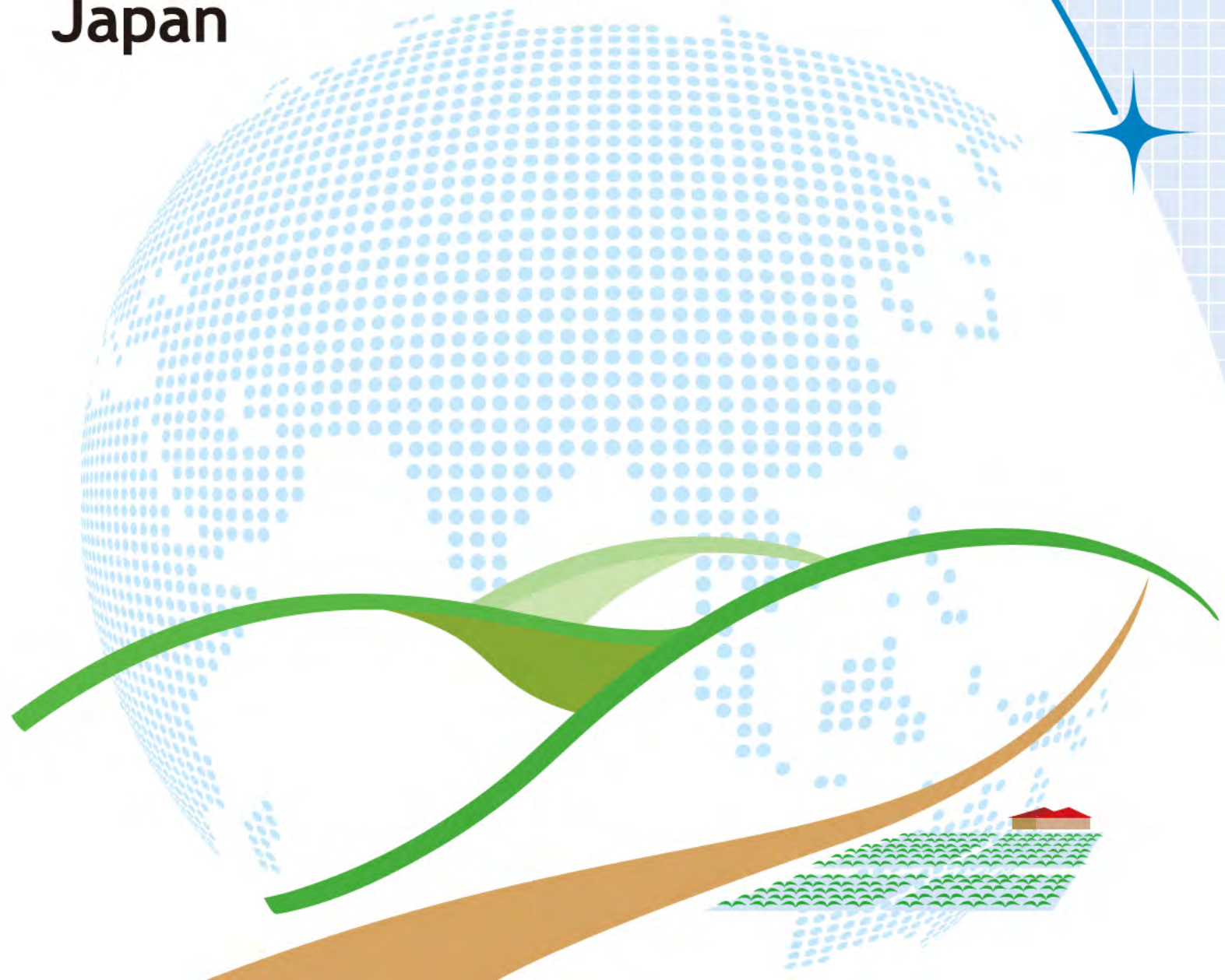




**ICCAE**

International  
Cooperation Center for  
Agricultural Education

Nagoya University  
Japan



## Message from the Director



Prof.  
Akira YAMAUCHI

The International Cooperation Center for Agricultural Education is a research institute mandated to function as a leading center for international cooperation in agricultural education. Since its founding in 1999, we have strengthened basic research and overseas field surveys in close collaboration with the Graduate School of Bioagricultural Sciences, Bioscience and Biotechnology Center and the other schools and institutes of Nagoya University, as well as other universities, by establishing networks among related institutions, placing special emphasis on the capacity building of human resources alongside those activities, and producing research outputs that are intended to contribute to solutions for real agricultural problems. In addition, as one of the platforms for such research accomplishments, we now publish the *Journal of International Cooperation for Agricultural Development*, and will attempt to establish a new field of science, 'International Cooperation for Agricultural Development'. We would therefore very much appreciate your active support and participation in our activities.

## Background of the Establishment

In developing countries, problems relating to downturns in agricultural production, environmental devastation, poverty, etc. have yet to be resolved. To solve these issues, it is important to develop the appropriate agricultural technologies while paying careful attention to their socioeconomic impact, the effective use of natural resources, and a respect for the environment. The development of human resources is also a pressing issue. In June 1996, the Ministry of Education, Science, Sports, and Culture (presently, MEXT) of Japan expressed their strong expectation for the role of universities in the promotion of international cooperation. Universities are expected to take the initiative in integrating their intellectual resources in order to develop multidisciplinary approaches for addressing agricultural issues and facilitating human resource development. Thus, ICCAE was established in April 1999, with the goal of becoming a leading centre for international cooperation with universities in Japan.

## Vision, Mission and Objectives

### Vision

To be a leading center for international cooperation of capacity building for agricultural and rural development

### Mission

#### <Education and Human Resource Development>

To contribute to human resource development for solving agricultural problems in developing countries

#### <Research>

To contribute to the solution of agricultural problems in developing countries by integrating interdisciplinary studies

#### <Coordination Network >

To contribute to the development of the coordination network among agricultural research and educational institutions and its use for the promotion of the international cooperation of education

### Objectives

#### <Division of Project Development>

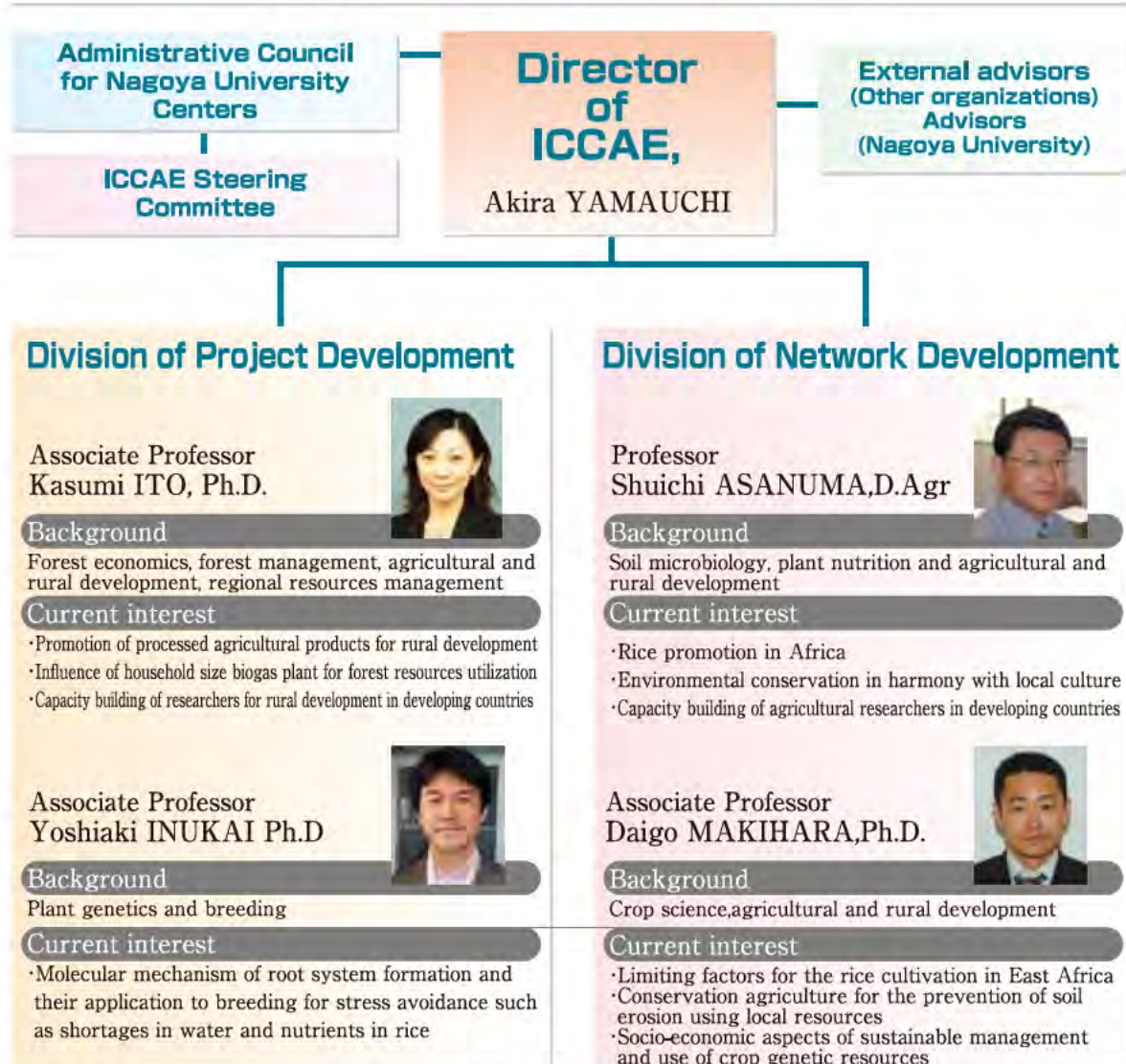
Investigate project development and evaluation technologies for promoting international cooperation of agricultural education.

#### <Division of Network Development>

Investigate network development and use technologies for promoting international cooperation of agricultural education.

- Contribute to overcome agricultural problems in developing countries by identifying needs in agricultural and rural development and by developing appropriate technologies adaptable to their situations.
- Investigate, analyze and evaluate the international cooperation projects on agriculture, rural community and agricultural education.
- Develop the database of intellectual and human resources of domestic agricultural universities, research institutions and others and use it in international cooperation of agricultural education responding to the needs of developing countries.
- Build up domestic and foreign human resources for international cooperation in agriculture and related fields.

## Organization and Staff



ICCAE has two positions available for visiting professors. One is for a Japanese visiting professor (one-year tenure), and another is for a foreign visiting professor/research fellow (three- to twelve-months tenure). Additionally, ICCAE can recruit post-doctoral fellows on an irregular basis. In addition, ICCAE appoints collaborative researchers/administrators from Nagoya University, other universities, research institutions, and international cooperation agencies in Japan.

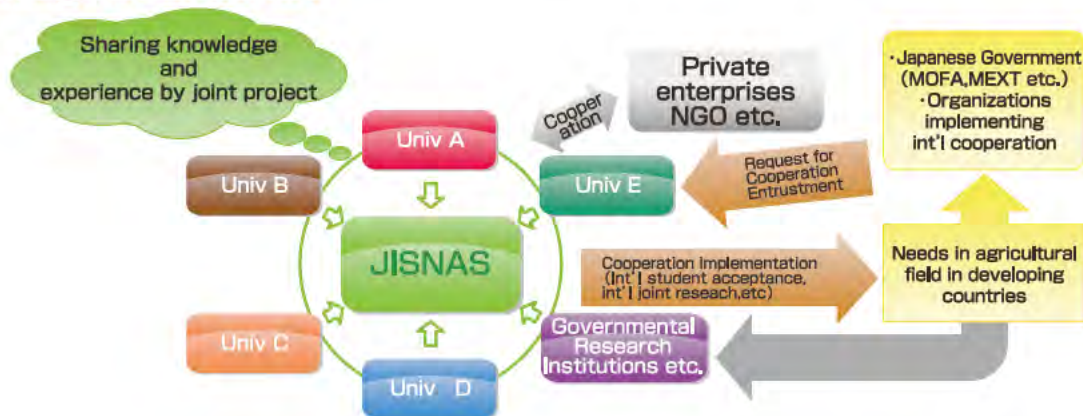
### ICCAE Steering Committee 2013

Prof. Akira Yamauchi	Director of ICCAE, Nagoya University
Prof. Setsuo Nishino	Graduate School of Education and Human Development, Nagoya University
Assoc. Prof. Tadashi Sonoda	Graduate School of Economics, Nagoya University
Prof. Nobutaro Ban	Graduate School of Medicine, Nagoya University
Prof. Hiroyuki Honda	Graduate School of Engineering, Nagoya University
Prof. Toshiharu Tanaka	Graduate School of Bioagricultural Sciences, Nagoya University
Prof. Koichi Usami	Graduate School of International Development, Nagoya University
Dr. Seiji Hayashi	Graduate School of Environmental Studies, Nagoya University
Prof. Motoyuki Ashikari	Bioscience and Biotechnology Center, Nagoya University
Prof. Shuichi Asanuma	ICCAE, Nagoya University
Assoc. Prof. Kasumi Ito	ICCAE, Nagoya University
Assoc. Prof. Yoshiaki Inukai	ICCAE, Nagoya University
Assoc. Prof. Daigo Makihara	ICCAE, Nagoya University

## Japan Intellectual Support Network in Agricultural Sciences (JISNAS)

JISNAS was established on November 30, 2009, with the aim of promoting collaboration both among universities and between universities and those international agricultural research institutions of Japan that are willing to collaboratively work towards international cooperation in agricultural education. ICCAE led in its establishment and has ever since been playing an important role as a secretariat of JISNAS. As of April 2013, the members of JISNAS include 40 agricultural faculties from universities and research organizations and 51 individual members. It is strongly supported by the Ministry of Education, Science, Sports, and Culture (presently, MEXT); the Ministry of Agriculture, Forestry and Fisheries (MAFF); the Japan International Cooperation Agency (JICA); and the Japan International Research Center for Agricultural Sciences (JIRCAS). To promote effective and strategic international cooperation in agricultural education and research with a focus toward developing countries, it is necessary to systematically utilize the intellectual resources of universities and to continuously meet their diversified and complicated needs. To realize this, a network system of universities and other professional research organizations would be an effective system for finding and utilizing not only limited and individual knowledge but also the comprehensive and qualified intellectual resources and experiences accumulated by such organizations. Even under Japan's competitive environment, it would be wonderful to show the true achievement addressing the needs of developing countries by working not competitively, but collaboratively among multiple actors.

### ◀Image of JISNAS▶



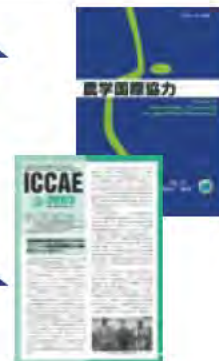
## Publication

### Journal of International Cooperation for Agricultural Development (JICAD)

In 2011, ICCAE renewed its annual bulletin 'International Cooperation in Agriculture' as an academic journal, *Journal of International Cooperation for Agricultural Development*. This journal will publish peer-reviewed academic papers on international cooperation in agricultural development, as well as case reports of international cooperation in agricultural education. It is open to researchers outside of ICCAE.

### ICCAE News

The semi-annual periodicals of ICCAE report on-going research activities, various announcements, personnel information, and other miscellaneous of ICCAE.



## Open Forum and Open Seminar

ICCAE organizes the open forum every year to discuss important and contemporary topics concerning international cooperation in agricultural education. Prominent researchers and practitioners are invited to the forum, which is open to the public. Furthermore, researchers and experts will be invited to give seminars on their own work to researchers, students, and the public as well. Six or more seminars are held in a year.



Participants with full of willingness

## Activities

### 1 Building a model of rural development by promoting an agro-processing business that meets market needs in Cambodia

Although Cambodia has already achieved food self-sufficiency, because of its own undeveloped processing industry, there is a large influx of processed foods from neighboring countries, such as Thailand and Vietnam. Thus, the strengthening of the agricultural sector and the introduction of value-added agricultural products such as agro-processing, which will contribute to livelihood improvement of rural people as well as economy of the country, is urgently necessary. This study aims to build a model of rural development in collaboration with Royal University of Agriculture Cambodia (RUA) through practical research on the development of and quality improvements for processed agricultural products based on market needs. Rice liquor, one of the traditional processed foods in Cambodia, was selected as a target to capture market needs, improve quality, increase commercialization, and cultivate its market through action research method supported by the Scientific Research Fund from the Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT). As of 2010, rice liquor was already commercialized and for sale in Cambodia. This model has been disseminated to neighboring countries that have the same or similar issues by the program of International Cooperation Initiative, MEXT.



Rice liquor producer in Takeo Province: A step-by-step guide from a Japanese expert.

### 2 Strengthening the research and education of Royal University of Agriculture Cambodia

Cambodia has been struggling with reconstruction, development, and poverty reduction since the end of its longstanding civil war in 1991. Although the country has already achieved food self-sufficiency, both its quantity and quality remain at low levels, and most rural farmers still suffer from low income caused by low productivity, poor quality, and low prices. The country's agricultural university, therefore, has the important role and responsibility of identifying agricultural issues and their solutions through research and capacity building based on field surveys. However, Cambodia's shortage of human resources, due to genocide and social disruption of the Pol Pot Regime, is still so severe as to disrupt their expected roles. ICCAE has supported the strengthening of education and research in RUA, including the introduction of credit-based curricula in 2001, the establishment of a master's course in 2002, and the establishment of a Ph.D. course in 2006. Recently, ICCAE has undertaken a 'Practical research and education' in both RUA and the Graduate School of Bioagricultural Sciences, Nagoya University, following both an Agreement for Academic Exchange and Cooperation and a Student Exchange Memorandum between them.

### 3 Impacts of introducing biogas generator by using animal manure to forest resources protection in Nepal

This study aims to identify the impacts of a household biogas generator on the utilization and protection of forest resources as well as the livelihood of rural people. In most developing countries, deforestation is derived from the consumption of firewood for cooking and heating. The household biogas generator has been introduced in many developing countries, mainly by international donors including non-governmental organizations, as an alternative source of fuel, in order to reduce the consumption of firewood. However, its introduction in developing countries has accelerated, without any observation of its negative impacts or the necessary conditions for maximizing the benefits of its introduction. The country of Nepal, one of the first countries to introduce biogas and therefore possessing one of the longest histories of using household biogas generators, was selected as the target area for identifying the potential positive and negative impacts of biogas, as well as the necessary conditions for maximizing its benefits, through an analysis based on quantitative and qualitative field surveys. The results of this study will contribute to the introduction of biogas in other developing countries.



Degraded forests in hilly areas of Nepal

## Activities

### 4 Multidisciplinary study on environment conservation and local culture in the region suffering from soil erosion in Western Kenya



Farmers' houses and farm fields nearby deep gullies

Soil erosion has been a serious environmental threat to the survival of the people of Western Kenya. Land degradation is generally known to occur as the result of various human activities as well as fragile soil and climatic conditions. In our research project, we intend to clarify the impacts of human activities on soil erosion, particularly gully erosion, by comparing climatic, geographical, geological, physical, and human factors between two sites (one with and one without soil erosion). In addition, a warning system for gully and conservation agriculture techniques will be developed. In order to achieve these objectives, we have formed a new research team, composed of professionals from interdisciplinary fields of study including soil science, plant nutrition, crop science, agricultural

economics, geology, and cultural anthropology. Those professionals are faculty members of either Nagoya University or Maseno University of Kenya. The team conducts field and/or household surveys together.

### 5 Development of rice breeding materials and cultivation technologies to overcome biotic and abiotic stresses in Kenya

In Kenya, rice production is constrained by various biotic and abiotic stresses such as drought, cold weather at high elevations, salinity, low soil fertility, rice blast disease, and rice yellow mottle virus. An important issue for Kenyan agriculture is to overcome these stress conditions in order to improve rice productivity and yield stability. In recent years, it has become technically possible to tailor a rice variety by introducing useful QTLs that control important traits for adaptation to the stress conditions. However, productivity and the stress resistance/tolerance that a rice variety expresses in the field are not determined by genetic factors alone, but can also be affected by cultivation environment and cultivation management. This study aims to identify the QTLs for stress resistance/tolerance that can function effectively in Kenya's conditions, and to clarify conditions for the proper functioning of useful QTLs through the analysis of Genotype × Environment × Management interactions. The goals of this study are to develop breeding lines carrying useful QTLs that overcome the stresses, as well as cultivation technologies that maximize the potential of a rice variety.



Cold weather damage on rice panicles (Mwea, Kenya)

### 6 Identification of traits related to drought resistance and their genetic analysis, and evaluation of genotype by environment interaction in rice



Rain-fed lowland rice at farmer's field in the Philippines.

About one third of the world's rice lands consist of a rain-fed, lowland rice ecosystem, which is fully dependent on rain. Drought is a major production constraint of rain-fed lowland rice. Therefore, the development of drought-resistance cultivars is an urgent subject. This study aims to (1) identify the desirable traits and their quantitative traits loci (QTLs) for drought-resistance, with special emphases on root development and functions; (2) characterize soil and climate environments in targeted rain-fed lowland areas; and (3) evaluate the interaction of useful traits (QTL) and environmental factors. The results of this study will provide fundamental and crucial information needed to breed rice genotypes for drought-resistance.

### 7 Creating new useful genes for rice breeding using New Plant Breeding Techniques

Genetic modification technology in the 21st century has dramatically developed into 'New Plant Breeding Techniques (NBT)'. The final products do not contain transgenes or the traces used for induction of a DNA alteration in the final breeding step of NBT. Among the NBT, engineered nucleases are powerful tools for genome editing, based on their capacity to target a specific genomic locus. Recently, we have come to gradually understand the genetic mechanisms that regulate root system formation using rice root mutants. According to this genetic information, we are now using the engineered nucleases to try to create new and useful genes for improving the root system architecture in rice.



Creating rice varieties through New Plant Breeding Techniques

## Activities

### 8 Development of rice blast disease control technology through characterization of rice blast fungus and rice cultivars in Kenya

Rice blast is one of the most destructive rice diseases in Kenya, where outbreaks have occurred in some irrigated paddy fields. What these blast affected areas have in common is that a single rice cultivar has been continuously grown at a large scale. Consecutive cultivation of a single rice cultivar for several seasons may cause a rice blast outbreak, due to the emergence of pathogenic races of the rice blast fungus that are able to infect the rice cultivar. The objective of this project is therefore to develop a coping technique to rice blast disease, through (1) collecting rice cultivars and clarifying the cultivation system, (2) collecting rice blast isolates and the clarifying pathogenic races, (3) characterizing Kenyan rice genotypes for blast resistance, and (4) evaluating blast resistance in rice lines introduced with blast resistance QTLs.



Field close up of rice panicles severely damaged by rice blast disease (West Kano, Kenya)

### 9 Promotion and strengthening international cooperation in agricultural education through JISNAS (Japan Intellectual Support Network in Agricultural Sciences)



JISNAS carries out the following activities for promoting and strengthening international cooperation in agricultural education. (A) It cooperates with ICCAE in organizing the editorial committee for the *Journal of International Cooperation for Agricultural Development*. (B) It operates the JICA-JISNAS Cooperation Program: Japan overseas cooperation volunteers (JOCV) for African food security. Post-graduate students will be sent to Africa as JOCVs to conduct research, in addition to volunteer work, under the supervision of researchers from the appointed African universities and/or research organizations. The students are expected to use the research results for the

thesis of their master or doctorate degree. (C) JISNAS cooperates with JICA to strengthen human capacity development through agricultural education in developing countries such as Myanmar, Vietnam, etc. It is expected to take a lead in educating young Japanese students, as well as in the globalization of research and international cooperation.

### 10 JICA group training course on development of core agricultural researchers for rice promotion in sub-Saharan Africa

About one-month training course has been conducted since 2012 with the aim of developing core rice researchers in sub-Saharan Africa in order to promote rice production in that region. The idea behind this training is based on the understanding that researchers are expected to lead in promoting rice in their respective countries. It is composed of two parts: a core part and an individual part. In the core part, lectures are presented on basic rice sciences related to plant physiology and nutrition, breeding, paddy field concept, rice development in Asia and Japan, policy and yield improvement in Japan, PCM, and so on, all of which should become common knowledge among rice researchers. In the individual part, individual trainees will be allocated to the appropriate member universities of JISNAS, where their research plans will be developed under the supervision of rice researchers. In 2013, seven universities cooperated in this training: Iwate, Yamagata, Niigata, Ibaraki, Nagoya (2 divisions), Mie, and Kyoto.



Closing ceremony with full of smile

# Advisors (Nagoya University) · External Advisors (Other organizations)

## Advisors (Nagoya University) (April 2013 - March 2015)

Masanori Aikyo	Asian Law/Comparative Legal Culture	Chieka Minakuchi	Applied Entomology
Atsuko Aoyama	International Healthcare	Shiro Mitsuya	Crop Physiology
Susumu Asakawa	Soil Biology and Chemistry	Jun Murase	Soil Biology and Chemistry
Masahiro Chikada	Studies of Higher Education	Hideo Nakano	Molecular Bioengineering
Kazuyuki Doi	Plant Genetics and Breeding	Tatsuya Natsume	Higher Education / Vocational Education
Kazuhiko Fukushima	Forest Chemistry	Shigehiro Sasaki	Cultural Anthropology
Ei-ichi Honda	Animal Morphology and Function	Chisato Takenaka	Forest Environment and Resources
Katsuya Ichihashi	Administrative Law	Takeo Ueda	Educational Management
Toshiko Ishizaki	Japanese Language Education	Koichi Usami	Agricultural Economics
Kazuhito Kawakita	Plant Pathology	Akira Watanabe	Resources Cycling in Pedosphere
Hidemi Kitano	Plant Genetics and Breeding	Hiroyuki Yamamoto	Bio-material Physics

## External Advisors (Other organizations) (April 2013 - March 2015)

Yukihiro Hayashi	College of Bioresource Sciences, Nihon University
Osamu Ito	Institute for Sustainability and Peace (UNU_ISP), United Nations University
Izumi Iwamoto	Faculty of Agriculture, Kagoshima University
Junichi Kashiwagi	Graduate School of Agriculture, Hokkaido University
Osamu Koyama	Research Strategy Office, Japan International Research Center for Agricultural Sciences
Yasutaka Kubo	Graduate School of Natural Science and Technology, Okayama University
Rie Miyaura	Faculty of International Agriculture and Food Studies, Tokyo University of Agriculture
Koichi Miyoshi	Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University
Masami Mizuno	College of Bioresource Sciences, Nihon University
Eiji Nawata	Graduate School of Agriculture, Kyoto University
Yoshiaki Nishikawa	Faculty of Economics, Ryukoku University
Kazuo Ogata	Institute of Tropical Agriculture, Kyushu University
Masahiro Ogawa	Faculty of Agriculture, Kagawa University
Takeshi Sakurai	Institute of Economic Research, Hitotsubashi University
Mariko Sato	Center for Research on International Cooperation in Educational Development, University of Tsukuba
Katsunori Sawai	Graduate School of Management, Kyoto University
Kojiro Suzuki	Japan International Cooperation Agency Chubu International Center
Kunihiro Tokida	Japan International Cooperation Agency
Kazumi Yamashita	Aichi Agricultural Research Center
Jun Yasuda	Faculty of Agriculture, Iwate University
Kazuhiro Yoshida	Center for the Study of International Cooperation in Education, Hiroshima University



## By Train

Nearest station: Nagoya Daigaku Station on the subway Meijo Line (Exit 2; 15 min. walk)  
 From Nagoya Station (JR, Meitetsu or Kintetsu Line):  
 (Subway Higashiyama line) ▶ Motoyama Sta. ▶  
 (Subway Meijo line, clockwise) ▶ Nagoya Daigaku Sta. (30min.)  
 From Kanayama Station (JR or Meitetsu Line):  
 (Subway Meijo line counterclockwise) ▶  
 Nagoya Daigaku Sta. (25min.)

## By Air

From Central Japan International Airport (Centrair):  
 (Meitetsu Kuko Line) ▶ Kanayama or Nagoya Sta. ▶  
 (Subway)  
 From (Aichi Prefectural) Nagoya Airport (Komaki):  
 (Express bus (Aoi Kotsu)) ▶ Nagoya Sta. ▶ (Subway)

## Contact



## International Cooperation Center for Agricultural Education (ICCAE) Nagoya University

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 URL: <http://icca.eagr.nagoya-u.ac.jp/en/>  
 e-mail: [icca.eagr@agr.nagoya-u.ac.jp](mailto:icca.eagr@agr.nagoya-u.ac.jp)