

Research Article

Food Safety, Consumer Behaviour, and Government Policy after the COVID-19 Pandemic in Thailand: A Review

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ORCIDSunee Hongwiset: <https://orcid.org/0000-0003-1116-4273>**Abstract.**

This paper focuses on the state of food safety and economic recovery in Thailand following the COVID-19 pandemic. Content analysis on the news, research studies, organizations' reports, and statistical data regarding food safety and relevant government policies during 2020–2022 was employed in order to analyse the impact upon and the adaptation of farmers and consumers, as well as the actions of the Thai government. COVID-19 resulted in various public health measures that placed restrictions on transportation, directly and indirectly affecting the supply chain system, food production, and employment. The Thai government has launched strategic policies based on the Bio-Circular-Green (BCG) economic model in order to recover the overall economic situation. It has supported the University to Tambon's (U2T) projects with the aim of strengthening the local communities across Thailand. Technological and innovative techniques and equipment have been adopted to create safe food production, especially agricultural products. The project's development is still underway and needs long-term evaluation and improvement.

Keywords: food safety, post COVID-19, economic recovery, U2T campaign

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1. Introduction

Thailand is basically an agricultural producing country, which means it depends on agriculture for much of its export earnings. According to the government's report in 2019, with an agricultural land area of over 238,803 square kilometers, the agricultural sector has played an important role in the food supply chain system and developing the Thai economy [1]. In 2020, the export of agricultural products reached US\$ 14,876 million, an increase of 2.3% compared to 2019. This accounted for more than 70% of the export of agricultural products to the world's markets [2]. However, according to previous studies, the challenges of the COVID-19 pandemic covered, at least, the stockpiling of food and consumable products, a higher price of food production, and food export restrictions [3, 4, 5]. These problems seemed to get worse when global economic circumstances

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were changed due to the lockdown measures of other countries. It was also seen as a severe threat to the supply chain on the one hand, and affected consumers' behavior on the other hand.

However, in the case of Thailand, the pandemic has not much affected the food security, but the safety that people are concerned about in tandem with healthcare and well-being. With these situations in view, the central question is placed on the roles of the Thai government and its policy decision-making in recovering domestic agricultural sector and economy as a whole. According to the observation and data collected, the Thai government has promoted several strategic policies to merge technology with food safety and delivery services. The most prominent strategy is the Bio-Circular-Green (BCG) economic model which has been introduced by the academic community and promoted by the Thai government as a new economic model for inclusive and sustainable growth. The government, private sector, and academia collectively implement this principle with the aim of strengthening the local communities. To clarify these points, the role of government and relevant actors has been represented and discussed.

2. Method

There are many countries affected by the COVID-19 pandemic. Especially in regard to food security and safety, the pandemic has caused an increase in production costs and the price of products, which has consequently affected the cost of living of people. However, in the case of Thailand, the pandemic has not much affected the food security, but safety. In order to clarify these points, this article employed content analysis on news, research studies, organizations' reports, and statistical data regarding food safety and relevant government's policies during 2020–2022 in order to analyze the impact upon, and the adaptation of, farmers and consumers, as well as the actions of the Thai government.

3. Results and Discussion

3.1. Food Safety in the Post-COVID-19 Pandemic

Looking back to the outbreak of COVID-19, it led to a decline in domestic demand for several agricultural products, mainly due to tourism and temporary lockdown measures by the government. Even though the measures have a high level of efficiency in controlling the spread of COVID-19, they have also had an impact on several sectors,

including the agricultural sector and public health. In reference to a study by Sapbamrer, et al. in 2021, COVID-19 increased the cost of planting, the cost of agrochemicals and fertilizers, the prices of agricultural products, and agricultural extensions [6]. The cost of production, prices, as well as household economic problems are factors that have an impact on the mental health of both farmers and consumers. In regard to these obstacles, the pandemic has caused a disruption in the supply chain of agricultural products.

According to statistical data regarding the export value of major agricultural products between 2017–2021 represented in Table 1, export agricultural products declined during the pandemic and surged again after the situation was better [7]. There is also a possibility of increases in COVID-19 related non-tariff barriers that originated because of food safety concerns and production standards. Food safety and standards concerns also affect upstream suppliers, small farmers, and fishers.

However, data in Table 1 shown that export values in 2021 have increased higher than in the pre-COVID-19 pandemic period, and seem to increase higher than before. Agricultural production grew by 4.1%, accelerating from a 0.6% contraction in the fourth quarter of 2021, driven by higher yields of crops such as paddy, sugarcane, oil palm, and pineapple. Livestock production increased, driven by increases in broiler production, hen eggs, and swine. In addition, fishing output continually expanded from the previous quarter [8].

TABLE 1: Export value of major agricultural products, 2017–2021.

Year	2017	2018	2019	2020	2021
Export value (Million THB (Thai Baht))	1,435,180	1,406,375	1,317,926	1,290,046	1,497,813

Source: Ministry of Agriculture and Cooperatives. Thailand foreign agricultural trade statistics 2021. Bangkok: Center of Agricultural Economics; 2021. 175.

All these are resulted partly from the government’s plans to promote productivity in the agricultural sector and agribusiness for rural employment and development. As part of the Thailand 4.0 national policy, Thailand is one of the earliest adopters of agriculture technology in the region. The main priority is digitalization, and more than 4500 Thai communities have become part of the project that introduced the integration of modern information and communication technology (ICT) into the industry.

Parallel to what was mentioned above is that farmers have been encouraged to cultivate by adopting new agriculture technology (AgTech) such as drones for agriculture, smart technology devices, and Internet of Things (IoT) technology in the agricultural sector. The public sector has simultaneously encouraged the use of technology and

innovative solutions to improve the quality of agricultural products [9]. All these have been concurrently operated with the aim of promoting food safety that covers three major aspects: handling, preparation, and storage of food to prevent contamination and foodborne illnesses [10].

At the first UN Food System Summit (UNFSS) in September 2021, Thailand's Minister of Agriculture and Cooperatives stated that Thailand wants to become the "Kitchen of the World". To achieve this, the model called "Three-S" (food safety, food security, and sustainability of natural resources and agroecology) was adopted together with the Bio-Circular-Green (BCG) economic model, which was endorsed by the cabinet on January 19, 2021 [11]. Several foreign companies have also entered into joint ventures with Thai companies to produce bio-products as investment promotions are now being granted by the Board of Investment (BOI) to promote BCG production and services.

At the same time, Thailand has an abundant and diverse supply of agricultural raw materials to produce bio-products. According to a report by the Office of Agricultural Economics, government of Thailand, agricultural economic in the first quarter of 2022 is expected to increase no less than the same period of last year [12]. The government has made significant efforts to support the farm sector and create rural jobs. The new projects aim to boost rural incomes by creating community products and promoting tourism.

3.2. Adaptation of Consumer's Behaviors

The spread of COVID-19 prompted workplace closures, social distancing, and restrictions on mobility and trade that had effects on economic activity and consumer's behaviors. As mentioned earlier, food safety is the ability of people to access sufficient amounts of safe and nutritious food, which is an important basis for sustaining life and promoting good health. On the other hand, unsafe food can be a vehicle of disease transmission if contaminated with harmful microbes or toxins. The COVID-19 health crisis continues to change the behavior of consumers and shape new normal lifestyles [13].

The pandemic has forced people to pay close attention to their health and the environment. Consumers are educating themselves about what they consume, and even where the food products and ingredients come from and how packaging is made to ensure that the foodstuffs and production process are good for their health [14]. According to a survey by the Economic Intelligence Center of the Siam Commercial Bank (SCB), Asian consumers' perceptions and behaviors seem to have changed in

response to changing context. Many people now cook at home instead of eating out and shopping at small shops nearby their residences.

One of the phenomena of social distancing was the increased use of technology for professional and social connectivity, such as work from home (WFH) measures and online meetings. Other changes in consumption habits were identified, such as the use of the internet for shopping, physical activities, and health services, among others. In the digital age, fast-moving consumer goods (FMCG) are needed. More people use delivery services and are eating healthier foods in an effort to curb viral infections. The data represented that Asian consumers bought more personal hygiene, health and nutrition products, and home cleaning services. While alcohol drinks, luxury goods, meat, and seafood are purchased less frequently [15],

In the case of Thailand, Thai consumers' lifestyles and behavior were remarkably adaptive to this pandemic. During the outbreak of COVID-19, consumers initially prepared by purchasing storable food stocks for lockdown, increasing online food purchases and home deliveries in order to align with social distancing. In the long term, the COVID-19 pandemic could lead to consumer adaptation to the 'New Normal' lifestyle and behavior, which covers being health-conscious, digitalization, sanitization, balancing of home and duty, and personalization in food choices [16]. These can be explained by two important behaviors. The first is the change in where to buy, which focuses on avoiding stores and face-to-face interactions by using e-commerce and home delivery. The second is changes in what to buy, which focus on the function and origin that are more important than price and brand. As a result, agricultural products have become an important choice for most Thai people.

3.3. Relevant Policies for Food Safety and Public Health

As represented in Table 2, the Gross Domestic Product (GDP) in the first quarter of 2022 increased by 2.2%, compared with a rise of 1.8% in the last quarter of 2021. The expansion was partly due to an acceleration in the agricultural sector.

As mentioned earlier, agricultural production grew by 4.1%, accelerating from a 0.6% contraction in the last quarter of 2021. This has shown a positive sign that the spread of COVID-19 may be recognized as a beneficial point for Thai agriculture as there has been a focus more on healthy food, including agricultural products. Importantly, during the COVID-19 pandemic, many efforts have been launched to assist various groups of people. A series of policy proposals aimed at rehabilitating the national and local economies can be explained as follows:

TABLE 2: Real GDP Growth Rates (%).

Year	2020				2021				2022
	1	2	3	4	1	2	3	4	
Quarter									
GDP	- 2.2	- 12.3	- 6.4	- 4.2	- 2.4	- 7.7	- 0.2	1.8	2.2
- Agriculture	- 8.3	- 3.5	- 1.6	- 0.2	1.0	2.1	2.2	- 0.6	4.1
- Non-agriculture	- 1.7	- 13.0	- 6.7	- 4.7	- 2.6	8.3	- 0.3	2.0	2.0

Source: NESDC. Gross Domestic Product: Q1/2022 [Internet]. Bangkok: NESDC; 2022 [cited 2022 Jun 25]. 35 p. Available from: https://www.nesdc.go.th/nesdb_en/article_attach/PDF%20Q1-2022%20ENG%20EDITED.pdf

3.3.1. Policy at national level

At the beginning of 2022, to underpinning Thailand’s 4.0 policy, the BCG was adopted as part of Thailand’s national agenda. Based on Thailand’s strengths in robust agricultural activities, rich natural resources, and diversity in terms of both biological resources and physical geography, the BCG model is adopted to focus on promoting four strategic industries, namely, (1) food and agriculture; (2) medical and wellness; (3) bioenergy, biomaterial, and biochemical; and (4) tourism and creative economy.

By focusing on these areas, Thailand hopes to achieve comprehensive security in key areas of food, health, energy, employment, and sustainable natural resources and the environment. Particularly in the food and agriculture sectors, it is a fundamental component of the bioeconomy. The values derived can be multiplied with product diversification, product differentiation, and premium-quality products and services. These strategies seek to capitalize on Thailand’s biodiversity throughout the supply chain, by strengthening the capacity of local communities and optimizing the use of new technologies and methods to enhance productivity.

As a result, the BCG model will bring together the government, private sector, academia, and society to collectively implement the principles, with the goal of rebuilding a healthier, greener, more sustainable, and inclusive economy in the aftermath of the pandemic. This strategy can be enabled by research and development as well as technologies such as smart farming technologies, and technologies for food and product safety. For example, the Ministry of Agriculture and Cooperatives (MOAC) has been collaborating with Agri-tech and Innovation Centers (AICs) in 77 provinces across Thailand to transfer over 700 technological innovations to over 8,500 producers in these regions, together with linking up databases with the National Farmer’s Council to provide better information and services.

An important result is the Thai Eastern Industrial Zone in Chon Buri province, set up in October 2020, the first bio-industrial zone that can generate an annual economic

value of over US\$ 3.2 billion. Part of the Eastern Economic Corridor (EEC), it has been helping farmers develop quality products to feed the bio-industry and creating stable incomes and jobs for more than 8,000 locals over three years. In addition, agriculture has also presented an opportunity for Thailand to promote organic tourism. The Tourism Authority of Thailand (TAT) has launched a platform that connects a network of organic farmers to consumers. Local and international tourists alike can find direct access to organic rice wherever they go in Thailand [17].

Meanwhile, Thailand's electronic phytosanitary certificate (e-Phyto) system, which was proposed by the Department of Agriculture of Thailand, has recently been enforced to cover all agricultural exports. Such a system could be used to trace supply chains back to farmers in Thailand. The e-Phyto pilot project covering 22 farm products exported to China has shown much better results than expected, said the Director General, Rapeepat Chantarasriwong [18]. Besides the BCG model, Thailand has been advocating several other development concepts and models, which have interconnected ideas between the conservation of natural resources and value creation.

Based on the sufficiency economy philosophy, economic development has been promoted from existing resources and strengthening local foundations towards creating a balanced, stable growth and a self-sufficient economy. As many measures have been undertaken to cope with COVID-19, at the 78th of the Economic and Social Commission for Asia and the Pacific (ESCAP) which was held in May 2022 in Bangkok, Thailand is praised as a role model in agriculture and public health. Importantly, Thailand is still be a leader in exports of rice, sugar, fruits, seafood, and other commodities [19].

3.3.2. Implementation at local level

The COVID-19 has restricted agricultural extension services and the food supply to the market. According to the Minister of Finance, 'Focusing on people-centered development and providing digitally enabled socio-economic support to local communities is a critical pathway for sustained recovery and resilience' [20]. As mentioned above, the Thai government has supported local community with various approaches, especially efforts have been put into increasing the capacity of local communities and optimizing the use of new technologies to enhance productivity.

However, these approaches can be applied mostly to large and medium-sized farms, especially those that are owned by young farmers. The main reasons are that young farmers are more risk-tolerant and more likely to take out loans to invest in and expand their farms than older farmers. They are also willing to learn and more likely to adopt

innovative methods and technologies that can enhance their farm management and productivity. From the marketing perspective, young farmers are more capable of adopting research and development, more accessible to markets and consumers, and more adherent to product and consumer health and safety, thus engaging in sustainable farming practices [21].

Many farmers, both in rural and urban areas have changed their methods of farming, and willing to learn entrepreneurship, technology, and new skills to catch up with the market. In this regard, universities have become the best actors in educating farmers. This is in line with what the government trying to promote the BCG model by using universities as a mechanism for rural and urban farming development. The goal is to build a cluster of production groups at the sub-district level. The operation of Thailand Community Big Data (TCD) collects data from communities across the country, including the database related to the BCG economy, e.g., local flora and fauna, agricultural data, local wisdoms, etc. In doing so, the Ministry of Higher Education, Science, Research, and Innovation (MHESI) has launched the University to Tambon (U2T) for BCG campaign encouraging new graduate to help develop at least 3,000 subdistricts across the country, while promoting job opportunities and the activity also aimed at reflecting perspectives and application of the integrated development approaches for the community. The emphasis is on economic and efficiency development related to the people's main occupation.

To launch the U2T community development project, students and fresh graduates will be sent to subdistricts across the country to work on local development projects, including agricultural development. The campaign is supervised by lecturers from universities, who will be working with students to survey and promote technological skills, financial skills, language skills, and social skills. In addition, to develop employee skills to be able to understand problems, think analytically, and brainstorm and deliver creative ideas through the Design Thinking process based on problems or needs in the central region of Thailand and through the Problem-based Learning process. For the U2T campaign, the government has approved more than 3,500 million Thai Baht to 7,435 subdistricts in 77 provinces, in which almost 57,000 fresh graduates have been hired to work.

4. Conclusion

The situation should be taken into consideration when solving problems through interdisciplinary collaboration. The pandemic can be drawn into an important case study regarding supply chain and crisis management, as well as the utilization of adaptive

technology and innovation with the local wisdom of communities. In the case of farmers, the types and methods of planting, the methods of enhancing agricultural productivity, and plant protection practices need to be discussed at both policy and practice levels. New technological know-how, equipment, and the distribution of subsidies are the basic requirements for recovering and improving food safety and productivity. In the case of marketing, the government needs to develop a plan for alternative logistics and production cost control so as to maintain the price of products in line with consumer demand and affordability. Also included in this regard is the role of the government in establishing a contingent or risk management plan for an unforeseen situation in the future. Even though the COVID-19 measures of the government are recognized as a successful case study in the region, integrative measures and implementation taken by relevant government's agencies are needed.

Conflict of Interest

There is no conflict of interest related to this article.

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