ARAFE

The Association for Regional Agricultural and Forestry Economics

地域農林経済学会

The 9th International Workshop

第 9 回　国際ワークショップ

Co-organized by the Faculty of Agriculture, Tottori University

共催 鳥取大学

Tottori Campus, Tottori University

Room: Lecture Room 3, 2F, Bldg. 1, Faculty of Agriculture

(Hybrid with Zoom)

鳥取大学 鳥取地区キャンパス

教室：農学部 1 号館 2F 第 3 講義室

（Zoom とのハイブリッド開催）

Saturday June 28, 2025

2025 年 6 月 28 日 (土)

9:30 – 16:55 JST

The Association for Regional Agricultural and Forestry Economics

The 9th International Workshop

Tottori Campus, Tottori University,
Lecture Room 3, 2F, Bldg. 1, Faculty of Agriculture
Saturday June 28, 2025
9:30 – 16:55 JST

Workshop Program

Saturday June 28, 2025:
Registration begins at 9:00.

9:30 – 9:35 5 min.
Opening remarks
Dr. Kazuki TAKETOSHI, ARAFE President, Ryukoku University
9:35 – 9:40 5 min.
Welcome remarks
Dr. Kinya AKASHI, Dean, Faculty of Agriculture, Tottori University
9:40 – 12:00 140 min.
Session 1. Regional development, training, and farm management
Session Chair: Dr. Hart FEUER, Kyoto University

Presentation 1.1 by Danarto SURI, Ritsumeikan University
"Factors That Affect a Village's Capacity To Generate Source Revenue"
Commented by Dr. Rosalia Natalia SELEKY, Shimane University

Presentation 1.2 by Charitha K. P. ELUHAGODE GEDARA, Hiroshima University
"Impact of Export Procedure Training on Export Engagement:
Evidence from the Export Agricultural Crop Sector in Sri Lanka"
Commented by Dr. Ken MIURA, Kyoto University

Presentation 1.3 by Dr. Runan YANG, Ibaraki University
"Measuring Psychological Capital and Its Impact on Performance in Urban Agriculture:
Focus on Environmentally Friendly Farming"
Commented by Dr. Yuki TOYAMA, Tottori University

Presentation 1.4 by Ishwor BARSHILA, Tohoku University
"Understanding the Barriers and Enablers of Good Animal Husbandry Practices among Smallholder Dairy Farmers in Inner Terai of Nepal"
Commented by Bin JIA, Ritsumeikan University

12:00 – 13:00 60 min. Lunch break

13:00 – 14:45 105 min.

Session 2. Food demand, preference, and safety

Session Chair: Dr. Nina TAKASHINO, Ritsumeikan University

Presentation 2.1 by Melli SURYANTY SN, Tottori University

"Rural and urban household food demand during the pre-, early, and late COVID-19 pandemic periods: Estimation using SUSENAS microdata for Bengkulu Province, Indonesia."

Commented by Dr. Michitoshi YAMAGUCHI, Ryukoku University

Presentation 2.2 by Dr. Kohei YAGI, Kobe University

"Consumer Preferences for Country-of-Manufacture at Japanese Cuisine in Shanghai, China: Proposing the Country-of-Cuisine Concept as One of the Country-of-Origin Dimensions"

Commented by Dr. Toshinobu Matsuda, Tottori University

Presentation 2.3 by Dr. Md. Rashidul HASAN, Sher-e-Bangla Agricultural University

"Assessing farmers' perceptions of Integrated Pest Management (IPM) adoption and its impact on poverty reduction: Evidence from brinjal cultivators in Narsingdi district, Bangladesh"

Commented by Dr. Niraj Prakash Joshi, Hiroshima University

14:45 – 15:00 15min. Coffee Break

15:00 – 16:45 105 min.

Session 3. Household behavior and rural development

Session Chair: Dr. Keshav Lall MAHARJAN, Hiroshima University

Presentation 3.1 by Kamal Bahadur SUNAR, Hiroshima University

"The Impact of Subsidized Inorganic Fertilizers on Farm Input Usage and Food Self-Sufficiency: Evidence from the Terai of Nepal"

Commented by Dr. Kouji YASUDA, Aomori Public University

Presentation 3.2 by Dr. Ryan OLVER, Tokyo International University

"Market Failure and Child Labor in the Ghanaian Cocoa Industry"

Commented by Dr. Seiichi FUKUI, Kobe University

Presentation 3.3 by Nanaya ODA, Kyoto University

"Spatial and Social Constraints and Consequences of Informal Cattle Rental for Land Preparation in Zambia"

Commented by Dr. Kenjiro YAGURA, Hannan University

16:45 – 16:50 5 min.

Acknowledgements by Dr. Minakshi KEENI, ARAFE Executive Board, Tohoku University

16:50 – 16:55 5 min.

Closing remarks

Dr. Hideyuki TSUJIMURA, ARAFE Vice President, Kyoto University

Zoom operation by Dr. Motoi KUSADOKORO (Tokyo University of Agriculture and Technology)

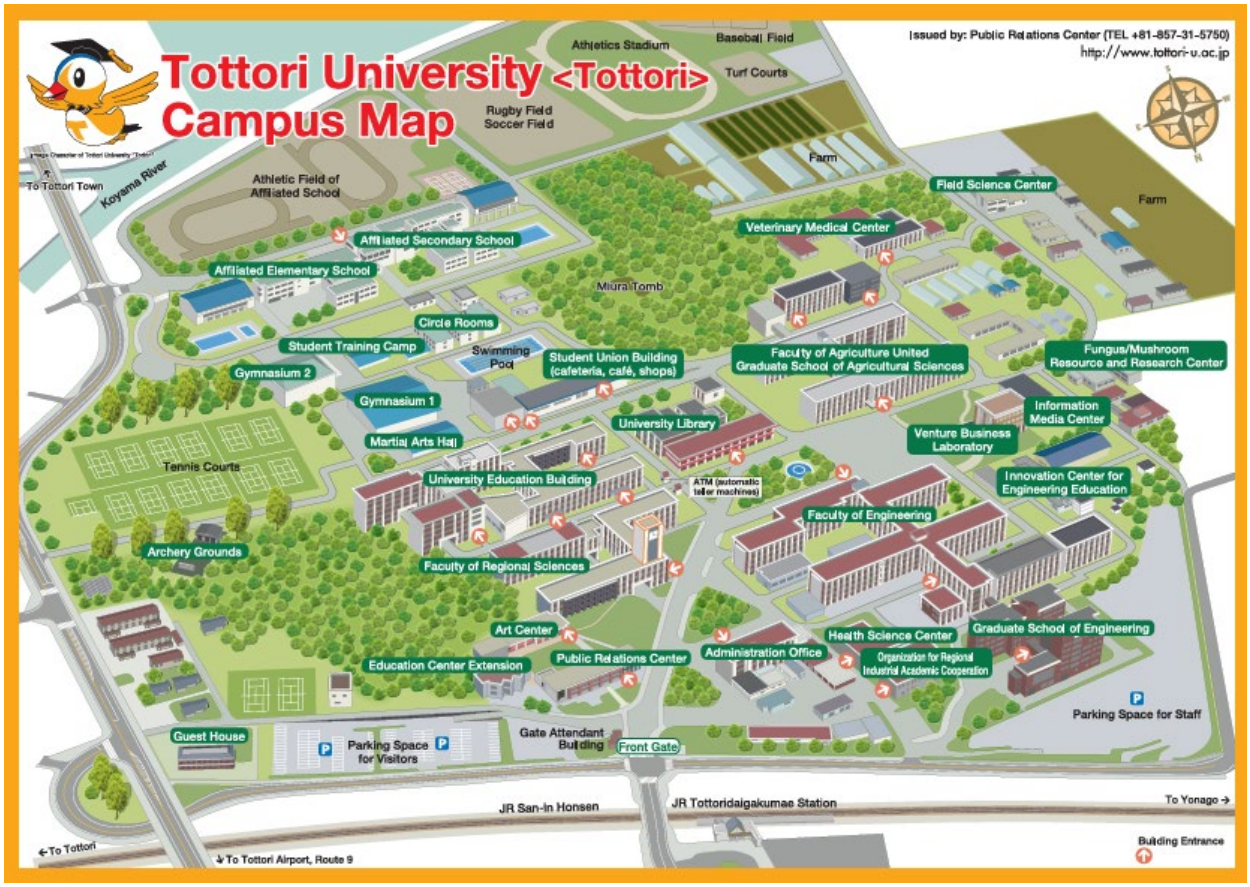
17:30 – 19:30 **Buffet party at the Cafeteria on the Campus** (Details will be announced at the venue.)

Venue Information
4-101 Koyama-cho Minami, Tottor

- 8 minutes by Rail from Tottori Station to Tottori University Station
- 3 minutes walk from Tottori University Station
- 15 minutes by taxi from Tottori Station

Access to Tottori University
URL: http://tottori-u.ac.jp/en/info/access/

Campus map



会場案内
〒680-0945 鳥取県鳥取市湖山町南４丁目１０１
最寄駅：JR「鳥取大学前」

キャンパスまでの交通案内
URL: https://www.tottori-u.ac.jp/access/in-prefecture/
キャンパスマップ
URL: https://www.tottori-u.ac.jp/access/campusmap-tottori/

Lunch info　お昼ご飯情報
Some campus cafes and convenience stores are open on Saturdays.
Convenience stores and restaurants are within walking distance from the campus.
キャンパス内のカフェ、コンビニは、一部、土曜も営業しています。
キャンパスから徒歩圏内にコンビニやレストランがあります。

Cafeteria Mare at campus
https://vsign.jp/tottori/maruco/shops/6
Hill Peak, Convenience store at campus
https://vsign.jp/tottori/maruco/shops/5

Buffet Party Info 懇親会
17:30 – 19:30 Cafeteria on the Campus (Details will be announced at the venue.)
Fee (per person): 5000JPY (full tariff), 3000JPY (student tariff).

Parking Info　駐車場 https://www.tottori-u.ac.jp/access/parking/

Parking is available. It is free for the first hour after entry, 100 yen for one hour or more but less than two hours, and 100 yen for each hour thereafter. The maximum amount for each 24 hours is 500 yen.
駐車場が利用できます。駐車料金は、入場後 1 時間までは無料、1 時間以上 2 時間未満は 100 円、以後 1 時間を経過するごとに 100 円を加算します。24 時間ごとの最高限度額は 500 円です。

Wifi Info　Wifi 情報

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Collection of Abstracts

Presentation 1.1

Factors That Affect a Village's Capacity To Generate Source Revenue

Danarto SURI[1]
1. Ritsumeikan University

Public finance is a relevant area of study encompassing government revenue and expenditure. Revenue is crucial for local governments to fund public services. In Indonesia, revenue from local governments is driven by three sources: own-source revenue, intergovernmental transfers, and other lawful income. Tax is not the only source of revenue; it also comes from service charges and income through legal activities.

Through decentralization, Indonesia shares power with the lowest level of government. Villages (desa) have the lowest level of government in the Indonesian administrative hierarchy. Despite the shared power, fiscally, the village government lacks authority to impose taxes on its people. Instead, villages generate their own revenue from service charges, business activities, and other legal activities. Many villages struggled with this limited authority.

As the data show, more than 90% of a village's income comes from transfers, indicating its high dependence on the central government. This contradicts Law No. 6/2014 that dictates that villages should be strong, advanced, independent, and democratic to create a strong foundation for implementing governance and development toward a just and prosperous society. Independence is defined as a process carried out by the village government and community to meet their needs with their own ability, representing a village's ability to generate revenue. However, few villages generate large sums of money through their activities.

This study examines the factors that influence villages' fiscal capacity, particularly their ability to generate own-source revenues. By identifying these factors, this study seeks to provide insights into how village-level fiscal capacity can be improved. This study contributes to the literature on fiscal decentralization by focusing on the challenges village governments face. To examine these factors, this study used quantitative data gathered from government institutions. Regression analysis was used to analyze the factors gathered through a literature review.

While much research has explored fiscal decentralization in Indonesian local governments, few have focused on villages. This study used villages in Bali, Indonesia, as a study sample. Balinese villages were selected because they offer a diverse range of fiscal capacities. In 2024, some villages in Bali reported zero-source revenue, whereas others generated over IDR 500 million, illustrating diversity and making them a compelling case for investigation.

Presentation 1.2

Impact of Export Procedure Training on Export Engagement: Evidence from the Export Agricultural Crop Sector in Sri Lanka

Charitha K. P. ELUHAGODE GEDARA [1]
1. Hiroshima University

The agricultural sector is one of the main export-earning sectors in Sri Lanka. This comprises export agricultural crops (EACs) and other crops. Spices constitute most EACs in Sri Lanka. EACs are the crops other than tea, rubber, and coconut that account for fifty percent of total production exports. The main EACs traditionally grown in Sri Lanka are spices (cinnamon, pepper, nutmeg, clove, cardamom, ginger, and turmeric), beverage crops (coffee, cocoa, and vanilla), stimulant crops (betel and areca nuts), and essential oil-bearing crops (citronella and lemon grass). EACs will have contributed approximately 17% of the total agricultural earnings by 2023. There is a high potential for expanding the export market for local EACs because of their unique aroma and flavor. Unfamiliar export procedures and documentation were ranked as high-impact export barriers. It is a timely requirement to provide training on export procedures to increase the export performance of EAC crop-based enterprises in Sri Lanka to increase foreign revenue. This study focuses on determining the impact of export procedure training on the export performance of business aspirants in the EACs sector. A randomized controlled trial was conducted with 314 export business aspirants registered for export procedure training. Baseline data (n = 314) were collected from 7th February to 7th March, followed by training programs on 7th and 12th March 2024. Entrance into the export market (export engagement), changes in the number of export buyers, and changes in monthly export volume (kg) were the three focal outcomes. We conducted three follow-up surveys at 1.5, 3, and 6 months after training. All three outcomes showed a statistically significant improvement in the treatment group three months after the intervention. There was a sustained positive impact on export volume (kg) six months after the survey, while the effects of other outcomes dissipated. This result emphasizes that once entrepreneurs enter the export market, they tend to elaborate on their export operations, indicating that targeted support can have a lasting and scalable impact on export performance. This study highlights the pivotal role of export procedures training in enhancing the performance of aspiring export businesses in Sri Lanka.

Presentation 1.3

Measuring Psychological Capital and Its Impact on Performance in Urban Agriculture: Focus on Environmentally Friendly Farming

Runan YANG [1]
1. Ibaraki University

Urban agriculture (UA) has emerged as a strategic response to global challenges and offers benefits such as bolstering local food security, reducing food miles, and fostering community engagement. Recent studies have shown that Tokyo's urban farmers remain competitive by diversifying their direct-to-consumer channels and adopting eco-friendly production methods. Nevertheless, they face structural constraints—including high land prices, inheritance-tax burdens, and labor shortages—that limit conventional scale expansion. In this context, managers' internal psychological resources are crucial for confident, adaptive, and future-oriented decision-making. Against this backdrop, this study tests the validity of the (PsyCap) scale and investigates its performance implications for Japanese urban farmers, focusing on those holding environmental certifications.

We surveyed 120 farm operators who employed environmentally friendly practices in the Tokyo metropolitan area, drawing on the eight-item, four-factor PsyCap scale proposed by Nakatsuka et al. (2024). Confirmatory factor analysis supported a streamlined three-factor model—Hope, Efficacy, and a combined Resilience–Optimism dimension—with an excellent fit (CFI = 0.985; RMSEA = 0.053) and satisfactory discriminant validity (HTMT < 0.79). Robust OLS regressions then assessed the effects of these PsyCap dimensions and their interactions with certification status on brand, environmental, and financial performance, and long-term persistence in farming while controlling for age, farm size, and estate income.

Efficacy consistently improved all the performance metrics, underscoring the importance of self-belief in the execution of diverse marketing and environmental strategies. The Resilience–Optimism composite boosted financial outcomes. It strengthened farmers' intent to keep cultivating over the next decade ($\beta = 0.192, p < 0.01$), highlighting the value of adaptive recovery and optimistic attribution when managing urban land-use uncertainty. By contrast, excessive Hope dampened environmental performance, and its interaction with organic (JAS) certification significantly weakened long-term persistence ($\beta = -0.589, p < 0.01$). This suggests that overly ambitious goals may undermine sustainability in highly regulated organic systems. Other certifications, such as Tokyo Eco and Tokyo GAP, show no significant performance effects via PsyCap interactions.

Overall, our evidence indicates that self-efficacy and the resilience–optimism composite are the PsyCap components that truly "move the needle" for Tokyo's urban farmers. Hope, when not tempered by realistic constraints, can impair environmental outcomes and erode confidence in long-term viability among JAS-certified operators. PsyCap, therefore, emerges not as a vague "feel-good" trait but as a measurable human asset shaping how effectively diversified and environmentally oriented strategies are executed in high-cost metropolitan settings. Interventions that strengthen farmers' efficacy and resilience while guiding them toward attainable, stage-appropriate goals are likely to secure both economic viability and ecological integrity.

Presentation 1.4

Understanding the Barriers and Enablers of Good Animal Husbandry Practices among Smallholder Dairy Farmers in Inner Terai of Nepal

Ishwor BARSHILA [1]

1. Tohoku University

This study examines the factors influencing the adoption of good animal husbandry practices by smallholder dairy farmers in Nepal. Cross-sectional data were gathered from 120 dairy farmers in the Udayapur district, representing the lower hills in eastern Nepal, using purposive random sampling during the year 2019/2020. A seemingly unrelated probit regression with a recursive structure was applied to assess the adoption decision of good animal husbandry practices (GAHP), which may have causal and sequential relationships. We used four GAHPs–conventional shed, artificial insemination, milk utensils, and milk preservation–as dependent variables within a recursive model employing the same explanatory variables. The major production and marketing-related problems of smallholder dairy farmers were assessed using forced-ranking techniques. First, animal insurance facilities significantly increased the likelihood of conventional shed adoption. Second, both conventional shed and village animal health worker services significantly increase the likelihood of AI adoption in dairy animals. Third, AI adoption reduced the likelihood of using proper milking utensils, whereas animal insurance facilities increased the likelihood of using proper milking utensils. Fourth, the proper use of milk utensils enhances the likelihood of adopting milk preservation methods. However, dairy cooperatives and village animal health worker services for dairy farmers significantly reduce the adoption of milk preservation practices. Fifth, the most severe production and marketing problems for smallholder dairy farmers were low technical knowledge and milk prices, respectively. Knowledge and adoption of the GAHP by smallholder dairy farmers for milk hygiene practices should be a prime concern to ensure that farmers receive fair pricing for milk. Therefore, the local government, along with the federal government, development partners, and the private sector, should focus on technical backstopping and raising awareness about adopting good animal husbandry practices at the farm level to maintain pre- and post-harvest milk hygiene.

Presentation 2.1

Rural and urban household food demand during the pre-, early, and late COVID-19 pandemic periods: Estimation using SUSENAS microdata for Bengkulu Province, Indonesia.

Melli SURYANTY SN [1]
1. Tottori University

Research comparing the impact of COVID-19 on the food demand in rural and urban areas is urgently required. This topic provides important information about the differences in food demand in both areas during the pre-, early, and late pandemic periods. Our study estimates household food demand in the rural and urban areas of Bengkulu Province, Indonesia, in the three periods using the quadratic almost ideal demand system on SUSENAS microdata. We tested the differences in food demand between the two areas among the three periods of the pandemic. We found that cereal demand is expenditure inelastic, and meat demand is the most expenditure elastic in both areas during all periods of COVID-19. In the urban area, people consumed less cereal, oil & coconut, coffee, tea & sugar, and seasonings during the pre-, early, and late COVID-19 periods. However, they consumed more eggs & milk, and prepared food. We also found that the demand for fish and meat was higher in the urban area in the pre- and early COVID-19 periods but was insignificant in the late pandemic. Vegetables and fruit substituted each other in both areas in the pre-pandemic period, and only in the rural area in the early period. In contrast, they complemented each other in the urban area in the late period. In the pre-and early COVID-19 periods, meat was the easiest to be substituted in both areas; however, in the late period, seasoning was the easiest. Tuber was the most difficult to be substituted in the late COVID-19 period in both areas. Family size, number of children, female household head, age, schooling years, work type, and marital status all affected household food demand. All demographic variables were necessary for the demand system. These findings have policy implications for Indonesian local governments in anticipating future crises.

Presentation 2.2

Consumer Preferences for Country-of-Manufacture at Japanese Cuisine in Shanghai, China: Proposing the Country-of-Cuisine Concept as One of the Country-of-Origin Dimensions

Kohei YAGI[1], Massimiliano CALVIA[2], Xinyuan ZHANG[3], Yuki MARUYAMA[4], Mizuho HAYASHI[4], Tomoo HIGUCHI[4], Guanjun LI[5], Ayari Hafidz FIKRI[1], Gioacchino PAPPALARDO[6], Roberta SELVAGGI[6]

1. Kobe University, 2. Free University of Bozen-Bolzano, 3. Yokohama National University,
4. The Policy Research Institute of MAFF, 5. Kochi University, 6. University of Catania.

The concept of country of origin represents a multifaceted construct that accounts for at least four dimensions: country of design, assembly, parts, manufacturing, and brand. This complexity is reflected in the different and often unexpected ways in which the country of origin can influence consumers' product evaluations. This study aims to elucidate the preference of consumers of Japanese cuisine, i.e., the country-of-cuisine, toward "made-in-Japan" food and food ingredients along the country-of-manufacture dimension. In this paper, we define the country of cuisine as the country from which the cuisine originated. Perceptions of the country of cuisine can differ among countries and consumers, as with California rolls, which vary from traditional sushi. These points raise the following question: Do Japanese cuisine consumers prefer food and food ingredients that are "made in Japan"?

The task of this paper is as follows:

(1) Uses Best-Worst Scaling to evaluate the importance of "made in Japan" among consumers of Japanese cuisine in Shanghai, China;

(2) Cluster analysis of the Best-Worst Scores is used to classify respondents and compare the attributes characterizing their consumption behaviors to evaluate the country of manufacture and country of cuisine.

The main findings were as follows. First, the country of manufacturing was unimportant to Shanghai residents who consume Japanese cuisine. Second, the country of manufacturing was more important to older and more frequent consumers of Japanese food.

The contributions of this study are as follows. First, it is valuable as the first study to analyze the relationship between the country of cuisine and the country of manufacture. Many studies have pointed out that a domestic bias occurs in traditional food consumption among regional residents. However, this is the first study to show that the country of manufacturing is not necessarily important for overseas country-of-cuisine consumers. This concept helps us understand whether the diffusion of country-of-cuisine leads to the export of agricultural products and foodstuffs in countries such as China, where diverse international cuisines intersect. Second, it provides important insights into whether the frequency of consumption of foods from a specific country and the demographic attributes of consumers may be closely related to the country of manufacture. In this study, cluster analysis was used to consider the diversity of food values, providing a basis for future analyses of the determinants of the relationship between country of manufacture and country of cuisine. Thus, it is necessary to examine the hypotheses by referring to many studies that present country-of-origin determinants. The results of this study also contribute to formulating these hypotheses. Third, we present the policy implications that contributed to the Japanese government's efforts to promote Japanese cuisine and agricultural and food exports. The promotion of Japanese cuisine does not necessarily lead to the export of agricultural products and food. These findings will help promote effective Japanese agricultural products and food exports to China.

Presentation 2.3

Assessing farmers' perceptions of Integrated Pest Management (IPM) adoption and its impact on poverty reduction: Evidence from brinjal cultivators in Narsingdi district, Bangladesh

Md. Rashidul HASAN [1]
1. Sher-e-Bangla Agricultural University

The overuse of pesticides poses significant environmental and public health challenges in Bangladesh. Integrated Pest Management (IPM) is an eco-friendly agricultural approach that offers a sustainable alternative to mitigate this issue. This study assessed brinjal (eggplant) growers' perceptions of IPM and identified socioeconomic factors influencing poverty reduction in Narsingdi District, Bangladesh. Raypura and Monohordi upazilas in the Narsingdi district of Bangladesh were selected. Using a simple random sampling technique, 200 brinjal growers were selected for this study. A pre-tested interview schedule was used to gather data from farmers between May and June 2024. A six-point Likert scale was used to evaluate the farmers' perceptions of IPM in the research area. A fractional logistic regression model was used to determine the key factors affecting poverty alleviation in the study area. The results revealed that 67.5% of the farmers strongly agreed that IPM outperformed synthetic pesticides, whereas 68.0% strongly endorsed its cost-reduction benefits. A total of 49.5% of farmers agreed with two statements: IPM does not harm water bodies, and IPM is beneficial for soil health. While 41.0% of farmers disagreed that IPM was more expensive than synthetic pesticides, 39.0% opposed the idea that IPM practices could be integrated with traditional pesticide-based technologies. Additionally, 59.5% agreed that IPM posed no health risks to farmers, and 46.0% acknowledged its role in enhancing vegetable productivity. Regression analysis identified household income from IPM-based cultivation, farmer education level, household size, and farm size as critical drivers of poverty reduction. Government initiatives must prioritize farmer education and awareness campaigns to promote IPM adoption and combat poverty. Targeted awareness campaigns should emphasize how IPM can strengthen long-term agricultural sustainability and protect the environment (e.g., safeguarding water bodies and maintaining soil health). Non-governmental organizations (NGOs) are also urged to facilitate training programs and disseminate IPM practices to ensure widespread implementation. These collaborative efforts are vital for fostering sustainable agriculture and improving the livelihoods of the region.

Presentation 3.1

The Impact of Subsidized Inorganic Fertilizers on Farm Input Usage and Food Self-Sufficiency: Evidence from the Terai of Nepal

Kamal Bahadur SUNAR[1]
1. Hiroshima University

Nepal faces shrinking cultivable land amidst a growing population, necessitating increased agricultural productivity to ensure a stable, year-round food supply. The provision of subsidized inorganic fertilizers (SIF) is a key policy instrument adopted by the Government of Nepal to enhance agricultural productivity. Although the subsidy constitutes a significant portion of the government's agricultural development budget, its impact on productivity—through a clearly defined identification strategy—has yet to be fully established. This study investigates the effect of SIF on farm input usage and household food self-sufficiency in the Terai region of Nepal, using data from the National Agriculture Sample Census 2021 (N = 147,070). An instrumental variable approach is employed as the identification strategy. The findings indicate that access to SIF increases the use of inorganic fertilizers by 3.31 quintals per year and expands both irrigated and gross cropped areas by 1.05 and 0.82 hectares, respectively, compared to non-recipients. These effects likely contribute to improved food self-sufficiency among SIF-recipient households, extending it by an average of 2.44 months. Heterogeneity analysis reveals that the impact of SIF on food self-sufficiency is more pronounced in the western Terai region, and among farmers who are aware of climate change, have received formal agricultural training, and refrain from burning crop residues. These findings underscore the significant role of SIF in influencing all four measured outcomes, highlighting the importance of policy measures that expand farmers' access to affordable inorganic fertilizers. Such efforts can enhance agricultural productivity and strengthen food security by promoting household-level food self-sufficiency.

Presentation 3.2

Market Failure and Child Labor in the Ghanaian Cocoa Industry

Ryan OLVER [1], Samuel AMPONSAH [1], Augusto DELGADO [1]
1. Tokyo International University

Agricultural child labor has proven to be a persistent and challenging issue, largely due to the vicious circle between child labor and poverty, which often depends on child labor to survive, but comes at the cost of children's education. Child labor is a pressing concern in high-income countries that have taken steps to restrict the sale of goods made using child labor. Most recently, the EU passed a regulation that bans all products made with forced labor (including child labor) by the end of 2027. However, altering the consumption patterns alone may not resolve this issue. Suppose the agricultural sector fails to adapt quickly enough, and high-income consumers turn elsewhere for agricultural products. In that case, these restrictions run the risk of worsening poverty levels and counterintuitively exacerbate the use of child labor (Luckstead et al,. 2019)

In Ghana, the cocoa sector comprises a significant portion of agricultural employment and up to 25 percent of the national export value. As such, it plays an important role in poverty reduction. The industry has also been identified as a target for reducing child labor, as evidenced by the formation of the International Child Labour Cocoa Coordinating Group in 2010. Previous research has indicated that institutional and socioeconomic factors impede investment and productivity growth (see Goldstein and Udry (2008) or Donkor et al. (2023)). Some studies also suggest that increasing land wealth may lead to increased dependence on child labor, but possibly only in the presence of labor market failure (see Basu et al. (2008) or Dumas (2020)).

Our research empirically tests the relationship between market failure and child labor in the Ghanaian cocoa industry. We have access to a unique dataset consisting of household surveys of Ghanaian cocoa farmers that include information on their income, consumption, labor, expenditure on inputs, assets, children's work, and the market cost of hiring labor from outside the household. Survey participants also recorded their monthly financial diaries, providing greater insight into their consumption patterns. Using this data, we plan to undertake the following two-step analysis: Consistent with the literature on agricultural household production (see Lambert and Magnac, 1997), we intend to model the production and consumption patterns of agricultural households in Ghana to test whether the implicit prices of goods and labor are equal to the market price. If this assumption does not hold, this suggests that households are subject to an imperfect market. Conditional on at least some households failing to meet this assumption, we investigate how the gap between implicit and market prices relates to households' use of child labor in cocoa production. The results of this research should contribute to furthering our understanding of the determinants of child labor and improving the efficacy of policies designed to reduce child labor.

Presentation 3.3

Spatial and Social Constraints and Consequences of Informal Cattle Rental for Land Preparation in Zambia

Nanaya ODA[1]
1. Kyoto University

Timely planting is crucial for achieving the potential yield by minimizing the risk of germination failure in rainfed agriculture. However, poor access to plowing inputs often limits farmers' ability to plant at the ideal time. This issue is particularly salient for African farmers who rely on cattle for land preparation and frequently depend on informal rental arrangements within their communities. Despite the importance of timely planting in African agriculture, the functional and productivity consequences of informal cattle rental markets remain poorly understood.

This study explores the constraints and consequences of cattle rental by using survey data from approximately 1000 maize farmers in the Southern Province of Zambia. The southern province presents an ideal setting for such an analysis because of the high exposure to dry spells in the early stages of the rainy season, the prevalent use of oxen for land preparation, and the acknowledged yield sensitivity to planting delays. Previous agricultural trials conducted at the study site reported a 19% reduction in maize yield (approximately 125 kg/ha) due to delayed sowing by 10–20 days. This highlights the importance of timely access to draught power. Furthermore, borrowing cattle from neighbors in the same village is widespread.

Our first analysis examined planting schedules based on cattle ownership and land preparation methods. We found no clear link between cattle ownership and planting duration. In contrast, households using one hired ox for plowing planted approximately five days later than those using their own oxen. These results suggest that while average farmers, regardless of cattle ownership, choose planting time flexibly owing to cattle rental from peers, some forgo maize yields due to delayed sowing. This indicates a need to understand what restricts access to rental opportunities.

Our second analysis explores this from both social and spatial viewpoints. We used two proxies: the number of relatives in the village for social connections and the Mahalanobis distance for spatial proximity. The Mahalanobis distance (the adjusted distance from the homestead to the village's centroid by considering the spatial distribution of neighbors' locations) measures how centrally or peripherally a household is located within the village. Thus, our empirical purpose was to gauge the importance of spatial remoteness relative to social connections in cattle rent.

Our preliminary analysis, using census data from a village at the study site, found that geographically connected households are more likely to own or borrow oxen. In contrast, households in the geographical periphery of the village face dual constraints: they are less likely to own oxen due to lower wealth levels and are less able to borrow, likely because physical remoteness increases transport and coordination costs. In contrast, we found no evidence of a significant role of social networks in borrowing cattle for farming.

Our findings highlight that informal input rental markets, when constrained by spatial factors, cannot address inefficient resource allocation owing to unequal ownership and potential yield losses. Policies that support broader access to productive resources, such as collective ownership of draught animals or targeted support for isolated households, could facilitate timely planting, thereby enhancing agricultural yields.

ARAFE The 9th International Workshop Conveners:

Dr. Minakshi KEENI, Tohoku University
Dr. Hart FEUER, Kyoto University
Dr. Nina TAKASHINO, Ritsumeikan University
Dr. Motoi KUSADOKORO, Tokyo University of Agriculture and Technology

For more information on the Association for Regional Agricultural and Forestry Economics (ARAFE), see http://a-rafe.org/2/0 or write to arfe@nacos.com