ABSTRACTS

SESSION 2: BUILD RESILIENCE TO VULNERABILITIES, SHOCKS AND STRESS

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2.1 Economic Impacts Of Covid-19 Lockdown Measures To Livestock Production In Thailand

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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.

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2.2 Food Sufficiency At A Time Of Pandemic: The Case Of Small-State Survival Of Singapore

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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

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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.

2.4 Adoption Of Smart Farming In Thailand: Case Study In Rice, Pineapple, And Cassava

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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.

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2.5 Seeds As A Starting Point Of Food System: Putting Crisis (Covid19) In Perspective

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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 A Systematic Scoping Review And Content Analysis Of Policy Recommendations For Climate-Resilient Asean Agriculture

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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

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