



Tokyo University of Agriculture 130th Anniversary Symposium

東京農業大学 130 周年記念事業シンポジウム

Tokyo NODAI as the Center of Excellence for Research and Education
on Food, Agriculture and Environment in Africa
アフリカにおける食・農・環境に関する研究・教育の拠点として東京農大の展開

Date: February 10th, Thursday, 2022 (2022 年 2 月 10 日)

Time: from 15:00 to 18:00 in JST (日本時間 15:00 から 18:00)

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Time (JST)	Contents
15:00~15:10	東京農業大学 130 周年記念事業シンポジウム 開会 Opening on Tokyo University of Agriculture 130th Anniversary Symposium Prof. Dr. Machito MIHARA (Director at Center for Global Initiatives)
15:10~15:20	東京農大の近未来宣言 Declaration on Near-Future by Tokyo University of Agriculture President Professor Dr. Fumio EGUCHI
15:20~15:30	在日タンザニア大使からの祝辞 Congratulatory Message from Ambassador Extraordinary and Plenipotentiary, H.E. Baraka Haran LUVANDA Embassy of the United Republic of Tanzania to Japan, Tokyo
15:30~16:00	特別講演 アフリカにおける農業農村開発の課題と未来について Special Lecture on Facing Problems and Future Perspectives on Agricultural and Rural Development in Africa Dr. Nteranya SANGINGA Director General, International Institute of Tropical Agriculture (IITA)
16:00~16:15	アフリカン SDGs に関するパネルディスカッションの紹介 Introduction on Panel Discussion on African SDGs Prof. Dr. Hironobu SHIWACHI Executive Director, Board of Directors, Tokyo University of Agriculture Educational Corporation Professor at Department of International Agricultural Development, Faculty of International Agriculture and Food Studies / Graduate School of International Food and Agricultural Studies, Tokyo University of Agriculture

<p>16:15~16:30</p>	<p>アフリカン SDGs に関するパネル発表 1 <i>Panel Presentation 1: Implementation of the Water Utilization Methods for Sustainable Agro-Pastoral System in Djibouti, Horn of Africa</i> Prof. Dr. Sawahiko SHIMADA Professor at Department of Bioproduction and Environment Engineering, Faculty of Regional Environment Science / Graduate School of Agro-Environmental Science, Tokyo University of Agriculture</p>
<p>16:30~16:45</p>	<p>アフリカン SDGs に関するパネル発表 2 <i>Panel Presentation 2: Enhancing Nutrition by Agrodiversity in Rural Areas of Kenya</i> Prof. Dr. Kenji IRIE Professor at Department of International Agricultural Development, Faculty of International Agriculture and Food Studies / Graduate School of International Food and Agricultural Studies, Tokyo University of Agriculture</p>
<p>16:45~17:00</p>	<p>アフリカン SDGs に関するパネル発表 3 <i>Panel Presentation 3: Symbiotic Relationship between Crops and Bacteria: A Promising Way toward Sustainable Agriculture?</i> Dr. Michel OUYABE Assistant Professor at Center for Global Initiatives, Faculty of International Agriculture and Food Studies, Tokyo University of Agriculture</p>
<p>17:00~17:15</p>	<p>アフリカン SDGs に関するパネル発表 4 <i>Panel Presentation 4: TASUKI-The Sashes of Tokyo Noda Feeding Scientists and Technologies on Future of Africa -Collaboration between Tokyo Nodai (TUA) and IITA-</i> Prof. Dr. Hidehiko KIKUNO Professor at Faculty of International Agriculture and Food Studies, Tokyo University of Agriculture</p>
<p>17:15~17:45</p>	<p>アフリカン SDGs パネルディスカッション <i>Panel Discussion on African SDGs</i> Prof. Dr. Hironobu SHIWACHI and Panelists Executive Director, Board of Directors, Tokyo University of Agriculture Educational Corporation Professor at Department of International Agricultural Development, Faculty of International Agriculture and Food Studies / Graduate School of International Food and Agricultural Studies, Tokyo University of Agriculture</p>
<p>17:45~18:00</p>	<p>東京農業大学 130 周年記念事業シンポジウム 閉会 Closing on Tokyo University of Agriculture 130th Anniversary Symposium Professor Dr. Rie MIYAURA (Deputy Director at Center for Global Initiatives)</p>

Declaration on Near-Future by Tokyo University of Agriculture

東京農大の近未来宣言

"Becoming a Pioneer in Creating New Wealth through Connections with Agriculture"

「農の縁(えにし)から新たな豊かさを創造する開拓者となる」

President Professor Dr. Fumio EGUCHI

学長 江口 文陽

The theme of the declaration is "Becoming a Pioneer in Creating New Wealth through Connections with Agriculture."

The Sustainable Development Goals (SDGs), which the global society is collectively aiming to achieve by 2030, encompass the full range of issues that Tokyo University of Agriculture must address such as those related to agricultural, forestry, and fishery resources, environment, energy, health, and hunger. As a world-leading institution of higher education in the field of agricultural and life sciences, Tokyo University of Agriculture is expected to play a pivotal role in solving these issues through innovative technologies in agriculture.

As we celebrate the 130th anniversary of the founding of Tokyo University of Agriculture, we promise to continue striving to fulfill our mission of realizing a sustainable food and agricultural production and consumption system for the future of our planet by utilizing our comprehensive knowledge and technology in agricultural and life sciences. We also hereby declare that we will foster human resources capable of addressing the issues, support Japanese agriculture, forestry and fishery, contribute to the improvement of food self-sufficiency, and take on the challenge of solving the world's food, agriculture, and environmental problems with a renewed spirit.

宣言のテーマは、「農の縁(えにし)から新たな豊かさを創造する開拓者となる」です。

2030年までに世界が目指す持続可能な開発目標 SDGs は、農林水産資源・環境・エネルギー・健康・飢餓など東京農業大学としても取り組むべき課題を多く含んでいます。これらの課題には農学における革新的技術による貢献が求められており、農学分野を牽引する本学としてもその役割が大いに期待されています。

東京農業大学は、創立130周年を迎えるにあたり、本学の使命として、地球の未来に持続可能な食と農の生産消費システムを実現するべく、総合農学・生命科学を駆使して取り組んでまいります。また、これらの課題解決に資する人材を育成し、日本の農林漁業者を支え、食料自給率の向上に寄与するとともに、世界の食料・農業・環境問題の解決に新たな気持ちで挑むことを宣言します。

Professor Dr. Fumio EGUCHI
President of Tokyo University of Agriculture,
Professor at Department of Forest Science,
Faculty of Regional Environment Science /
Graduate School of Agro-Environmental Science,
Tokyo University of Agriculture



Congratulatory Message

CONGRATULATORY MESSAGE

Baraka Haran LUVANDA

It gives me profound pleasure to share my felicitation message with Tokyo University of Agriculture (TUA) on this auspicious occasion of 130th Anniversary. It is both an honour and privilege to do so on behalf of the Government of the United Republic of Tanzania.

130 years of your existence are a significant number, by any standard. But more so, what is even more important and worth celebrating is the fact that the University has stood steadfast to fulfill its original mission of realizing sustainable food and agricultural production by enhancing systems for the future of our planet through comprehensive knowledge and technology sharing. And, as one of the beneficiaries of such knowledge and technology sharing, Tanzania will always cherish the noble work of this prestigious University for many years to come.

I am particularly glad to see that the cooperation framework between TUA and the Sokoine University of Agriculture (SUA) which was established through a Memorandum of Understanding in 2009 continues to be implemented to the letter. Under this arrangement, many Tanzanian experts have been trained and have subsequently made a remarkable contribution in the sector back in Tanzania. So, we continue to look upon TUA to scale up these opportunities as we grapple with the existential challenges of underproductivity, untapped agricultural potential, food self-insufficiency, environmental degradation issues, crop health as well as value addition to our agricultural products.

As the University continues to render its noble service to the globe, may I pledge on behalf of the Government of Tanzania our continued association with you during my tour of duty in this Great Nation and wish you greater milestones in the coming future.

Long Live TUA!

H.E. Baraka Haran LUVANDA

Ambassador Extraordinary and Plenipotentiary,
Embassy of the United Republic of Tanzania to Japan,
Tokyo



Special Lecture

Facing Problems and Future Perspectives on Agricultural and Rural Development in Africa

Nteranya SANGINGA

Untapped agricultural potential has contributed to persistent poverty and deteriorating food security. The number of undernourished people was projected to increase from 240 million in 2015 to 320 million in 2025 and more by 2050. At the same time, increased food demand and changing consumption habits driven by population growth and urbanization are leading to rapidly rising net food imports, which were expected to surge from US\$35 billion in 2015 to over US\$110 billion by 2025. When Africans move to cities, their consumption patterns change as they are exposed to higher quality and often imported food. As urbanization is projected to increase to 50% by 2025 and 70% by 2050, production needs to adapt to changing consumption patterns; otherwise, pressure will increase on imported products.

African farmlands and rangelands are increasingly degraded, while African farmers are increasingly susceptible to climate change-induced fluctuation in rainfall and temperature, with major African staple crops expected to have 8%-22% lower yields by 2050.

The most important challenge confronting African agriculture is the average age of the farmer (60 years) and the lack of interest of the youth in agriculture. For this generation, agriculture is Poverty, Penury, and Pain. This is not helped by government policies that still consider agriculture a social activity with the least injection of the state budget.

If the sector is transformed, the challenges facing African agriculture could be construed as an opportunity to improve the quality of life of Africans and support economic growth. The large and growing net food imports demonstrate that there are substantial markets for prospective agribusiness investors to address, worth over US\$100 billion per year by 2025 and a trillion US\$ by 2050.

Transformation is beginning to occur in some parts of Africa. Liberalization of input markets, expansion of innovative agricultural finance, and land policy reform have made significant advances. Nigeria has registered and distributed inputs to over 14 million farmers. Floriculture is flourishing in Ethiopia, the horticulture sub-sector is one of the top foreign exchange earners in Kenya, rice yields have been improved in Senegal and Mali, Rwanda has reduced malnutrition rates, Morocco has had successes in vertical integration and agro-processing, and cotton production is booming in Burkina Faso.

The above examples present the opportunity to draw out best practices, build on the successes already starting to emerge, and replicate them across the continent. I will try during the panel discussion to make a case of expanding opportunities and unlocking potentials – potentials for countries, for women, for the youth, for the private sector, for the continent.

Dr. Nteranya SANGINGA

Director General,
International Institute for Tropical Agriculture (IITA),
Nigeria



Implementation of the Water Utilization Methods for Sustainable Agro-Pastoral System in Djibouti, Horn of Africa

Sawahiko SHIMADA

The achievements of the long-term collaborative research efforts between Tokyo University of Agriculture (Tokyo NODAI) and Djibouti were evaluated in terms of adoption of our proposal as one of the governmental important projects targeting global issue supported by JST (Japan Science and Technology Agency) and JICA (Japan International Cooperation Agency), i.e., Science and Technology Research Partnership for Sustainable Development (SATREPS).

This project, titled “Project for Advanced and Sustainable Methods on Water Utilization Associated with Greening Potential Evaluation in Djibouti”, was proposed in order to enhance and implement sustainable agro-pastoral system in Djibouti. Although the project has been stopped at the onset for a year and a half under the situation of COVID-19 pandemic, Tokyo NODAI with the University of Djibouti (UD), the main counterpart of the project, are attempting to develop comprehensive and systematic monitoring and evaluation methods for implementing green dots in an arid land to achieve the SDGs #2 “Zero hunger”, #6 “Expand capacity-building support in water-related activities”, and #15 “Combat desertification”.

Here, I would like to share the vision of our SATREPS project for the next 3 years with the water resource and land greening evaluation scheme.

Prof. Dr. Sawahiko SHIMADA

Professor,
Laboratory of Environmental Information Studies,
Department of Bioproduction and Environment Engineering,
Faculty of Regional Environment Science,
Tokyo University of Agriculture



Enhancing Nutrition by Agrodiversity in Rural Areas of Kenya

Kenji IRIE

In the modern world, eating habits dependent on a narrow range of foods are considered to affect future food and nutrition security. Population growth and increasing urbanization coincide with an increase in health problems related to poor nutrition around the world.

About 800 million people experience food insecurity, while 2.1 billion people are obese or overweight. At the same time, 2 billion people lack vitamins and minerals such as vitamin A, iron and zinc, crucial to growth and development. It is worth mentioning that these forms of malnutrition often coexist. On the other hand, the use of traditional vegetables and fruits can supplement the intake of micronutrients through food diversification and can contribute to the improvement of nutrition through food consumption. In addition, it can help combat malnutrition, obesity and other health issues in developing and developed countries. Recently, the number of NCDs has increased in Kenya. It is therefore necessary to extract the topic into lifestyles. There is a variety of local agricultural products in Kenya that families have traditionally relied on. These products are highly adaptable to a variety of environmental stresses, have high micronutrients content, and are available to low- and middle-income households. There are a lot of tribes in Kenya, and their local food, crops and agricultural products are different. The development of a nutrient assessment system based on regional characteristics is necessary.

Today more than ever, the world needs to end malnutrition. The challenge for food and nutritional security in the future is a sustainable transition to nutritionally sensitive food systems that provide safe and quality food for all. We promote an effective ICT-based method for evaluating dietary habits in Kenya, with the aim of providing healthy meals to improve nutrition using local resources.

Prof. Dr. Kenji IRIE

Professor,
Department of International Agricultural Development,
Faculty of International Agriculture and Food Studies /
Graduate School of International Food and Agricultural Studies,
Tokyo University of Agriculture



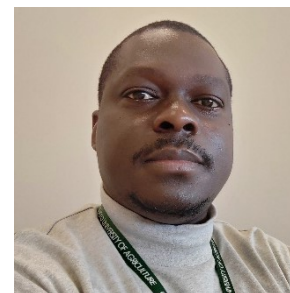
Symbiotic Relationship between Crops and Bacteria: A Promising Way toward Sustainable Agriculture?

Michel OUYABE

Since the invention of the Haber-Bosch Process and the beginning of the Green revolution several decades ago, agricultural practices have placed significant pressure on natural resources and the environment. To counter these environmental problems along with the effects of climate change, the United Nations adopted in 2015 the Sustainable Development Goals (SDGs). The SDG 2 target 4 emphasizes the need for a sustainable food production system and resilient agriculture. According to the USDA, sustainable agriculture intends to protect the environment, expand natural resources and improve soil fertility. Plant growth, productivity, yield, and food quality are influenced by both biotic and abiotic factors (Singh *et al.*, 2018), among which bacteria play an important role. Several microorganisms, such as fungi and bacteria, have been reported to be beneficial to crops. Several benefits brought by bacteria to crops include nutrients availability (Ashraf *et al.*, 2004), tolerance to biotic and abiotic stresses (Kumar *et al.*, 2020) and yield improvement. Yam (*Dioscorea* spp.) is a tropical tuber crop of important economic and medicinal value with more than 600 known species. The response of several genotypes of this crop to the application of chemical fertilizers has shown inconsistency. A field observation was made that one genotype of *Dioscorea alata*, one of the widespread cultivated yam species, could grow and yield similarly as a nitrogen-treated sample. We therefore conducted a series of studies to elucidate the interaction between several genotypes of this crop and endophytic bacteria for nutrients, especially nitrogen acquisition. Our results showed that 20-60% (genotype-dependent) of total nitrogen in the plant was derived from the air as the results of the symbiotic association with genera of bacteria belonging to the phylum Proteobacteria and Firmicutes. This result shows that the use of bacteria as biofertilizers is a promising alternative over chemical fertilizers towards sustainable agriculture. However, more scientific investigations are required as the specific host-bacterium interactions in a given ecological condition is key-factor in the outcome of this symbiosis.

Dr. Michel OUYABE

Assistant Professor,
Faculty of International Agriculture and Food Studies,
Tokyo University of Agriculture
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Tokyo University of Agriculture



**TASUKI-The sashes of Tokyo Noda feeding scientists and technologies
on future of Africa -Collaboration between Tokyo Nodai (TUA) and IITA-**

Hidehiko KIKUNO

IITA (International Institute of Tropical Agriculture) is located in Nigeria and it is a non-profit institution established in 1967 as one of 15 research centers in the CGIAR. IITA mission is to improve livelihoods, enhance food and nutrition security, increase employment and preserve natural resource integrity in Africa.

I was an ex IITA scientists belonged from 2003 to 2012. During my stay in IITA Ibadan Nigeria, 6 master students from Tokyo Nodai (TUA) were supervised by me. One of students of mine, Dr. Ryo Matsumoto is a strong scientist of IITA and he has been leading yam researches in Africa. I am deeply impressed that he has supervised a lot of students from TUA so far. Since 2012, TUA and IITA have entered into an engagement (MoU) with IITA. Although before and after the execution, Japanese students have been dispatched from TUA to IITA Ibadan Nigeria in West Africa. However, there was no movement African students came from IITA to TUA until 2015. After ABE initiative launched, IITA young staffs have been dispatched into TUA as a master student and they returned back to IITA with the degree and fruitful research experience in Japan.

The new yam technology, i.e., vine propagation on yam which has been produced and updated by Japanese scientists working with Japanese and African students, now this technology has been used at IITA with some modification. Through an ex IITA scientist (CIRAD France), this had distributed to Caribbean islands in where yam is one of staple food for local people. Now we are tackling on the innovative study on yam which is nitrogen fixation bacteria (NFB) on yam. IITA is already working on this study with TUA.

I hope that technologies and scientists originated from TUA would reach into famer field in Africa at some future day. I was also handed over the TASUKI from a Japanese senior scientist at IITA in 2003. I have to pass it to students from all over the world into TUA.

Prof. Dr. Hidehiko KIKUNO

Professor,
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