suited to local environments and to farmers' own demands. Selection or development of appropriate cowpea varieties that meet specific market demands, as well as cultivation environments and cropping systems for each production area could be a key success factor/approach for cowpea, which is deeply rooted to farmers' livelihoods and culture.

Diversification of varieties and cropping systems will enhance the stability and reduce agricultural production risks, thus enhancing food security and generating extra income for small-scale farmers. Through JIRCAS's international collaborative researches, we hope to advance the understanding of the roles of culturally and traditionally important "regional crops" for further development and utilization. By strengthening the role of regional crops, we can contribute to improve and provide more resilience to the livelihoods of people under challenging conditions in the region.

Satoru Muranaka and Hiroko Takagi
Tropical Agriculture Research Front

EDITS-Cowpea



Cowpea grains of various colors and sizes sold at a grain market in Zinder, Niger Republic



Various cowpea dishes prepared at a farmer's house in Kano, Nigeria

Session C: Evaluation of the various uses of indigenous resources and establishment of value chains in Asia

Establishing a sustainable food production system that co-exists with nature requires an understanding of the true value of local resources and traditional food technologies that have been formed over a long period of time. In Southeast Asia, people have been living with the blessings of nature such as animal and plant resources gathered from tropical forests, fields, rivers, and seas since ancient times. However, in some countries, natural resources and traditional food technologies are being lost as industrial development progresses. To address this concern, the development of technologies that are suitable to the development stage of the each country is necessary.

In Session C, topics related to the evaluation and utilization of indigenous resources and food development through application of traditional technologies were discussed. Furthermore, the objectives of the “Asian Food Resource Network (AFRN)”, a collaborative effort established by JIRCAS, were described, and the roles of research institutes and other stakeholders in sharing information and research cooperation were explained.

Dr. Kenichiro Kimura (Senior Researcher, Rural Development Division, JIRCAS) delivered a speech titled “Uses of Non-Timber Forest Products in Lao PDR and their values”. He reported on the importance of non-timber forest products (NTFPs) in the food supply system and household economy in rural areas. The roles of NTFPs were identified in his study, which is being implemented under the JIRCAS project titled “Establishment of sustainable and independent farm household economy in the rural areas of Indochina”. (Please see next page.)

Professor Patcharee Tungtrakul (Director, Institute of Food Research and Product Development, Kasetsart University) followed with a speech titled “Effort in Thailand for value chain establishment and international collaboration”. She discussed the establishment of successful value chains in Thailand featuring rice, indigenous crops, and fermented food items.

During general discussion, the session vice-chair reported on the activities of the AFRN. He said that after the network issued a joint declaration in 2013, a database on



Chair: Masayoshi Saito (left), Vice Chair: Kazuhiko Nakahara (right)



Patcharee Tungtrakul (Director, IFRPD, Kasetsart University)

indigenous or traditional food resources of Thailand, as well as results obtained from some of its scientific studies, was produced. In connection with JIRCAS’s next mid-term plan, the network plans to contribute to the construction of food value chains from the standpoint of food scientists together with reliable counterparts in Asia.

Masayoshi Saito
Program Director
Rural Livelihood

Kazuhiko Nakahara
Biological Resources and Post-harvest Division

Uses of non-timber forest products in Lao PDR and their values

Livelihoods and non-timber forest products

Laos, the only landlocked country in Southeast Asia, is classified as one of the least developed countries in the world. The population consists of 80% farmers and their main livelihood is rice farming, which they carry out in the lowlands as well as hilly and mountainous areas. Laos is well known for its forests where both timber and non-timber forest products (NTFPs) such as bamboo shoots, mushrooms, and wildlife species are gathered.

As a result of deforestation and degradation in recent years, the amount and variety of NTFPs have changed and is believed to have an effect on the livelihood of the villagers.

NTFPs and their economic values

How many NTFPs are there, and how much do the farmers collect? In the survey village, 289 NTFPs of plant origin (including mushrooms) and 124 NTFPs of animal origin were collected, most of which are being consumed as food.

Forest resources are very important to Lao farmers who live in mountainous areas. Villagers depend on forests for their daily meals and for the fuel they need to cook. In Laos, the main fuel is firewood, with annual consumption amounting to 2 tons per household. The total economic value of NTFPs (including firewood) consumed annually per farm household is approximately 850 USD, which is equivalent to about 70% of earnings from a 1-ha paddy field or about twice the economic value of slash-and-burn upland rice farming in N Village.

Fallow forests and NTFPs

What kinds of forests are there in N Village? In the mountainous areas in Laos, upland rice farming by slash-and-burn method is performed. After burning off a forest, upland rice is cultivated and the land is restored to a forest after the harvest. Such areas are called fallow forests, which display major differences compared with the original natural vegetation. It was found during a survey that areas with fallow periods of 3 to 10 years after upland rice farming comprise 70% of fallow forests. It was also noted that these woods have turned into thickets and are rarely used by the farmers. Furthermore, they produce few NTFPs and thus have low economic value.

About mushroom gathering

Mushroom, a typical NTFP, is a valuable food item for the villagers. Currently, about 4000 kg of mushrooms are picked annually in the whole village. Sixty percent are classified as two species of *Lentinus* sp. It is known that

these mushrooms grow on old trees or stumps of *Dipterocarpaceae*. For this reason, trees belonging to *Dipterocarpaceae* are being traded at an inflated price, which is why these species do not grow much in the village anymore. For now, we can still find mushrooms growing on *Dipterocarpaceae* tree stumps; however, once these stumps are completely gone, so are these mushrooms.



Enhancing farmers' incomes towards better living

In the near future, the amount of harvestable mushroom is expected to decline further. Additionally, collecting NTFPs that include firewood will require longer hours as one will have to travel far to gather it.

Our main research objective, therefore, is to find attractive, native tree species with great heating power, as well as mushrooms that are fast-growing, so that the villagers benefit, both health-wise and economically. We are suggesting a new local forest use model, which should encourage the villagers to plant the aforementioned trees in fallowed forests where NTFPs are limited in order to create a new source of income.

Lastly, we will aim to build a new value chain in Laos by applying Japan's white charcoal production and raw 'wood' mushroom cultivation techniques and use them locally, thus providing added value to NTFPs.

Kenichiro Kimura

Rural Development Division



Mushrooms growing on a fallen tree

JIRCAS TODAY

2015 Japan International Award for Young Agricultural Researchers

JIRCAS, together with the Agriculture, Forestry and Fisheries Research Council (AFFRC) Secretariat, presented the 2015 Japan International Award for Young Agricultural Researchers. The commendation ceremony was held at the U Thant International Conference Hall of United Nations University in Tokyo, Japan on October 27.

The award commenced in 2007 and was held for the ninth consecutive year. It recognizes and honors young foreign researchers (under 40 years of age) who are highly recommended by their institutes, and whose outstanding achievements promote research and development of agricultural, forestry, fishery and other related industries in developing regions. The winners were chosen from among nominees who met the following qualifications:

- 1) a developing country national who belongs to a non-Japanese research institute or university
- 2) under 40 years old as of January 1, 2015
- 3) engaged in research and development in agriculture, forestry, fisheries, and related industries in developing regions
- 4) able to attend the commendation ceremony in Japan (travel expenses borne by JIRCAS)

The seven-member selection committee conducted a document review, with the three winners – Dr. Ani Widiastuti (Indonesia), Dr. Viengsakoun Napisirth (Laos), and Dr. Atef Swelam (Egypt) – determined from among 36 nominees.

The awardees and guests were welcomed by Mr. Yoshio Kobayashi, Chairman of the AFFRC. Congratulatory remarks were delivered by Dr. Takuji Sasaki, Professor of NODAI Research Institute, Tokyo University of Agriculture, and former member of the Independent Science and Partnership Council (ISPC); Mr. Akira Nagata, Senior Programme Coordinator of UNU; and Mr. Tomochika Motomura, Senior Advisor of Japan International Cooperation Agency (JICA). The selection process was explained by Dr. Mutsuo Iwamoto, Chair of the selection committee. The award testimonials and monetary prizes (USD 5,000 per awardee) were given by AFFRC Chairman Kobayashi and JIRCAS President Masa Iwanaga. Afterwards, the awardees presented their research achievements to the audience.



Mr. Akira Nagata, Senior Programme Coordinator, United Nations University



Mr. Tomochika Motomura, Senior Advisor, Japan International Cooperation Agency



Dr. Mutsuo Iwamoto, Chair of the Selection Committee



Conferral of awards (with AFFRC Chairman Yoshio Kobayashi and JIRCAS President Masa Iwanaga)



Mr. Yoshio Kobayashi, Chairman of the Agriculture, Forestry and Fisheries Research Council, MAFF



Dr. Takuji Sasaki, Professor, NODAI Research Institute, Tokyo University of Agriculture



Awardees, members of the selection committee, and other officials (Front row, L-R: Dr. Atef Swelam, Dr. Ani Widiastuti, Mr. Yoshio Kobayashi, Dr. Viengsakoun Napisirth, and Dr. Masa Iwanaga; Back row, L-R: Selection Committee members Mr. Hidenori Murakami, Dr. Kiyooki Maruyama, and Mr. Nobuhiko Harada; Dr. Mutsuo Iwamoto; Dr. Takuji Sasaki, Mr. Tomochika Motomura, and Mr. Akira Nagata)

JIRCAS TODAY

The 2015 awardees and their research achievements are as follows:



Dr. Ani WIDIASTUTI

Sex: Female

Age: 38

Nationality: Republic of Indonesia

Institute: Universitas Gadjah Mada

Recommending Institute: Universitas Gadjah Mada

Research Achievement:

Mechanism, Potency and Practical Application of Heat Shock-Induced Resistance

Reason for the Award:

Dr. Widiastuti's research on disease resistance in crops induced by heat shock treatment of seedlings shows promise for reducing pesticide use. Her consistent approach, from basic research through various applications, was based on a unique idea and has been highly evaluated. Dr. Widiastuti is also actively involved in programs that make significant contributions to local communities, including the dissemination of this technique, which shows promise for further developments in this domain, to farmers in Indonesia.



Dr. Viengsakoun NAPASIRTH

Sex: Male

Age: 37

Nationality: Lao PDR

Institute: National University of Laos

Recommending Institute: Japan International Research Center for Agricultural Sciences

Research Achievement:

Development and utilization of silage technique and agro-industrial by-products for cattle feed for the promotion of sustainable livestock agriculture in Laos

Reason for the Award:

Dr. Napasirth was the first to introduce silage to the farmers of Laos. Since then, he has worked on improving silage techniques by processing (ensiling) cassava residues into fodder, and by collecting and analyzing bacterial strains to be used for silage production in this region. These techniques are effective in solving the problem of fodder shortage during the dry season in Laos, thereby significantly contributing to the development of sustainable farming. Moreover, these techniques have promising applications in developing countries in Southeast Asia and Africa.



Dr. Atef SWELAM

Sex: Male

Age: 39

Nationality: Arab Republic of Egypt

Institute: International Center for Agricultural Research in Dry Areas

Recommending Institute: International Center for Agricultural Research in Dry Areas

Research Achievement:

Development of a cost-effective raisedbed machine for small-scale farms to improve land and water productivity in the Nile Delta

Reason for the Award :

The machine developed by Dr. Swelam for raisedbed planting has remarkable effects on reducing irrigation water use and preventing waterlogging. Manual planting on raisedbeds is extremely time- and effort-intensive for farmers; the introduction of this machine would therefore lead to improved efficiency and significantly increased income for farmers. Mechanization of farming is a very practical approach for small-scale farmers in this region, and it has potential applications in neighboring countries, leading to advances in the field.

