INTERNATIONAL VIRTUAL CONFERENCE ON

SUSTAINABLE FOOD SYSTEM

IN SOUTHEAST ASIA UNDER AND BEYOND COVID-19 :

POLICY EVIDENCES AND CALL FOR ACTION

19 - 20 MAY 2022

BOOK OF ABSTRACTS

Table of contents

Committee

Local organizing committee

Kampanat Vijitsrikamol, Head of Department of Agricultural and Resource Economics Kasetsart University, Adviser

Petipong Pungbun Na Ayudhya, President of Agricultural Economics Society of Thailand Under Royal Patronage, Adviser

Department of Agricultural and Resource Economics, Kasetsart University

Orachos Napasintuwong, Chair

Borworn Tanrattanaphong, Secretary

Aerwadee Premashthira

Areeya Obidiegwu

Atchara Patoomnakul

Jumtip Seneerattanaprayul

Kanchana Sripruetkiat

Nuttapon Photchanaprasert

Ravissa Suchato

Uchook Duangbootsee

International organizing committee

Adam Kennedy, International Food Policy Research Institute

David Tschirley, Michigan State University

Duncan Boughton, Michigan State University

Nandita Srivastava, International Food Policy Research Institute

Suresh Babu, International Food Policy Research Institute

Suriyan Vichitlekarn, Mekong Institute

Xinshen Diao, International Food Policy Research Institute

International Seminar on Sustainable Food System in Southeast Asia under and beyond COVID-19: Policy Evidence and Call for Action

Date: 19-20 May 2022
Time zone: Bangkok (GMT+7)
Platform: Hybrid event (online and on-site)

Concept Note

Southeast Asia is one of the key regions for agricultural and food production in the world. The region has experienced significant growth in GDP, which for most countries has averaged close to 5% per year while the regional population has grown close to 1.3% per year over the period 2000-16 (OECD/FAO, 2017), resulting in very rapid growth in per capita incomes in the region. In 2019, the region produced 188.8 million tons of rice, 51.98 million tons of maize, 210.59 million tons of sugarcane, 362.13 million tons of oil palm fruits, and 74.85 million tons of cassava (FAO, 2021). Southeast Asia is home to the world's two largest rice exporters (Thailand and Viet Nam), and the top three exporting countries for pineapples, bananas, mango, sugar, coffee, cashew nuts, and cassava (BCSD Singapore et al. 2016). It is also the top producer and exporter of palm oil, coconut, rubber, and seafood. Fishery, aquaculture, meat, dairy, and vegetable industries have also expanded dramatically (OECD/FAO, 2017). These agribusinesses are embedded in the value chain of the food systems, and in effect creates a multiplier effect upon the economy through interrelated industries like transportation, logistic, and retail (ASEAN-Japan Center, 2020). With differences in levels of economic development, agricultural and food industries are under different stages of development across countries. Nevertheless, the agricultural landscape in this region still exhibits much reliance on small-scale farming, low capital investment, poor risk management, and the absence of strong supporting institutions. Some countries in the region still rely on the import of processed food due to the lack of processing capabilities which creates a future trend in the region to shift to a more value-added food processing industry and goes beyond farms (ASEAN-Japan Center, 2020).

While the economy in Southeast Asia is growing, the region still faces some challenges in agricultural and food production from climate change, broader environmental challenges, food security, nutrition security, and poverty reduction. The Southeast Asia region is home to around 600 million people. Urbanization, rising incomes, aging population, changing food demand from staple cereal consumption to protein-based diets, diversification requirements of food consumption, increasing demand for healthy diets and higher nutrition even as processed and ultra-processed foods increase their share in diets, all create new challenges to agricultural and food industries. The estimates of the prevalence of undernourishment and moderate or severe food insecurity over the period of 2017-2019 were 9.8% and 19.2%, respectively (FAO, 2021). On the

contrary, rising unhealthy diet has caused obesity and overweight problems in several countries (WHO, 2021).

With many challenges facing the food systems, a common understanding of the concept of food systems is needed. The UN Food Systems Summit proposed a practical understanding of the concept focusing on promoting sustainable development goals, assisting policymakers, and stressing the importance of interconnectivity both within the food systems and related systems such as health, energy, and ecology. In this regard, food systems should not be viewed in isolation and should be addressed holistically (For example, the problem like malnutrition rests upon poverty and causes health issues). The UN Food Systems Summit also proposed 5 action tracks to address problems holistically (Von Braun et al., 2021):

1.) Ensuring Access to Safe and Nutritious Food for All
2.) Shifting to Sustainable Consumption Patterns
3.) Boosting Nature-Positive Production at Sufficient Scale
4.) Advancing Equitable Livelihoods and Value Distribution
5.) Building Resilience to Vulnerabilities, Shocks, and Stresses

Food systems transformation is at the center stage of sustainable development due to its interaction with various global issues such as malnutrition, chronic disease, poverty, environmental degradation, and climate changes. A recent study on food systems transformation suggested that to address the problem of food insecurities and malnutrition sustainably the topics such as reinventing agriculture, healthy diets, climate change, and evidence-based policy should be the main priorities (Kenedy et al., 2021).

The recent COVID-19 Pandemic is one of the prime examples of food systems shock and the importance of food systems resilience. Recent studies on the COVID-19 impact on ASEAN food systems have shown that the pandemic has affected several spheres of food system transformation including labor mobility, on-farm, and off-farm income and employment, and the increasing need for safe and healthy foods. These effects placed constraints that could escalate into developmental issues such as malnutrition and debt on the region (APFC and ASEAN, 2021; Boughton et al., 2021). These changes occur both to the supply and the demand side from the way businesses are conducted to the altered consumer choices. Technologies such as online payment and delivery services were utilized to address the issues surrounding the pandemic. COVID-19 outbreak stressed the significance and need for the region to implement an evidence-based policy for food system transformation in order to create a food securities program that is sustainable and resilient. This created the need for further studies and discussions which could act as a basis for policymakers' decisions. Transformation towards a sustainable food system thus requires more attention on policy and programmatic responses that recognizes challenges and new evidence related to emerging issues such as healthy diet, traceability of food origin, information management, application of digital technology, enabling e-commerce, and logistics and trade.

Several efforts have focused on achieving food system transformation in the Southeast Asia region. Sustainable agriculture and food system became key objectives following the UN sustainable development goals (SDGs) in the region. In particular, ASEAN has a shared vision to promote competitive, inclusive, resilient, and sustainable Food, Agriculture, and Forestry (FAF) sector for 2025 goals (ASEAN Secretariat, 2015). In addition, promoting responsible growth and investment in food and agriculture, developing and supporting bio-based economy, circular economy, and green economy, inclusive agriculture are emerging as key strategic areas in the region. Given that Southeast Asia is an important region for agricultural and food production, facing challenges post-COVID-19 would require updated and evidence-based information to provide insights on the issues and challenges to ensure that actions regulations, policy implementation, capacity development would be facilitated. The policy responses and the actions should be guided by the recent evidence and the outcomes of the United Nations Food System Summit in September 2021.

Thematic sessions

1. Boosting sustainable production
2. Building resilience to vulnerabilities, shocks, and stress
3. Promoting safe, nutritious, and sustainable consumption
4. Food system profile and policy

Objectives

Department of Agricultural and Resource Economics at Kasetsart University plans to organize an international seminar focusing on Southeast Asia sustainable food system issues to share knowledge and information from evidenced-based research to provide policy recommendations to promote high-quality research, education, and effective capacity development in Southeast Asia. Key objectives of the seminar are as follows:

- To promote research-based and evidence-based knowledge sharing among academic and research institutions and policymakers in Southeast Asia
- To provide strategic and effective ways to advocate policy recommendations to support the transition towards a post-COVID-19 sustainable food system
- To identify possible areas for collaborative research projects and partnership opportunities and discussion on ways to establish a regional knowledge network on post-COVID-19 sustainable food system

Expected Outcome

The presentations and discussions will be documented in the form of a Manifesto presenting a vision of research and policy recommendations. The key outputs of the seminar will include policy briefs for consideration by stakeholders as a basis for policy actions. The outputs of this seminar will feed into the manifesto and eventually be disseminated to policymakers. In addition, new opportunities for regional knowledge network for collaborative research and capacity

development is expected.

Participants:

Selected regional representatives including academic institutions, research institutions, national and international outreach institutions, non-governmental organizations, civil society, as well as policymakers from Southeast Asia.

Organizers:

Department of Agricultural and Resource Economics, Kasetsart University
Mekong Institute
Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence (PRCI), Michigan State University
Regional Strategic Analysis and Knowledge Support System (ReSAKSS-Asia)
International Food Policy Research Institute (IFPRI)
Agricultural Economics Society of Thailand under Royal Patronage (AEST)

Sponsors:
Office of the Ministry of Higher Education, Science, Research and Innovation; and the Thailand Science Research and Innovation through the Kasetsart University Reinventing University Program 2021
New Zealand Foreign Affairs & Trade Aid Programme

References:
Asia Pacific Foundation of Canada and ASEAN Secretariat. 2021. COVID-19 Pandemic Implications on Agriculture and Food Consumption, Production and Trade in ASEAN Member States. https://www.asiapacific.ca/publication/covid-19-pandemic-implications-agriculture-and-food

ASEAN-Japan Center. 2020. Global Value Chains in ASEAN. https://www.asean.or.jp/en/centre-wide-info/gvc_database_paper15/

ASEAN Secretariat. 2015. Vision and Strategic Plan for ASEAN Cooperation in Food, Agriculture and Forestry (2016-2025). https://asean-crn.org/wp-content/uploads/2017/04/08Sept_Vision-and-SP-FAF-final.pdf

BCSD Singapore et al. 2016. Efficient agriculture, stronger economies in ASEAN: Private sector perspectives for policymakers.

Boughton, Duncan, et al. 2021. Impacts of COVID-19 on agricultural production and food systems in late transforming Southeast Asia: The case of Myanmar. Agricultural System. 188. https://doi.org/10.1016/j.agsy.2020.103026

FAO. 2021. FAO Stat. http://www.fao.org/faostat/

Kenedy, E., Webb, P., Block, S., Griffin, T., Mozaffarian, D., & Kyte, R. 2021. Transforming Food Systems: The Missing Pieces Needed to Make Them Work. Current Developments in Nutrition, 5(1), nzaa177. https://academic.oup.com/cdn/article/5/1/nzaa177/6030026?login=true

OECD/FAO 2017. OECD-FAO Agricultural Outlook 2017-2026

Von Braun, J., Afsana, K., Fresco, L., Hassan, M., & Torero, M. 2021. Food Systems–Definition, Concept and Application for the UN Food Systems Summit. A paper from the Scientific Group of the UN Food Systems Summit. https://www.un.org/sites/un2.un.org/files/food_systems_concept_paper_scientific_group_-_draft_oct_26.pdf

WHO. 2021. Executive Summary: Food Systems Delivering Better Health. https://video.lmdint.com/file/healthtalks/Executive-Summary-Health-Narrative.pdf

Program

Bangkok time zone (GMT+7)

Day 1: 19 May 2022

8:30 – 8:45 Webinar open for participants

Plenary session:

8:45 – 9:00 Opening session:

Background and introduction: Suriyan Vichitlekarn, Executive Director, Mekong Institute

Welcoming remarks: Kampanat Vijitsrikamol, Head, Department of Agricultural and Resource Economics, Faculty of Economics, Kasetsart University

Welcoming remarks: Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute

9:00 – 10:00 Keynote presentation

Repositioning policies for transforming food systems in Southeast Asia

Shenggen Fan, Chair Professor and Dean of Academy of Global Food Economics and Policy, China Agricultural University & Former Director General of International Food Policy Research Institute

Rapporteur: Adam Kennedy, International Food Policy Research Institute

10:00 – 10:15 Intersession break (photo session)

10:15 – 12:15 Session 1: Boosting sustainable production

Chair: Wallapak Polasub, Senior Researcher, Institute for Sustainable Food Systems, Kwantlen Polytechnic University

Rapporteur: Teeka Yotapakdee, Maejo University; Pakapon Saiyut, Khon Kaen University

1.1 Minimizing global double impacts (Climate change & COVID-19) to agri-food system transformation in Myanmar

Yarzar Hein

Associate Professor, Department of Agricultural Economics, Yezin Agricultural University

1.2 Natural Capital Impacts on Food System

Santi Sanglestsawai* and Nopasom Sinphurmsukskul

Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

1.3 Pesticide use practices in Cambodia's vegetable farming

Sim Sokcheng

Director, Center for Policy Research in Agriculture and Rural Development, Cambodia Development Resources Institute (CDRI)

1.4 World fruit tree technology and innovation: implications towards sustainable farming

Nithicha Thamthanakoon* et al.

Department of Agricultural and Resource Economics, Kasetsart University

12:15 – 13:00 Lunch Break

13:00 – 16:00 Session 2: Building resilience to vulnerabilities, shocks and stress
Chair: Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute
Rapporteur: Uchook Duangbootsee, Kasetsart University; Jirawan Kitchaicharoen, Chiangmai University; Palakorn Sutsue, Prince Songkla University

2.1 Economic impacts of COVID-19 lockdown measures to livestock production in Thailand
Aerwadee Premashthira* et al.
Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

2.2 Food sufficiency at a time of pandemic: The case of small-state survival of Singapore
Yoshihisa Godo* and Tai Wei Lim
Professor, Department of Economics, Meiji Gakuin University

2.3 Impact of COVID-19 Situation on Thai agricultural households and the role of agricultural digitalization
Witsanu Attavanich
Associate Professor, Department of Economics, Kasetsart University

2.4 Adoption of smart farming in central Thailand: Case study in rice, pineapple, and cassava
Thanaporn Athipanyakul* et al.
Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

2.5 Seeds as a starting point of Food System: Putting Crisis (COVID19) in Perspective
Kanokwan Chodchoey
Executive Director, The Asia and Pacific Seed Association (APSA)

2.6 Policy recommendations for climate resilient ASEAN agriculture. What do we learn from a review study?
Associate professor, Gordana Manevska-Tasevska* et al.
Department of Economics, Agrifood Economic Center, Swedish University of Agricultural Sciences (SLU)

Day 2: 20 May 2022

9:00 – 11:30 Session 3: Food System Profile and Policy
Chair: Suriyan Vichitlekarn, Executive Director, Mekong Institute
Rapporteur: Piyawong Punjatewakupt, Thammasat University; Pornsiri Suebpongsang, Chiangmai University

3.1 Specialization, scale, and spillovers in Southeast Asia's transforming food systems

Benjamin Belton
Associate Professor, Department of Agricultural, Food, and Resource Economics, Michigan State University & interim Global Lead for Social and Economic Inclusion, WorldFish
3.2 Differences in impact on sustainability-based supply chain certification on nucleus and plasma tea plantations (Case Study in Tea Plantations in Central Java - Indonesia)
Adi Djoko Guritno* et al.
Associate Professor, Department of Agroindustrial Technology, Universitas Gadjah Mada
3.3 Food Systems Profile - Along a rural-urban transect in North Vietnam
Tuyen Huynh* et al.
Senior Research Associate, The Alliance of Bioversity International & International Center for Tropical Agriculture (CIAT)
3.4 Vietnam's Food System: The characteristics, challenges and opportunities
Dao The Anh
Vice-President, Vietnam Academy of Agricultural Sciences
3.5 Thailand Food Systems: A systematic approach toward integrated policy process
Santi Charoenpornpattana
Director, Science Technology and Innovation Policy Institute, King Mongkut's University of Technology Thonburi

11:30 – 13:00 Lunch Break

13:00 – 14:30 Session 4: Promoting safe, nutritious and sustainable consumption
Chair: Emorn Udomkesmalee, Senior Advisor, Institute of Nutrition, Mahidol University & former Board Chair of International Food Policy Research Institute
Rapporteur: Thasanee Satimanon, National Institute of Development Administration; Chayada Bhadrakom, Kasetsart University
4.1 Consumers' food choice during the COVID-19 pandemic: Evidence from a key urban consumption zone in the Philippines
Marie Claire Custodio
Associate Researcher, Market and Food Systems Research, International Rice Research Institute & Ghent University
4.2 Market transformation of agriculture products in Indonesia: COVID-19 pandemic and agri-food digital market
Sahara Djaenudin et al.*
Head, Department of Economics, Faculty of Economics and Management, IPB University
4.3 COVID-19 impacts beyond production: changes in food environments in Thailand and the Philippines
Jody Harris

Global Lead Specialist – Food Systems, World Vegetable Centre

14:30 – 14:45 Intersession break

14:45 – 16:20 Policy Forum: Sustainable Food System: Policy Discussion and Call for Action
Moderator: Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute Senior Research Fellow
Rapporteur: Duncan Boughton, Michigan State University; Orachos Napasintuwong, Kasetsart University
Panelists

1. Dr. Nipon Poapongsakorn, Distinguished fellow, Thailand Development Research Institute (TDRI)
2. Dr. Mercedita A. Sombilla, Undersecretary, Regional Development Group, National Economic Development Authority, the Philippines
3. Dr. Eiichi Kusano, Senior Researcher, Social Science Division, Japan International Research Center for Agricultural Sciences (JIRCAS)
4. Dr. Ravi Khetarpal, Executive Secretary, Asia-Pacific Association of Agricultural Research Institutions (APAARI)

16:20 – 16:35 Wrap up session: Duncan Boughton, Department of Agricultural, Food, and Resource Economics, Michigan State University
16:35 – 16:40 Closing remarks: Visit Limsombunchai, Dean, Faculty of Economics, Kasetsart University

*speaker

Day 1: 19 May 2022

Plenary session

Opening session:

Background and introduction: Suriyan Vichitlekarn, Executive Director, Mekong Institute

Welcoming remarks: Kampanat Vijitsrikamol, Head, Department of Agricultural and Resource Economics, Faculty of Economics, Kasetart University

Welcoming remarks: Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute

Keynote presentation

Repositioning policies for transforming food systems in Southeast Asia

Shenggen Fan, Chair Professor and Dean of Academy of Global Food Economics and Policy, China Agricultural University & Former Director General of International Food Policy Research Institute

Rapporteur: Adam Kennedy, International Food Policy Research Institute

Background and Introduction

Suriyan Vichitlekarn
Executive Director, Mekong Institute

Kasetsart University executives,
Organizing partners,
Fellow researchers, online audiences from 42 countries,
Excellencies, colleagues and friends, good day to all of you

Allow me on behalf of the organizing partners to welcome you to the International Seminar on Sustainable Food System in Southeast Asia under and beyond COVID-19: Policy Evidence and Call for Action Post COVID-19!

Southeast Asia is home to one of the world's richest natural resources and recognized as the world's major food supply. Its agriculture and food production have been the backbone economy of the region, providing means of livelihoods, employment, which contribute to food security and poverty reduction. The sector also produces biomass, which is the basis of bio, circular and green (BCG) economy.

At the same time, Southeast Asia is also home to over 600 million people with the trends towards urbanization, rising incomes, aging population changing food diet and consumption patterns, coupled with impacts from climate change, environmental challenges. Its agriculture and food production face critical challenges to continue to be the backbone economy and meet the demand of food and nutrition security and contribute to poverty alleviation.

Colleagues and friends,

Against this background, the concept of food systems has emerged to provide a holistic understanding to agriculture and food production. And solutions we need today lie in how we maintain multifunctionality and resilience of our food systems.

The UN Food Systems Summit held last year called for a practical understanding of the emerging concept on promoting sustainable development goals, assisting policymakers, and stressing the importance of interconnectivity both within the food systems and related systems such as health, energy, and ecology. This could be addressed through 5 action tracks, namely,

1. Ensuring Access to Safe and Nutritious Food for All
2. Shifting to Sustainable Consumption Patterns
3. Boosting Nature-Positive Production at Sufficient Scale
4. Advancing Equitable Livelihoods and Value Distribution

5. Building Resilience to Vulnerabilities, Shocks, and Stresses

Food systems transformation is at the center stage of sustainable development, considering its interaction with various global issues such as malnutrition, chronic disease, poverty, environmental degradation, and climate changes. To address the problem of food insecurities and malnutrition sustainably, the topics such as reinventing agriculture, healthy diets, climate change, and evidence-based policy should then be the main priorities.

Colleagues and friends,

The COVID-19 Pandemic and the current war in Ukraine are the prime examples of food systems shock and the importance of food systems resilience. Recent studies on the COVID-19 has shown that the pandemic has affected several spheres of food system transformation including labor mobility, on-farm, and off-farm income and employment, and the increasing need for safe and healthy foods. These effects placed constraints that could escalate into developmental issues such as malnutrition, and poverty in the region. These changes occur both to the supply and the demand side from the way businesses are conducted to the altered consumer choices. COVID-19 pandemic stressed the significance and need for the region to implement an evidence-based policy for food system transformation. Such a policy will foster programmatic responses that recognizes challenges and new evidence related to emerging issues such as healthy diet, traceability of food origin, information management, application of digital technology, enabling e-commerce, and logistics and trade.

Several efforts have been focusing on achieving food system transformation in the Southeast Asia and its subregions. In particular, ASEAN has a shared vision to promote competitive, inclusive, resilient, and sustainable Food, Agriculture, and Forestry (FAF) sector for 2025. However, taking further actions in the course of post COVID-19 recovery and other emerging challenges would require updated and evidence-based information to provide insights on the issues and challenges to ensure that actions regulations, policy implementation, capacity development would be facilitated.

Colleagues and friends,

This is what this International Seminar is all about. It is intended to share knowledge and information from evidenced-based research to provide policy recommendations as well as to promote high-quality research, education, and effective capacity development for food systems transformation in Southeast Asia. It is also envisaged to identify possible areas for collaborative research projects and partnership opportunities and discussion on ways to establish a regional knowledge network on post COVID-19 sustainable food systems in the future.

Over the next two days, the audience will be guided through thematic sessions, namely

1. Boosting sustainable production
2. Building resilience to vulnerabilities, shocks, and stress
3. Promoting safe, nutritious, and sustainable consumption
4. Food system profile and policy

I hope the audience will find the Seminar useful and actively engage in the sessions in sharing insights, knowledge on the topic and co-create recommendations to support food systems transformation in the future.

Thank you.

Guest present at the Opening Ceremony

1. Dr. Chongrak Watcharinrat, Kasetsart University President
2. Mr. Suriyan Vichitlekarn, Executive Director, Mekong Institute
3. Dr. Petipong Pungpun Na Ayudhya, President, Agricultural Economics Society of Thailand under Royal Patronage
4. Dr. Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute (IFPRI) Regional Strategic Analysis and Knowledge Support System (ReSAKSS-Asia)
5. Dr. Duncan Boughton, Michigan State University representing USAID Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence or PRCI
6. Dr. Visit Limsombunchai, Dean of Faculty of Economics
7. Dr. Kampanat Vijitsrikamol, Head of the Department of Agricultural and Resource Economics
8. Dr. Nuchanata Mungkung, Kasetsart University Vice-President for finance and asset management
9. Dr. Kampanat Pensupar, Kasetsart University Vice-President for international affairs
10. Dr. Tanapon Chaisan, Assistant to the President for Research and Creation

Welcoming Remarks

Dr. Kampanat Vijitsrikamol
Head of Department
Department of Agricultural and Resource Economics
Faculty of Economics, Kasetsart University

Distinguished speakers, panelists, colleagues, all participants,

On behalf of Kasetsart University, it is a great honor and privilege to welcome you to the opening of the International Seminar on Sustainable Food Systems in Southeast Asia under and beyond COVID-19: Policy Evidence and Call for Action.

Sustainable food systems are at the heart of the United Nation's Sustainable Development Goals, which was adopted in 2015 and recently updated by the UN Food Systems Summit in 2021. Transformation of food systems is critical to alleviating malnutrition, disease, poverty, and adverse impacts of climate change. The SDGs call for major transformations in agriculture and food systems to end hunger, achieve food security, and improve nutrition by 2030.

This seminar intentionally focuses on the issues and challenges to transforming food systems here in Southeast Asia. It is appropriate to look specifically at Southeast Asia due to its increasing role in providing food to many regions of the world. And to consider the post Covid-19 challenges that we must confront.

On behalf of the Department of Agricultural and Resource Economics, Faculty of Economics, and Kasetsart University, I wish to thank the speakers, presenters, and sponsors for your contributions. We look forward to hearing from our speakers and panelists and welcome your insights and recommendations in the call to action.

And I want to recognize the hard work of the organizers who worked so diligently in planning the seminar. You have arranged an impressive range of experts.

I recognize the seriousness of the issues before us, and I invite all in attendance, in person or online, to actively share in the discourse.

Again … welcome to all who are joining in person or online. Thank you for participating.

Welcoming Remarks

Dr. Suresh Babu
Head, Capacity Strengthening, International Food Policy Research Institute

Good morning, everyone.

On behalf of the consortium partners of The Feed the Future Innovation Lab on Food Security Policy – Policy Research, Capacity, and Influence (PRCI) – I welcome one and all of you to this two-day international seminar of Food System Transformation in Southeast Asia. The PRCI innovation lab is funded by the USAID and The PRCI innovation Lab is led by the Michigan State University, the International Food Policy Research Institute (IFPRI), and the Cornell University. We work with both Asian and African leading policy research institutions to strengthening institutional capacity for policy research, outreach and policy communications. I also would like to extend warm welcome to the participants on behalf of the ReSAKSS – Asia – the Regional Strategic Analysis and Knowledge Support System managed by IFPRI and funded by USAID.

Policy research that is relevant for the policy makers to make evidence-based decision are key for the transformation of food systems. Through PRCI and ReSAKSS Asia we are able to provide this support to the policy think tanks in Thailand, Cambodia, and Loas in Southeast Asia and in India, Nepal, and Sri Lanka in the South Asia region. We begin with a set of key policy research priority themes that are common to the countries in the region, develop the research questions and methodology together, provide capcity development support for the researchers to develop policy analytical skills and help them to disseminate the research results for the benefit of policy makers and other stakeholders at the national and regional levels.

This international seminar has been in the making over the last one year. I take this opportunity to thank all the collaborators and particularly the Kesarsart University for the leadership to bring us all together in the form of this 2-day event. We look forward to continued collaboration in the years to come.

I once again welcome one and all of you.

Keynote Presentation

Repositioning policies for transforming food systems in Southeast Asia

Shenggen Fan
Chair Professor and Dean of Academy of Global Food Economics and Policy, China Agricultural University & Former Director General of International Food Policy Research Institute

The agri-food systems in Southeast Asia already face multiple challenges and increasingly complex risks such as climate change, increased frequency of extreme weather events, natural resource degradation, trade frictions, regional conflicts, and plant and animal diseases. The COVID-19 pandemic has clearly show how vulnerable and fragile food systems are. Smallholders, rural migrants, youth and women in the region are particularly vulnerable and they have less capacity to cope with and recover from shocks. To recover from the pandemic's shocks and deal with these challenges, new priorities of government policy must be set to increase the resilience of food systems.

First, national governments in the region should continue to increase its investment in agricultural research and rural infrastructure. Equally important is to set new priorities for agricultural research to achieving goals beyond staple crop yield to include those in nutrition and health, climate mitigation and environmental sustainability. During the COVID-19, e-commerce platforms effectively reduced the risk of infection caused by people's shopping gathering.

Secondly, agricultural insurance systems and agricultural risk management must be established and expanded. Agri-food systems inevitably face the impact of natural risks. The agricultural natural and health disaster insurance program and reinsurance system implemented by the United States, the United Kingdom, New Zealand and other developed countries have effectively reduced farmers' losses caused by natural disasters. Developing countries could learn from these countries in order to help agricultural production and operation entities, especially small farmers, to manage risks and enhance their ability to recover quickly from shocks.

Thirdly, social safety nets must be further strengthened to protect those who are the most affected and vulnerable. They are also crucial in the post-epidemic period to drive reconstruction efforts. With the continuous advancement of urbanization, more and more people will live in cities and towns. Therefore, it is very important to expand social protection for low-income people in cities and enhance their ability to recover from shocks. Smallholders' access to capital, credit, insurance and agricultural technical services is also critical for building their resilience against natural, economics and health shocks. Therefore, an integrated rural and urban social security system including unemployment insurance is a more sustainable solution for building resilience among migrants, smallholder farmers, urban poor and other vulnerable groups. Safety nets should be accompanied by interventions in health and nutrition, investing in the health and nutrition of vulnerable populations could lower the mortality rate of diseases such as COVID-19 and noncommunicable diseases.

Similarly, reducing gender inequality in agriculture and empowering women in agriculture are critical to building resilient food systems. Women mediate pathways from agriculture to nutrition. Improving the nutrition and health of mothers, increasing

credit support for women, giving women cash subsidies and training in nutrition education programmes can effectively improve the diversity of family diets and reduce the incidence of stunting in children.

Finally, the development and operation of agri-food systems should respect the laws of nature and protect the habitats of wild animals and plants. Historically, food and agricultural production has destroyed the habitat of wild animals, and as a result the interaction between human and wild animals intensified. Incidences of zoonoses increased exponentially for the past several decades. Sustainable intensification and halting the expansion of agricultural and other activities into forests and other natural habitats of wildlife must be pursued and practiced. Great efforts are needed to track, monitor and rapidly respond to zoonoses. Many countries have issued many laws and policies related to wildlife protection, and it is very important to ensure that these laws and policies are implemented, monitored and evaluated.

Shenggen Fan is currently Chair Professor and Dean of Academy of Global Food Economics and Policy (AGFEP) at China Agricultural University (CAU). Prior to joining CAU, Dr. Fan served as director general of the International Food Policy Research Institute (IFPRI) from 2009 to 2019. He currently serves as a member of the United Nations' Lead Group for the Scaling Up Nutrition (SUN) Movement. He was a member, vice chair and chair of food and nutrition council of the World Economic Forum. He is a Fellow of Agricultural and Applied Economics Association(AAEA), and a Honorary Life Member, International Association of Agricultural Economists (IAAE). Dr. Fan received a PhD in applied economics from the University of Minnesota and bachelor's and master's degrees from Nanjing Agricultural University in China.

Rapporteur: Adam Kennedy, International Food Policy Research Institute

Session 1: Boosting sustainable production

Chair: Wallapak Polasub, Senior Researcher, Institute for Sustainable Food Systems, Kwantlen Polytechnic University

Rapporteur: Teeka Yotapakdee, Maejo University; Pakapon Saiyut, Khon Kaen University

1.1 Minimizing global double impacts (Climate change & COVID-19) to agri-food system transformation in Myanmar

Yarzar Hein
Associate Professor, Department of Agricultural Economics, Yezin Agricultural University

1.2 Natural Capital Impacts on Food System

Santi Sanglestsawai* and Nopasom Sinphurmsukskul
Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

1.3 Pesticide use practices in Cambodia's vegetable farming

Sim Sokcheng
Director, Center for Policy Research in Agriculture and Rural Development, Cambodia Development Resources Institute (CDRI)

1.4 World fruit tree technology and innovation: implications towards sustainable farming

Nithicha Thamthanakoon* et al.
Department of Agricultural and Resource Economics, Kasetsart University

1.1 Minimizing global double impacts (Climate change & COVID-19) to agri-food system transformation in Myanmar

Yarzar Hein
Department of Agricultural Economics, Yezin Agricultural University
Email: yarzarhein@yau.edu.mm

Abstract:
With the existing global setting, almost all of the countries suffer the double impact i.e., climate change and COVID19 global pandemic impacts, to their agriculture sectors. This double impact also threatens the country food system of Myanmar; specifically, changes in precipitation and temperature have spatial effects on the upstream environment of the agri-food system and COVID 19 on the downstream environment. The climate-smart village approach verified the potential to contribute to diversifying and improving the quality of food consumption and highlighted the fact that climate-smart agriculture of any kind does have a positive influence on dietary diversity in a household. Moreover, self-adaptation measures to climate change proved that there was an additional profit and a cost reduction if the farmer adopted the climate adaptation practices. While struggling with that climate change impacts, however, the country's food system suffers a new challenge from the global pandemic COVID-19. The 30% to 35 % of agricultural production will be reduced due to the second and third waves of the COVID 19 outbreak recently. In this regard, following the evidence of potential transformation, there is a need to alter an adaptive and resilient food system that can respond to changing circumstances and new challenges as they emerge, in addition to the COVID-19 Economic Relief Plan (CERP) and Myanmar Economic Recovery and Reform Plan (MERP)

1.2 Natural Capital Impacts on Food System

Santi Sanglestsawai* and Nopasom Sinphurmsukskul
Department of Agricultural and Resource Economics, Kasetsart University
Email: santi.sa@ku.th

Abstract:
Natural capital provides flow of benefits to people and the economy in the form of "Ecosystem services". However, due to human activity the world's ecosystem services have been degraded in the accelerating rate. We are using 50% more natural capital than the regeneration rate. As the global population continues to grow, it has been estimated that by 2030 we will need the natural capital equivalent of two planets to sustain ourselves. Current practices of food systems are also causing significant damage to environment and human well-being.

This study aims to investigate the impact of food system on natural capital in monetary term – valuing the externality from food system. The assessment start by quantifying the environmental consequences in physical terms which are GHG, Air pollutions (SO2, NOx, PM2.5, NH3, VOCs), Water pollution and Waste generation using LCA (Life Cycle Analysis). Then put the values on the impacts using economic valuation technique (Benefit Transfer). The selected food products including Meats, Egg, Vegetables, Fruits, Sugar cane and Shrimp.

*speaker

1.3 Pesticide use practices in Cambodia's vegetable farming

Sim Sokcheng
Center for Policy Research in Agriculture and Rural Development
Cambodia Development Resource Institute (CDRI)
Email: simsokcheng@cdri.org.kh

Abstract:
Our survey of vegetable farmers reveals that pests and diseases are the biggest challenge Cambodian vegetable production. Pesticides/herbicides account for the largest share in vegetable production costs in our study areas, suggesting that chemical pesticides are commonly used in vegetable farming in Cambodia, particularly our study areas which are the main producers of vegetables in the country. Additionally, it is common that farmers mix various types of pesticides per spray which is not good practice. Applying ordinary least squares regression and probit model, we investigated the factors that facilitate or impede pesticide use practices. The results show that lower use of pesticide is associated with age of farmers in charge of pesticide spraying, educational attainment, female farmer, and varied by locations. At the same time, there is a significant link between the use of large quantities of pesticide and farmers' misperception of pesticide use practices and the proportion of pesticide spending in total input costs. Apart from this, knowledge/advice about pest management/control farmers receive from their peers and pesticide stores, household participation in social groups such as agricultural cooperatives, and farm size are positively correlated with the probability that a farmer will comply with recommended pesticide doses. These results imply that modifying farmers' attitudes towards pesticide use and promoting the role of women in vegetable pest management are among the important interventions to reduce pesticide dependence.

1.4 World fruit tree technology and innovation: implications towards sustainable farming

Nithicha Thamthanakoon*, Suwanna Praneetvatakul, Kampanat Vijitsrikamol, Chakrit Potchanasin, Suwanna Sayruamyat, and Piyatat Pananurak
Department of Agricultural and Resource Economics, Kasetsart University
Email: nithicha.t@ku.th

Abstract:
The world research data or research systematic mapping for fruit technology are synthesized by searching the literatures through various international academic database using keywords on “inventions, innovations, and technologies”. From the 28,894 international searched databases, only 113 articles are appropriate for further evaluation. The results showed that most articles come from journals that have peer reviewed. During 2005-2019, there was an increasing trend of publication. Most of the study area was located in Europe. Nevertheless, when classified by country, the United States produced the highest studies in terms of fruit tree type. Apple is the fruit tree type that appeared mostly in the studied articles. Most articles are the scientific basic research or at the experimental plots. When classified the papers according to fruit farm production process, most articles conducted research projects into 3 categories, namely the disease and insect management, harvesting, and farm management, respectively. Lastly, the interesting technologies are such as unmanned aircraft technology, trunk drilling inoculation and injection technology, automatic spraying technology, robot harvester, technology to use of robot for disease detection and inspection within the orchard, etc. Further researches on fruit tree farming towards these new technologies are encouraged for Thai government to invest in. However, barriers and uptakes are needed to be considered.

*speaker

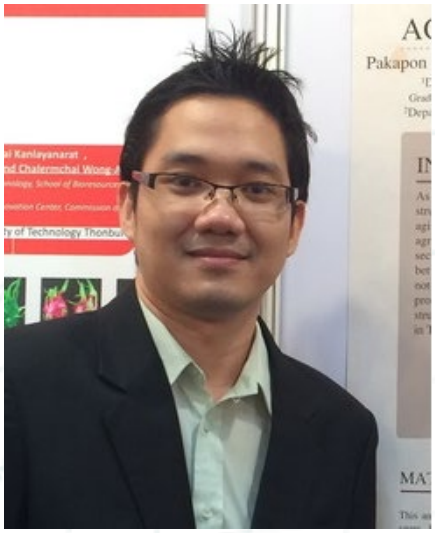
Biodata of Session 1

Chair:

Dr. Wallapak Polasub is Senior Research Associate at the Institute for Sustainable Food Systems, Kwantlen Polytechnic University. Her research interests are on economics of local food systems, farm direct marketing, community food security and consumer behaviors. As COVID-19 has highlighted the fragility of global food supply chains, Dr. Polasub is currently studying how consumers are adapting, what barriers to food access remain, which citizens are most acutely affected, and consumer attitudes towards building resilient place-based food systems. Dr. Wallapak is also an aspiring knowledge broker. She hopes to bridge the gap between knowledge creators and knowledge users and build capacity through a variety of educational resources as well as peer to peer learning.

Rapporteurs:

Assistant Professor Teeka Yotapakdee is a lecturer of Applied Economics for Community Development Department at Maejo University Phrae Campus, Thailand.
She teaches courses related to agricultural economics and forest economics. Her research and publications have delved into two subjects … her research in agricultural economics has focused on the supply chain and value chain of commercial native chickens, and another study examined the wood furniture industry in northern Thailand. Her forest economics research involved an ecosystem service evaluation of provision services, cultural services, and carbon credits along the Chao Phraya River.



Pakapon Saiyut finished his Ph.D. in Agricultural and Resource Economics from Kasetsart University, Thailand in 2018. He currently is a lecturer at Department of Agricultural Economics, Faculty of Agriculture, Khon Kaen University, Thailand. His teaching courses are Agricultural Production Economics, Econometrics in Agricultural Analysis, Economics of Agricultural Development, and Statistics for Agribusiness. His current researches emphasize on Agricultural Transformation and Economic Development, Quantitative Analysis in Economics, and Agricultural Production Economics.

Speakers:

Dr. Yarzar Hein's research revolves around natural resource economics, and currently he is exploring the non-market valuation of natural resources. His studies have examined diverse environmental change topics such as climate vulnerability, adaptation, mitigation, and resilience in Myanmar's agricultural and food systems, and the Myanmar farming community's awareness and perception of climate change. He completed his Ph.D. degree from Kasetsart University in the field of agricultural and resource economics, focusing on climate change and natural resources. He is now Associate Professor of Agricultural Economics at Yezin Agricultural University, Myanmar, and teaches undergraduate and graduate level classes on Natural Resource and Environmental Economics.

Assistant Professor Santi Sanglestsawai, Ph.D., is a Lecturer in the Department of Agricultural and Resource Economics, Faculty of Economics, Kasetsart University. His teaching includes courses related to econometrics, agricultural resource economics, and the valuation of natural resources.

His recent research and publications have examined topics related to consumer preferences and the non-market valuation of natural resources and the environment.

His studies have included an economic evaluation of drinking water dispensed from water vending machines, an assessment of the monetary value of environmental costs accrued from Thailand's egg industry, and an analysis of the potential social benefits of implementing a social security system for informal workers.

Mr. Sim Sokcheng has extensive experience in leading and managing research projects on agriculture, economic development, and program impact evaluation, focusing on smallholder farmers and rural communities.

He is currently the Director and a Research Fellow in the Center for Policy Research in Agriculture and Rural Development of the Cambodia Development Resource Institute. Mr. Sokcheng holds a Master's degree in Economics, with a major in Development Economics, from Kobe University, Japan, and is a Ph.D.

Current research highlights include research on promoting sustainable and inclusive agricultural development through public-private partnerships (PPPs), Cambodian vegetable farmers use practices of pesticides, and the impacts of rice policy changes in Vietnam on Cambodia's rice policy and rice producers.

Dr. Nithicha Thamthanakoon is Assistant to the Dean for Research and Social Development, and is a Lecturer in the Department of Agricultural and Resource Economics, Faculty of Economics, Kasetsart University, Thailand. She was a member of the team from KU who participated as a researcher under the Institutional Links project sponsored by the Newton Fund of the British Council and the Office of Higher Education Commission Thailand to undertake research that explored sustainable agribusiness model to reduce poverty in Thailand small-scale rubber farmers.

She received her B.Sc. and M.A. in Agribusiness from Kasetsart University, her M.Sc. in Marketing, from Hertfordshire University (UK), and her Ph.D. from Harper Adams University (UK).

Her most recent paper, entitled 'Factors driving Thailand rice farmer decision-making in the choice of marketing channels' was published in the British Food Journal (2022).

Session 2: Building resilience to vulnerabilities, shocks, and stress

Chair: Suresh Babu, Head, Capacity Strengthening, International Food Policy Research Institute

Rapporteur: Uchook Duangbootsee, Kasetsart University; Jirawan Kitchaicharoen, Chiangmai University; Palakorn Sutsue, Prince Songkla University

2.1 Economic impacts of COVID-19 lockdown measures to livestock production in Thailand

Aerwadee Premashthira* et al.
Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

2.2 Food sufficiency at a time of pandemic: The case of small-state survival of Singapore

Yoshihisa Godo* and Tai Wei Lim
Professor, Department of Economics, Meiji Gakuin University

2.3 Impact of COVID-19 Situation on Thai agricultural households and the role of agricultural digitalization

Witsanu Attavanich
Associate Professor, Department of Economics, Kasetsart University

2.4 Adoption of smart farming in central Thailand: Case study in rice, pineapple, and cassava

Thanaporn Athipanyakul* et al.
Assistant Professor, Department of Agricultural and Resource Economics, Kasetsart University

2.5 Seeds as a starting point of Food System: Putting Crisis (COVID19) in Perspective

Kanokwan Chodchoey
Executive Director, The Asia and Pacific Seed Association (APSA)

2.6 Policy recommendations for climate resilient ASEAN agriculture. What do we learn from a review study?

Associate professor, Gordana Manevska-Tasevska* et al.
Department of Economics, Agrifood Economic Center, Swedish University of Agricultural Sciences (SLU)

*speaker

2.1 Economic impacts of COVID-19 lockdown measures to livestock production in Thailand

Aerwadee Premashthira* et al.
Department of Agricultural and Resource Economics, Kasetsart University
Email: fecoadu@ku.ac.th

Abstract:
COVID-19 pandemic has resulted in economic crisis in many sectors which livestock is one of the most susceptible sectors. The current economic impacts assessments of 90 dairy cattle farmers in the north and 304 pig farmers in the central, northeast, and south reveal that the control of epidemic or lockdown measure is interrupting the access to inputs and services and movement to markets of swine and dairy production. Comparing to before the announcement of an emergency decree in March, 2020, the average total cost of dairy production increased 2.63%, resulting in a 4.36% decreased in the benefit-cost ratio. In the same direction, swine farming had average total cost of production increased by 3.19%, and the benefit-cost ratio increased by 1.65%. Farmers had adjusted their production and sales procedures to ensure the continued functionality of livestock value chain and food supplies. They also had managed to reduce production costs and increased financial liquidity, such as machine use, production capacity reduction, finding an alternative career. Lessons learned from Thailand's first lockdown measures to control the COVID-19 indicate that the farmers had modified the operation, increased unit productivity and looked for more sales channels. These adaptations could also result in higher return-to-cost ratios and more stability.

*speaker

2.2 Food sufficiency at a time of pandemic: The case of small-state survival of Singapore

Tai Wei LIM, Senior Research fellow adj National University of Singapore EAI; Associate lecturer, Singapore University of Social Sciences; Associate Professor SUJ and Yoshihisa GODO*, Professor of Economics, Meiji Gakuin University
Email: limtaiwei2009@gmail.com

Abstract:
Singapore, a small vulnerable country, always carry an existential sense of crisis about its survivability and low levels of food self-sufficiency (with less than 1% of its land area allocated for agricultural purposes). The statistics show that Singapore did not fall into food shortage in the COVID-19 pandemic. Singapore not only averted any food supply crises but also showcased its high technological capabilities and resilient food distribution system. The Singapore authorities showed (1) technological progress in Singapore and (2) continued work with Kranji farms as a showcase model for general application. Government and private sector investments in the research and development of high tech agri-food output through hydroponics, aquaponics, vertical and rooftop farming by utilizing innovative, climate-resilient technologies to boost its production sustainably, accelerated by the COVID-19 coronavirus pandemic. Singapore has a pandemic-era grant that invests in urban farms with the view of boosting production. In terms of regional cooperation, the COVID-19 coronavirus pandemic situation has proven the greater urgency for such integration of food supply sources and chains (e.g. between Riau/Johor and Singapore) as the pandemic has disrupted food supply for many countries. There is greater economic complementarity between Singapore and Malaysia/Riau, given that Johor/Riau were affected by the economic impact of the COVID-19 coronavirus pandemic while the pandemic highlighted the importance of food security, diversification and advantages of agriculturally-rich neighbours for Singapore. They can leverage off each other's comparative advantages while meeting food security needs (for Singapore) and ramping up economic growth (for Malaysia and Riau Indonesia). Throughout the pandemic, the Malaysian government allowed food trucks to pass into Singapore without breaks, keeping a constant supply of food into the city-state. The COVID-19 pandemic crisis can be a dry run to cope with future challenges that can disrupt the supply chains as the coronavirus pandemic had done.

*speaker

2.3 Impact of COVID-19 Situation on Thai agricultural households and the role of agricultural digitalization

Witsanu Attavanich
Associate Professor, Department of Economics, Kasetsart University
Email: witsanu.a@ku.ac.th

Abstract:
Aside from the rising vulnerability of climate change, increasing cost of production and volatility of agricultural prices, recent COVID-19 situation has posed huge threats to Thai agricultural households especially smallholders who are already in the poor economic status. Past studies revealed that the adoption of digital technologies could potentially increase the adaptive capacity of farmers to these challenges. Unfortunately, in Thailand, there is a small portion of smallholders applying digital technologies for their farm activities. In addition, there is no study that academically investigate the role of agricultural digitalization in improving the economic status of these smallholders. This study, therefore, aims to investigate the impact of COVID-19 situation on Thai agricultural households and simultaneously evaluate the role of agricultural digitalization on farm income using the recent farm survey. Propensity score matching is employed to address the problem of selection bias. We hypothesized that the COVID-19 situation will adversely affect smallholders and agricultural digitalization will enhance farm income and improve the resilient of smallholders. The findings from this article will provide policymakers with insights to mitigate the impact of the COVID-19 situation and promote the use of digital technology for smallholders.

Keywords: Impact of COVID-19; smallholders; agricultural digitalization; farm income; propensity score matching

2.4 Adoption of smart farming in central Thailand: Case study in rice, pineapple, and cassava

Thanaporn Athipanyakul*, Suwanna Sayruamyat, Supawadee Khunthongjan
Department of Agricultural and Resource Economics, Kasetsart University
Email: thanaporn.at@ku.th

Abstract:
As the 20-year Agriculture and Cooperatives Strategy (2017–2036) is aimed at introducing agricultural innovation to improve productivity, farming efficiency, and increase farmers' incomes, this study aims to identify mechanisms to enable farmers in the central region to adopt innovation. Qualitative and quantitative research methodologies were employed in the study, and 512 farmers took part in the study. The results showed that there were four levels of adoption in farmers: the low adoption level, moderate adoption level, high adoption level, and remarkably high adoption level. Barriers to the low adoption level included the age of farmers, low levels of education, high risk aversion, limited land resources, small scale farms, and a lack of access to agricultural technologies. The barriers faced by the farmers who had a moderate adoption level were similar to those faced by farmers with a low adoption level, but the moderate adoption level farmers were more open to adopting technologies. The farmers-to-farmers model is suitable for low adoption and moderate adoption levels; this model can involve establishing a network by involving farmers with a high level of adoption as trainers in the participatory extension programme. In this way, the technologies will spread from farmers to other farmers. For farmers who had a high level of adoption, the barriers to the adoption of innovation were lack of water, a high cost of adoption, inappropriate of the technologies with what farmers faced with, and a lack of proper infrastructure, such as electricity and a stable internet connection. Meanwhile, the farmers with a remarkably high level of adoption were willing to invest in the innovation but on the condition that the technologies not be expensive and be suited to their production processes. Product innovation, including value added products, and precision agriculture should be introduced to this group.

*speaker

2.5 Seeds as a starting point of Food System: Putting Crisis (COVID19) in Perspective

Kanokwan Chodchoey
Executive Director of the Asia and Pacific Seed Alliance (APSA)
Email: may@apsaseed.org

Abstract:
Seeds are the primary basis of the food supply chain system. More than US$ 3.4 billion worth of seed for sowing purposes was traded in the region in 2019 constituting about 14% of the global seed trade according to the data from WTO. A smooth seed trade in the region is crucial to sustain the region's food and nutrition security and economic prosperity. When the World Health Organization has declared (WHO) the COVID-19 outbreak a pandemic on 11 March 2020, APSA and World Vegetable center carried out the survey among APSA company members (132 companies from 20 countries/territories in APAC and 21 countries/territories outside APAC) during April, May and August 2020 to monitor the impact of pandemic on the overall operation of seed company. International Seed Federation (ISF) and Organization for Economic Co-operation and Development (OEDC) have provided their input in the August survey. The survey result indicated that more than 50% of seed companies have strongly affected seed trade in May 2020 and gradually recovered in August 2020. Seed business operations (international and domestic seed shipments, input delivery and labour availability) experienced little improvement between the May and August surveys. After that APSA carried out a survey round to monitor the situation in May 2021. Results suggested that the situation continues to stabilize in most areas (labor shortage, domestic seed shipment, access to finance and R&D). However, many challenges and difficulties persist, especially in the international seed trade. In order to smoothen or facilitate the international seed movement, a strong public private partnership and a private-private partnership are a key driver to tackle these challenges. The study recommended that the international framework (UPOV, ISTA, OECD and ISF) on quality seed production, a support from the governments to recognize seed as part of the essential items, the policies that enable ease of doing business, the harmonization in the seed trade policy and investment in infrastructure for adequate and safe storage of agriculture product and agriculture related inputs at trading port are important to smoothen the international seed trade. This will eventually help to sustain the global food system.

2.6 Policy recommendations for climate resilient ASEAN agriculture. What do we learn from a review study?

Gordana Manevska-Tasevska* et al.
Assistant Professor, Department of Economics, Agrifood Economic Center,
Swedish University of Agricultural Sciences (SLU)
Email: gordana.tasevska@slu.se

Abstract:
Climate resilience (CR) is among the top policy priorities for the Association of Southeast Asian Nations' (ASEAN) food, agriculture and forestry sectors. Understanding research findings with policy implications is crucial for evidence-based policy-making. We combine a scoping review to explore current knowledge on policy pathways for climate resilient agriculture (CRA) in the ASEAN with a content analysis to evaluate which climate resilience capacities (CRC) are targeted with these pathways in terms of *anticipation*, *robustness*, *adaptability* and *transformability*. *Anticipation* is needed for the agricultural sector to be proactive to detect trends that could lead to critical changes, and to prevent the sector from potential crisis. *Robustness* enables the sector to cope i.e. to absorb the disturbance from existing challenges, whereas *adaptability* and *transformability* are required for enabling necessary responses including adjustments and transformations into something new. In this study, we considered findings from: i) qualitative and quantitative studies, focusing on climate change, agriculture, food, and policy, in a combination with adoption of practices to climate change, adaptive capacity resilience, resilience capacity; ii) written in English, published in peer-reviewed journals, conference papers and book chapters; iii) from countries from the ASEAN, and iv) listed in Web of Science and Scopus, until July 21st 2021. The research team performed a double-blind title and abstract screening on 195 articles; 78 papers with selected abstract were further considered for full paper review, out of which 47 papers were considered for analysis.

Our first finding shows that the policy pathways can be grouped by eight policy categories among which support to "Infrastructure for communication and knowledge sharing" and "Research and technology development" are the most frequent, appearing in 36% and 29% of the identified policy categories. There is a lack of evidence regarding other policies enabling CRA, reflecting the lack of either research, actual policy support or a need for these categories. For instance, "Risk management" is the third most common CRC policy category, identified in 11%, whereas, "Environmental/climate support", "Investment support", "Infrastructural support", "Production support" and "Land use/market regulation and certification" appear in less than 10% of the cases.

Policies supporting "Infrastructure for communication and knowledge sharing" are aimed at raising the awareness and knowledge in reducing the impact of climate change on the agricultural sector. This policy category mainly targets a*daptability* especially via social-learning and *transformability* via in-depth learning. "Infrastructure for communication and knowledge sharing" supporting social-learning should enable cooperative efforts and dissemination of knowledge and information among all relevant stakeholders such as policy makers and authorities who are involved in planning and implementing CR actions. It also implies enabling environment for farmers' self-organisation, collaborative learning, information sharing, agricultural training and skills development. "Infrastructure for communication and knowledge sharing" that enables *transformative* in-depth learning, considers support for participatory approaches in

discussing/building appropriate solutions, e.g. via: i) field/climate field of schools for farmers; ii) learning networks to turn learner farmers into innovative practitioners; iii) demonstrations of complex climate projection methods to users; iv) national and local climate science–policy dialogue; v) connecting stakeholders with conflicting interests together so they can learn from each other and build partnership. Last but not the least, policies for "Infrastructure for communication and knowledge sharing" are needed to support *anticipation,* especially for enabling communication/infrastructure for "crisis predictions".

"Research & technology development" support is the most commonly suggested for enabling *transformability*, aimed at accelerating innovations and experimentation and in-depth learning via strengthening the linkages among research, policy making and the practice. Supporting "Research & technology development" is suggested for enabling *anticipation,* especially for developing "predictions" technology and methods to provide accurate climate forecasting models and measures. These policy actions benefit from connecting the science, the policy and the practice, for the knowledge generation, developing- and adoption of adaptation plans, thus supporting "Research & technology development" should encourage multi-stakeholder participation.
"Risk management" policies mainly target *robustness*, especially via reducing the sector "sensitivity to resources" and "risk preventing measures". For instance, human and asset safety, loans for coping with adverse events such as floods, or loans to low income families are provided to buffer the modest income under the adaptation. Financial support for insurance appears as most typical instrument of risk management. Regional food reserves have been suggested as a safeguard mechanism for food security to tackle after-effects of major production failures.

The second finding is that policy pathways identified from the review connect multiple policies, but are typically limited to 2-3 policy categories. Moreover a single policy category can target multiple CRC dimensions. Fourthly, the representation of the CRC dimensions in the policy pathways is unbalanced. While *adaptability* and *transformability* are the most targeted (43% and 35% respectively), little attention has been given to policies targeting *anticipation* and *robustness* (12% and 10% respectively). Our result might be an indication for the perceived importance of *adaptability* and *transformability* in responding to climate change in the ASEAN, both by researchers and stakeholders participating in the research, e.g. via surveys, interviews, or participatory workshops.
With the key findings above, this review contributes to the resilience literature and inform CRA policy making of the ASEAN. The review provides insight into the application of the resilience literature in analysing and designing CRA policies across ASEAN countries.

*speaker

Biodata of Session 2

Chair:

Dr. Suresh Babu is an international agricultural economist who has conducted policy research, capacity development, and policy advisory activities for more than 30 years in the Sub Saharan Africa, South Asia, Central Asia, and other developing regions.

He joined IFPRI in 1992 and has since served in several positions including as Coordinator of IFPRI's Southern Africa Food Security Program, Coordinator of its Central Asia Program, and Coordinator of its South Asia Initiative and its Policy Analysis and Advisory Network.

At IFPRI, Dr. Babu is guiding its regional and country programs in their capacity development activities. He has conducted many national dialogues leading to the development of national food security and agricultural policies of several developing countries in Africa including, Malawi, Ghana, and Nigeria; and in Asia including India, Bangladesh, Nepal, Sri Lanka, and Bhutan.

Dr. Babu was previously a research economist at Cornell University.

Over the course of his distinguished career, he has published 20 books and more than 100 peer reviewed journal papers on food and agricultural policies in developing countries, and he has served on the editorial boards of several leading academic journals including, Food and Nutrition Bulletin, Food Security, Agricultural Economics Research Review, and the African Journal of Agricultural and Resource Economics.

Dr. Babu earned his M.Sc. in Agricultural Economics from the Tamil Nadu Agricultural University, India, and received his M.S. and Ph.D. in Economics from Iowa State University, USA.

His most recent co-edited publication is (2019) Agricultural extension: Global status and performance in selected countries. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/9780896293755

Rapporteurs:

Dr. Uchook Duangbootsee's areas of research include Production Economics and Development Economics. He is currently Assistant Professor and Associate Chair of Foreign Affairs and Information, Department of Agricultural and Resource Economics, Faculty of Economics, Kasetsart University, Thailand

His recent research projects include a study of of climate resilient farming in ASEAN, which is funded by the Swedish Foundation for International Cooperation in Research and Higher Education, and, an assessment of rural households' livelihood strategies and transitions in Thailand, which is supported by the Thailand Research Fund.

His recent publications examined the land rental market in Thai agriculture and its impact on household welfare, and the impacts of an aging society on farm households' agricultural production and inequalities in rural Thailand.

Dr. Uchook received his M.S. in Policy Economics from the University of Illinois at Urbana-Champaign and his Ph.D. in Agricultural Economics from Michigan State University, USA.

Dr. Jirawan Kitchaicharoen is currently an assistant professor and also the head of the Department of Agricultural Economy and Development, Faculty of Agriculture, Chiang Mai University, Thailand.

Her teaching and research involve topics related to natural resource economics, environmental economics, and the economics of agricultural development and policy. Her research has spanned a variety of topics relate generally to land and water resource management methods in upland farming areas that best promote sustainable agricultural development. Some of the recent studies have analyzed the economic valuation of ecosystem services, the application of payment of ecosystem services in watershed management systems, the economic impact and assessment of development projects and agricultural technology, and the development of sustainable indicators at community and provincial levels. Dr. Jirawan received her Ph.D. in Agricultural Economics from the University of Hohenheim, Germany.

Dr. Palakorn Satsue is Lecturer at the Department of Agricultural Economics and Eanagement in the Faculty of Economics at Prince of Songkla University, Thailand.

His research interests include examining the risk perception and management of rubber farmers, rubber farmer livelihood, and Social Return on Investments assessment. He worked as a researcher at the Fiscal Policy Research Institute Foundation, and has advised several governmental institutions, including the Ministry of Finance, the Royal Thai Police, and the Office of Industrial Economics to help them design and develop institutional policies intended to improve their efficiency and better achieve their missions.

Dr. Palakorn received his Master's in Economics from the Faculty of Economics, Thammasat University, Thailand and currently a Ph.D. candidate at the Faculty of Agribusiness and Commerce, Lincoln University, New Zealand. His Ph.D. research investigates the impact of free trade agreements on trade flow using spatial econometric analysis.

Speakers:

Assistant Professor Aerwadee Premashthira is a lecturer in the Department of Agricultural and Resource Economics, Faculty of Economics, Kasetsart University.

Her teaching and research areas are related to Quantitative Analysis, Strategic Management, and Project Planning in Agricultural Economics. Her recent publication is analyzing the swine industry and the economic impact caused by COVID-19 lockdown measures on livestock production in Thailand. She has also completed studies into the impacts of the non-zero ractopamine pork import ban policy, and consumer behavior in Thailand affecting the Thai pork industry.

.

Dr. Yoshihisa Godo is Professor of Economics at Meiji Gakuin University, Tokyo. His research fields include development economics and agricultural economics. Godo's Development Economics (3rd edition), co-authored with Yujiro Hayami and published by Oxford University Press in 2005, is especially well known. His Japanese book, Nihon no Shoku to Nou (Food and Agriculture in Japan), received the 28th Suntory Book Prize, one of the most prestigious academic book prizes in Japan.

He has frequently been a visiting professor and researcher at many prestigious institutions, including the East Asian Institute at the National University of Singapore, the Economic Growth Center at Yale University, and the Asia Pacific Research Center at Stanford University. He is also engaged in various social activities such as Special Councillor to the Osaka City Government. He received his Ph.D. degree from the University of Kyoto, Japan.

Dr. Witsanu Attavanich research frequently involves economic analysis of governmental and regional policies (mainly in climate change and the environment; agriculture; and food security and agricultural development). His contributed report won the 2016 Abraham Lincoln Honor Award for Increasing Global Food Security from the U.S. Department of Agriculture.

In addition to his teaching and impressive record of research, he serves as Associate Editor of the Kasetsart Journal of Social Sciences and Associate Deputy Editor of Climatic Change.

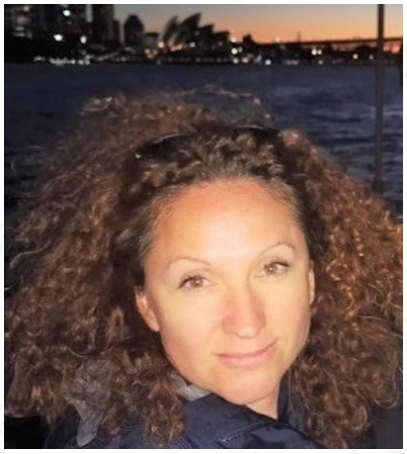
Dr. Witsanu completed his graduate and doctoral studies in Economics. He earned his M.A. from Thammasat University, Thailand, and his Ph.D. from Texas A&M University, USA. He then pursued postdoctoral studies at Rutgers University, USA, and served as a visiting scholar at Harris Manchester College,University of Oxford, UK.

Dr. Thanaporn Athipanyakul's research and contributions focus on mechanism design for modern agriculture in the central region of Thailand. Her studies have included several case studies of various economic crops, including rice, cassava, and pineapple. Her current research topics are focused more intensely on sustainable global value chains for eco-agri-food systems in Thailand, and the Thai sugar and cane industry. Most notably, she has published widely on sugarcane production in Thailand.

She is currently Associate Dean for Research and Social Development at the Faculty of Economics at Kasetsart University and Director of the Applied Economics Research Center. She teaches courses on economics for farm management and agricultural production economics.

Dr. Kanokwan's primary focus is seed sector development in Asia and the Pacific region by managing activities that provide wider awareness regarding protection of various plant varieties, the regional marketplace and trading of quality seeds, and related intellectual property rights. Her initiatives include launching public and private partnerships that lead to policy dialogues in seed trade, innovation, and capacity building for research and development using plant breeding technologies.
Currently, Dr. Kanokwan is leading the Asia and Pacific Seed Association, whose headquarters are in Singapore. Previously, she used her expert to work in a multinational seed company to manage its quality assurance and marketing program throughout the Asia and Pacific region.

Dr. Kanokwan holds a Ph.D. in Biotechnology from Mahidol University, Bangkok, Thailand.



Dr. Gordana Manevska-Tasevska is an applied economist and a policy analyst. Her research often involves a broad focus on the performance of agricultural systems and their interplay with the Common Agricultural Policy.

She is currently Associate Professor and Director of Ph.D. Studies at the Department of Economics, in the Agrifood Economic Center of the Swedish University of Agricultural Sciences in Uppsala, Sweden. Her research focuses on the evaluation of rural development policies, particularly farm-level economics and environmental performance, farm diversification, competitiveness, and the sustainability and resilience of the agricultural systems.

Day 2: 20 May 2022

Session 3: Food System Profile and Policy

Chair: Suriyan Vichitlekarn, Executive Director, Mekong Institute

Rapporteur: Piyawong Punjatewakupt, Thammasat University; Pornsiri Suebpongsang, Chiangmai University

3.1 Specialization, scale, and spillovers in Southeast Asia's transforming food systems

Benjamin Belton
Associate Professor, Department of Agricultural, Food, and Resource Economics, Michigan State University & interim Global Lead for Social and Economic Inclusion, WorldFish

3.2 Differences in impact on sustainability-based supply chain certification on nucleus and plasma tea plantations (Case Study in Tea Plantations in Central Java – Indonesia)

Adi Djoko Guritno* et al.
Associate Professor, Department of Agroindustrial Technology, Universitas Gadjah Mada

3.3 Food Systems Profile – Along a rural-urban transect in North Vietnam

Tuyen Huynh* et al.
Senior Research Associate, The Alliance of Bioversity International & International Center for Tropical Agriculture (CIAT)

3.4 Vietnam's Food System: The characteristics, challenges and opportunities

Dao The Anh
Vice-President, Vietnam Academy of Agricultural Sciences

3.5 Thailand Food Systems: A systematic approach toward integrated policy process

Santi Charoenpornpattana
Director, Science Technology and Innovation Policy Institute, King Mongkut's University of Technology Thonburi

3.1 Specialization, scale, and spillovers in Southeast Asia's transforming food systems

Belton, Benjamin
Department of Agricultural, Food, and Resource Economics
Michigan State University
Email: beltonbe@msu.edu

Abstract:
Literature on agricultural development often invokes an implicit bimodal model that contrasts smallholder farming with industrial agriculture. Smallholder farms are often assumed to be uniformly 'traditional', and poorly integrated into markets, while large farms are often assumed to be 'modern' and technologically sophisticated. This bimodal model is poorly representative of contemporary realities in Southeast Asia. Drawing on examples from Myanmar, we contend that a large portion of agricultural output originates from a continuum of intermediate farms that are neither 'traditional smallholder', nor 'modern industrial'. These can be 44roportion44ed as falling into two broad and partially overlapping groups: (1) Smallholder farms producing grains and other staples that are already deeply integrated into multiple factor markets. Such farms are fragmenting over time but have proven persistent and are increasingly maintained through non-farm livelihood diversification. (2) Small- and medium-scale farms specializing in increasingly sophisticated cultivation for sale of higher value crops, including fish, poultry, and fruits. Specialized small- and medium-scale farms have emerged as part of diversification and investment strategies pursued by smallholders, wealthier rural households, and middle-class non-farm households, in response to opportunities presented by growing demand from domestic and some export markets. Specialised farms tend to be highly spatially clustered, creating concentrated 44roportio demand for labour, goods, and services, leading to the proliferation of SMEs upstream and downstream of the farm. They may also make significant contributions to food and nutrition security by increasing the availability and accessibility of diverse foods in domestic markets.

3.2 Differences in impact on sustainability-based supply chain certification on nucleus and plasma tea plantations (Case Study in Tea Plantations in Central Java – Indonesia)

Adi Djoko Guritno*, Rosa Amalia, Megita Ryanjani Tanuputri
Dept. of Agroindustrial Technology, Fac. Of Agricultural Technology, Universitas Gadjah Mada, Indonesia
Email: adidjoko@ugm.ac.id

Abstract:
Tea (Camellia sinensis) is one of the important commodities that shows a fairly positive development trend at the end consumer level for both domestic and global markets. Tea in Indonesia has been developed since 1826 and has become part of the national economy for both nucleus plantations (owned by the government and private) and plasma plantations (owned by the people). Tea products in Indonesia have become part of the global supply chain so that global certification treatment is also implemented from the plantation level, industry to the finished product. The Covid-19 situation forced the tea business to slightly change their orientation due to a decline in tea demand or other reasons that reduced the volume of production produced. This study aims to compare the impact of environmental certification on tea plantations (nucleus and plasma) so that a policy suggestion can be obtained as the final result. Several aspects that want to be known in this research are: (1) identifying aspects of supply chain sustainability in the plantation industry; (2) understanding the parties involved and benefiting in the supply chain sustainability scheme; (3) provide proposals for improvement of supply chain sustainability schemes that are fair to actors. This research was conducted in 3 districts of central tea plantations in Central Java Province, namely: Banjarnegara, Pekalongan and Batang. The number of respondents involved were: 75 tea farmers, 14 tea company employees, 2 global certifiers, 2 district-level policy makers, and 3 tea traders.Too many small tea farmers, and even plantation owners, accept very low prices for their crops despite the huge global demand for them. The tea trade has narrow margins, so many farmers and producer groups cannot afford to invest in sustainability. On the other hand, high tea production has attracted multinational companies to enter the Indonesian tea business. With large capital, multinational companies hold more power to influence the entire supply chain in the tea sector. This global supply chain of tea commodities plays an important role in the development of the tea industry and trade. For this reason, it is necessary to examine whether the role of global environmental certification is important in maintaining the stability of the tea business, both in terms of its impact on core and plasma tea plantations. In addition, it will also be tested whether understanding the benefits of certification for each supply chain actor is important as a basis for willingness to apply this certification standard.

Key words: tea plantation, nucleus-plasma, global certification, impacts, policy.

*speaker

3.3 Food Systems Profile – Along a rural-urban transect in North Vietnam

Tuyen Huynh* et al.
Country Coordinator of CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) Program in Vietnam
Senior Research Associate, The Alliance of Bioversity International and CIAT
Email: T.Huynh@cgiar.org

Abstract:
Using data collected from a cross-sectional study in Moc Chau, Dong Anh and Cau Giay districts in Vietnam, this report aims to elucidate specific components of local Vietnamese food systems along a rural to urban transect focusing specifically on (i) diets, (ii) nutrition status (anthropometry), (iii) consumer behavior, (iv) food environment, and (v) food flows. The results are summarized as below:

Diets
Diet Diversity Score of urban and peri-urban women, men and children under five were significantly higher than rural women, men and children under five.
The percentage of urban and peri-urban women and men reaching Minimum Dietary Diversity was significantly higher than that of rural women and men, while the percentage of children in urban areas reaching Minimum Dietary Diversity was significantly higher than that of peri-urban and rural children.
For children under five, overall, the average food intake for all food groups was significantly higher in the peri-urban and urban sites, except for vegetables.
The average intake of vegetables and starchy staples was significantly higher in the rural site, while consumption of dairy, as well as meat, poultry and fish, was significantly lower in the rural site than in the peri-urban and urban sites.
For both men and women, the starchy staples group represented the largest portion in diet in all three study sites, following a decreasing gradient from rural to urban, via peri-urban site.

Food flows
Study participants in 3 sites acquired food items from various sources: own production, purchase, gift, and other sources. In general, rural people grew more of their own food, especially starchy staples, while the purchase category was the most popular food source in the urban district. Interestingly, households in the peri-urban site purchased more than 60% of their food. They self-produced some typical Vietnamese food groups, such as starchy staples.

Environmental footprint
The average dietary greenhouse gas emission per day in the rural site was lower than the values in the peri-urban and urban sites. Beef, pork, and starchy staples were the largest contributors to the carbon footprint of the adult diet, especially in the peri-urban and urban sites. For children under 5, the most two contributors of greenhouse gas emission were dairy and starchy staples.

Nutritional Status
For children under five years of age, the urban-rural gradient was a significant predictor of stunting. Similarly, our result shows a significantly higher proportion of underweight

among rural children compared to those in urban or peri-urban areas. Wasting was 3.5 times more prevalent in children in the rural site than that in urban areas. In contrast, the proportions of overweight and obesity in children in urban and peri-urban areas were higher than that in the rural area.
The47roportionn of underweight in adults was about two times higher in rural or peri-urban areas than in urban areas. In contrast, the prevalence of adult overweight was higher in the urban site than in peri-urban or rural sites.

Consumer behavior

Food consumption in the past 7 days

The five food groups that were most commonly consumed by the households in the past 7 days across the three sites were starchy staples; meat, poultry and fish; condiments and seasonings; vitamin A – rich dark green leafy vegetables; and other vegetables. Ouseholds in rural areas consistently had a lower consumption across different food groups than those in urban and peri-urban areas. Roughly 20% fewer rural households consumed pulses and dairy products than households in urban and peri-urban areas. To a lesser degree (10 to 15% of difference), this was also the case for the consumption of eggs, oils and fats.

Consumers' most important factors for food choice

Food safety and healthiness were the most important factors for consumers' food choice, and they were equally important for all households regardless of locations.

Food outlets where households buy most of the food during a week

Consumers in urban areas often went to a wider variety of retail outlets to make their food purchases, while rural consumers relied more on traditional markets, hence not much outlet diversity. Yet, our results showed that across all the areas, traditional food outlets like street markets were the most common points of food purchase.

Nutrition knowledge and food label usage

Nutrition knowledge was limited in all areas, yet participants in rural areas had a significantly lower score than the urban and peri-urban areas.
Urban consumers usually preferred branded/packaged products, and shopped more in modern outlets, used food labels more than their peri-urban and rural counterparts. Paradoxically, out of those food label users, only a small percentage of them understood the information on the labels.

Food safety concerns

Consumers in rural areas were more concerned about food safety than those in urban and peri-urban areas. Regardless of region, most consumers were concerned about food safety sold at traditional markets (formal and informal), while these markets remained the typical food outlets for all consumers.

Food away from home

The number of urban and peri-urban household members eating away from home was roughly five times higher than rural household members. There was no significant difference between urban and peri-urban households.

Food environment

Our picture of food environment more closely resembled a typical emerging economy with specific features such as non-market food sources (e.g., own production and food transfers) in peri-urban and rural areas, and the dominance of the informal retail sector

across all three areas. The urban site enjoyed the highest availability and variety of food destinations.
In sum, these results are important for building food systems that can be integrated into policies and programs to improve nutritional outcomes through improved diets, food environment and consumer behaviors.

This research has been conducted under the umbrella of and with the financial support of the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH), which is implemented with support from the CGIAR Fund Donors and through a bilateral funding agreement with IFPRI. For details, please visit https://a4nh.cgiar.org/partners/donors/.

Reference: https://cgspace.cgiar.org/handle/10568/113417

*speaker

3.4 Vietnam's Food System: The characteristics, challenges and opportunities

Dao The Anh
Vice President, Vietnam Academy of Agricultural Sciences (VAAS)
Email: daotheanh@gmail.com

Abstract:
Vietnam is now an increasingly important producer of food and food security for domestic and global markets. Agricultural intensification and innovation have increased yields, production areas and output of key domestic and export food crops over the last twenty years. There have also been remarkable reductions in poverty rates, and the prevalence of malnutrition, micronutrient deficiencies and stunting nationally since 1990. But there were numerous risks, shocks and stresses that increasingly impact the food system, and represent a direct threat to future food security, economic growth, resource condition and livelihoods, particularly of vulnerable groups. Whilst the food system has demonstrated extraordinary resilience during the COVID-19 pandemic the interconnected impacts of climate change (e.g. saltwater intrusion and increasing temperatures) and more frequent extreme and severe weather events and natural disasters including flooding, droughts, typhoons and landslides were identified as critical issues, particularly in high risk areas. However other important risks were identified such as transboundary diseases and pandemics, resource degradation (land, inland waterways, and marine environments), market volatility and political unrest. About food nutrition security, three main themes emerged in relation to access to safe and nutrition foods, and sustainable diets and consumption patterns.

The structure of food value chains in Vietnam which are dominated by hundreds of thousands, if not millions of smallholder farmers and input supply, trading, processing, wholesaling, and retailing businesses. Farmers and business are arranged in highly fragmented, complex value chains, often with weak linkages to markets or other actors in the chain. The increasingly intensive small-scale production systems also put mounting pressure on the environment and natural resources. The major challenge here is how can farmers and MSMEs be supported and enabled to implement necessary investments, innovations and technology adoption in these areas required to be both sustainable and competitive over the long term. An identification a range of cross-cutting initiatives and opportunities that are necessary for Vietnam's food system transformation toward sustainability.

3.5 Thailand Food Systems: A systematic approach toward integrated policy process

Santi Charoenpornpattana
Director, Science Technology and Innovation Policy Institute,
King Mongkut's University of Technology Thonburi, THAILAND
Email: santi.cha@kmutt.ac.th

Abstract:
For Thailand, food sector is one of the most important sectors and giving significant impacts both to national economy and the society. Furthermore, food sector involves variety and complexity of drivers and numbers of stakeholder group. Food systems research is a systematic approach to explore, understand and analyze food sector, its components and the interactions. This paper proposes 'Thailand Food Systems Framework', comprising 1) socio-economic drivers such as market drivers, public policy and political drivers, science and technology drivers, population drivers, etc., 2) environmental drivers such as climate, water, soil, etc., 3) food activities, such as agricultural production, processing and packaging, retailing and wholesaling, and consuming and disposing, and 4) three dimensions of the food systems outcomes. By the comprehensive reviews of the national policies and plans together with experts and stakeholders consultation, goals for development of Thailand's food systems are identified and proposed, based on the food systems framework. The framework and goals lay foundation for policy analysis, formulation as well as monitoring and evaluation of the national food systems.

Acknowledgement: This paper bases on the research supported by the Agricultural Research Development Agency (Public Organization)

Biodata of Session 3

Chair:

Mr. Suriyan Vichitlekarn is the Executive Director of the Mekong Institute. He is a dedicated professional who heads a variety of projects intended to promote sustainable development through regional cooperation and integration. He has over 20 years of experience in developing cooperation partnerships, particularly in agriculture & rural development, formulating public-private partnerships, and trade facilitation. He is a strong advocate for ASEAN and Greater Mekong Subregion integration initiatives.

He actively engages and shares his experiences in a wide-range of platforms organized by various institutions, such as the Asian Development Bank, the Food and Agriculture Organization of the United Nations, the Greater Mekong Subregion Economic Cooperation Programs, APEC, and the Sustainable Rice Platform.

Throughout his impressive career he has worked with and led development efforts in alliance with a long list of regional and international organizations, all in pursuit of partnership development in the food and agriculture sectors, including as Regional Project Director of the Better Rice Initiative Asia, as Manager and Regional Secretariat of the Greater Mekong Subregion Working Group on Agriculture, and as Head of Agriculture Industries and Natural Resources Division. He also was the main author of the ASEAN Integrated Food Security Framework, to name a few of his professional affiliations.

Rapporteurs:

Dr. Piyawong Punjatewakupt is a lecturer and researcher at the Faculty of Economics, Thammasat University, Thailand.

His teaching is primarily in microeconomics and econometrics and his research focus is on the agricultural production economics, and food and resources economics.

He graduated from Thammasat University with a Master's of Arts in Economics and received his Ph.D. degree in Agricultural Economics, Food and Resource Economics Department, at then University of Florida, USA.

Dr. Pornsiri Suebpongsang is Assistant Professor of Agricultural Economics at the Department of Agriculture Economy and Development, Faculty of Agriculture, Chiangmai University.

Her research fields are in agribusiness and agricultural economics. She has led a variety of research projects, such as examining the production and marketing potential of The Royal Project's cut flowers, a survey of the production and marketing potential of agricultural products in Chiang Rai Province, and an economic impact analysis of agriculture and policy proposals intended to alleviate poverty in rural East Asia. She has also participated as a researcher in an international project that studied the competitiveness of the commercial agriculture market in Africa, which evaluated traditional markets and food value chains to develop strategies for more sustainable markets. She received her Ph.D. degree from Hohenheim University, Germany.

Speakers:

Dr. Ben Belton is an interdisciplinary social scientist who has lived and worked extensively in South and Southeast Asia. He currently holds a joint appointment as Associate Professor of International Development, at the Department of Agricultural, Food, and Resource Economics, Michigan State University, USA, and as interim Global Lead for Social and Economic Inclusion with WorldFish, Malaysia.

His research focuses on aquaculture and capture fisheries development, value chains and food systems, livelihoods, rural economies, and their links to food and nutrition security, poverty, wellbeing, and the environment. He received both his Master's degree and Ph.D. from the University of Stirling, United Kingdom..

Dr. Adi Djoko Guritno is a lecturer at the Department of Agroindustrial Technology and Master's in Management Study Program, Gadjah Mada University, Indonesia.

His research interest and specializations are in the fields of Supply Chain Management, Risk Management, and Operations Management. In addition to his teaching duties at the university, he is active as a risk management consultant and currently serves as the President Director of PT Pagilaran, a commercial tea plantation and manufacturing company in Central Java.

He has led several research initiatives, including as General Chairperson of the Research & Development on Supply Chain Indonesia association, Chair of the Association of Agro-Industrial Technology Indonesia, and is the Coordinator of the Japan International Corporation Agency for Technical Cooperation at his university, plus other affiliations.

He also is a peer reviewer for several academic journals. Dr. Adi Djoko Guritno received his Ph.D. from Ehime University, Japan, majoring in Agricultural Economics and Agribusiness.

Mrs. Tuyen Thi Thanh Huynh is Senior Research Associate working on food environment and consumer behavior at the Alliance of Bioversity International. The Alliance is a collaborative initiative between Bioversity International and the International Center for Tropical Agriculture. It delivers research-based solutions that harness agricultural biodiversity and sustainably transform food systems.

Mrs. Tuyen Thi Thanh Huynh leads and participates in activities that support policy development and implementation by national governments and international agencies. Her research interests are nutrition sensitive food systems, food environment, and consumer behavior. Her work seeks to build sustainable food systems by ensuring the production, delivery and use of healthy food that ultimately provides economic, social, and nutritional benefits to consumers while minimizing their environmental footprint.

Dr. Dao The Anh is Vice President of the Vietnamese Academy of Agricultural Sciences in Hanoi. Formerly, he was Director of the Centre for Agrarian System Research and Development and Deputy Director General of the Field Crops Research Institute. Dr. Dao The Anh is actively involved in capacity building and advocacy for smallhold farmers in VietNam. He is the national convener of the United Nations Food Systems Summit in VietNam.

His academic studies focused on agricultural production. He earned his Master's in Farming Systems and his Ph.D. in Agricultural, Rural and Food Economics, both from Montpellier SupAgro, France.

Over the past 30 years, he has developed a passion for research involving the agricultural systems and family farming, particularly along the Red River Delta and Northern Mountain regions of VietNam. Recently, his research has focused on agro-ecological farming systems, adaptation and mitigation for climate change of production systems, food safety certification, and the development of cooperative farmer organizations. He also has taken a sharp interest in the role of safe agriculture and Zero Hunger initiative based on promoting the role of small farms.

Dr. Santi is currently Director of the Science Technology and Innovation Policy Institute at King Mongkut's University of Technology Thonburi. This institute was established as a collaborative initiative between Thailand's Ministry of Science and Technology and King Mongkut's University to undertake research to support national science technology and innovation policy formulation and implementation. Dr. Santi's recent works include evaluative research involving agriculture and food systems.

Dr. Santi has been involved in various national research and innovation systems design projects, including budgeting systems used in research and innovation projects, and monitoring and evaluating research and innovation policies and their implementation. These system designs are intended to provide instruments used to assess and strengthen the deployment of Thailand's national research and innovation initiatives, and lead to more efficient and effective policy implementations.

Dr. Santi received his Master's in Civil Engineering from the Asian Institute of Technology, Thailand, and his Ph.D. in Infrastructure Systems from the University of Tokyo, Japan.

Session 4: Promoting safe, nutritious and sustainable consumption

Chair: Emorn Udomkesmalee, Senior Advisor, Institute of Nutrition, Mahidol University & former Board Chair of International Food Policy Research Institute

Rapporteur: Thasanee Satimanon, National Institute of Development Administration; Chayada Bhadrakom, Kasetsart University

4.1 Consumers' food choice during the COVID-19 pandemic: Evidence from a key urban consumption zone in the Philippines

Marie Claire Custodio
Associate Researcher, Market and Food Systems Research, International Rice Research Institute & Ghent University

4.3 Market transformation of agriculture products in Indonesia: COVID-19 pandemic and agri-food digital market

Sahara Djaenudin* et al.
Head, Department of Economics, Faculty of Economics and Management, IPB University

4.3 COVID-19 impacts beyond production: changes in food environments in Thailand and the Philippines

Jody Harris
Global Lead Specialist – Food Systems, World Vegetable Centre

4.1 Consumers' food choice during the COVID-19 pandemic: Evidence from a key urban consumption zone in the Philippines

Marie Claire Custodio
International Rice Research Institute (IRRI) & Ghent University
Email: m.custodio@irri.org

Abstract:
The impact of the COVID-19 pandemic was felt in varying degrees across the world. In Southeast Asia, the pandemic has caused disruptions in the food supply chains and the food environment. It is important to understand how consumers cope with the pandemic in relation to their food choice and diets because the latter is a critical link between the components of food systems and nutrition and health outcomes, which have become more prone to disruption during the pandemic.

An online survey was conducted among middle-income households in Metro Manila, Philippines. The survey was conducted in April 2021, more than a year into the pandemic and when another city-wide lockdown was about to be imposed. The objectives are (i) to understand the impact of consumers' diets during pandemic, and (ii) to measure consumers' valuation for healthier rice types (i.e., brown/unpolished, colored/pigmented, and low-GI) as a nutritional intervention through contingent valuation method.

Results suggest that the types of dishes consumed during the pandemic did not vary from those consumed before the pandemic. However, ingredient substitution was evident. Respondents claim to have consumed more quantity of rice during the pandemic. Results also suggest that consumers are generally willing to accept the concept of healthier rice, given the types of dishes that they can use it for as well nutritional benefits. The price consumers are willing to pay for these healthier rice types is in line with the current market price of premium white rice.

Insights gained from the study may be used to provide policy makers with evidence-based recommendations to serve as basis in developing nutrition-sensitive intervention strategies to improve and protect consumers' nutritional status and well-being

4.3 Market transformation of agriculture products in Indonesia: COVID-19 pandemic and agri-food digital market

Sahara Saharaa*, Pria Sembadab, Apri Laila Sayektic, Syarifah Amaliaha
aDepartment of Economic, IPB University (Bogor Agricultural University), Gedung FEM Lantai 2 Jl. Agatis, IPB Dramaga Campus, Bogor, West Java, Indonesia 16680; bSekolah Vokasi, IPB University (Bogor Agricultural University), Kampus IPB Cilibende, Jalan Kumbang No.14, Bogor, West Java, Indonesia; cIndonesian Centre for Horticulture Research and Development, Indonesian Agency for Agriculture Research and Development
Email: sahara@apps.ipb.ac.id

Abstract:
The COVID-19 pandemic has raised concerns over the resilience of agricultural supply chains including in Indonesia. Much of agriculture products are produced in rural areas by small farmers, while the majority of consumers live in urban areas. Therefore, the supply chain of agri-food products tends to be long and heavily dependent on well-functioning, long-distance road and rail transportation networks involving a significant number of intermediaries. Prior to Covid-19 pandemic, the existence of conventional and modern food retailers in Indonesia has successfully linked smallholders and consumers. The use of the online agrifood marketplace has gained even more traction during the COVID-19 pandemic. Using the probit model, the paper identifies determinant factors influencing Indonesian consumers' decisions concerning their means of purchasing food during the Covid 19-pandemic. Younger and more educated consumers who have full-time jobs will tend to use online channels. The results also show that online purchasing behavior is increasingly observed for red meat, chicken, and fruits. The results from this study are important for food traders selling their products through online channels and agriculture policy in Indonesia in linking smallholders to consumers through the online channel.

Keywords: buying frequency; probit model; smallholders

*Speaker

4.3 COVID-19 impacts beyond production: changes in food environments in Thailand and the Philippines

Jody Harris
World Vegetable Center
Email: jody.harris@worldveg.org

Abstract:
Unhealthy diets lacking fruits and vegetables are among the major drivers of illness and death globally, underpinning 11 million deaths globally each year. Yet healthy diets based on diverse plant-based foods are already inaccessible for 3 billion people globally, and shocks such as COVID-19 exacerbate this problem. Viewing the issue of healthy diets through the lens of food systems gives us a framework for researching how COVID-19 has had impacts on food choices and behaviour; on prices and affordability of different foods; and on how food system policy and practice decisions were made during the course of the pandemic. This study looks at these issues across the food system in two different ASEAN contexts to draw lessons from the current pandemic to be better prepared for future food system disruptions.

Biodata of Session 4

Chair:

Dr. Emorn Udomkesmalee is the Senior Advisor and Former Director of the Institute of Nutrition, Mahidol University, Thailand. She also is Adjunct Associate Professor in the Department of International Health, Bloomberg School of Public Health, at Johns Hopkins University, USA.

She is a member or holds leadership positions with numerous international research and policy development bodies. To mention a few … Dr. Emorn is Chair of the Board of the International Food Policy Research Institute, a Board Member of the Micronutrient Forum and the Sight and Life Foundation, and she is the Scientific Director of the International Life Sciences Institute for the Southeast Asia Region.

At the national level, she is an Eminent Panel Member for the National Policy Council on Higher Education, Science, Research and Innovation and she is Chair of the Sub-Committee on Agriculture and Nutrition at the Office of Atoms for Peace (Thailand).

Her research interests include micronutrient assessment, bioavailability and metabolism; efficacy of food-based interventions to address micronutrient deficiencies; and maternal and child nutrition policy and program implementation.

She received her Ph.D. in nutritional biochemistry and metabolism from the Massachusetts Institute of Technology, USA, and completed post-doctoral training at the Vitamin and Mineral Nutrition Laboratory, Beltsville Human Nutrition Research Center, under the United States Department of Agriculture.

Rapporteurs:

Dr. Thasanee Satimanon is an Assistant Professor in the School of Development Economics, at the National Institute of Development Administration, Bangkok. Her expertise is in agricultural and labor economics with a research focus on inequality in the agricultural sector and food marketing, especially sustainable products. Currently, she is evaluating policies related to consumer behavior, nutrition, and life span as it increasingly affects our aging society.

She received her M.A. in Economics from Thammasat University, Thailand, and her Ph.D. from the Department of Agricultural, Food and Resource Economics at Michigan State University, USA.

Dr. Chayada Bhadrakom is Assistant Professor in the Department of Agricultural and Resource Economics at the Faculty of Economics, Kasetsart University, Thailand. At present, her research interests are in agribusiness with particular focus on economic analysis of the intersection of food, nutrition, and on health and regulatory policies that promote good health. Her research has included analysis of overnutrition in Thailand including the effect of tax regimes on sugared or sweetened beverages consumed in Thailand.

She obtained her Master's in Agricultural and Food Economics from Kasetsart University and her Ph.D. in Food Economics and Marketing from the University of Reading, United Kingdom.

Speakers:

Marie Claire Custodio is an Associate Researcher for Market and Food Systems Research at the International Rice Research Institute, the Philippines. Her research and work involve food choice in the context of markets and value chains in South and Southeast Asia.

She is currently a Ph.D. candidate and researcher, focusing on rural development at the Department of Agricultural Economics, Ghent University, Belgium. Her research topic is estimating the value of healthier rice in the Philippines in the context of rice-based diets. She holds a MBA degree from the University of the Philippines. After obtaining her MBA degree, she held professional research positions in various market research companies in Southeast Asia.

Dr. Sahara has wide experience in conducting research funded by national and international organizations, including the Australian Centre for International Agricultural Research, the Australian Department of Foreign Affairs and Trade, Japan International Cooperation Agency-World Bank Group, and other international and regional bodies. Her areas of expertise encompass food policy, agri-food value chains, agri-food digital market, contract farming, and rural economic development. She publishes widely on agri-food economics issues in Indonesia and often contributes opinion editorials to several national newspapers related to the development of agriculture in Indonesia.

Dr. Sahara is now Head of the Department of Economics at the Faculty of Economics and Management, Bogor Agricultural University (IPB), Indonesia. Previously, she was Deputy Director of the International Centre for Applied Finance and Economics at IPB, and Secretary of the Rural Development Program at IPB.
Dr. Sahara completed her Ph.D. from the University of Adelaide, Australia, where she studied under the John Allwright Fellowship.

Dr. Jody Harris is an applied researcher with a particular interest in the politics and ethics of food systems, and in policy and social interventions to achieve healthy diets and sources of nutrition. She conducts mixed methods research into the power within societies, including research work on equity and marginalization, power in politics and food policy processes, and power in food systems, including the roles of different actors in food systems. Dr. Harris is currently Senior Researcher at the World Vegetable Centre, which aligns research focus on food policy and vegetables in food systems, to achieve sustainable, healthy diets. She is also a Research Fellow at the Institute of Development Studies (UK), where she has furthered conceptual thinking on power, equity and ethics in nutrition.

Dr. Harris' most recent study is exploring and analyzing COVID-19 impacts beyond production, by examining changes in food environments and food policy in Thailand and the Philippines. This study brings together research across the food system in two different ASEAN contexts to draw lessons from the current pandemic to be better prepared for future food system disruptions.

Policy Forum: Sustainable Food System: Policy Discussion and Call for Action

Moderator:

Dr. Suresh Babu is an international agricultural economist who has conducted policy research, capacity development, and policy advisory activities for more than 30 years in the Sub Saharan Africa, South Asia, Central Asia, and other developing regions.

He joined IFPRI in 1992 and has since served in several positions including as Coordinator of IFPRI's Southern Africa Food Security Program, Coordinator of its Central Asia Program, and Coordinator of its South Asia Initiative and its Policy Analysis and Advisory Network.

At IFPRI, Dr. Babu is guiding its regional and country programs in their capacity development activities. He has conducted many national dialogues leading to the development of national food security and agricultural policies of several developing countries in Africa including, Malawi, Ghana, and Nigeria; and in Asia including India, Bangladesh, Nepal, Sri Lanka, and Bhutan.

Dr. Babu was previously a research economist at Cornell University.

Over the course of his distinguished career, he has published 20 books and more than 100 peer reviewed journal papers on food and agricultural policies in developing countries, and he has served on the editorial boards of several leading academic journals including, Food and Nutrition Bulletin, Food Security, Agricultural Economics Research Review, and the African Journal of Agricultural and Resource Economics.

Dr. Babu earned his M.Sc. in Agricultural Economics from the Tamil Nadu Agricultural University, India, and received his M.S. and Ph.D. in Economics from Iowa State University, USA.

His most recent co-edited publication is (2019) Agricultural extension: Global status and performance in selected countries. Washington, DC: International Food Policy Research Institute (IFPRI). https://doi.org/10.2499/9780896293755

Rapporteurs:

Dr. Duncan Boughton has over 30 years of professional experience in policy analysis focusing on efforts to raise smallholder farmer incomes in Southeast Asia and Sub-Saharan Africa, and has undertaken long-term assignments in the Philippines, The Gambia, Mali, Malawi, Mozambique, and Myanmar.

His work has focused on agricultural research and technology transfer for smallholder farmers, value chain development, policy analysis and outreach to host country senior government decision makers, and capacity building of local staff.

Professor Boughton's published research has examined the constraints affecting smallholder farmers' ability to participate in markets for various types of crops, and the need for complementary investments in crop productivity and market access. In Myanmar his work focused on improving agricultural policy and strategy, and preparation of a long-term investment plan to establish a national agricultural research system. At Kasetsart University he collaborates with faculty working on the Innovation Lab for Policy, Research, Capacity Building and Influence (PRCI) in Southeast Asia, and the integration of climate change adaptation and mitigation into national agricultural strategies in the region. Duncan received his B.Sc. and M.Sc. from the University of Reading in the United Kingdom, and his Ph.D. from Michigan State University, USA.

Dr. Orachos Napasintuwong is Associate Professor at the Faculty of Economics, Kasetsart University. Her teaching and research are in the areas of agricultural technology policy, economics of biotechnology and agricultural innovation, and agricultural production economics. She has published several research papers and book chapters that examine agricultural biotechnology, agricultural technology adoption, and the seed industry and rice economy in Southeast Asia.

She is also Editor of the Applied Economics Journal and Book Review Editor of the Asian Journal of Agriculture and Development. She has served on several national and regional boards of network associations that focus on diverse aspects of agricultural policies, as Executive Committee Member of the Agricultural Economic Society of Thailand under Royal Patronage; a member of the Board of Directors of the Asia Pacific Agricultural Policy Forum; and as Director of Feed the Future Innovation Lab for Food Security Policy Research, Capacity, and Influence (PRCI) in Southeast Asia, and others. She obtained her MBA from Louisiana State University and her Ph.D. in Food and Resource Economics from the University of Florida, USA.

Panelists

1. Dr. Nipon Poapongsakorn, Distinguished fellow, Thailand Development Research Institute (TDRI)

Dr. Nipon Poapongsakorn is a Distinguished Fellow and former President of the Thailand Development Research Institute Foundation. Earlier, he was Associate Professor and Dean of the Faculty of Economics, Thammasat University, Thailand.

Dr. Nipon Poapongsakorn is the author of over 200 research projects and publications related to agricultural policies, focusing specifically on water management and climate change; rural credit markets; labor economics and human resources; trade, competition and industrial policies; and anti-corruption and conflicts of interest policy. His on-going research focuses on smart farming and technology policy, and the future of small farmers.

Dr. Nipon Poapongsakorn has advised the Thai government, the Asian Development Bank and the World Bank on various issues ranging from rice price and agricultural policies to education and industrial policy, to trade strategies.

He has held leadership positions or been a member of numerous national or international associations that work on agricultural development, including the Asian Society of Agricultural Economists, the Asia Pacific Agricultural Policy Forum, Thailand's National Rice Policy Committee, and the Thai Economics Society, to name just a few.

Dr. Poapongsakorn received his Master's in Economics from Middle Tennessee State University, USA, and his Ph.D. in Economics from the University of Hawaii, Manoa, USA.

2. Dr. Mercedita A. Sombilla, Undersecretary, Regional Development Group, National Economic Development Authority, the Philippines

Dr. Mercedita Agcaoili Sombilla is currently Undersecretary of the National Economic and Development Authority, which is the economic planning body of the Philippine Government.

Her early passion was research which she continues to do, aligned with various international policy institutions, including the International Food Policy Research Institute based in Washington D.C.; the International Rice Research Institute based in Los Baños, Laguna, the Philippines; and the Southeast Asian Center for Graduate Studies in Agriculture, also

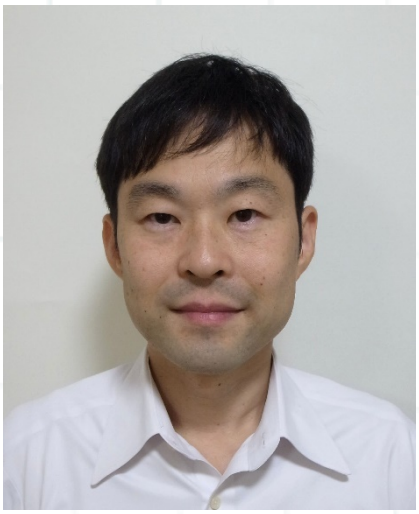
based in Los Baños Laguna.

As a researcher she focuses primarily on policy studies related to the development of agricultural and rural economies. Her work and research have provided her with rich perspective on critical challenges in the agriculture sector, particularly within the ASEAN region.

She has also served as consultant to various development partners, such as the Asian Development Bank, the World Bank, the International Fund for Agricultural Development, Australian Center for International Agricultural Research, the United States Agency for International Development, and also to various governmental ministries.

She received her M.A. in Economics from the University of the Philippines, and her Ph.D. in Agricultural Economics from the University of Minnesota, USA.

3. Dr. Eiichi Kusano, Senior Researcher, Social Science Division, Japan International Research Center for Agricultural Sciences (JIRCAS)



Dr. Kusano's expertise is analyzing food supply and demand using macro-level data. He compiled information on the food value chain in ASEAN member states for the Economic Research Institute for ASEAN and East Asia (ERIA) based in Jakarta, working with researchers in each country.

Currently, he has been conducting research on the impact of the fall armyworm, a transboundary pest insect, infecting countries in the Mekong Region, as well as estimating global food and nutrition supply for the Japan International Research Center for Agricultural Sciences (JIRCAS).

He has provided his expertise related to basic food supply and demand analysis to officials in the Ministry of Agriculture for ASEAN countries by actively participating in the activities of the ASEAN Food Security Information System (AFSIS) in Bangkok. He also shared his expertise regarding the food value chain to university students in ASEAN countries under a project of the ASEAN Sectoral Working Group on Agriculture Cooperatives (ASWG on ATE).

4. Dr. Ravi Khetarpal, Executive Secretary, Asia-Pacific Association of Agricultural Research Institutions (APAARI)

Dr. Ravi Khetarpal has been the Executive Secretary of the Asia Pacific Association of Agricultural Research Institutions (APAARI) since 2017. He facilitates information management and promotes networking and capacity building with partners in the Asia Pacific region involving projects related to agricultural innovation systems, phytosanitary compliance, pesticide risk mitigation, agribiotechnology and bioresources, agricultural science technology indicators, and risk mitigation.

He presently chairs the Tropical Agricultural Platform of the United Nation Food and Agriculture Organization (FAO) and was recently selected to chair the Global Forum of Agricultural Research and Innovation.

He previously served as Head, Plant Quarantine at the Indian Council of Agricultural Research National Bureau of Plants Genetic Resources, (ICAR-NBR), New Delhi, and also as Regional Director of ICAR Centre for Agriculture and Bioscience International (ICAR-CABI) for South Asia. He was also a Consultant to several collaborative projects sponsored by the FAO/World Bank/United States Department of Agriculture (USDA) that focused on biosecurity and compliances in Asian countries and he represented Asia as Developing Country Expert to the working group on Standards and Trade Development Facility (STDF) under the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS).

He earned his Ph.D. in Life Sciences (Plant Pathology) from the University of Paris.

Wrap up session

Duncan Boughton, Department of Agricultural, Food, and Resource Economics, Michigan State University

Good afternoon and thank you for this opportunity to reflect together.

I would like to thank all participants at this virtual conference for their attendance and active participation, and I hope you have found it as stimulating and motivating as I have.

I would like to acknowledge the high professional quality of presentations, as well as the insightful comments by our distinguished policy panelists.

Our virtual conference has demonstrated that high quality evidence is available but that at the same time there are also important gaps in the evidence which we need to fill. The good news is that the human and organizational *capacity to generate evidence* is available if we can mobilize the financial resources and regional collaboration to address them. We also need to engage our students, our *future research capacity*, in this research so that a new generation of researchers will embark on the urgent challenge before us.

Our colleagues at Mekong Institute, and other regional organizations, will have an important role to support this process of expanding focused and applied research activities. I am also encouraged that the United States Agency for International Development, which provides valuable financial support to the Feed the Future Innovation Lab for Policy Research, Capacity Building and Influence, as well as to Re-SAKSS Asia, is expanding its engagement on climate change and food systems transformation in the Asia region through the Climate Action Change Initiative.

The challenge we face is not only to increase the availability of quality evidence, but how to *use evidence* to *accelerate positive change*? This is an important part of the "call to action" goal of our virtual conference, and our distinguished policy panel has provided valuable insights in this regard.

Given the breadth of the topics and presentations it is obviously an impossible task to synthesize all the lessons in just a few minutes. Fortunately for you, and for me, the organizers will provide a detailed synthesis publication covering all the conference presentations and their policy implications, together with the insights from our policy panel.

I also want to recognize that I am an agricultural economist and so my comments on the presentations and discussions inevitably reflect my own disciplinary perspective. Other perspectives are equally important and necessary for a holistic perspective, and the synthesis document will aim to reflect that goal.

I would like to organize my reflections around four takeaway points:

1) Food System change to achieve multiple Sustainable Development Goals is complex, and will require a range of innovations and investments;

2) Food System change requires the contribution of participants from all sectors, requiring innovations that facilitate consultation and collective action in food system governance;

3) The current global food price crisis is an opportunity to accelerate food system change IF policies are explicitly designed to facilitate *adjustment* to change rather than preserving the status quo; and finally

4) Improved technologies, especially digitally enabled technologies, are an essential driver of food system change and deserve a high priority in government and private sector investment portfolios.

Let me now expand briefly on each of these four points, drawing from what I have learned from presentations and our policy panel.

Takeaway #1

Professor Shenggen Fan, in his keynote presentation noted the context of multi-dimensional SDG challenges for the food system:

- Production (for growing population)
- Nutrition (mitigation of triple burden)
- Sustainable (preserving biodiversity, natural capital and GHG abatement)
- Inclusive (smallholders, youth, women)
- Resilience to shocks (climate, conflict, international markets, pandemic)

Whether you are a plant breeder, a veterinarian, an engineer or a policy economist, you know that the *complexity* of a task increases exponentially with the number of objectives you are trying to achieve. This is due to the way pursuing any one objective affects others: there can be negative trade-offs, whether for different groups in society or for the environment, just as there can be positive synergies that need to be captured.

In order to address multiple objectives you need multiple tools (Prof Shenggen Fan again):

- Technological innovations: increasing investment and re-prioritize ag R&D for multiple wins
- Policy Innovation: repurpose subsidies
- Infrastructure innovation (resilient physical infrastructure, clean energy transport, improved water management)
- Institutional innovations (multi-sectoral coordination, social protection)
- Respect for Nature (forests, biodiversity, wetlands/mangroves)
- Open and Resilient trade (building trust in trade while reducing dependence)
- Behavioral innovation (education for consumers, producers and other FS actors)

A newly published book addresses the topic of combining different types of innovation to address food system change. The book is called “Socio-Technical Innovation Bundles for Agri-Food Systems Transformation” and was prepared by a very experienced team of authors. This book can be downloaded free and our conference technical team will put a link to the site in the chat box. If you open the link to the book description, and then click on the underlined title of the book, you will be able to download it. If you have any difficulties just send me or the organizers an email and we will help you to access it.

Takeaway #2

As reflected in our panel discussion, the translation of evidence into action requires the participation of multiple stakeholders. There are two reasons why inclusive participation is necessary:

First, as demonstrated by today's distinguished policy panel, different groups of FS actors have different resources and can make different contributions - all are needed:

- **Government** is a key sector as they are responsible for public investment in research and extension, water management and transport infrastructure, and for designing and enforcing policies and regulations to ensure public and animal health;
- the **Private sector**, including farmers, is a key sector because they determine the amount and processes used in the manufacture, production and distribution of agricultural inputs and products;
- **Consumers** are a key sector because they ultimately choose what to consume, in what quantities and form of preparation, subject to their knowledge, income and location;
- **Civil society organizations** that represent or provide services to vulnerable groups; and
- **Knowledge institutions** – universities, research institutes - are a key sector because they produce the knowledge resources available for other actors and provide training to raise labor productivity.

Second, different groups of food system actors can have competing or conflicting interests – changes that are beneficial for one group may not be beneficial to another group. For example, the presentation about sustainable certification in Indonesia's tea VC showed unequal distribution of benefits between sellers and traders compared to producers. By working together we can identify, understand and find ways to reconcile conflicts and move from win/lose options to win-win options.

Moving from evidence to action in an inclusive manner requires innovation to establish consultative platforms, whether of a temporary nature to address a specific problem, or more permanent mechanisms to continuously monitor and evolve more effective food systems. The Executive Director of the Asia Seed and Policy Association gave us the example of a platform for dialog between the commercial seed industry and governments in the region on seed policy and regulation which allowed the sector to work with government to resolve bottlenecks in seed production and supply caused by COVID-19.

It is of course very important to establish consultative platforms not only at national level but also at local level to ensure that all stakeholders have an equal voice in the process.

Takeaway #3

What about the emerging global food price crisis? Isn't this the wrong time to advocate for food system change? Actually – as our panelist Dr Mercy said – food system shocks are the best time to accelerate action…

The current global food price crisis will likely be much more serious than the 2008 crisis. This is not only because the crisis is affecting multiple commodities at once – fuel and fertilizer, oilseeds and wheat – but it is occurring at a time when large groups of consumers are less resilient due to income losses associated with COVID-19. In other

words, high food price inflation is occurring at the same time as many consumers have reduced spending power. While consumers are clearly facing increased financial stress, farmers also are not benefitting from the situation as input prices are increasing more rapidly than farm gate prices as higher marketing costs are taking a larger share of retail value.

So if the current crisis is going to be even worse than the previous world food price crisis why is now a good time to engage in action for food system change? Should we not address the short-term crisis first and worry about food system change later? This is certainly a question that our political representatives are grappling with. The political pressure to reduce food price inflation quickly regardless of longer-term consequences is very real. We see this in recent decisions by some countries to ban exports of fertilizer, vegetable oil and wheat to keep domestic prices lower.

But at the same time as the crisis presents urgent challenges it also provides opportunities for positive long-term change. The higher costs of agricultural inputs, higher transport costs, and higher food costs, all provide incentives for climate-smart and resilience building innovation, for example:

- Higher fertilizer prices provide an incentive to use fertilizer much more efficiently (less fertilizer intensive cropping systems, correct fertilizer dosing and placement, integration of livestock and crop systems);
- Higher pesticide prices provide an incentive to reduce pesticide applications through the use of data driven integrated pest management practices;
- Higher meat prices provide consumers an incentive to switch from meat-based protein to vegetable-based protein sources.

These types of adjustment would have valuable long-term environmental and nutritional gains as well as improving short-term food security.

It is therefore very important that government policies NOT try to preserve or re-create the pre-crisis "normal" by subsidizing farm inputs or food prices. Instead, *government policies should focus on helping food system actors to make adjustments that provide efficiency gains AND improve environmental and nutritional outcomes*. Examples include measures to:

- expand access to resources for soil testing, plant spacing, precision farming methods and improved water management;
- educate consumers on the health benefits of plant-based diets, avoiding sugar and highly processed foods (like the example Dr Nipon gave of Thailand's decentralized primary health care system), using smaller amounts of healthier oils;
- Modernize and promote food safety in peri-urban food systems with higher quality and lower carbon footprints; while
- expanding social protection for farmers and consumers who are unable to adjust, as Dr Jody Harris mentioned in her presentation.

If we use knowledge, technologies and policies that facilitate *adjustment* by farmers, consumers and other food system actors to the current food price crisis, rather than attempting to *insulate* them from it, then the efficiency gains will be permanent rather than temporary.

Takeaway #4

A common theme running across many presentations is the *potential* to use *digital applications* to make knowledge resources available to actors – crop and livestock farmers, consumers, traders, processors and distributors – and to track or monitor food attributes as it moves through the food system. Professor Witsanu Attavanich showed that, in the case of Thai farmers, digital applications can have a very big impact on farm incomes and help mitigate the impact of shocks like COVID-19.

But he also noted that the actual use of digital applications, especially at the farm level in Thailand, is still very low. This is unfortunate because smallholder farmers urgently need to improve efficiency because of the small size of their landholdings, and also because youth are more likely to be interested in agriculture and staying in farming if they have access to modern digital farming tools. It would be very helpful if Ministries of Agriculture in the region could establish task forces jointly with the private sector and research and extension services to incorporate the integration of digital tools in their climate-smart agricultural plans.

In most cases, digital applications work synergistically with biological or mechanical innovations. Little has been said in our virtual conference about whether current levels of investment in research are sufficient. But given the scale of the challenge, investment and innovation in the research systems of the region needs to increase, always in partnership with farmers as our panelist Ravi Khetarpal reminded us, as well as increased investment in the OneCGIAR international research system represented by several of our presenters. New tools for crop breeding, for example, have the potential to accelerate the development and release of improved varieties. But to make use of these tools there needs to be greater collaboration between research institutes in different countries and between public and private sectors. Hopefully the OneCGIAR system will be an effective catalyst in promoting collaboration among countries and sectors and be adequately funded to achieve this.

To summarize, the challenge of food system change is urgent and complex, but rapid progress can be made IF we can mobilize resources and build the necessary collaboration mechanisms between the public sector, private sector, civil society and research organizations to design and implement transformative investment programs. The current food price crisis provides additional motivation to put these mechanisms in place sooner rather than later, to ensure that measures to adapt to the food price crisis also align with climate smart and nutrition smart food system change. We must also take the opportunity to engage the next generation of young researchers in this task.

Now is the time for action!! Thank you for your attention.

Closing Remarks

Dr. Visit Limsombunchai
Dean of the Faculty of Economics
Kasetsart University

Distinguished speakers, chairpersons, and honorable participants,

This seminar is about to come to an end, and on behalf of the Faculty of Economics, Kasetsart University, I am here to express my genuine thanks and a few final words in closing.

I would like to congratulate the participants and organizers for your successful contribution to this important conference. The expertise demonstrated by our well-respected speakers, the ideas shared, and the valuable exchange of perspectives has made this event a remarkable experience for all of us. Without doubt, the issues discussed are all important for our work and the call to action is urgent. One thing's for sure…this serves as a reminder of how critical our roles are in working together to achieve our main goals—which is to actively address the challenges our countries' face and develop a more sustainable and forward-looking environment for all.

On behalf of the Faculty of Economics and Kasetsart University, I would like to express our most sincere thanks to all speakers, panelists, and dignitaries. I am sure that all who participated in this program have found your insights and recommendations beneficial.
I would also like to especially thank our organizing partners, Mekong Institute, Innovation Lab for Food Security, Policy Research, Capacity, and Influence (PRCI), International Food Policy Research Institute--ReSAKSS Asia, Agricultural Economics Society of Thailand under Royal Patronage and the Department of Agricultural and Resource Economics at Kasetsart University. Special thanks go to our sponsors, Office of the Ministry of Higher Education, Science, Research and Innovation, the Thailand Science Research and Innovation through the Kasetsart University Reinventing University Program; the New Zealand Foreign Affairs and Trade, and USAID (United States Agency for International Development).

Let me acknowledge the team of rapporteurs as well from various universities in Thailand; from Chiang Mai University, Khon Khaen University, Maejo University, National Institute of Development Administration or NIDA, Prince of Songkla University, Thammasat University and Kasetsart University, and chairpersons from Mahidol

University and Kwantlen Polytechnic University in Canada. Lastly, I wish to express my appreciation to the faculty members and staff in the Faculty of Economics for their hard work on the arrangements. It is gratifying to see that everyone's efforts have served the goal and purpose of this seminar effectively…my congratulations to you all.
As a host, I would like to extend my apologies to everyone if we have committed any inconvenience to you during the seminar.

Ladies and gentlemen, it has been two utmost rewarding days…I look forward to how this seminar will promote collaborative research and outcomes that will ensure sustainable food system far into the future.
Again…Thank you everyone.