

**ARAFE**

The Association for Regional Agricultural and Forestry Economics

地域農林経済学会

## **The 7<sup>th</sup> International Workshop**

第7回 国際ワークショップ

Ritsumeikan University, OIC Campus **room AN310**

**The room was changed**

Hybrid with Zoom and in-person

立命館大学 大阪いばらきキャンパス **AN310 教室**

**教室が変更されました**

(Zoom と対面のハイブリッド開催)

Saturday July 15, 2023

2023 年 7 月 15 日 (土)

9:30 – 16:55 JST

The Association for Regional Agricultural and Forestry Economics

## The 7<sup>th</sup> International Workshop

Ritsumeikan University, Osaka Ibaraki Campus room AN310

Saturday July 15, 2023

9:30 – 16:55 JST

### Workshop Program

Saturday July 15, 2023:

**9:30 – 9:35**      **5 min.**

#### Opening remarks

Dr. AKITSU Motoki, ARAFE President and Professor, Kyoto University

**9:35 – 9:40**      **5 min.**

#### Welcome remarks

Dr. SEKINE Kae, ARAFE Executive Board of Internationalization and Professor, Aichi Gakuin University

**9:40 – 12:00**      **140 min.**

#### Session 1. Sociology of Food, Agriculture & Rural Livelihoods

Session Chair: Dr. Hart FEUER, Kyoto University

##### **Presentation 1.1** by Bin JIA, Ritsumeikan University

“Customary Land Reallocation in Rural China:

Its Transformation and Impact on Farmers' Livelihoods, Land Ownership, and Social Relations”

Commented by Dr. Yoshio KAWAMURA, Ryukoku University.

##### **Presentation 1.2** by Hatsu TANAKA, Kyoto University

“The relationship between the residents’ online time and offline activities in Japanese rural area”

Commented by Dr. Minakshi KEENI, Tohoku University.

##### **Presentation 1.3** by Jiyeon BAE, Kyoto University

“A Comparative Study of Egg Confectionery in Nanban Ryorisyo:

Tracing the prominence of eggs in Japanese confectionery to Edo period Nanban traditions”

Commented by Dr. Atsushi Ito, Kyoto University.

##### **Presentation 1.4** by Abel ALARCO, Kyoto University

“The Interdisciplinary Researcher:

Probing the Impact of Academic Structures and Scholarly Identity on Agri-Food Sociology”

Commented by Dr. Masashi Tachikawa, Nagoya University.

**12:00 – 13:00**      **60 min.**      **Lunch break** (Zoom breakout rooms will be open)

**13:00 – 14:45 105 min.**

**Session 2. Agricultural & Rural Development Economics in Asia**

Session Chair: Dr. Akihisa NONAKA, Mie University.

**Presentation 2.1** by Dr. Seiichi FUKUI, Kobe University

“The influences of discrimination against the migrants on the wage gap in Chinese urban labor market”

Commented by Dr. Junichi ITO, Kyoto University.

**Presentation 2.2** by Kana MIWA, Nagasaki University

“Studying, Working, or Both: Evidence from Cambodian School-Age Children”

Commented by Dr Kenjiro YAGURA., Hannan University.

**Presentation 2.3** by Dr. Kumar BHATTA, Kyushu University

“Profitability in Nepalese Rural Restaurants and Owners Motivation to Diversification:  
Agritourism Perspective”

Commented by Dr. Kexhav Lall MAHARJAN, Hiroshima University.

**14:45 – 15:00 15min. Coffee Break** (Zoom breakout rooms will be open)

**15:00 – 16:45 105 min.**

**Session 3. Behavior Science of Farmers and Rural Livelihoods**

Session Chair: Dr. MASUDA, Tadayoshi, Kindai University

**Presentation 3.1** by Gulkaiyr SAPAROVA, Hiroshima University

“Farmers Preference for Systematization to facilitate crop phytosanitary safety in Kyrgyz Republic:  
Evidence from Randomized Conjoint Experiment”

Commented by Ms. Yoko ICHIJO, Kyoto University.

**Presentation 3.2** by Theresia TSUHIMUNGU, Tohoku University

“The roles of cassava production in improving the income of farm households:  
Cases from Kinshasa/Democratic Republic of Congo (DRC)”

Commented by Dr Niraj Prakash Joshi, Hiroshima University.

**Presentation 3.3** by Hermann NKONGOLO KAZADI, Tokyo University of Agriculture and Technology

“Participation in Artisanal Diamond Mining and Food Insecurity:  
Case Study of Kasai Oriental in DR Congo”

Commented by Dr. Magezi E. Francis, Tohoku University

**16:45 – 16:50 5 min.**

**Acknowledgements** by Dr. Tadayoshi MASUDA, ARAFE Executive Board of Internationalization and  
Assoc. Professor, Kindai University

**16:50 – 16:55 5 min.**

**Closing remarks**

Dr. Yoshihiro ADACHI, ARAFE Vice President and Professor, Kyoto University

M.C. & Zoom operation by Dr. Nina TAKASHINO, ARAFE Executive Board of Internationalization and  
Assoc. Professor, Ritsumeikan University

## Venue Information

Ritsumeikan University, OIC Campus room AN310

Access to Osaka Ibaraki Campus

<https://en.ritsumei.ac.jp/access/>

Osaka Ibaraki Campus map and Osaka Ibaraki Campus Floor Guide

<https://en.ritsumei.ac.jp/campusmap/>

## 会場案内

立命館大学 大阪いばらきキャンパス AN310

大阪いばらきキャンパスまでの交通案内

<https://www.ritsumei.ac.jp/accessmap/oic/>

キャンパスマップとフロアガイド

<https://www.ritsumei.ac.jp/campusmap/>

Lunch info お昼ご飯情報

GARDEN TERRACE LION 銀座ライオン

<https://tabelog.com/osaka/A2706/A270604/27084416/>

MINAMEN café みなめん cafe (夏季営業、要確認)

<https://tabelog.com/osaka/A2706/A270604/27131779/>

Starbucks Coffee スターバックス

<https://store.starbucks.co.jp/detail-2058/>

Café Pinocchio ピノキオ

<https://tabelog.com/osaka/A2706/A270604/27131443/>

University Cafeteria and Coop shop is closed on Saturday

There is a convenience store next to the campus where you can buy lunch.

学食と大学生協は土曜は閉まっています。

キャンパス隣にコンビニがありお弁当を買えます。

## Collection of Abstracts

### Presentation 1.1

#### **Customary Land Reallocation in Rural China: Its Transformation and Impact on Farmers' Livelihoods, Land Ownership, and Social Relations**

Bin JIA<sup>1</sup>

1. Ritsumeikan University

The formation of China's agricultural land system after the Reform and Opening-up was accompanied by a series of policies to suppress the practice of reallocating agricultural land. Since the early days of the Reform and Opening-up, farmers have been gradually prohibited from reallocating land within villages. However, numerous studies and tracking surveys have shown that land reallocation did not fade or disappear following prohibitive policies and that it has survived as a customary practice in rural life, despite adopting the Household Responsibility System and a strict prohibition on land reallocation in China.

This phenomenon suggests that some farmers are uninterested in the options offered by the Chinese government in terms of contract rights and tenure. Therefore, it is necessary to explore the impact of land reallocation on local farmers' livelihoods and social relations under policy constraints and whether farmers' perceptions and attitudes toward land reallocation have changed. Thus, it is possible to clarify the main causes of persistent land reallocation.

Specifically, this study is interested in whether land reallocation is related to local village size, clan composition, and subsistence economy structure. In this Workshop, I will report the results of my survey in Village X in Shandong Province, China, which will contribute to the second aspect of my research. The survey covered 154 households with 668 people and was conducted in February 2023. Interesting results were obtained using the snowball sampling questionnaire.

I found that the educational level of the respondents was generally low, with about 41.6% having only an elementary school education or less. In addition, nuclear families were the dominant family type, accounting for 62.3%, with an average household size of 4.3 persons/families. I also found that the proportion of younger generations leaving agriculture has increased compared to previous generations, with a share of 26% choosing to work in other sectors while they still registered as farmers in national household registration. Growing one's own land is still the main form of the farm, with a high percentage of 76.6%. It is worth noting that 90.9% of respondents had experienced land reallocation and 51.9% had experienced both large and small land reallocations. Overall, the respondents had a more supportive attitude toward land reallocation (4.57/7). Among the specific attitudes toward land reallocation, the respondents' judgments showed a more diverse distribution. At the same time, I found that villagers did not agree with the idea that land reallocation would lead to too short formal land tenure (4.03/7). This finding provides a different perspective from the previous literature. There was a moderate positive correlation between equality cognition and attitudes toward land reallocation (LR), with a correlation coefficient of 0.576 ( $p < 0.01$ ). This suggests that the higher the level of equality cognition, the more positive the individual's attitude toward LR.

## Presentation 1.2

### The relationship between the residents' online time and offline activities in Japanese rural area

Hatsu TANAKA <sup>1</sup>

1. Kyoto University

This study clarified the relationship between rural residents' time spent using the Internet, the frequency of offline interactions with residents in rural communities, and participation in local group activities and events.

In rural areas of Japan, ties between residents in local communities are weaker because of the falling birthrate, aging population, and depopulation. In addition, residents have more opportunities to use the Internet because of improved telecommunications infrastructure and the spread of Internet services.

While the Internet has increased convenience for rural residents through online interactions with people outside the region and online shopping, an increase in online time can reduce the time spent on offline interactions with the residents, group activities, and events, according to the time displacement theory. Therefore, the author hypothesizes that the longer residents spend on the Internet, the less frequently they interact with the residents and participate in group activities and events.

However, there are no surveys based on Internet use in rural areas. Because it was not possible to determine the actual Internet use of residents there, the author conducted a survey in December 2021 in Kouzaki District, Miyamae-cho, Kameoka City, Kyoto Prefecture.

The questionnaire consisted of questions about the amount of each residents' time spent using Internet and the frequency of participating in offline activities in the district. Time spent using the internet was surveyed on weekdays and holidays, and offline interactions within the community were categorized into four types: family and relatives not living together in the community, neighborhood associations, members of local groups, and other community residents. In terms of group activities and events, twelve types of community activities and events were surveyed, respectively.

The results showed a negative correlation between online time, offline interactions, and community activities, with a stronger negative correlation with the time spent on holidays than on weekdays. Regarding offline interactions, residents who stayed online for a longer time interacted with the neighborhood association and members of the groups to which they belonged less frequently. Regarding group activities, residents who stayed online longer participated in autonomous associations less frequently. Regarding community events, residents who stayed online longer participated in six events less frequently.

These results verify that our hypothesis is correct. However, the results for younger (under 40s) and middle-aged (40s-60s) residents were the same as the hypothesized results, while for older residents (over 70s), the longer they spent on the internet, the more they participated in offline activities. Considering generational change and acceleration of digitalization, it is expected to further reduce residents' offline activities in the future. Therefore, during residents' free time, such as on holidays, we suggest that rural residents engage in offline local activities instead of internet use.

## Presentation 1.3

### A Comparative Study of Egg Confectionery in Nanban Ryorisyo

~ Tracing the prominence of eggs in Japanese confectionery to Edo period Nanban traditions ~

Jiyeon BAE<sup>1</sup>

1. Kyoto University

In the Nanban culinary culture that arose in Japan in the 16th Century, sugar was the most prominent foodstuff for confectionary purposes; however, eggs were also introduced. According to Matsumoto (1992), the consumption of eggs was taboo before the wider acceptance prompted by the rise of the Nanban culture. Particularly through the influence of Europeans through the Nanban trade routes, it became more routine for Japanese people to include eggs in their food.

While the prominence of eggs in modern Japan can be traced back to the influence of the Nanban trade and interactions, it remains unclear whether eggs were as widely incorporated into Japanese confections. There is uncertainty about the extent of the influence of the Nanban cultural exchange on acculturation in Japanese confectionery culture, as trade declined during the isolation of the Edo period. This raises the question of whether eggs continue to gain popularity through more general culinary influences, such as the spread of more general Nanban cooking methods. This study aimed to explore the timeline of when and where egg confectionery became popular in Japan and investigate the role of Nanban recipes in facilitating interest in eggs as an ingredient.

The *Nanban Ryorisyo* (南蛮料理書) (estimated to have been published around 1610) describes various confections containing eggs, such as 'Kesachih-ina(けさちひな),' 'Ohiriyasu(おひりやす),' 'Hiriyasu(ひりやす),' 'Kaste-horo(かすてほうろ),' and 'Tamako-Somen(たまこそうめん).' In the other hand, egg white has contained in the ingredient, but egg isn't not a main ingredient, such as 'Karumeira(かるめいら)' and 'Aru-heito(あるへいと)' has also targeted in this study.

In this study, I examined similar recipes for these seven confections in cookbooks published during the later stages of the Edo period, when such books began to gain popularity and egg confections became widespread. The research method involves analyzing recipes of confections from the 'Nanban Ryorisyo' that match the ingredients and cooking techniques mentioned in later Edo period cookbooks. This study aimed to determine whether cooking methods for egg-containing confections were prompted by the spread of Nanban culinary influences. This can be achieved by content analysis and by comparing the relative proportions of eggs in the repertoire of various cookbooks to Nanban sources.

Keywords: Nanban Culture, Historical recipes, Edo Period, Acculturation (Domestication)

## Presentation 1.4

### The Interdisciplinary Researcher:

#### Probing the Impact of Academic Structures and Scholarly Identity on Agri-Food Sociology

ALARCO<sup>1</sup>, Abel

1. Kyoto University

Drawing on my ongoing Master's research, this workshop presentation seeks to ignite reflective dialogue among participants concerning their academic roles and the influence of the structure of academia on their scholarly identities. This issue is of heightened importance in the field of agri-food sociology, where boundary-crossing and systems-oriented approaches are almost universally agreed to be key pathways towards the alleviation of global and systemic food-related issues. The question at the heart of this discussion is, how do existing academic structures limit our capacity for more impactful boundary-crossing collaboration?

My Master's research considers this topic as part of a larger exploration examining the current state of boundary-crossing research related to food systems. With this aim, my research involves three distinct research platforms, each dedicated to systemic agri-food issues and pursuing participatory and transdisciplinary methodologies. These are the "Transforming the UK Food Systems Programme," the Japan-based "Participatory Action-Research FEAST Project," and the "European Long-Term Ecosystem and socio-ecological Research Infrastructure." These platforms serve as fruitful grounds for discerning the current obstacles impeding synergy between the natural and social sciences and for bridging the gap between academia and other societal sectors.

A significant concern emerging from my interviews and literature review is the effect of academic structures on scholarly identity, a scholar's ability to identify and align with a discipline. Academic institutions define courses and career paths that scholars can pursue, and inadvertently shape their identities. Regrettably, these structures often overlook boundary-crossing, leading to underrepresentation and inadequate structures. This absence of support inhibits the evolution of boundary-crossing identities and consequently dampens diversity within academia.

The literature and my initial interviews reveal that early career researchers (ECRs) frequently express that academia may not be as hospitable to innovative ideas as it is generally expected, underscoring the necessity for a more inclusive environment. However, the examined platforms offer promise, as they seem to stand against the rule through the creation of encouraging spaces where diverse scholars feel valued.

With the agri-food field currently emphasizing a systemic understanding of food — supported by extensive literature, projects, and international institutions endorsing the "holistic food-systems" paradigm — the need for more boundary-crossing research is apparent. Therefore, the workshop will stimulate participants through questions exploring the adequacy of resources for this type of research, career prospects for ECRs, overlooked topics in agri-food sociology, and the feasibility of boundary-crossing researcher training.

## Presentation 2.1

### The influences of discrimination against the migrants on the wage gap in the Chinese urban labor market

Seiichi FUKUI<sup>1</sup> and Kazutoshi NAKAMURA<sup>2</sup>

1. Kobe University 2. Kyushu Sangyo University

This study explores the influence of discrimination against rural migrants on the wage gap in the Chinese labor market. Several studies have investigated this issue. However, controversy still exists regarding the existence of a wage gap caused by discrimination. This study empirically examines the extent to which discrimination against rural migrants influences the wage gap between and within the formal and informal sectors for two different types of groupings: rural hukou holders vs. other hukou holders, and between migrants and local urban residents. For this purpose, we applied the Oaxaca-Blinder decomposition method, taking the formal/informal sector wage gap and the probability of entering each sector into the method (Brown's model). According to the decomposition results for the case of rural hukou holders versus other holders, 24% and 31% of the wage gap can be explained by intra-sector differentials of individual characteristics and inter-sector differentials of it, respectively. On the other, 30% and 14% cannot be explained by intra-sector differentials of individual characteristics and inter-sector differentials of it, respectively. The results revealed that the unexplained components still had a significant influence on the wage gap, although their influence was smaller than that of the explained components. These findings are inconsistent with those of existing studies that show that the influence of discrimination against rural hukou holders on wage differentials has already vanished. As for the case of migrants vs. urban residents, 16% and 26% of wage differentials can be explained by intra-sector differentials of individual characteristics and those of inter-sector differentials, respectively, whereas 44% and 14% cannot be explained by intra-sector differentials of individual characteristics and those of inter-sector differentials, respectively. In this case, in contrast to the case of rural hukou holders versus other hukou holders, the influence of unexplained components on wage differentials is greater than that of the explained ones. These results are consistent with existing studies showing that the impacts of discrimination on wage differentials between migrants and urban residents are too large to ignore. Finally, in both cases, the influence of the unexplained component of intra-sector differentials was greater than that of the unexplained component of inter-sector differentials.

**Keywords:** urban labor market, wage gap, rural hukou, discrimination against migrants

## Presentation 2.2

### Studying, Working, or Both: Evidence from Cambodian School-Age Children

Kana MIWA<sup>1</sup>

1. Nagasaki University

Cambodia has maintained a high economic growth rate since 2000 and has witnessed improvements in both the national GDP and living standards. Owing to the Covid-19 pandemic, the Cambodian growth rate was -3.1% in 2020, and it has recovered to 3.0% and 5.3 % in 2021 and 2022, respectively. Cambodia is endeavoring to become an upper-middle-income country by 2030. However, it remains one of the least developed countries and continues to face the problem of poor children constituting human capital. Children often contribute to household income by engaging in economic activity, and their work (child labor) is considered one of the obstructive factors to attending school and continuing to study in secondary or post-secondary school.

This study explored the time trends and determinants of school-age children's education and work based on datasets from the Cambodia Socio-Economic Survey (CSES). Data from eight surveys (years) (CSES 2003/04, 2007, 2009, 2010, 2014, 2015, 2016, 2019/20, and 2021) were used for the analysis. School-age children (aged 10–17 years) were the main focus of this study, and information on education and work (economic activity) was available for 60,716 children. Of these, 73.3% of children reside in the rural areas. To verify the trends and determinants of children's education and work, they were categorized into four groups depending on their schooling and working (economic activity) status: not in school and no work (Group 1), current student (currently attending school) and no work (Group 2), current student and working (Group 3), and not in school and working (Group 4). The variable classified into these four groups was used as the dependent variable and a multinomial logit model was used for the analysis.

To examine the time trends, only the survey year dummies were included as independent variables. From the estimated marginal effect of the multinomial logit model, compared with 2003, the probability of being in Group 2 (in schools with no paid or unpaid work) had been increasing. On the one hand, children had been less likely to be in group 3 (both attending school and working), especially after 2010. Cambodian school-age children seem to have been affected by Covid-19 because the probability of being in Group 2 decreased, whereas the probability of being in Group 3 increased in 2019.

In addition to the year dummies, the characteristics of children and households were included to explore the determinants of children's education and work. Female children were more likely to be in Groups 2 and 4. Specifically, younger female children (aged 10–14 years) had been attending school more, and older girls (aged 15–17 years) had been more engaging in economic activities (instead of going to school). In addition, the number of younger siblings (aged nine years or less), the household head's education, and the residential area had a significant effect on children's education and work status.

## Presentation 2.3

### **Profitability in Nepalese Rural Restaurants and Owners' Motivation to Diversification: Agritourism Perspective**

Kumar BHATTA<sup>1</sup>

1. Kyushu University

Rural restaurants (RR) are in rural areas and are primarily open for business purposes, but they also contribute to economic opportunities for other rural people. RR uses locally produced and natural resources available in local areas and sells them on the spot. Furthermore, in the case of developing countries, RR is becoming a center of economic circulation. However, RRs face sustainability challenges because rural areas worldwide encounter problems such as depopulation, low-quality public services, poor infrastructure, fewer economic opportunities, short-term migration to foreign countries, poor living in rural areas, and reliance on agriculture and urbanization. These problems hinder rural restaurants' sustainability. Thus, this study mainly aims to investigate profitability in RR and owners' motivation for agritourism development because profitability and business extension are positively correlated.

We used the Tobit model and ordered the logit model for data analysis based on data collection in two regions (105 samples in 2022 and 2023) of Nepal. This study conceptualized and confirmed the contributors to RR profitability as supply side, demand-appealing, and COVID-19-related. Similarly, we explore whether owners' motivations for agritourism are affected by restaurant features, quality-related factors, and attributes. Specifically, this study concludes our two hypotheses that (H1) RR owners have lower profits if they perform side business and (H2) RR owners are motivated to engage in agritourism to increase profitability. These are the main contributions of this study to the tourism literature.

In addition to the statistical results, the authors felt the necessity for quality improvements in the RR during the field survey. The government recently started a compulsory registration policy for quality control and tax execution in RR; however, many RRs still operate without permission. The main reason for this is that the government does not have active, regular monitoring or quality-checking teams. Regular inspection not only increases the quality of restaurants but also increases tax revenue. Therefore, through strong consumer laws, policymakers should formulate a quality control team responsible for training in quality improvement in RR, monitoring, evaluating, and promoting agritourism.

### **Presentation 3.1**

## **Farmers' Preference for Systematization to facilitate crop phytosanitary safety in Kyrgyz Republic: Evidence from Randomized Conjoint Experiment**

Gulkaiyr SAPAROVA <sup>1</sup>

1. Hiroshima University

With a total population of 6.52 million and a gross domestic product of USD 8.54 billion, the Kyrgyz Republic remains one of the developing countries. Agriculture is the backbone of the Kyrgyz Republic's rural economy, employing about 40% of the country's labor force, and contributes approximately 14% to GDP (USAID, 2022). Most farmers in Kyrgyzstan are small-scale, cultivating over 75% of the country's agricultural land and operating on 1-3 hectares (Akmataliev, 2019). Although small-scale farmers produce the top agricultural products in the country, they face several challenges, such as low productivity, high transportation, and limited access to credit and markets. In addition, managing food safety risks at the farm level remains a challenge for small-scale farmers. This limits farmers' access to profitable market channels, leaving them vulnerable to exploitation by intermediaries who purchase and export them to foreign markets, resulting in the return of products. This study aims to assess small-scale farmers' preferences toward organizing and systematizing through a randomized conjoint experiment. We designed hypothetical scenario-based attributes selected through a literature review to create a choice set. The attributes considered were the type of provider, production inputs, loans, farmers' need for market information, inspection frequency, and annual payment with two to four levels. Respondents were presented with two alternative sets of choices, along with a status quo or opt-out option to rank (Hainmueller, 2014). This task was repeated five times. Since the potential export products in Kyrgyzstan are fruits, 378 fruit farmers were surveyed in five villages in the Issyk-Kul region of Kyrgyzstan, which resulted in 3780 observations. The results showed that farmers prefer hypothetical policy scenarios to their current state. Farmers preferred production inputs, loans without interest, and market information. Annual payments had a negative impact; that is, an increase in annual payments led to a decreased preference for systematization. Because only one person worked in a family with an average family size of up to 4-5 people, it is necessary to manage additional payments for farmers. The lower bound of the WTP for systematization was 14072.27 Kyrgyz som. Farmers do not trust the government. Since land privatization, former processing industries have collapsed, and farmers have not received support from the government (Lerman, & Sedik, 2017). Farmers in Kyrgyzstan can access loans with a pledge and the interest of banks to 6-18% for agricultural purposes (Aiyl Bank, 2023). The loan must be repaid within one year. Therefore, farmers preferred interest-free. They can pay back within one year but without interest. Farmers struggle to sell their products. Hence, the provision of market information increases their preference towards systematization. Small-scale farmers have shown motivation to enter into systematization. Hence, to improve phytosanitary safety in terms of labeling, policy implications can consider supporting small-scale farmers in terms of loans without interest and providing market information and production needs by systematizing them.

## Presentation 3.2

### **The roles of cassava production in improving the income of farm households: Cases from Kinshasa/Democratic Republic of Congo (DRC).**

Theresia TSUHIMUNGU<sup>1</sup>

1. Tohoku University

In Kinshasa, cassava farmers have low incomes compared with all other actors in the value chain, despite the economic importance of cassava in rural and urban areas. More than 90% of the commercial and agricultural activities of households are based on cassava. Therefore, farmers are poor and cannot live with that revenue throughout the year. Cassava requires special treatment after harvest from the roots to the fresh leaves. Therefore, processing is of paramount importance to the stability of the cassava value chain. Owing to the lack of good processing and standardized procedures, trade in cassava products is very limited, and the majority of products are only accessible in rural and local markets. This study analyzes the income of farmers based on cassava production and the barriers to obtaining better income.

Two-stage or cluster sampling was used for the primary data collection in this study. In the first stage, two villages were selected based on secondary data. Sixty agricultural households were chosen in the second stage in these villages in a completely random manner.

According to the results, yield and cropping season are the main factors influencing profit, and the cropping season also has an impact on crop yield. Therefore, the major problem at the producer level that could significantly improve income is yield improvement. To improve farmers' incomes, it is necessary to increase the yield of cassava leaves and tubers by improving production techniques. The second issue is the production costs. The production techniques used are closely related to the production costs. Improving the production techniques would effectively help to decrease costs.

The DRC is the second largest cassava producer in the world, producing 42.000.000 tons per year; however, no significant cassava exports have been recorded. However, it records significant imports of cassava products such as paper, cardboard, collars, and starch. This is because there is no cassava processing industry in the country, although the Congolese only eat processed cassava. Cassava processing centers are operated by artisans and experience many losses owing to a lack of precision and adequate equipment. The solution is not the first to process cassava for the international market but the local, national, and regional markets. The DRC and its nine neighboring countries together have approximately 309 million inhabitants. Organized national and regional markets have sufficient potential to bring in more income than international markets.

With the well-established cassava commodity in the DRC, cassava consumption patterns and overall market demand are expected to remain stable. Consequently, the growth of its population and demand for food products will remain the main drivers of the market in the medium term. The future of cassava in the domestic starch market requires improved efficiency and quality and decreased production costs. By developing different markets and creating cooperative farmers, cassava farmers in Kinshasa can increase their profits and develop village economies.

### **Presentation 3.3**

#### **Participation in Artisanal Diamond Mining and Food Insecurity: Case Study of Kasai Oriental in DR Congo.**

Hermann NKONGOLO KAZADI<sup>1</sup>

1. Tokyo University of Agriculture and Technology

Food insecurity remains a pressing issue in many developing countries, particularly in Sub-Saharan Africa. Agriculture is often seen as the mainstay of rural livelihoods. Relying solely on traditional subsistence farming may not guarantee improved food security and poverty reduction, especially as the population continues to grow. Consequently, non-farm sectors, such as artisanal mining, present a potential pathway to poverty and food insecurity for rural households. This study investigated the connection between participation in artisanal diamond mining, food insecurity, and children's nutritional status in the Kasai Oriental region of the Democratic Republic of Congo. By adopting a context-specific approach tailored to the region, this study aims to provide insights into the relationship between artisanal mining activities, food insecurity, and nutrition in households reliant on local resources. To achieve this goal, we use cross-sectional data collected between November and December 2022. The data were analyzed to examine the association between participation in artisanal diamond activities, household food security, and the nutritional status of children aged 0-59 months. Food security was assessed using the household food insecurity access scale (HFIAS), while the nutritional status of children was assessed through anthropometric z-score measurements, including height for age (HAZ), weight for age (WAZ), and weight for height (WHZ). We employed an IV approach to address potential endogeneity issues related to households participating in artisanal diamond activities. The association was analyzed using the village fixed linear regression method for food security and children's nutritional status. In our model, we included socioeconomic, demographic, mining, and institutional variables as control variables. While participation in artisanal diamond mining itself does not show a significant relationship with food insecurity, earning diamond income among participants is negatively associated with food insecurity. This implies that the additional income from diamond activities plays a crucial role in mitigating the risk of food insecurity among households dependent on natural resources. Therefore, policies that promote and formalize non-farm income-generating activities, including artisanal diamond mining, which provides supplementary job opportunities for farmers and local communities, should be encouraged in Kasai Oriental.

**ARAFE The 7<sup>th</sup> International Workshop Conveners:**

Prof. Kae SEKINE, Aichi Gakuin University  
Assoc. Prof. Tadayoshi MASUDA, Kindai University  
Assoc. Prof. Nina TAKASHINO, Ritsumeikan University

Copyright © 地域農林経済学会

The Association for Regional Agricultural and Forestry Economics (ARAFE), Japan, 2022.

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