

**The Twenty-third International Students Summit (ISS) on  
Food, Agriculture and Environment**

**Youth Actions and Collaboration  
towards Resilient Food Systems  
and Environmental Conservation.**

July 31 - August 3, 2024



**2024 TOKYO**

Organized by  
Tokyo University of Agriculture (Tokyo NODAI)

# The Twenty-third International Students Summit (ISS) on Food, Agriculture and Environment

*Youth Actions and Collaboration towards Resilient Food Systems  
and Environmental Conservation.*

**July 31 - August 3, 2024**

## Statement

Over the last centuries, the world has gone through remarkable changes in various fields such as agriculture, food and Environment. Some of these changes include climate changes, emerging technologies and rapid population increase. Today, demographers expect the world population to peak by the end of this century. Fueled by climate shocks, many are facing unprecedented food insecurity. We cannot deny that the future of mankind is at a critical crossroads and we need to rise to the challenge of meeting people's immediate food needs, ensuring environmental protection and at the same time, through collaboration, supporting the processes that build long-term resilience. Our communities must take smart and efficient decisions based on our common commitments to reducing to the minimum all emissions of greenhouse gases which impact multiple aspects of our lives. This global situation makes it evident and urgent to draw together the wisdom and vitality of youth, the torchbearers of the future of mankind. There are especially wide-ranging missions for agricultural students, as agricultural science plays a key role in the solution of fundamental problems in food production and safety, environmental conservation, energy, and human health. How the youth can act to bring answers to those challenges is utmost needed and represents an outline of what one can expect in the future innovations to tackle such issues.

Tokyo University of Agriculture (Tokyo NODAI) organizes the "International Students Summit on Food, Agriculture and Environment (ISS)" to provide students from our global partner universities with an opportunity to gather and exchange views and ideas on global food, agricultural, and environmental issues, and also to discuss their own roles in sustainable development.

This year, the 23<sup>rd</sup> ISS will take place from July 31 - August 3, 2024 around the theme "*Youth Actions and Collaboration towards Resilient Food Systems and Environmental Conservation*" which was adopted at the 22<sup>nd</sup> ISS. We expect the participating students to attend physically and share the activities (actions) undertaken at home university that have a positive impact to the communities during ISS presentations and discussions. These student-led actions can either be ideas or ongoing activities. The framework of student activity as to the rationale, methods, implications (economic, social and cultural), and constraints should be clarified in order to foster their contributions to the solution of global problems for the sustainability of this world. Basically, one oral presentation will be accommodated for each selected participating university in the following fields.

Students' Actions in the field of agriculture

Students' Actions in the field of environment

Students' Actions in the field of food

Students' Actions in the field of education

Students' Actions in the field of nutrition

\* Submitted ISS manuscripts will be reviewed by ISS Committee during the screening process following the criteria provided and to evaluate if the presentation is within the scope of the ISS main theme.

\* Each partner university is required to appoint a faculty advisor(s) to support the presenter(s). The advisors are welcome to attend ISS physically if self-sponsored or otherwise supported.

Organizing Committee & Students Committee,  
International Students Forum,  
Tokyo University of Agriculture

# CONTENTS

Statement of the 23rd International Students Summit .....	1
List of University Student Presenters .....	3
Program .....	6
<b>Group Discussion A</b>	
(Group theme: Sustainable Solutions, Youth Innovations) .....	11
<b>Group Discussion B</b>	
(Group theme: Thinking Globally while Acting Locally to Nurture the Planet) .....	17
<b>Group Discussion C</b>	
(Group theme: Towards a Better Tomorrow) .....	23
<b>Group Discussion D</b>	
(Group theme: Unity for Our Vitality) .....	29
<b>Group Discussion E</b>	
(Group theme: Eco-friendly Innovation for a Sustainable Tomorrow) .....	35
<b>Group Discussion F</b>	
(Group theme: Empowering Communities through Sustainable Practices) .....	41
<b>Group Discussion G</b>	
(Group theme: Education and Actions towards Sustainability) .....	47
<b>Voices from Next Generation</b> .....	53
<b>Materials</b> .....	63
Tokyo Declaration .....	64
International Students Summit Action Plan .....	65
Establishing International Students Forum .....	66
Establishing Global Network for Environment, Food and Agriculture .....	67
Mission Statement of International Students Forum (ISF) .....	68
Acknowledgement .....	69

**To the audience of the 23rd International Students Summit**

Please check the ISS Tokyo Nodai website for the latest information.

<https://www.isstokyonodai.net/>

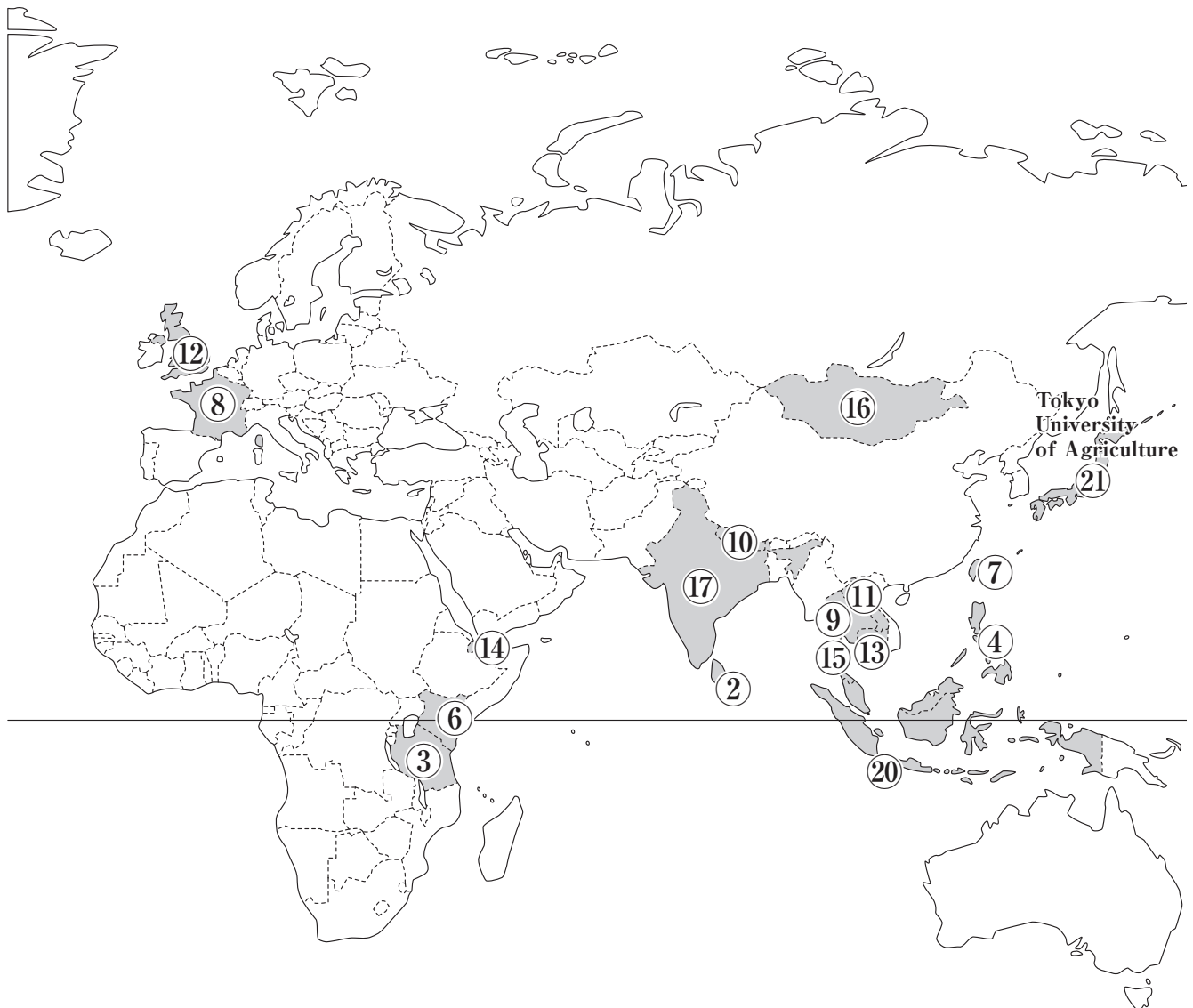
## List of University Student Presenters

Student Name	University	Page
<b>Group A</b>		
Zinsou Chungwon Fructueux (Chairperson) Ebisawa Sumire (Chairperson)		
Annabelle Liao	The University of British Columbia	12
Nimthara Heshani Witharana	University of Peradeniya	13
Beny John Mwamhanga	Sokoine University of Agriculture	14
Jeanne Loise S. Pempeña	University of the Philippines Los Baños	15
<b>Group B</b>		
Andrew Agrey Abiya (Chairperson) Laura Lee Zi Lyn (Chairperson)		
Mário Davi Coutinho Santos	Federal Rural University of Amazon	18
Faith Wangui Esika	Jomo Kenyatta University of Agriculture and Technology	19
Naoki Kato	Tokyo University of Agriculture	20
Yi Xuan Liu	National Chung Hsing University	21
<b>Group C</b>		
Kazuma Matsuo (Chairperson) Phyoe Su Su Kyaw (Chairperson)		
Peter Oguda Okech	Jomo Kenyatta University of Agriculture and Technology	24
Di Matteo Margot	UniLaSalle	25
Chanyaorn Panrat	Kasetsart University	26
Sarita Shrestha	Agriculture and Forestry University	27
<b>Group D</b>		
Marwa Moilid Aboubaker (Chairperson) Hideaki Miyagi (Chairperson)		
Emma Chepkoech	Jomo Kenyatta University of Agriculture and Technology	30
Phetsavanh Songvilay	National University of Laos	31
Sofiia Yemets	University of Reading	32
Limkang Eang	Royal University of Agriculture	33
<b>Group E</b>		
Martha Deogratias Hilary (Chairperson) Tashiro Akitaka (Chairperson)		
Idleh Aya Osman	University of Djibouti	36
Raymond Gabriel Semindu	Sokoine University of Agriculture	37
Nattarika Jitfour	Thammasat University	38
Enerel Ser-Od	Mongolian University of Life Sciences	39
<b>Group F</b>		
Ayoubu Williadi Mtagawa (Chairperson) Yuki Sawai (General Chairperson)		
Tannu	CCS Haryana Agricultural University, Hisar	42
John Kinyanjui Wanjira	Jomo Kenyatta University of Agriculture and Technology	43
José Renato Schmidt de Carvalho	University of São Paulo	44
Martha David Biseko	Sokoine University of Agriculture	45
Mai Mochizuki	Tokyo University of Agriculture	46
<b>Group G</b>		
Kabuga Norah Gakii (Chairperson) Nao Hayashi (Chairperson)		
Elizabeth Marie Babcock	Michigan State University	48
Miyuri Takahashi	Tokyo University of Agriculture	49
Lilian Marselian Kway	Sokoine University of Agriculture	50
Andi Mahatir Nur Tasrih	IPB University	51

General Chairpersons    Orujov Oruj  
                                  Hiroki Sato  
                                  Yuki Sawai

All the chairpersons are students representing Tokyo University of Agriculture

## The 23<sup>rd</sup> ISS Participating Universities



- ① The University of British Columbia
- ② University of Peradeniya
- ③ Sokoine University of Agriculture
- ④ University of the Philippines Los Baños
- ⑤ Federal Rural University of Amazon

- ⑥ Jomo Kenyatta University of Agriculture and Technology
- ⑦ National Chung Hsing University
- ⑧ UniLaSalle
- ⑨ Kasetsart University
- ⑩ Agriculture and Forestry University



- ⑪ National University of Laos
- ⑫ University of Reading
- ⑬ Royal University of Agriculture
- ⑭ University of Djibouti
- ⑮ Thammasat University
- ⑯ Mongolian University of Life Sciences

- ⑰ CCS Haryana Agricultural University, Hisar
- ⑱ University of São Paulo
- ⑲ Michigan State University
- ⑳ IPB University
- ㉑ Tokyo University of Agriculture

# Program

Venue: Setagaya Campus International Center 2F Enomoto Hall

Join live in Microsoft Teams: <http://tiny.cc/Nodai-ISS-2024>



## Group A: Sustainable Solutions, Youth Innovations

---

Aug. 1, Thursday 10:40 AM (Japan time)

---

**[Embedding Sustainable and Equity-Driven Food Systems in Vancouver Using Collaboration, Youth Leadership, and The University of British Columbia as a Launchpad]**

Annabelle Liao, *The University of British Columbia*

**[Sustaining Cascaded Tank Systems in Sri Lanka: Mobilizing Youth to Take Initiatives in Conserving the Habitats and Biodiversity for Safeguarding the Livelihood System]**

Nimthara Heshani Witharana, *University of Peradeniya*

**[Advancing Climate-Smart Livestock Farming in Tanzania: The Use of Mnyama Check Digital Platform Integrated with Sensor Technology for Monitoring, Adaptation and Sustainable Livestock Production]**

Beny John Mwamhanga, *Sokoine University of Agriculture*

**[Youth-Based Recommendations for Upcycling Community Food Wastes into Sustainable Agricultural Inputs]**

Jeanne Loise S. Pempeña, *University of the Philippines Los Baños*

## Group B: Thinking Globally while Acting Locally to Nurture the Planet

---

Aug. 1, Thursday 13:00 PM (Japan time)

---

**[Characterization of Organic Solid Waste from Production Chains of Para State Economy with an Aim to Propose Efficient Reuse Solutions]**

Mário Davi Coutinho Santos, *Federal Rural University of Amazon*

**[Utilizing Frass from Black Soldier Fly Larvae as Fertilizer to Enhance Soil Fertility and Promote Sustainability in Agriculture and Environmental Management]**

Faith Wangui Esika, *Jomo Kenyatta University of Agriculture and Technology*

**[Protecting the Biodiversity: A Study of Marine Debris in Mangroves]**

Naoki Kato, *Tokyo University of Agriculture*

**[Research on Consumers' Purchase Behavior of Agricultural Products in Taiwan Farmer Associations on Live-Streaming]**

Yi Xuan Liu, *National Chung Hsing University*

## Group C: Towards a Better Tomorrow

---

Aug. 1, Thursday 14:40 PM (Japan time)

---

**[Effect of Different Fermentation Methods on Nutritional Value and Alkaloid Content of Slenderleaf Vegetables (*Crotalaria brevidens*)]**

Peter Oguda Okech, *Jomo Kenyatta University of Agriculture and Technology*

**[Champ d’Innovation at School: Fostering Dialogue and Collaboration for Sustainable Agriculture]**

Di Matteo Margot, *UniLaSalle*

**[Youth Awareness and Action on Environmental Conservation]**

Chanyaorn Panrat, *Kasetsart University*

**[Cultivating Change: Youth-Led Sustainability Initiatives in Tikapur, Nepal]**

Sarita Shrestha, *Agriculture and Forestry University*

## Group D: Unity for Our Vitality

---

Aug. 1, Thursday 16:30 PM (Japan time)

---

**[Dragon Fruit Revolution: Empowering Youth for Sustainable Food Systems and Environmental Conservation]**

Emma Chepkoech, *Jomo Kenyatta University of Agriculture and Technology*

**[Establishment of Non-Timber Forest Products Reserve Area: Research Study to Ensure Sustainable Food Security in Laos]**

Phetsavanh Songvilay, *National University of Laos*

**[The Impact of University Life on Students’ Food Choices: An Examination of Eating Habits and Influences]**

Sofia Yemets, *University of Reading*

**[Histamine Reduction in Prahok (Fermented Fish Paste) Production]**

Limkang Eang, *Royal University of Agriculture*



## Group E: Eco-friendly Innovation for a Sustainable Tomorrow

---

Aug. 2, Friday 9:00 AM (Japan time)

---

**[Preservation of Mangroves in Djibouti: Study on the Impact of Anthropogenic Pollution on the Growth and Photosynthetic Efficiency of *Rhizophora Mucronata* in the Douda-Damerjog Mangrove and Sustainable Management Strategies]**

Idleh Aya Osman, *University of Djibouti*

**[Enhancing Maize Productivity through Biopesticide Mixture: Evaluating the Efficacy of Palm Oil, Tobacco and Neem Leaf Extracts Against Fall Armyworm (Faw) Infestation in Mikese, Morogoro Region, Tanzania]**

Raymond Gabriel Semindu, *Sokoine University of Agriculture*

**[Development of Bio-products to Enhance Growth Promoting and Disease Control of Economic Plants]**

Nattarika Jitfour, Dusit Athinuwat, and Wilawan Chuaboon, *Thammasat University*

**[The Way of Opportunities to Reduce, Reuse and Recycling Food Wastes in Mongolia]**

Enerel Ser-Od, *Mongolian University of Life Sciences*

## Group F: Empowering Communities through Sustainable Practices

---

Aug. 2, Friday 10:40 AM (Japan time)

---

**[Resource Optimization: Innovative Strategies for Straw Management]**

Tannu, *CCS Haryana Agricultural University, Hisar*

**[Improving Food Security through Increasing Productivity of Chicken]**

John Kinyanjui Wanjira, *Jomo Kenyatta University of Agriculture and Technology*

**[Sharing Actions: The Human Element in a Sustainable Journey]**

José Renato Schmidt de Carvalho, *University of São Paulo*

**[The Challenge of Limited Availability and Variety of Food Options on University Campuses]**

Martha David Biseko, *Sokoine University of Agriculture*

**[Tea Matters: Student Cultivating Change in the Japanese Tea Industry through the Matcha Project]**

Mai Mochizuki, *Tokyo University of Agriculture*

## Group G: Education and Actions towards Sustainability

---

Aug. 2, Friday 13:00 PM (Japan time)

---

### **[Utilizing Arts-Based Education to Create Resilient Food Systems]**

Elizabeth Marie Babcock, *Michigan State University*

### **[The Role of Students in Creating a Sustainable Cacao Industry]**

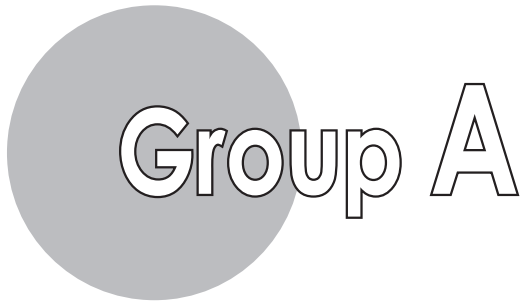
Miyuri Takahashi, *Tokyo University of Agriculture*

### **[Enhancing Food and Nutrition Security through Promotion of Underutilized Indigenous African Leafy Vegetables]**

Lilian Marselian Kway, *Sokoine University of Agriculture*

### **[StayedLocal: Advocacy Program for Integrating Local Food Supply Distribution to Strengthen Food Independence and Sustainable Business Practices in South Tangerang]**

Andi Mahatir Nur Tasrih, *IPB University*



## **Sustainable Solutions, Youth Innovations**

Presenters:

**Annabelle Liao**, The University of British Columbia

**Nimthara Heshani Witharana**, University of Peradeniya

**Beny John Mwamhanga**, Sokoine University of Agriculture

**Jeanne Loise S. Pempeña**, University of the Philippines Los Baños

Chairperson:

**Zinsou Chungwon Fructueux**

**Ebisawa Sumire**

# Embedding Sustainable and Equity-Driven Food Systems in Vancouver Using Collaboration, Youth Leadership, and The University of British Columbia as a Launchpad

Annabelle Liao

*Academic Supervisor: Dr. Leslie Lavkulich*

The University of British Columbia, Canada

## **Abstract**

With acceleration of the effects of climate change and rapidly rising food costs, the intersections of environmental sustainability and strong food systems are extremely prevalent, requiring an all-hands-on-deck approach. Describing the campus as a “living lab” to catalyse sustainability innovation, the University of British Columbia’s Vancouver campus (UBCV) is a leader in supporting the creation and implementation of programs, projects, and policies that foster climate-friendly and affordable food systems which often continue generating impact across the broader City of Vancouver. This acknowledgement of their ideal positioning and commitment by UBCV to create a just and resilient campus-wide food system, coupled with the abundance of environmentally inclined youth changemakers who take leadership in collaborating with community partners and campus stakeholders, empowers the prioritization of multiple intersectional pathways to embed more resilient climate-friendly and equitable food systems in communities. Thus, this paper will outline and evaluate three collective initiatives (youth-led and UBCV-supported) designed to alleviate food insecurity while bolstering environmental sustainability through the lens of grassroots organizing, institutional-level change, and policy development and advocacy.

**Keywords:** sustainability, food insecurity, climate-friendly food systems, youth leadership, equity

# **Sustaining Cascaded Tank Systems in Sri Lanka: Mobilizing Youth to Take Initiatives in Conserving the Habitats and Biodiversity for Safeguarding the Livelihood System**

**Nimthara Heshani Witharana**

*Academic Supervisor: Prof. H.M.G.S.B. Hitinayake*

University of Peradeniya, Sri Lanka

## **Abstract**

The cascaded tank-village system in the Dry Zone of Sri Lanka was designated as a GIAHS in 2017. This system comprises a connected series of tanks (small water reservoirs) arranged along a natural drainage line in a watershed. Over time, these tank cascade systems have developed into ecosystems rich in biodiversity, providing habitats for endangered species such as Asian elephants (*Elephas maximus*), resident and migratory water birds, as well as numerous native plant species with significant medicinal and nutritional value. The ecosystem services rendered by this system are extensive, encompassing water conservation, purification, soil stabilization, flood control, carbon dioxide sequestration, climate change adaptation, mitigation, and more.

My primary aim in undertaking this project was to benefit my community and safeguard the surrounding environment, particularly as a resident of Anuradhapura, renowned as 'the kingdom of tanks' due to its high concentration of tanks in Sri Lanka's northern dry zone. The initial literature review I conducted highlighted the gradual decline of these tank system components, as well as their functionality, as a key concern. Subsequent exploratory visits to tank villages and ecosystems further confirmed and deepened my understanding of these issues. A specific tank in Anuradhapura was chosen for an in-depth study, including a biodiversity assessment to grasp the ecological significance of the tank ecosystem. Presently, the lack of proactive involvement among the youth, who represent the future village leaders, in ensuring the sustainability of these tank systems is posing uncertainties regarding their health, longevity, and overall sustainability. Furthermore, there is a noticeable deficiency in the youth's knowledge about the system, its ecosystem components, and their operations. To bridge this gap, a transect walk was organized to enhance the youth's understanding of the tank ecosystem components and their functioning. Subsequently, to sustain this endeavour, a youth society was formally established in the village as the next phase of the project.

**Keywords:** biodiversity conservation, cascaded Tank-Village system of Sri Lanka, mobilization of youth

# Advancing Climate-Smart Livestock Farming in Tanzania: The Use of Mnyama Check Digital Platform Integrated with Sensor Technology for Monitoring, Adaptation and Sustainable Livestock Production

**Beny John Mwamhanga**

AFYA YA MNYAMA DIGITAL LIMITED

*Academic Supervisor: Prof. Esron Karimuribo*

Sokoine University of Agriculture, Tanzania

## **Abstract**

Livestock sector is a key agriculture sub-sector in Tanzania which employs about 36% of farm households engaged in livestock keeping. Out of the 36% households, only 1% practice pure livestock farming while 35% practice mixed crop-livestock farming. The sub-sector contributes 7% to the country GDP and food security. Climate changes has posed significant impacts on livestock management including pasture and water availability, spread of trans-boundary (TADs) as well as emerging and re-emerging diseases affecting both animals and humans. Other impacts are related to poor breeding, and low animal productivity; leading to reduced contribution to the national GDP and food security in our country. We designed and adopted “Mnyama check” platform that integrates sensor technology to monitor livestock health parameters and climate variables is revolutionizing how livestock can be managed and monitored. Farmers can use the technology to streamline the monitoring of animal behaviour and welfare, predict disease outbreaks, reproduction, location tracking and optimize feeding schedules. Currently, the platform has been piloted on three farms with a total number of 4,000 livestock including cattle, sheep and goats, pigs and dogs. Initial findings indicate that there was enormous improvement in real-time monitoring and early detection of animal diseases, reduced loss of animals and cost of disease management, and increased animal reproduction rates. We recommend investment in innovative sensor technologies in Tanzania so that they could contribute to enhanced animal productivity and sustainability in Tanzania.

**Keywords:** livestock production, mnyama check, sensor technology, digital tool, climate change

# Youth-Based Recommendations for Upcycling Community Food Wastes into Sustainable Agricultural Inputs

Jeanne Loise S. Pempeña

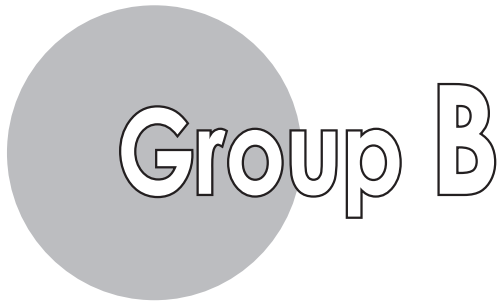
*Academic Supervisor: Prof. Dr. Percival P. Sangel*

University of the Philippines Los Baños, Philippines

## Abstract

Food waste (FW) poses a significant global challenge, contributing to environmental degradation and exacerbating food insecurity. The rising prices of essential agricultural inputs disproportionately burden smallholder farmers, hindering their ability to cultivate sustainably sourced, nutritious produce. While efforts have been made to address these issues by converting food waste into agricultural inputs, it is crucial to carefully optimize these processes to meet industry standards and local resource capacities. This youth initiative seeks to establish practical guidelines for partnerships with university research faculties and student organizations aimed at transforming community food waste into farmer-friendly agricultural inputs. The initial step involved conducting a survey to identify and characterize the food waste generated by key food enterprises. Findings revealed that small- to medium-sized dining areas (SMDAs) produced the highest average weekly food waste at five (5) kg per establishment, followed by *karenderias* at four (4) kg and bakeries at two (2) kg. Clustering analysis emphasized common waste streams including food leftovers, vegetable trimmings, spice peels, used cooking oil, and eggshells which were further categorized as edible or inedible. An open-forum discussion with university youth led to the development of a preliminary processing pipeline designed for sustainable conversion of classified edible and inedible food wastes into animal feeds or biofertilizers using techniques such as heat treatment, dehydration, aerobic composting, black soldier fly (BSF) culture, vermiculture, and silage incorporation. These approaches are feasible within university premises and well-suited to the skill level of youth volunteers. Additionally, biotechnological augmentation is considered pivotal in enhancing various facets of this pipeline, leveraging efficient indigenous microbial strains and sustainable enzyme digestion systems to optimize nutrient recovery and bioavailability. By addressing interconnected challenges faced by both FW management and agricultural sustainability, this initiative shall bolster collaborative efforts among youth and stakeholders in empowering local farmer communities towards a more circular and resilient agricultural-food system.

**Keywords:** community food waste, upcycled farm inputs, farmer empowerment



## **Thinking Globally while Acting Locally to Nurture the Planet**

Presenters:

**Mário Davi Coutinho Santos**, Federal Rural University of Amazon

**Faith Wangui Esika**, Jomo Kenyatta University of Agriculture and  
Technology

**Naoki Kato**, Tokyo University of Agriculture

**Yi Xuan Liu**, National Chung Hsing University

Chairperson:

**Andrew Agrey Abiya**

**Laura Lee Zi Lyn**



# Characterization of Organic Solid Waste from Production Chains of Para State Economy with an Aim to Propose Efficient Reuse Solutions

**Mário Davi Coutinho Santos**

Research in environmental education and solid waste students' group.

*Academic Supervisor: Dr. Ana Regina da Rocha Araújo*

Federal Rural University of Amazon, Brazil

## **Abstract**

Currently, with the increase in the world population, the problem of generating a large amount of industrial and agro-industrial waste has contributed to the so-called "global environmental crisis". The implementation or improvement of actions and programs aimed at the reuse and correct disposal of solid waste requires commitment from the entire society, greater planning and attention from public authorities, and effective participation from industry, promoting gains in the social, economic and environmental spheres. Therefore, the objective of this work was to carry out the chemical characterization of different organic waste generated on a large scale in the state of Pará, with the aim of proposing solutions for the correct management of this material. The study is divided into two stages, the first involves the characterization of the nutrients found in the plant material and in the second stage, this material goes through a thermal-catalytic cracking process, carried out on a bench scale, with the aim of subsequently evaluating the properties and applications of the final products. Therefore, the results obtained showed that there was a difference between the concentrations of nutrients in the waste, in which the nutritional aspect varied according to the type of waste analyzed. The results of analyzing the nutritional composition and obtaining pyrolysis by-products showed great potential for the biomass analyzed as a possible alternative for generating clean energy. In addition, there will be the preparation of a technical manual for the reuse of waste of great relevance in the state of Para by the research group on environmental education and solid waste, responsible for this study.

**Keywords:** environmental education, pyrolysis, reuse

# Utilizing Frass from Black Soldier Fly Larvae as Fertilizer to Enhance Soil Fertility and Promote Sustainability in Agriculture and Environmental Management

Faith Wangui Esika

*Academic Supervisor: Dr. Matthew Kigomo*

Jomo Kenyatta University of Agriculture and Technology, Kenya

## Abstract

Insect frass fertilizer as an alternative soil amendment has been shown to improve the soil fertility and structure thereby promoting resilience in the productivity of soil and in conservation of the environment. Insect farming in Kenya and especially among the youth is on the rise. Black soldier fly larvae (BSFL) farming specifically is steadily becoming a popular venture among the youth who wish to do insect farming. However, BSFL farming has mainly focused on the production of insect-based feed for livestock, leading to a gap in knowledge on the exploration of insect frass fertilizer as a sustainable soil amendment to not only improve the soil fertility and structure of the soil but also promote resilience in agricultural systems. Frass fertilizer is produced from the excreta of the larvae after feeding on organic waste materials and other agricultural by-products. From emerging research and practical applications, frass fertilizer shows great potential in enhancing nutrient availability in the soil, improving the soil structure, increasing crop yields and reducing the reliance on synthetic fertilizers. From recent studies done in collaboration with the International Centre of Insect Physiology and Ecology (ICIPE), Nairobi, frass fertilizer from BSFL has been shown to have higher concentrations of the macronutrients; Nitrogen, Phosphorus, Potassium, Sulfur than other insect fertilizers and significant amounts of the micronutrients. In another study, the amendment of soil with BSFL frass fertilizer was seen to increase the yields and nutrient supply of maize and other locally consumed vegetables. This was attributed to the high release of nutrients resulting from the high mineralization rate of BSFL frass fertilizer and high availability of mineral nitrogen in the top 20cm of soil. Moreover, the use of frass fertilizer contributes to environmental conservation in ways such as; reducing environmental pollution associated with waste disposal, minimizing water pollution, soil degradation and soil biodiversity loss arising from the use of chemical inputs and improving soil carbon sequestration. By harnessing this potential of frass fertilizer, farmers and agricultural practitioners in Kenya can adopt more sustainable soil management practices which contribute to resilient food systems and environmental conservation efforts.

**Keywords:** environmental conservation, frass fertilizer, resilient agriculture, soil fertility

# Protecting the Biodiversity: A Study of Marine Debris in Mangroves

**Naoki Kato**

Mangrove Research Association

*Academic Supervisor: Dr. Kou Hinokidani*

Tokyo University of Agriculture, Japan

## **Abstract**

The Mangrove Research Association, established in 2006 and revitalized in 2021, is a student club with three primary objectives: to protect natural environments including mangroves, to engage with local communities near mangrove forests and learn about their traditions and cultures, and to conduct research to uncover unknown aspects of mangroves. With these goals in mind, the group strives to enjoy activities in harmony with nature. Currently, the group consists of 38 student members who go to Iriomote Island, one of the World Heritage Sites in Okinawa Prefecture, every year to conduct research and activities. Other activities include making presentations at the school festival and growing mangroves in the university. I joined the Mangrove Research Association in the first month of my freshman, motivated by the importance of mangrove ecosystems for biodiversity, carbon sequestration, and disaster mitigation. This report presents the findings from our investigations in 2022 and 2023 and outlines future challenges. In 2022, we collected marine debris along a 1.5-kilometer stretch of coastline on Iriomote Island, identifying and categorizing the types and origins of the waste, with plastic bottles being the most. In 2023, we measured the weight of microplastics at six different coastal locations on Iriomote Island, finding an average of 49.38 grams of microplastics per square meter, equivalent to the weight of a single egg. These results highlight significant environmental concerns regarding marine pollution. I would like to use this International Student Summit to consider the current state of the marine litter problem and how we should face it in the future.

We are currently being studied for microplastic and marine debris accumulation in mangrove forests. There is a hypothesis that mangroves may help reduce litter discharge into the ocean by serving as natural trash collectors due to their intricate root systems. The roots of mangroves act like a cage, trapping and entangling litter, making it easier to collect on land. This method is potentially more cost-effective than collecting debris from the ocean directly.

**Keywords:** mangrove, microplastic, marine debris

# Research on Consumers' Purchase Behavior of Agricultural Products in Taiwan Farmer Associations on Live-Streaming

Yi Xuan Liu

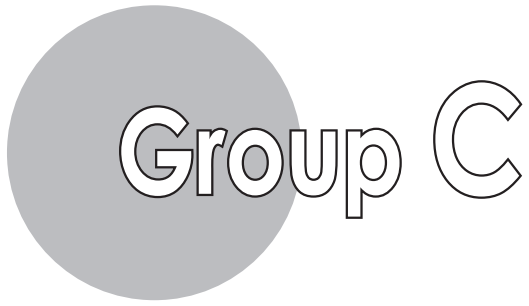
*Academic Supervisor: Prof. Shang-Ho Yang*

National Chung Hsing University, Taiwan

## **Abstract**

The global digital economy has thrived with the widespread adoption of mobile 5G technology and the rapid development of the internet since 2010, especially in e-commerce. Currently, many platforms in e-commerce have introduced the function of live-streaming in various countries, including Taiwan. Previous studies have shown that the live-streaming has potential to improve sales of agricultural products, thereby, increasing farmers' income. It brings us an idea of whether young farmers in Farmer Association (FA) could adopt this approach and increase the sales of agricultural products or not. The study follows the stimulus-organism-response (SOR) theory to explain the impact of live-streaming on the sales of FA. The research seeks to understand what factors could influence the purchasing intention and behavior of FA supermarket consumers. A quantitative approach via a survey with 500 samples can help us to identify the factors. Since the characteristics of FA in Taiwan and Japan Agricultural (JA) Cooperatives are very similar, it would be great to share our new findings at the 2024 international student summit.

**Keywords:** live-streaming, farmer association, marketing, purchasing intention



## Towards a Better Tomorrow

Presenters:

**Peter Oguda Okech**, Jomo Kenyatta University of Agriculture and  
Technology

**Di Matteo Margot**, UniLaSalle

**Chanyaorn Panrat**, Kasetsart University

**Sarita Shrestha**, Agriculture and Forestry University

Chairperson:

**Kazuma Matsuo**

**Phyoe Su Su Kyaw**

# Effect of Different Fermentation Methods on Nutritional Value and Alkaloid Content of Slenderleaf Vegetables (*Crotalaria brevidens*)

Peter Oguda Okech

*Academic Supervisor: Prof. Arnold Onyango*

Jomo Kenyatta University of Agriculture and Technology, Kenya

## Abstract

African foods and associated traditional technologies can contribute significantly to alleviating hunger and malnutrition. The importance of African indigenous vegetables is undeniable, but they are often seasonally linked and considered “food for the poor” despite their high nutritional content. Major challenges facing the consumption of these vegetables include a lack of awareness of their nutritional value, improper processing methods, and inadequate seed production. To promote consumption of these vegetables, I conducted research to determine slenderleaf’s vitamin composition and developed a processing method that increased its shelf life, enhanced its vitamin composition, and reduced its alkaloid content. This was accomplished through the lactic acid fermentation of the vegetable. The vegetables were fermented through controlled and spontaneous fermentation. Controlled fermentation involved use of *Lactobacillus plantarum* BFE 5092 starter culture at 32 °C in a 6% brine solution. Spontaneous fermentation was done at room temperature (22-26 °C) without any starter culture in a 6% brine solution. There was a 49.3% reduction in alkaloids after 5 days of controlled fermentation, while vitamin C,  $\beta$ -carotene, thiamine, folate, and cobalamin increased by 12.9%, 49.4%, 152.7%, 33.3%, and 14.3%, respectively. Under spontaneous fermentation, these vitamins increased by 2.9%, 22.9%, 118.3%, 42.9%, and 7.2%, respectively, while alkaloids decreased by 38.7%. The research outlines the future role of lactic acid fermentation in achieving resilient food systems that are environmentally friendly and cost-effective. Beyond research, I also engaged in an indigenous vegetable seed production project, producing quality seeds for small farm holders in Kiambu County. Additionally, I conducted an awareness campaign among university students, educating them about the important role of African indigenous vegetables. Through collaboration, we are also creating a nutrition awareness website for the promotion of indigeneous vegetables, which will target the youth. This demonstrates youth collaboration and involvement in building a resilient food system that is environmentally friendly and cost-effective.

**Keywords:** African indigenous vegetables, lactic acid bacteria, vitamins

# Champ d'Innovation at School: Fostering Dialogue and Collaboration for Sustainable Agriculture

**Di Matteo Margot**

Champs Innovation at School

*Academic Supervisor: Terrie Caroline*

UniLaSalle, France

## **Abstract**

The United Nations' sustainability goals highlight the pursuit of sustainable education in agriculture, however there are still many obstacles to overcome. In response, the Sustainable Development Education programs of the French Ministry of Agriculture have been launched with the objective of educating and involving stakeholders in the direction of a more sustainable framework. The French Ministry of Agriculture's projects are examined in this article, with a special emphasis on those undertaken in Normandy. According to Haruna et al., participants in agricultural education programs actively participate, which benefits community development and the provision of a sustainable food supply. Youth, however, voice reservations about the effectiveness of initiatives in tackling prominent issues. To solve this, it is imperative that school farms be established and managed by students, as this will encourage increased participation and practical skills.

The Regional Chamber of Agriculture of Normandy organizes the "Champ d'Innovation" forum, which encourages discussion among agricultural professionals about sustainable production practices. The Chamber commissioned "Champ d'Innovation at School," an additional event, in recognition of the substantial student involvement, with the goal of promoting student-startup collaboration on sustainable solutions.

The goal of the UniLaSalle students' "Champ d'Innovation at School" project is to encourage communication between students and sustainable entrepreneurs. A great deal of planning was done, including research, interactions with clients, and collaboration with startups and educational institutions. The purpose of the multi-location event is to encourage student involvement and contact suppliers of sustainable solutions.

Overcoming language hurdles and maximizing team abilities are among the challenges encountered. Nonetheless, the project's goal is to maintain a stable forum for upcoming generations.

The project supports the dissemination of information and useful solutions, which is in line with the theme of education. It gives students optimism in the face of insurmountable obstacles by enabling them to take the lead in promoting sustainability in Normandy's agriculture industry.

**Keywords:** education, forum, sustainable, dialogue, Chamber of Agriculture of Normandy

# Youth Awareness and Action on Environmental Conservation

Chanyaorn Panrat

*Academic Supervisor: D.Eng. Varinporn Asokbunyarat's*

Kasetsart University, Thailand

## Abstract

Environmental issues have become the biggest challenge for our world today. As a result, the government has adopted SDGs (Sustainable Development Goals) to find sustainable solutions for these issues. The activities I've done are directly related to Zero Hunger, Responsible Consumption and Production, Climate Action, Life Below Water, and Life on Land. In addition, the first thing we have to do is to be aware of the environment issues so we will be able to solve it. Simple things like 3R (reduce, reuse, recycle) and waste sorting are part of the solution that everyone can easily participate in everywhere while living daily life. I have always done waste sorting at home and university. I have an idea for a future to start adding more waste sorting garbage in my community and university and to spread information about the correct way to separate waste. Most people in this generation are aware of environmental issues and how they affect their lives and the future living conditions of the next generation. As students, we can use social media to be a voice for making people aware of the importance of the environment. In addition to that we can still participate in terms of environmental conservation camps at our university and community. Eventually, with cooperation from both the government and the public, I believe that we can create a sustainable way to solve environmental issues.

**Keywords:** environmental conservation, SDGs, waste sorting



# Cultivating Change: Youth-Led Sustainability Initiatives in Tikapur, Nepal

Sarita Shrestha

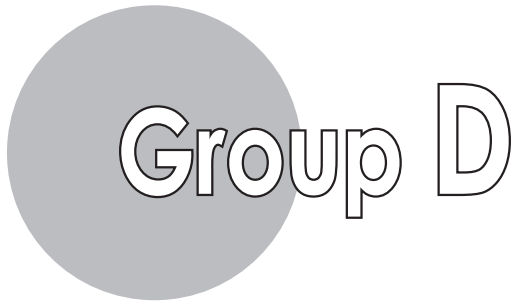
*Academic Supervisor: Prof. Ramesh Upreti*

Agriculture and Forestry University, Nepal

## Abstract

Tikapur community in Nepal faces a multitude of challenges related to food security and environmental conservation, stemming from socio-economic, environmental and institutional factors. Over the time, traditional agricultural methods have transitioned to inorganic practices to meet the rising food demands, leading to reduced yields and increased susceptibility to food insecurity and poverty. This problem is further intensified by environmental degradation, driven by unsustainable activities like deforestation and heavy pesticide use, alongside climate change effects such as unpredictable rainfall, extended droughts and rising temperatures. Lack of access to extension services, adoption of recommended farming practices and lack of training for organic farming further worsens the situation, leading to migration for better opportunities and trapping smallholder farmers in vicious poverty cycles. ASLF recognizes these challenges and provides platform that mobilizes youth to take action for sustainable future. In response, youth-led initiatives such as awareness campaigns, tree plantation drives, waste management initiatives and community garden projects have been undertaken. These efforts have led to increased awareness, improved sanitation, higher youth participation and capacity enhancement among participants to tackle local challenges faced by them. A post-campaign survey revealed the effectiveness of these initiatives, with 90% of trainees reporting improved understanding and implementation of organic farming practices and more than half of the respondents noting a decrease in the cost of chemical fertilizers and pesticides. Furthermore, 70% reported adoption of at least one eco-friendly technique. Despite these positive outcomes, barriers to agricultural production were identified using a force ranking scale technique, with poor access to agricultural inputs ranking highest among the challenges. Resource constraints, knowledge gaps and cultural resistance remained challenging issues during the course of activities conducted. However, engaging local communities, building partnerships, enhancing capacity and implementing adaptation strategies offer promising pathways to overcome these challenges and promote resilient food systems and environmental conservation in Tikapur, Nepal. Through these efforts, we aim to inspire and mobilize youth globally to address the interconnected challenges faced by our communities and the planet.

**Keywords:** climate change, awareness, sustainability, youth



## Unity for Our Vitality

Presenters:

**Emma Chepkoech**, Jomo Kenyatta University of Agriculture and Technology

**Phetsavanh Songvilay**, National University of Laos

**Sofia Yemets**, University of Reading

**Limkang Eang**, Royal University of Agriculture

Chairperson:

**Marwa Moilid Aboubaker**

**Hideaki Miyagi**

# Dragon Fruit Revolution: Empowering Youth for Sustainable Food Systems and Environmental Conservation

Emma Chepkoech

*Academic Supervisor: Prof. John Mwibanda Wesonga*

Jomo Kenyatta University of Agriculture and Technology, Kenya

## Abstract

Putting to mind the vast growing population on earth and the global changes in the climate, initiatives must be made by the youth who are the “working group” in the economy to cope up with these changes. Many of these youths are either unemployed or under skilled. One significant issue in the Global South, particularly in sub-Saharan Africa, is youth unemployment. This is a result of the aging and shrinking agriculture industry, increased unemployment rates mixed with a sizable unskilled workforce, and rapid population expansion (Abdulrazaq K. Daudu et.al, 2022) Agriculture encompasses a vast array of opportunities that remain largely untapped, with fruit crop cultivation standing out as a particularly promising sector. Fruit farming can serve as an exemplary model within this year’s theme of “Youth Actions and Collaboration towards Resilient Food Systems and Environmental Conservation.” One of the popular yet under cultivated fruit in Kenya is the Pitaya commonly known as the dragon fruit, *Selenicereus undatus*. Dragon fruit farming can attract young entrepreneurs due to its relatively low initial capital investment, fast growth and potential for high returns. Engaging the youth can be achieved through, formation of youth led cooperatives, thus by pooling resources and labor productivity is improved. Engaging more farmers in dragon fruit growing may help reduce the price and the country can also venture into exportation of the fruit. (Dr Waiganjo, KNA). She further explained that one can grow the plant in pots if one lives in small residential areas saying that from one acre of land a farmer can make almost Ksh 2 million per year having harvested twice. Currently the fruit is imported to the country (Kenya) from Israel, South Africa and Vietnam. The Pitaya is a plant of the Family Cactaceae, thus it is drought resistant and it can thrive in arid and semi-arid regions making it suitable for area prone to climate change induced water scarcity. The plant is not soil specific and can tolerate a ph. of 5-6.5 (KNA). It originated from South America thus making it a tropical fruit. Through incorporation of this fruit in the local food ecosystem, the youth contribute to diversity in food sources. There are 3 types of dragon fruit that include red skin with white flesh, red skin with red flesh and yellow skin with white flesh.

**Keywords:** dragon fruit, youth unemployment, agriculture, climate change, sustainable farming

# Establishment of Non-Timber Forest Products Reserve Area: Research Study to Ensure Sustainable Food Security in Laos

Phetsavanh Songvilay

*Academic Supervisor: Assist. Prof. Kolakoth Phommalinh*

National University of Laos, Laos

## Abstract

This research study aimed to establish a Non-Timber Forest Products (NTFPs) Reserve Area in Bolikhamsai Province, Lao PDR, to enhance sustainable food security and protect the area's ecological integrity. This research study emphasized sustainable forest management, local accountability, and student engagement. Three main actions were taken: a detailed literature review, field data collection, and showcasing research findings to university students. These activities systematically analyzed data to understand NTFP usage patterns, fostered collaboration, and encouraged students to develop holistic solutions to sustainability challenges. This study engaged 62 university students, raising their awareness of current forest management issues and promoting a culture of conservation among future leaders. The field data collection provided insights into the relationship between local communities and forest resources, highlighting the role of women in forest management and the community's economic dependence on NTFPs. The field data poster significantly boosted students' understanding and motivation, inspiring many to participate in conservation activities. Overall, this research study demonstrated the potential of informed and motivated students to drive future conservation initiatives.

**Keywords:** sustainability development, non-timber forest resources, food security

# The Impact of University Life on Students' Food Choices: An Examination of Eating Habits and Influences

Sofiia Yemets

*Academic Supervisor: Dr. Sarah Cardey*

University of Reading, United Kingdom

## Abstract

University students in the UK are increasingly facing challenges in maintaining healthy eating habits due to various factors such as the convenience of fast food, the high cost of fresh produce, and limited cooking facilities. Recent statistics indicate that 39% of UK university students consume fast food more than three times a week, and 30% experience weight gain during their first year (NUS, 2022). This study aims to explore the impact of university life on students' food choices and develop strategies to promote healthier eating habits among this demographic. Interviews were conducted with 50 students at the University of Reading between November and December 2022, using a non-probable, convenience sampling method. The interviews, which lasted 30-50 minutes, focused on food habits and choices. Following the interviews, Nutrition Workshops were organised to educate students on the importance of a balanced diet and how to prepare quick, nutritious meals. The findings reveal that time constraints, economic factors, and convenience are major drivers of unhealthy eating habits among students. Most participants cited time constraints due to academic pressures as the primary reason for consuming fast food. Economic factors also played a significant role, with some students eating less meat due to budget constraints. Despite these challenges, some students reported efforts to eat healthier and reduce meat consumption. The study highlights the need for interventions to promote healthier eating habits among university students, which can positively impact their well-being and address broader environmental and economic concerns. Recommendations include enhancing public health initiatives and revising university food policies to support sustainable food consumption practices. The use of technology such as mobile apps in partnership with University existing apps should also be considered. The research faced challenges such as limited participant responses due to time constraints and the need for a larger, more diverse sample for robust data analysis. Future research should explore the food habits of international students and the impact of cultural backgrounds on food choices. Overall, this study aligns with the ISS theme of sustainable food consumption by identifying barriers to healthy eating among students. Encouraging healthier food choices improves public health, reduces food-related waste, and promotes sustainable local agriculture.

**Keywords:** food choices, healthy eating, university impact, food habits

# Histamine Reduction in Prahok (Fermented Fish Paste) Production

**Limkang Eang**

Dana SAMOEUN, Monirath HOUR, Thong KONG

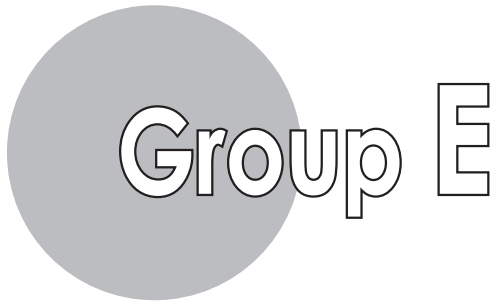
*Academic Supervisor: Dr. Rithy Chrun*

Royal University of Agriculture, Cambodia

## **Abstract**

Prahok (fermented fish paste) is a form of fermented fish that is brown or gray in appearance, is commonly used as a side dish or condiment in Cambodian cuisine. This fermentation process can take anywhere from several months to a year, during which the fish undergoes enzymatic breakdown. Because of the raw material and inadequate hygiene during processing, this type of fermented fish was frequently loaded with histamine toxicity. Histamine food poisoning, also known as histamine fish poisoning, is a type of foodborne illness caused by the consumption of fish that contain high levels of histamine due to improper handling or storage. Histamine, a biogenic amine formed during the microbial decarboxylation of amino acids, poses potential health risks when present in elevated levels in fermented fish products. This research aimed to investigate the impact of different fish washing times on histamine reduction in Prahok. In this study, 12 Samples of Prahok (3 replications for each washing interval) were processed by using *Henicorhynchus entmema* fish sourced from a local wet market (Takhmao market) which is located in Sangkat Takhmao, Takhmao City, Kandal, Cambodia. Fish washing times were set at intervals of once, twice, three times, and four times washes, with subsequent analysis revealing a noteworthy reduction in histamine levels as the washing frequency increased. Histamine content was determined during processing and storage stage by colorimetric method using histamine dehydrogenase. Data were statistically analyzed using standard deviation and standard error to understand the variability and precision of the histamine levels across different washing frequencies. The findings demonstrated that the optimal histamine reduction was achieved when the fish underwent four washing cycles. This result suggests that an effective histamine mitigation strategy in Prahok production involves thorough washing of the fish raw material. Further research could explore additional parameters influencing histamine formation and reduction, enhancing safety and quality of fermented fish products.

**Keywords:** prahok, biogenic amine, histamine, fermented fish



## **Eco-friendly Innovation for a Sustainable Tomorrow**

Presenters:

**Idleh Aya Osman**, University of Djibouti

**Raymond Gabriel Semindu**, Sokoine University of Agriculture

**Nattarika Jitfour, Dusit Athinuwat, and Wilawan Chuaboon,**

Thammasat University

**Enerel Ser-Od**, Mongolian University of Life Sciences

Chairperson:

**Martha Deogratias Hilary**

**Tashiro Akitaka**

# **Preservation of Mangroves in Djibouti: Study on the Impact of Anthropogenic Pollution on the Growth and Photosynthetic Efficiency of *Rhizophora Mucronata* in the Douda-Damerjog Mangrove and Sustainable Management Strategies**

**Idleh Aya Osman**

*Academic Supervisor: Dr. Ibrahim Souleiman Abdallah*

University of Djibouti, Republic of Djibouti

## **Abstract**

Mangroves, tropical and subtropical coastal ecosystems, provide essential ecological services. In Djibouti, an arid country located in the Horn of Africa, they are crucial for the local economy. They support tourism and the livelihoods of rural populations through fishing. They also protect the coasts. However, these ecosystems are now threatened by climate change. In Djibouti, additional threats include overgrazing by camels, excessive wood cutting, and pollution. This study was conducted in the Douda-Damerjog mangrove, a 60-hectare area located 10 km south of the capital. It aimed to assess the impact of anthropogenic pollution on this mangrove. The objective was to examine its effects on the growth and photosynthetic efficiency of *Rhizophora mucronata*, a plant found in certain areas of this mangrove. The results showed very high concentrations of phosphorus. This could explain the low photosynthetic efficiency of the plants in this mangrove, resulting in poor growth. To explain these high concentrations of phosphorus, Google Earth was used. Two potential sources of pollution were identified: an urban wastewater discharge area 8.6 km from the mangrove and a port industry 3.6 km away. However, their impact remains to be proven by analyzing seawater at different points between these areas and the mangrove. Due to a lack of equipment, it was not possible to analyze the content of other elements such as heavy metals and hydrocarbons. These analyses could strengthen my conclusions and raise awareness about the impact of this pollution on these ecosystems. To promote the sustainability of these ecosystems, several actions should be taken. These include improving the sanitation network, installing additional wastewater treatment plants, and creating awareness programs in collaboration with local ecological associations. It is also necessary to strengthen monitoring and enforce regulations. The conservation and preservation of these ecosystems will support coastal populations, jobs, and food security, as well as three Sustainable Development Goals.

**Keywords:** Djibouti, mangroves, anthropogenic pollution, photosynthetic efficiency, sustainable management



# Enhancing Maize Productivity through Biopesticide Mixture: Evaluating the Efficacy of Palm Oil, Tobacco and Neem Leaf Extracts Against Fall Armyworm (Faw) Infestation in Mikese, Morogoro Region, Tanzania

Raymond Gabriel Semindu

*Academic Supervisor: Dr. Kyaruzi A. A*

Sokoine University of Agriculture, Tanzania

## Abstract

Fall Armyworm (FAW), (*Spodoptera frugiperda*) infestation significantly threatens maize (*Zea mays* L.) production and food security in Mikese, Tanzania. While conventional synthetic pesticides initially provided control, their overuse increases environmental worries (pollution) and threatens human health because of non-target organism harm and pest resistance. This study explores the efficacy of a locally produced bio pesticide mixture as a sustainable alternative. The mixture leverages easily available plant materials: palm oil, tobacco, and neem leaf extract. Each component possesses insecticidal properties: palm oil disrupts larval movement, tobacco's nicotine acts as a neurotoxin and neem leaf extract gives anti-feedant and insecticidal outcomes. Field trials examine the combination's effectiveness in controlling FAW to untreated manipulate plots. The research will determine the optimal application timing and concentration for FAW Control. Assessment of crop damage, maize yield, and the mixture's persistence in the field to ensure minimal environmental impact.

**Keywords:** fall armyworm (FAW), bio pesticides mixture, sustainable pest management, maize yield, food security

# Development of Bio-products to Enhance Growth Promoting and Disease Control of Economic Plants

Nattarika Jitfour, Dusit Athinuwat, and Wilawan Chuaboon

*Academic Supervisor: Asst.prof.Dr. Wilawan Chuaboon*

Thammasat University, Thailand

## Abstract

All the 182 strains of beneficial bacteria were screened from 20 samples of chili. The samples were divided into 8 groups according to the colonies on nutrient glucose agar (NGA). Then tested for efficacy of beneficial bacteria against anthracnose disease by dual culture method and arranged by a completely randomized design (CRD). The SP-TU6, SP-TU7, and SP-TU3 were found to be effective in inhibiting the growth of *Colletotrichum capsici* P-TU008 was 24.8, 22.8 and 10.4%, respectively, and high efficiency inhibited mycelium growth of P-TU008 was 98.93, 94.62, and 95.69%, respectively as chemical control (carbendazim). The development of 3 bio-products that can promote the growth of economic crops are including, Bioproduct 1 = talcum: CaCO<sub>3</sub>: CMC (9.75:1.5:1), Bioproduct 2 = corn flour: talcum: CaCO<sub>3</sub>: CMC (10:87.5:1.5:1), and Bioproduct 3 = corn flour: talcum: CaCO<sub>3</sub>: CMC (20:87.5:1.5:1). All bioproducts showed the best level of solubility in water, distribution, and sedimentation. Found that, the bioproduct 1 was suitable for survival of beneficial bacteria SP-TU3 and SP-TU6 with a population of  $4.5 \times 10^{12}$  and  $3.2 \times 10^{13}$  CFU/g bio-product, respectively. The bioproduct 2 was suitable for strain SP-TU7 ( $2.4 \times 10^{12}$  CFU/g bio-product) after storage for 3 months. The strain SP-TU3 in bioproduct 1 can induce seed germination and growth parameter of chili (*Capsicum* spp.) were 95% and 1.86, respectively and SP-TU7. The bioproducts 2 had the highest efficiency to induce seed germination and growth parameter of ruzi grass (*Brachiaria ruziziensis*) with 62% and 6.51 respectively. Whereas the strain SP-TU6 was the most effective germination and growth parameter of *Brassica chinensis* and *B. oleracea* with 98%, 88% and 3.62, 88.00, respectively.

**Keywords:** beneficial bacteria, bio-product, plant growth promoting, economic plant

# The Way of Opportunities to Reduce, Reuse and Recycling Food Wastes in Mongolia

Enerel Ser-Od

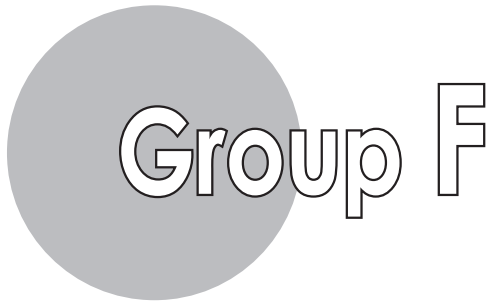
*Academic Supervisor: B. Enkhjargal (Ph.D, Associate Professor)*

Mongolian University of Life Sciences, Mongolia

## Abstract

Food scraps, vegetable and fruit peels, bones, used cooking oil, pastry leftovers, scraps, and eggshells account for one-third of the total waste in our country (Unread.today, 2020). Therefore, we have researched ways to reduce food waste, and determined vegetable and fruit scrap nutrition, and the possibility of reusing them. A questionnaire survey was conducted with 40 households, comprising 21 questions on food consumption and waste. When the daily vegetable and fruit waste of five households was calculated, the average was 284 grams per household, totaling 1.423 kilograms. In this research; we used spectrophotometric and microbiological methods and the results were calculated with a frequency of 3 times. Vitamin C content in pumpkin peel, apple peel, carrot peel, cabbage core, and broccoli stem were 2-3 times higher than raw materials, while vitamin A was 0.136-5.9 mg/100 g, which contained less vitamin A content when compared to raw materials. Total bacterial counts were detected in vegetable scraps, but not in pasteurized, heat-treated soup and apple juice. According to our research, vegetable peel soup, and apple peel juice provide enough daily vitamin A and C requirements. The economic assessment of five types of purchased fruit and vegetable waste revealed that 37% of the total purchased value is discarded, leaving only 63% utilized. These findings have prompted the development of crucial proposals and recommendations to tackle the issue of food waste comprehensively. Proposed initiatives include enhancing awareness among households, institutions, universities, and students, promoting the use of food waste for composting, establishing a centralized statistical database through expanded research, implementing legal provisions, analyzing the nutritional content of commonly used vegetables, investigating the production of eco-friendly plastics using vegetable waste, exploring the integration of vegetable waste into animal feed production, and designing a supermarket and mobile application to facilitate the sale or donation of surplus food at discounted prices.

**Keywords:** vegetable scrap, apple peel, nutrition, soup, suggestion



## **Empowering Communities through Sustainable Practices**

Presenters:

**Tannu**, CCS Haryana Agricultural University, Hisar

**John Kinyanjui Wanjira**, Jomo Kenyatta University of Agriculture and  
Technology

**José Renato Schmidt de Carvalho**, University of São Paulo

**Martha David Biseko**, Sokoine University of Agriculture

**Mai Mochizuki**, Tokyo University of Agriculture

Chairperson:

**Ayoubu Williadi Mtagawa**

**Yuki Sawai**

# Resource Optimization: Innovative Strategies for Straw Management

Tannu

*Academic Supervisor: Dr. Amoghavarsha Chittaragi*

CCS Haryana Agricultural University, Hisar, India

## Abstract

Rice is a major food crop, especially in Southeast Asia. Large-scale rice production is essential to meet the food demand of nations, involving various processes from sowing seeds to harvesting paddy. A significant amount of biomass, such as rice straw, is generated during harvesting. According to reports, 1.35-1.50 tons of straw are generated for every ton of rice produced. The rice-wheat cropping system is common in Asian countries. Due to the slow decomposition of rice straw, open-field burning is a regular practice in the Philippines, Thailand, and India to facilitate land preparation for the wheat crop, as there is a short window period between paddy harvesting and wheat sowing. Despite the ban on open burning in many rice-producing countries, the practice has increased over the past decades, leading to environmental and health hazards. Open-field burning exacerbates air pollution and causes problems for the skin and respiratory system due to the release of a significant amount of greenhouse gases (GHGs) into the atmosphere, including CO, NO<sub>x</sub>, SO<sub>x</sub>, CH<sub>4</sub>, and particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>). This problem can be managed by educating the rice-cultivating farmers with various technologies that can be employed for sustainable rice straw management. For this purpose, I conducted the survey in Haryana, India, and utilized the rank-based quotient (RBQ) method to analyze the reasons behind crop residue burning. After finding the reasons, I have shortlisted the various technologies that can be employed for sustainable rice straw management. The use of rice straw for composting, mushroom cultivation, silica extraction, paper production, biogas production, power generation, pellet production, pyrolysis, and gasification can reduce the open-field burning of straw. Organizing farmer training for awareness generation, the establishment of custom hiring centers, and demonstrations of straw management can solve the problem at the grass-roots level. Overall, the use of sustainable rice straw management technologies holds potential for addressing environmental concerns, improving resource efficiency, and meeting the demand for sustainable production.

**Keywords:** rice straw, open field burning, waste management, power generation, valuable products

# Improving Food Security through Increasing Productivity of Chicken

**John Kinyanjui Wanjira**

*Academic Supervisor: Dr. John Maina Kagira*

Jomo Kenyatta University of Agriculture and Technology, Kenya

## **Abstract**

Chicken play a significant role in solving food challenges in local communities. Helping mitigate the challenges experienced in the poultry sector will boost its capacity to contribution as food resource in developing countries. They provide a sustainable source of protein – rich meat and eggs, which are essential for combatting malnutrition and food insecurity. Their ability to thrive in diverse environments makes them easily adaptable to different climates and landscapes, making them an ideal livestock option for farmers in various regions. Furthermore, chicken can play a significant role in environmental conservation as they play a crucial role in waste management by consuming kitchen scraps and agricultural by products thus reducing environmental pollution. Their manure can also be used as organic fertilizer to enrich soil health and improve crop yields promoting sustainable agriculture practices. Chicken also release less carbon to the environment as compared to ruminants, thus embracing them as animal food source can help reduce the rate of greenhouse gas emission reducing global warming which is on the rise and an acute global environmental issue. Additionally, chicken are relatively low cost to raise and require minimal space compared to larger livestock, making poultry farming accessible to small scale farmers. It also enables their production in peri-urban farming in areas experiencing intensive land subdivision such as Nairobi and its metropolitan area including Kiambu and Kajiado. Improving productivity of chicken can help to generate income and economic opportunity to rural communities. The current study shows the strategies youth can use in producing healthy chicken in urban and peri-urban settings in Kenya.

**Keywords:** agriculture, diseases, pollution, poultry

# Sharing Actions: The Human Element in a Sustainable Journey

José Renato Schmidt de Carvalho

*Academic Supervisor: Prof. Dr. Silvio Frosini de Barros Ferraz*

University of São Paulo, Brazil

## Abstract

Fueled by the global shift towards more sustainable systems, numerous Brazilian's public and private organizations are actively contributing to climate-smart agricultural solutions for tackling global warming. Such is the Center for Carbon Research in Tropical Agriculture (CCarbon) at Luiz de Queiroz College of Agriculture of the University of São Paulo (ESALQ/USP), which aims to pioneer low-carbon agriculture research for positioning Brazil as an international reference. These actions are in accordance with the axes of sustainability, by providing economically viable innovations for environmental issues. Even so, there is a gap in preparing the human element for the oncoming changes, as such comprehensive approaches seem to be relatively rare. ESALQ Júnior Florestal (EJF) is a group inside ESALQ/USP in the category of Junior Enterprise - nonprofit organizations within universities, formed and managed by university students - and it has the goal to unite entrepreneurship with environmental and forest projects and activities. At EJF, we deal with reconciling social and human developing aspects with environmental projects on a daily basis. This manuscript aims to comment on three of our projects within this thematic, with the general scope of: (1) forest management, (2) leadership development for the agribusiness sector, and (3) and environmental education programs for children. These actions had their biggest effect on our local students community, and we believe that this work, within an organization with an environmental mission, has shifted our group's mindset towards a sustainable future that prioritizes human development. In the future we intend to organize trainings/workshops focused on management principles with this goal in mind. The Human Element approach is key to fostering: preparedness for change, cross-sector leadership, a holistic understanding of environmental issues, and informed consumer choices. This, in turn, would pave the way for the creation of green jobs and opportunities, as well as effective policies supporting a sustainable future.

**Keywords:** sustainability, global warming, leadership development, entrepreneurship and environmental awareness

# The Challenge of Limited Availability and Variety of Food Options on University Campuses

Martha David Biseko

*Academic Supervisor: Dr. Safiness Msollo*

Sokoine University of Agriculture, Tanzania

## Abstract

Food insecurity is a pressing issue that affects millions of students worldwide, particularly on university campuses. Most of the university students on campus find themselves eating the same foods they eat every day. The limited availability of healthy and affordable food options poses a significant challenge to students' well-being, academic performance, and overall quality of life.

The lack of access to nutritious food can have severe consequences for students, including malnutrition, decreased energy levels, and poor mental health. Moreover, the limited availability of food options can lead to feelings of isolation, particularly for students who are far away from home and may not have access to familiar foods. This not only affects their academic performance but also their mental health and overall well-being.

To address this issue, universities must take a proactive approach to ensuring that healthy and affordable food options are available to all students. This can be achieved through a variety of initiatives, such as establishing food banks, providing subsidies for food purchases, and creating community gardens. Additionally, universities can work with local food vendors to ensure that healthy and affordable options are available on campus.

In conclusion, the limited availability of food on university campuses is a pressing issue that affects not only students' well-being but also their academic performance and overall quality of life. It is essential that universities take a proactive approach to addressing this issue and ensure that all students have access to healthy and affordable food options.

**Keywords:** limited availability, variety of food options, university campuses



# Tea Matters: Student Cultivating Change in the Japanese Tea Industry through the Matcha Project

**Mai Mochizuki**

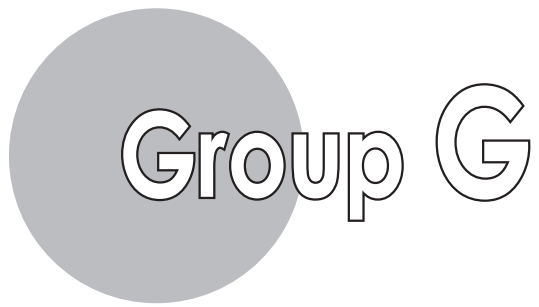
*Academic Supervisor: Assoc.Prof. Dr. Nina N. Shimoguchi*

Tokyo University of Agriculture, Japan

## **Abstract**

In Japan, environmental problems caused by abandoned farmland are becoming severe. The tea industry is not an exception. Due to the increasing consumption of PET-bottled green tea, farmers' income has significantly reduced, making it impossible to continue farming. Through the agribusiness field practice hosted by KAWANE Matcha Co. Ltd. in Shizuoka Prefecture, we, as agribusiness students, realized the need to address these issues by establishing a business model that can secure new entrants by communicating the attractiveness of the production area and the tea industry on behalf of farmers. In collaboration with KAWANE Matcha Co. Ltd., we established the Matcha project in 2022 to learn about the issues in the tea industry and find ways to solve the problems faced by the farms. Our current yearly activities include harvesting tea, making products and activity proposals using organic matcha, finding OEM manufacturers, developing products, and selling them through online and on-site stores. So far, the products we have created are matcha yokan, matcha furikake, and dyed products with rejected matcha, such as tote bags, pouches, and drawstring purses. In addition to the usual social media postings as a promotional activity, the company is expanding the scope of its activities by featuring our activities in newspapers and on TV. We also raised funds more than the target amount through crowdfunding in 2023. These are the efforts of our people to establish resilient food systems and protect the environment, which is the theme of the ISS.

**Keywords:** sustainable, organic, sixth industrialization



## **Education and Actions towards Sustainability**

Presenters:

**Elizabeth Marie Babcock**, Michigan State University

**Miyuri Takahashi**, Tokyo University of Agriculture

**Lilian Marselian Kway**, Sokoine University of Agriculture

**Andi Mahatir Nur Tasrih**, IPB University

Chairperson:

**Kabuga Norah Gakii**

**Nao Hayashi**

# Utilizing Arts-Based Education to Create Resilient Food Systems

Elizabeth Marie Babcock

*Academic Supervisor: Prof. Vincent Delgado*

Michigan State University, United States of America

## Abstract

In the summer of 2023 I conducted investigatory research, with a partner Angelina Franzese, in the community of LIFE Monteverde in the Monteverde region of Costa Rica. Our investigation was administered by Michigan State University through a study abroad program focusing on issues of sustainability. The LIFE Monteverde community expressed interest in implementing arts-based sustainable agriculture education programs at LIFE Monteverde, and we collaborated with LIFE Monteverde staff to develop recommendations for community-integrated arts programs. We designed two pilot education programs, one with photography and one with drawing, and afterward debriefed with the participants, discussing their thoughts on the experience. These results were shared with a core research group that represented the community of LIFE Monteverde, and with their input, we offered recommendations for implementation of a permanent arts program, which LIFE Monteverde plans to put into practice.

Implementation of these recommendations will improve the pedagogy of sustainable agriculture education programs in the LIFE Monteverde community. Visitors will leave the experience with a deeper understanding of the problems surrounding our food system, which can spread awareness to the point of inspiring social change. As a global community, we struggle to have resilient food production systems due to lack of practical implementation of sustainable education. Therefore, improving the pedagogy of sustainable education is the first step to seeing change in worldwide food production, the environment, the economy, and human health. Furthermore, education reaches people of all ages, including youth, and youth are a vital part of this process. The youth are the future of our world, and if education can be provided on the importance of sustainable food systems, then there is hope to see the correlating agricultural practices in the future.

This research also serves as an example for community collaboration. When working to solve the issues LIFE Monteverde was facing, there was consistent communication with the community. In the end, this allowed for solutions that impacted the community positively. I plan to utilize this approach when I work with communities in the future, and others can use this method as an example for effective community collaboration.

**Keywords:** education, art, community, sustainable, food system

# The Role of Students in Creating a Sustainable Cacao Industry

Miyuri Takahashi

*Academic Supervisor: Prof. Taku Kato*

Tokyo University of Agriculture, Japan

## Abstract

Cacao production faces various challenges such as farmer poverty, deforestation and child labour. In Japan, the Sustainable Cacao Platform for Developing Countries aims to contribute to the realization of a socially, economically, and environmentally sustainable cacao industry in developing countries, and diverse stakeholders are co-creating and collaborating to solve the problems facing the cacao industry. This time, I participated in the “Ghana Cacao Industry Study Tour” held on this platform for five days in late March 2024. And I gained ‘first-hand experience’ to examine and explore possible solutions that can be tackled by the organizations to which I belong, and solutions that can be tackled by members working together. Meanwhile, Tokyo university of agriculture launched the Nodai Cacao Platform last year. There is potential for students to work in the Nodai Cacao Platform project to address issues in the cacao industry and create value for cacao, and we need to clarify the food value chain in the cacao industry and change consumer behavior in the future. And the collaboration with the Sustainable Cacao Platform will also promote solutions to the challenges in the cacao industry.

**Keywords:** cacao, child labour, sustainable cacao platform, NODAI cacao platform

# Enhancing Food and Nutrition Security through Promotion of Underutilized Indigenous African Leafy Vegetables

Lilian Marselian Kway

*Academic Supervisor: Dr Nuria Majaliwa*

Sokoine University of Agriculture, Tanzania

## **Abstract**

This study aimed to explore the role of underutilized indigenous African leafy vegetables in improving food and nutrition security across my surrounding community. The case study was conducted at my university campus (Edward Moringe campus) where, due to a higher rate of malnutrition and food insecurity around my community, more utilization of neglected indigenous African leafy vegetables will pave the way to minimize the risks associated with it and help to increase dietary diversity.

Data was collected by means of simple semi-structured questionnaires from the surrounding households and from my fellow university student to obtain intake trends of leafy vegetables. The results show that most respondents consume once or do not consume at all the leafy vegetables. About five varieties of leafy vegetables were cultivated at my university and to the households around the campus.

The mostly strategic reason was to teach farmers the nutritional benefits of indigenous leafy vegetables, how to grow them and emphasize the culture of growing the leafy vegetables.

**Keywords:** food and nutrition security, malnutrition, leafy vegetables

# StayedLocal: Advocacy Program for Integrating Local Food Supply Distribution to Strengthen Food Independence and Sustainable Business Practices in South Tangerang

Andi Mahatir Nur Tasrih

*Academic Supervisor: Lokita Rizky Megawati, S.Pd., M.M*

IPB University, Indonesia

## **Abstract**

South Tangerang City is one of the hinterland areas in Indonesia with high business activity, which leads to an increased supply of vegetables and fruits. The limited agricultural land in this area forces 140,000 micro, small, and medium enterprises (MSMEs) to source vegetables and fruits from distant locations (>10KM). As a result, this leads to high expenditure on transportation costs and reduces the quality of vegetable and fruit supply. Moreover, the high transportation intensity in the delivery of food supplies also increases carbon emissions, thus contributing to environmental pollution. Hence, the StayedLocal initiative was introduced as a three-month advocacy program (May-June 2023) that aims to integrate local distributors and MSMEs in specific regions to streamline the supply chain and reduce carbon emissions from transportation. Collaborating with nearby distributors, it mainly focuses on the supply of goods such as chili, shallots, garlic, and eggplant. The results achieved showed a 91.70% reduction in carbon emissions (CO<sub>2</sub>e), a 70% reduction in supply chain distance, and 50% savings in supply chain costs with the modification of operations of micro, small, and medium enterprises (MSMEs) involved in the distribution of vegetables and fruits.

**Keywords:** advocacy, carbon footprint, environment, food supply, MSMEs

# Voices from Next Generation

## High School Students' Poster Presentations

- 1 **【The Effect of Agricultural Experience on Children's Food and Health Awareness:  
A Trial of Growing Bitter Melon】**  
Yuto Kawano  
*Senior High School at Sakado, University of Tsukuba*
- 2 **【Research on Japanese Traditional Food that Utilizes Vegetable Waste  
in the Suburbs of Tokyo】**  
Soichi Kondo  
*Senior High School at Sakado, University of Tsukuba*
- 3 **【An Environment Friendly Way to Eliminate Weeds  
~ Coffee Grounds Have the Ability to Eliminate Weeds ~】**  
Juri Ohya, Anju Motegi  
*Yamawaki Junior & Senior High School*
- 4 **【Are There Microplastics in Commercial Seafood ? 】,**  
Yuu Sugimoto, Hinano Sasaoka  
*Yamawaki Junior & Senior High School*
- 5 **【The Future of Food Security】**  
Nana Kawade, Aoi Muto, Tomoha Yoshida, Azusa Koyama, Hikaru Nakase  
*The First High School, Tokyo University of Agriculture*
- 6 **【Adapting International Strategies for Food Loss and Waste Reduction in Japan】**  
Mizuki Inoue, Haruno Ogawa, Manari Watamoto  
*The First High School, Tokyo University of Agriculture*
- 7 **【Seabirds and Plastic Trash】**  
Risa Yuasa, Niko Tadokoro, Rina Iwasaki, Takeru Ichikawa  
*The Second High School, Tokyo University of Agriculture*
- 8 **【NO DAIKON NO LIFE】**  
Towa Shimizu, Aimi Shimada, Aiko Takahashi, Yumi Hashimoto  
*The Second High School, Tokyo University of Agriculture*
- 9 **【SDGs and World Health: How High School Students Can Make a Difference】**  
Akane Matsuoka, Chisaki Akiyama, Mio Arimoto, Hikari Miyake  
*The Third High School, Tokyo University of Agriculture*

# **The Effect of Agricultural Experience on Children's Food and Health Awareness: A Trial of Growing Bitter Melon**

**Yuto Kawano**

Senior High School at Sakado, University of Tsukuba

Childhood before teenage is the time to build a healthy body. It is beneficial for young children to take balanced nutrients from food and experience various tastes and flavors, including bitterness and sourness, which most children do not prefer. However, children's food environment is deteriorating due to the common use of fast food and chemical seasonings. Some children do not know that we get energy and nutrients to support our health from other living things. We will address this problem by giving children the experience of growing bitter melon, *Momordica charantia L.*, which is not popular among children because of its bitter taste. About twenty children between the ages of five and twelve will be invited to our school farm with their parents to help grow vegetables three times in three months during the summer. Questionnaires will be given to the children and their parents before and after the activities to see how their willingness to eat vegetables changes. We also plan to ask their parents to observe any changes in their children's eating habits afterward. We expect to verify the effects of agricultural experience on children's willingness to consume vegetables and try foods of unfamiliar taste.



# Research on Japanese Traditional Food that Utilizes Vegetable Waste in the Suburbs of Tokyo

**Soichi Kondo**

Senior High School at Sakado, University of Tsukuba

Reducing food waste presents a significant global challenge. Approximately 1.3 billion tons of food, equivalent to one-third of global production, are discarded annually. This wastage increases greenhouse gas emissions, resource depletion, and heightened food insecurity, impacting the environment, economy, and society. In the suburb of Tokyo, a wealth of valuable knowledge on traditional food preservation methods exists that offer solutions to minimize food waste. These time-honored practices, passed down through generations, involve techniques such as fermentation, pickling, and drying, all aiming to extend the shelf life of food and prevent spoilage. For example, preserving leftover vegetables through pickling and fermenting soybeans into *miso* (soybean paste) are deeply rooted traditions in Japan. Unfortunately, this invaluable knowledge is not widely disseminated among younger generations, as contemporary lifestyles often prioritize convenience over preservation practices. Effective and practical solutions to food waste validated over generations should be noticed and appreciated. To use this valuable heritage for sustainability, comprehensive research will be conducted by interviewing knowledgeable individuals and documenting their expertise in a detailed recipe book. This initiative seeks to preserve traditional techniques and encourage broader adoption of sustainable food practices. We aim to reduce global food waste while preserving cultural heritage for future generations.

# **An Environment Friendly Way to Eliminate Weeds ~ Coffee Grounds Have the Ability to Eliminate Weeds ~**

**Juri Ohya, Anju Motegi**

Yamawaki Junior & Senior High School

Coffee powder after extraction is called coffee grounds. This study considered that coffee grounds could reduce weeds in fields. Coffee grounds are burned as waste. Not burning coffee grounds can reduce the amount of carbon dioxide. Previous research explained that 10 kg of coffee grounds are needed per square meter for weeding. In this study, it was found that 5 kg of coffee grounds per square meter is sufficient for weeding. Previous research has explained that caffeine and chlorogenic acid (polyphenols) contained in coffee grounds are responsible for weeding. In this study, it was found that coffee grounds contain almost no chlorogenic acid. Furthermore, it has been found that by adding certain compounds, it is possible to reduce the amount of coffee grounds needed for weeding. The perfect balance of coffee grounds and additive compounds can create an environment where vegetables can grow but weeds cannot. This exquisite balance has been found.

# Are There Microplastics in Commercial Seafood ?

**Yuu Sugimoto, Hinano Sasaoka**

Yamawaki Junior & Senior High School

In recent years, microplastics (MP) have been attracting worldwide attention as a new environmental problem. MP are fragments smaller than 5 mm in diameter, and there are concerns that they cause bioaccumulation rather than the toxicity of the plastic itself, or that it promotes chemical reactions between other substances on the surface of the plastic.

Therefore, in order to clarify the presence or absence of MP contamination in processed marine products, we attempted to detect MP from several types of fish and shellfish.

*Trachurus japonicus*, *Ruditapes philippinarum*, and *Todarodes pacificus*, which I bought at a mass retailer, were tested, and the edible parts of the clams were cleaned and the entrails of the mackerel and squid were removed.

10% KOH solution was added to the sample until the entire sample was immersed and dissolved in a water bath set at 35°C. The dissolved material was filtered with two layers of plankton net (0.25 × 0.25 mm nylon mesh) to collect the residue. The solids obtained from the sample were subjected to a Fourier transform infrared spectrophotometer (hereinafter referred to as FT-IR) to check for the presence or absence of plastic.

As a result, it was not possible to conclude the presence or absence of polypropylene, which is a type of MP. Currently, we are trying again by changing the purification method to eliminate the influence of organic matter.

In the future, we would like to analyze the materials of MP obtained from the samples and investigate whether the surface of MP promotes photodegradation of chemical substances such as UV-filter.

# **The Future of Food Security**

**Nana Kawade, Aoi Muto, Tomoha Yoshida,  
Azusa Koyama, Hikaru Nakase**

The First High School, Tokyo University of Agriculture

The increase and decrease in fish species in Japan and their reasons. Japan's fishing industry is facing a decline in production and is overly dependent on imports. This is despite the global increase in demand for fish, Japan's abundant marine resources, and its advanced technology. So, where did the problem arise? There are two reasons for the decline in catch. The first reason is international fisheries management, including the establishment of Exclusive Economic Zones (EEZs) and catch restrictions. Due to the EEZ, the principle of maritime freedom has vanished, leading to a decline in Japan's deep-sea fishing industry. Japan can no longer fish freely. The second is the changes in the environment of rivers and oceans. Recent global warming has increased water temperatures in rivers and oceans, shifting the habitat of fish that used to be caught around Japan to the north. On the other hand, owing to the rise in water temperatures, fish that originally lived in the south have moved north, allowing new species to be caught. Furthermore, the number of farmed fish has not declined. Advances in aquaculture technology have ensured stable farmed fish production. For these reasons, Japan cannot catch enough fishes now so we have to come up with ideas on what we should do.

# **Adapting International Strategies for Food Loss and Waste Reduction in Japan**

**Mizuki Inoue, Haruno Ogawa, Manari Watamoto**

The First High School, Tokyo University of Agriculture

Today, there are many food loss problems in Japan. The household recycling rate is very low. This is because recycling itself is troublesome and is not well maintained by local authorities. Although some efforts have been made to create a motto to make recycling easier, not much effect has been seen. In fact, the same ingredients are used to make review types of products and this has reduced commercial food loss. Furthermore, efforts are also being made to reduce food loss at home by selling ready-to-eat sizes. Therefore we looked into the efforts being made in France and the Netherlands, where food waste is low. For instance, in the Netherlands, supermarkets are implementing measures to prevent overbuying. Furthermore, this app started in Denmark called “Too Good TO GO” sells an assortment of products that are about to be discarded. Policies have been established that allow individuals to take steps to prevent food loss. France has also established a national certification and labeling system to reduce food waste. We thought it would be possible to arrange these examples of initiatives and apply them to Japan. We thought that we could organize examples of these efforts and apply them to Japan. Specifically we believe we could introduce something similar to the food waste act, the French law that prohibits the disposal of expired food.

# Seabirds and Plastic Trash

**Risa Yuasa, Niko Tadokoro, Rina Iwasaki, Takeru Ichikawa**

The Second High School, Tokyo University of Agriculture

Many people are aware of the problem of fish dying from ingesting microplastics. However, seabirds are also affected by human social activities and ghost gear. “Ghost gear” refers to fishing gear and fishing traps with plastic buffers. This time, we will talk about the relationship between seabird numbers and plastic litter. In fact, the number of seabirds is gradually declining due to plastic litter and ghost gear generated by human activities. Various measures are being taken to solve this problem, including the recycling of fishing gear, the collection and commercialisation of used fishing nets and the development of new fishing gear.

# NO DAIKON NO LIFE

**Towa Shimizu, Aimi Shimada, Aiko Takahashi, Yumi Hashimoto**

The Second High School, Tokyo University of Agriculture

How much do you know about daikon? It has rich dietary fiber and helps us to keep our health. The leaves, which are often discarded, are classified as a green and yellow vegetable and have higher nutritional value than the root. However, with the problem of the large amount of food waste, many people tend to peel daikon and throw away the leaves. For this reason, daikon is the third most discarded vegetable. Therefore, we propose a daikon bath that makes use of daikon. The ingredients of daikon are expected to bring about skin beautifying effects and alleviate fatigue. We also believe that by providing daikon that cannot be shipped to hot springs, which are abundant in Japan and popular with people overseas, we will be closer to achieving Goal 12 of the SDGs, which states, "Produce sustainably and consume responsibly".

## **SDGs and World Health: How High School Students Can Make a Difference**

**Akane Matsuoka, Chisaki Akiyama, Mio Arimoto, Hikari Miyake**

The Third High School, Tokyo University of Agriculture

The Sustainable Development Goals (SDGs) set by the United Nations aim to address global challenges, including those related to health. High school students can significantly contribute to improving world health by engaging in several key activities. Firstly, they can raise awareness about health-related SDGs through school projects, social media campaigns, and community events. Educating peers and the community about issues such as poverty, hunger, and disease prevention can foster a more informed and proactive society. Additionally, students can participate in or organize local health initiatives, such as vaccination drives, health screenings, and hygiene promotion activities. Volunteering with local health organizations or international NGOs provides practical experience and direct impact. Moreover, advocating for policy changes at local and national levels can amplify their voices. Students can collaborate with health professionals to promote legislation that supports public health infrastructure and services. Engaging in science and health education, students can innovate solutions to health problems. Projects focusing on sustainable practices, such as clean water initiatives or nutritious food programs, can contribute to long-term health improvements. By combining education, advocacy, and practical action, high school students can play a pivotal role in advancing the SDGs and promoting better health worldwide.





# MATERIALS

**Tokyo Declaration**

**International Students Summit Action Plan**

**Establishing International Students Forum**

**Establishing Global Network for Environment,  
Food and Agriculture**

**Mission Statement of International Students Forum (ISF)**

**Acknowledgement**



# TOKYO DECLARATION

---

*International Students Summit on Food, Agriculture and Environment*

*Date: November 19 - 20, 2001*

*Venue: Tokyo University of Agriculture, Tokyo, Japan*

In commemoration of 110<sup>th</sup> Anniversary of the Founding of Tokyo University of Agriculture, an International Students Summit on Food, Agriculture and Environment in the New Century is held. Students from twelve countries and area in the world participated and discussed about present conditions and future issues on food, agriculture and environment. With this opportunity, we air our opinions and views raised in this Summit documented in this Tokyo Declaration, which we propose to the world.

1. Agriculture carries an important role of producing food for mankind to live. With the remarkable population increase since the 1950s, food production has been greatly increased through the Green Revolution, but negative effects to the environment and health occurred due to the intensive use of chemical fertilizers and agricultural pesticides. For now and the coming years, global food production increase and poverty alleviation are vital and agriculture plays an important role. "Therefore, we aim at sustainable development in the New Century through the recognition of the value of agriculture as a life industry, and the respect of the unique ecosystem and wisdom of each region. Through the collaboration between traditional agriculture knowledge and wisdom, and modern science and technology, we endeavor to develop environment-friendly technologies and production systems. Eventually, we hope to develop and promote a new form of organic agriculture which will meet social, economic and environmental requirements."
2. Based on science and technology development, various new technologies are being developed and spread in the agricultural field. Among them, biotechnology, especially Genetically Modified Organisms (GMO) is considered the mainstream technology. Consumers also have strong concerns regarding GM crops and foods. "Therefore, we recognize the potentials of biotechnology including GMO based on judgment with right knowledge. At the same time, we, as agricultural students, need to study and research more about the safety of biotechnology especially GMO in relation to human health and environment, and we have a role of disseminating result-related information to consumers."
3. In each region, history gave birth to food culture and molded people. By definition, food should be consistently safe from production to consumption. "Therefore, we create a new system wherein we can continuously be supplied and be able to consume safe foods. Each actor in the system, based on the social infrastructure provided and improved by the government, should consider the importance of safety issues such as pesticide residues at the production level, and post harvest and food additive usage problems at the processing and distribution levels. At the same time, we, as consumers, must think better of healthy regional food culture and are urged to cooperate and understand the added costs for commodities that are produced in a safe and environmentally friendly way."
4. Nowadays, although trade liberalization is progressing under the WTO system, all countries and areas do not have access to fair food distribution because economic infrastructure and social infrastructure gaps still exist. "Therefore, we promote Regional Self-sufficiency mainly for staple foods by making use of the unique ecosystems and regional individuality from the local point of view. Then, in the global point of view, food self-sufficiency in the whole of Asia can be achieved if food self-sufficiency is promoted in each area."
5. In the years to come, we, the students have a huge role to play. More international cooperation is encouraged through human resource exchange and sharing knowledge to overcome barriers such as academic disciplines and geographic borders. "Therefore, we, as the core group consisting of students from thirteen (13) countries and areas, aim to create an International Students Network. Also, we share a new and same value, wherein we need to create a new social system where an environmentally benefiting and safe food production, distribution, processing and consumption exist."

In realization of this *Tokyo Declaration*, we take an oath to make an *International Students Summit Action Plan* for each country and area.

November 20, 2001  
Tokyo



## International Students Summit Action Plan

In line with the Tokyo Declaration adopted during the 1<sup>st</sup> International Students Summit organized by the Tokyo University of Agriculture held last November 19-20, 2001, the action plan has been drawn up in this 2<sup>nd</sup> International Students Summit. As part of the future generation, we students commit ourselves to the following actions.

### ***General Actions***

- ✧ We shall study issues of food, agriculture and environment in holistic manners. We shall serve as a bridge between producers, consumers and professionals for the betterment of the society.
- ✧ We shall not limit ourselves to studying; we shall raise our own awareness and put our ideas into practice.
- ✧ We shall reconsider and emphasize the cultural aspect of agriculture.
- ✧ We shall appreciate and conserve our respective traditional technologies and institutions.

### ***Specific Actions***

#### **Environmental Conservation**

- ✧ We shall study and make public the roles and values of agriculture and environment, by participating in farm training and the like in rural areas.
- ✧ We shall conduct various campaigns and promotions of the present condition and prospects of agriculture and agricultural communities; and deepen consumers' understanding and interest on agriculture and environment.
- ✧ We shall vigorously promote environmentally friendly agriculture such as organic agriculture for establishing the system of stable supply of safe food.

#### **Biotechnology**

- ✧ We shall encourage unbiased research and undertaking. We shall publicize scientific information and research results about biotechnology.
- ✧ We shall vigilantly investigate food biotechnology such as GMO and inform the public about the results.

#### **Food Safety**

- ✧ We shall review our respective dietary life, conduct surveys and research on food from farm to table, and update the public about recent findings.
- ✧ We shall encourage strict labeling of food. We shall charge appropriate social responsibilities to any company found to have committed food safety violation.

#### **Food Security**

- ✧ We shall reduce food wastes. We shall avoid over consumption to conserve resources and promote health.
- ✧ We shall consume what is needed rather than what is demanded, on the basis of energy-saving local production and local consumption framework.
- ✧ We shall promote home production of food using any available space.

#### **Students Network**

- ✧ We shall establish the "International Students Forum," on food, agriculture and environment.
- ✧ As a body, we shall actively lobby and take actions on relevant issues, and represent youth in national and international conferences.

The above action plan shall serve as the basis for the country or area level action plans to be made by students of the respective participating university. Thus, we urge the participating universities to make their respective action plan as soon as possible.

November 17, 2002  
Tokyo, Japan



## Establishing International Students Forum (ISF)

Agricultural science plays a vital role in solving the fundamental problems of human beings in relation to food, environment, human health, and natural resources and energy. Because food production and consumption systems are closely related to the condition of the natural environment, the stage of economic development and food culture in each country and area, their patterns and problems reflect regional characteristics, requiring a multiple region-oriented approach.

Tokyo University of Agriculture organized the International Students Summit on Food, Agriculture and Environment in the New Century in 2001 and adopted the “Tokyo Declaration”.

In line with the action plan adopted at the 2nd International Students Summit in 2002, we hereby agree to organize the International Students Forum (ISF), a students’ network for the betterment of food, agriculture, and environment problems.

### 1. Objective

International Students Forum (ISF) promotes information exchange and discussion among the students of agricultural and other related sciences, in order to solve the problems common to human beings, such as environmental conservation, development of harmonious food production and establishment of food safety.

### 2. Organization

- ISF consists of Committees of International Students Forum set up in the participating universities.
- Members of the respective ISF Committees play an active part while in school and resign from ISF automatically at their graduation.
- Each ISF Committee decides the matters on the management respectively in each country and area.

### 3. Role

- ISF Members constantly make effort toward solutions of the problems common to human beings such as world environmental conservation, promotion of sustainable food production and establishment of food safety.
- ISF Members exchange information and opinions via the Internet. (Internet International Conference)
- Representatives of ISF committees in the respective universities get together on a regular basis and hold an international conference to present the results of research and study. (International Students Summit, ISS)

### 4. Activities

- ISF Members play an active role as students for solutions of food, agriculture and environment problems.
- ISF Members work in accordance with the common theme agreed upon at the International Students Summit for the whole year.
- ISF Members are expected to present the results of the previous year’s activity and decide on the common theme for the following year.

### 5. Participating Universities

- Universidade de São Paulo, Brazil
- China Agricultural University, China
- Tokyo University of Agriculture, Japan
- University Autonoma Chapingo, Mexico
- Wageningen University, Holland
- University of the Philippines Los Baños, Philippines
- Kasetsart University, Thailand
- Hanoi Agricultural University, Vietnam
- The University of British Columbia, Canada
- Bogor Agricultural University, Indonesia
- Kyungpook National University, Korea
- Mongolian State University of Agriculture, Mongolia
- The State Agriculture University of La Molina, Peru
- National Chung-Hsing University, Taiwan
- Michigan State University, USA

### 6. Secretariat

Secretariat of International Students Forum is set up at NODAI Center for International Programs, Tokyo University of Agriculture to take care of related administrative matters.

November 17, 2002  
Tokyo, Japan

## **Establishing Global Network for Environment, Food and Agriculture (Global NEFA)**

Since 2001, the International Students Summit (ISS) has been the venue for student discussions on relevant global issues on food, agriculture and environment. Due to the call for a students' network as documented in the adopted "Tokyo Declaration" and "Action Plan", the International Students Forum (ISF) was established in 2002. In total, there have been more than 400 student-participants from around the world. Most of us have already graduated and are now part of the working society. Using the knowledge and experience we gained in the ISS, we are now playing an active role in different fields in various countries. However, there have been limited opportunities to meet and exchange information among ourselves. Therefore, we have established the "Global Network for Environment, Food and Agriculture (Global NEFA)" as an alumni association of ISS/ISF.

### **Objective**

Based on the adopted "Tokyo Declaration" and "Action Plan", the organization aims to contribute to the sustainable development of the international society.

### **Membership**

Membership is initially open to all past ISF members or ISS participants who agree to the objectives of the organization. Other interested persons can join the organization through a recommendation of members.

### **Activities**

- Manage the website and mailing list
- Provide information related to employment and graduate study opportunities for students
- Organize study meetings, symposiums, and similar activities
- Promote information exchange
- Hold annual general meeting

November 25, 2005  
Tokyo, Japan

## Mission Statement of International Students Forum (ISF)

ISF is an international network of students which encourages cooperation, discussion and research to aid in the sustainable development of food, agriculture and environment into the future. ISF allows students to use their knowledge and expertise in their field of study to promote collective action, which will result in the unity of our global food system and our environment.

We have recognized that in order to implement the objectives of the ISF within our respective countries and area, we must consider the following plans of action:

1. The ISF joint communique and mission statement must be translated into the language of the participants' countries of origin.
2. A clear explanation of the objectives and mission of ISF must be placed online.
3. A pamphlet including the objectives and mission statement of ISF should be circulated to the members of ISF, in the language of the participant's countries of origin.
4. A newsletter should be delivered regularly to past and present ISS participants. This newsletter would include updates from alumni and the ISF.

We have recognized that in order to improve the current structure of the ISS, the following ideas must be implemented:

1. Establish the ISF in each partner university.
2. Support of the ISS student presenters must be maintained, both through the partner universities and ISF-Japan.
3. Create new partnerships with universities, in order to represent population distribution around the world.
4. Promote ISS earlier in the school year, in order to generate a new participant base.

Through the implementation of these suggestions, we believe that the promotion of the sustainability of food, agriculture and environment will be improved.

November 30, 2007  
International Students Summit  
Tokyo University of Agriculture, Japan

## Acknowledgment

Since its inception in 2001, the International Student Summit on Food, Agriculture, and Environment (ISS) has seen remarkable growth and evolution. Over the years, the ISS has attracted more diversified participants, reflecting a broader spectrum of backgrounds, perspectives, and experiences. The introduction of the ISS's original song has become a unifying anthem, fostering a sense of identity and pride among participants. Additionally, the diversified ISS Advisors has brought in a wealth of expertise and insights, ensuring that the ISS continues to innovate and address the needs of its increasingly varied audience.

It would be wonderful if students could share their activities and ideas and discover new perspectives that they cannot attain from their original ground. We hope that the awareness and relationships gained through the ISS will contribute to a new path of global agricultural and environmental innovation for achieving a sustainable society.

Our grateful thanks go to all those who have helped us put together the 23rd ISS. To mention a few, we are deeply obliged to the ISS Advisors Committee members who have not only evaluated and reviewed the 23rd ISS manuscripts, but also provided guidance, suggestions, and ideas to ensure the efficiency and effectiveness of the 23rd ISS. We are also indebted to presenters who have provided superb content in their areas of study, including the Technical Advisors of each presenter. Furthermore, we would like to thank the Tokyo NODAI Committee for Global Education (国際教育専門委員会) for giving valuable academic guidance to ISS participants.

We would also particularly like to thank the chairpersons, general chairpersons, and all Tokyo NODAI student groups who have tirelessly dedicated themselves to preparing the 23rd ISS.

Lastly, we would like to express our sincere gratitude to the valuable audience for making this event a fruitful and enriching experience for all.

Center for Global Initiatives  
Tokyo University of Agriculture

1-1-1 Sakuragaoka, Setagaya, Tokyo, 156-8502, Japan  
Tel : 03-5477-2560 Fax : 03-5477-2635  
e-mail : [isf@nodai.ac.jp](mailto:isf@nodai.ac.jp) website : <https://www.nodai.ac.jp/cip/iss>

ISBN 978-4-905331-24-7

