

How does China respond to the agricultural commodities market: A case study in the post COVID-19 era?

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Abstract: COVID-19 pandemic caused different levels of impact across the industries, including agriculture, since it is a food chain reaction from the raw materials to the end product. The main purpose of our review research is to find out how the Chinese government responded to food security and price in the agricultural market in post COVID-19 era and then follow with key issues that need to be considered, such as steady agricultural product prices. Also, during the post COVID-19, the conflict between Russia and Ukraine affected the world's agricultural production and market. This review research concluded the strategies of the Chinese government to respond to this global issue from the point of view of agriculture. The paper also proposed some solutions and suggestions that can be applied during this new era. In the end, we concluded effective policies and regulations that have been proven by the Chinese government and can be referred to by other countries or regions.

Keywords: post COVID-19 era; Chinese policy; agriculture; food security

1 Introduction

In 2020, the World Health Organization officially named the new worldwide pandemic COVID-19 (WHO, 2020). The pandemic caused by the COVID-19 disease has a comprehensive effect on many aspects, including agriculture and the food supply chain, mainly affecting food demand and, consequently, food security, with a great impact on the most vulnerable population in the world. Those countries that don't have stable agricultural production capabilities and heavily depend on food imports are influenced by the spread of Coronavirus, they are looking for substitutes and adjusting their agricultural commodities markets to solve the urgent food crisis caused in the post Covid-19 era (Boyacı-Gündüz, C. P., et al., 2021). From another perspective, the pandemic also caused the problem of labor shortage. For example, workers are ill and need to quarantine themselves. Any sector of the food supply chain lack of labor would result in a chain reaction,

factories will shut down, food shelves will be empty in the supermarket, and there is not enough labor to harvest or grow agricultural production in labor-intensive periods. (Reid et al., 2020).

And China, with its large size and significance in the world agricultural commodities market, its response to the food crisis globally is of particular importance. Overall, the three major staple grains of rice, wheat, and corn will continue to maintain a good momentum of development in the long term, even during the Covid-19 era. There is an abundant supply of rice and wheat. However, soybean and edible oil supply capacity will need a large number of imports. Nevertheless, the rate of increase in grain production in China is lower than that of grain consumption which means there is still a food supply threat, not to mention that China is a country with low arable land per capita. In the post Covid-19 era, the basic agricultural development condition still exists. Therefore, the government's policy response is worth learning about for the development of agriculture in the post COVID-19 era.

2 Literature review

2.1 The influence of the COVID-19 pandemic on the agricultural commodities market on the view of the overworld

2.1.1 The impacts of Covid-19 around the world

The pandemic called COVID-19 disease has had a great impact on the actions and activities of humanity. Agriculture is not outside this impact. Food demand and thus food security are greatly affected due to mobility restrictions, reduced purchasing power, and a greater impact on the most vulnerable population groups. As cases of contagion increase, governments take more drastic measures to stop the spread of the virus, also influencing the global food system. The premise of any measure adopted should be to protect the health and food security of the population, to the detriment of economic growth, although some governments go in the opposite direction (Siche, R., 2020).

2.1.2 World's response to agricultural commodities in the post Covid-19 era

In the context of the global food crisis of 2007-2008 and the financial crisis of 2008-2009, the Committee on World Food Security developed the Global Strategic Framework for Food Security and Nutrition, which aimed to promote rights-stakeholders in the global, regional, and guidelines and recommendations are provided for concerted action at the country level. Meanwhile, the framework also served as a tool to provide information for the actions executed by

policymakers and all stakeholders with a role in food security and nutrition (Burdock, R., & Ampt, P., 2017).

2.2 Overview of the agriculture commodities market in China (before, during COVID-19, and in post COVID-19 era)

The producer price index of agricultural products is a relative number that reflects the trend and magnitude of changes in the price level of agricultural products sold by agricultural product producers within a certain period. The index can objectively reflect the changes in the production price level and structure of agricultural products across the country and meet the needs of agricultural and national economic accounting ("Producer Price Index of Agricultural Products - Alchetron, Baidu Encyclopedia", 2022). According to the National Bureau of Statistics, the producer price index of agricultural products keeps increasing from 2017 to 2020, as shown in table 1. The producer price index of agricultural products is 96.5, but it increased to 114.5 in 2019. The producer price index of cereal, rice, and maize increased significantly (2022). Due to the influence of the COVID-19 pandemic, the producer price of agricultural products increased in China.

Table 1 Producer price index of agricultural products from 2017 to 2020

Index	2017	2018	2019	2020
Produce price index of agricultural products (previous year=100)	96.5	99.1	114.5	115
Produce price index of plant products (previous year=100)	99.5	101.2	100.8	102.8
Cereal produce price index (previous year=100)	100.5	102.3	100.3	104.1
Wheat produce price index (previous year=100)	104.4	100.1	100.1	100.5
Rice produce price index (previous year=100)	100.7	99.7	95.5	100.8
Produce price index of maize (previous year=100)	97.1	105.1	102	107.6

Source: National Bureau of Statistics, 2022

Accordingly, the food (substances intended for human consumption or drinking, including processed, semi-finished, and unprocessed foods, excluding tobacco or substances used only as medicines) commodity retail price index also increased obviously during the COVID-19 pandemic in China, and the biggest increase is for oil products (2022).

So far, we have collected the demand and supply of agricultural products in China till April 2022. Affected by the epidemic control, the transportation of grain sources in some major corn-producing areas in Northeast and North China is not smooth, and the corn inventory in northern ports is low. It is expected that the domestic corn market price will remain at a high price range. Domestically, soybean purchases and sales are in the off-season, and the market is generally stable. It is expected that domestic soybean prices will continue to run at a high

level. Internationally, South American soybeans encountered high temperatures and drought during the critical period of growth and development, affecting soybean flowering and grain filling, resulting in lower unit yields and lower total output. The international soybean supply and demand situation are tight, and international soybean prices are expected to fluctuate at high levels. The national lint sales rate was 45.6%, a year-on-year decrease of 39.5 % points. The sales progress was slow, and the cotton spot market supply was loose. The cotton price continued to run at a high level, the transmission to the downstream textile and apparel market was not smooth, and the market was generally cautious about the market outlook. Cotton in the northern hemisphere has entered a critical period for planting, and weather changes in the main cotton-producing areas have become the focus of affecting the trend of international cotton prices. With the addition of factors such as the conflict between Russia and Ukraine, and the Federal Reserve raising interest rates, the fluctuation of cotton prices at home and abroad has intensified. The high international price has restrained the import demand for rapeseed and peanut; the import volume of specialty oilseeds such as sesame is expected to increase, driving the output of specialty vegetable oil such as sesame oil to increase by 60,000 tons. The country's accumulative sugar production was 8.89 million tons, a decrease of 1.24 million tons over the same period of the previous year; the accumulative sugar sales were 3.71 million tons, a decrease of 470,000 tons over the same period of the previous year, and the accumulative sugar sales rate was 41.7%, 0.4 percentage points higher than the same period of the previous year. Due to the epidemic, some sugar mills in the Yunnan production area have delayed the harvest and crushing time, and the sugar production may be affected ("数据 - 文章详情", 2022)

2.3 China's response to agricultural commodities before the spread of the Covid-19 pandemic

Agriculture is an infrastructure industry in China. China's agriculture has experienced three stages: traditional mode (depending on natural climate and environment), biochemical mode (overuse of chemical products), and smart agriculture era (adoption of advanced technology, such as blockchain technology, smart supply chain, etc.) (Sun et al., 2021). China has been taking continuous measurements in agriculture. For example, the Rural Revitalization Strategy was first announced by China's Chairman Xi Jinping. He strengthened the importance of rural areas, agriculture, and farmer as in priority (Xu ., 2021).

In 2012 and 2014, international food prices fluctuated drastically, with an annual fluctuation of more than 40%. While China's food prices have always remained stable, the prices of agricultural products such as corn, soybeans, beef, and mutton in China have been under strong downward pressure until the outbreak of Covid-19. With the support of the Minimum Purchase Price Policy (MPPP), the market prices of rice and wheat, these two staple foods in China, have stabilized near the minimum purchase price level. The MPPP stabilized the grain output of the

current season and helped stabilize the continuous grain production capacity. (Yao, Z., & Xuan, P., 2019, April)

Besides, the red line of domestic food production of 1.8 billion mu (Approx. 1.2 million KM²) of arable land ensures the safety of staple foods such as rice and wheat, moderately importing other agricultural products and agricultural raw materials to ensure agricultural production and supplementing the policy of importing non-staple agricultural products such as soybeans/meat. The combination of mutual support and support constitutes a three-in-one guarantee structure for China to deal with food security risks. It is also the fundamental support for China to successfully cope with the severe challenges to food security caused by various emergencies such as the international financial crisis and major natural disasters over the years. (Wang, Y. S., 2019)

2.4 China's response to agricultural commodities in the post Covid-19 era

The outbreak of COVID-19 highlights the shortcomings of China's traditional agricultural economic development model. To feed the biggest national population, China's agriculture must transition to a smart farming era, focusing on both economic benefit and environmental effects. National policy or regional policy is the efficient manner to lead the direction of agriculture. In this review, we mainly discussed the policy response of China toward agriculture in the post COVID-19 era.

Many methods have been analyzed by the government, for example, to strengthen and improve the system of agricultural support policy, continue to promote the reform of the purchase and storage system of agricultural products, besides implement more effective and compliant support and subsidy measures as well as protect and improve farmers' enthusiasm of farming. Secondly, it is necessary to further increase the support for the main grain-producing regions and consolidate the local enthusiasm and sense of responsibility for focusing on agriculture commodities. Thirdly, to increase the support for agricultural infrastructure construction, promote the innovation of agricultural science and technology vigorously, and effectively improve the comprehensive grain production capacity.

The 2020 Central Document No. 1 pointed out that the construction project of cold chain logistics facilities for agricultural product storage and preservation will be launched. Industry development is the core of the Rural Revitalization Strategy. Improving the financial support role of the financial industry in the development of the agricultural supply chain is of great significance for consolidating the industrial foundation for Rural Revitalization Strategy. This construction project of cold chain logistics facilities for agricultural product storage and preservation provides support and a basis for the traditional agriculture to the financial business

model of the agricultural supply chain and its intelligent transformation(Xu ., 2021).

Referring to China's government work report in 2022, the No. 1 document of the Central Committee, and the No. 1 document of the Ministry of Agriculture and Rural Affairs, all those documents called for increasing the production capacity of soybeans and oilseeds. And China will focus on two major preparations in 2022, and the first one is to promote the model of "soybean and corn belt compound planting" of more than 15 million mu (Approx. 10,000 KM2) in 16 provinces across the whole country by using this special model to make full use of high-level crops and corn and to take advantage of the expansion of the space for low-level crops, accomplish the synergistic symbiosis of crops, and double harvest in one season.

2.5 The conflict between Russia and Ukraine and the agricultural commodities market of China

2.5.1 The important roles of Russia and Ukraine in the agriculture commodity sector

Russia and Ukraine play a substantial role in global food production and supply. Russia is the world's largest exporter of wheat, and Ukraine is the fifth largest. Together, they provide 19% of the world's barley supply, 14% wheat, and 4% maize, making up more than one-third of global cereal exports. They are also lead suppliers of rapeseed and account for 52% of the world's sunflower oil export market. The global fertilizer supply is also highly concentrated, with Russia as the lead producer. ("New Scenarios on Global Food Security based on Russia-Ukraine Conflict | FAO in the Philippines | FAO, 2022)

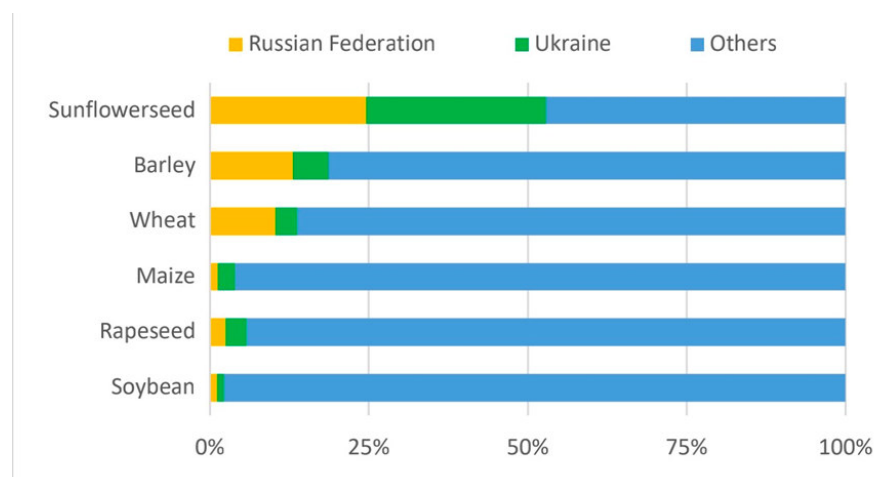


Figure 1: Share in global production of selected crops (2016/17-2020/21 Avg.)

Source: FAO XCBS system

2.5.2 The impact of this conflict on Chinese agriculture

Firstly, there is no comprehensive food security issue in staple food such as grain since China's grain production per capita is 483 kg in 2021(National Bureau of Statistics of China) which exceeds the food security line of 400 kg per capita of the United Nations Food and Agriculture Organization by 21%. Secondly, China is not involved in the sanctions against Russia; neither Russia nor Ukraine would prohibit grain exports to China, but they will reduce exports due to domestic demand. At the same time, as Ukraine has gradually entered the spring plowing season, the conflict will largely affect the plowing work in spring, which will likely lead to a decrease in grain production in autumn.

2.5.3 How should China respond to the consequences of the Russia and Ukraine conflict?

In terms of ensuring food security, strengthening the ability to increase grain production and grain reserves, strengthening the construction of grain supply chains, and actively exploring alternative sources of imports to form a complete supply chain. As for the global cooperation in China's agriculture, promoting the diversification of international agricultural cooperation methods, basing itself on the domestic market, and increasing the layout of geographically adjacent areas are options. In terms of trade in China's agricultural products, from the perspective of the government, it is necessary to establish a mechanism for monitoring and early warning of agricultural products to ensure the stability of the domestic supply of agricultural products and from the perspective of industry associations and enterprises, it is necessary to allow them to have the bargaining power of industry associations and increase the active participation of enterprises in agriculture and the capacity of the industrial chain.

The conflict also brings unpredictability to the prices of agricultural products in China, especially in the context of geopolitical uncertainty. Therefore, China proposed to firmly protect the country from the bottom line of food security in the No. 1 document of the Central Committee of China in 2022. This may also predict the uncertainty of the entire international food supply, so China, as a large country with a 1.4 billion population, must further promote the security of agricultural products.

3 Methodology

To get reliable information for the research purpose, the review paper was based on a huge amount of literature study and some web information from China's

official government portal. We aimed to analyze the influence of COVID-19 on China's agricultural commodities market and China's response to the agricultural commodities market in post COVID-19 era. In the end, we will notify the suggestion for future researchers.

4 Results

Historically, epidemics affected the agricultural market development, mainly from the food supply. The COVID-19 pandemic is the biggest shock to all the counties, especially the country living on agriculture. Besides, the unstable global environment also puts agriculture in danger, such as in the conflict between Russia and Ukraine. China is one of the biggest agricultural countries, and its shortage was exacerbated by COVID-19. The influence of COVID-19 is not only a challenge but also an opportunity for China to change its traditional agriculture system to a modern smart agriculture system. China has taken continuous policies accordingly to respond to the demand and supply changing, such as the Minimum Purchase Price Policy, Rural Revitalization Strategy, establishment of construction projects of cold chain logistics facilities for agricultural product storage and preservation, and so on.

5 Conclusion

COVID-19 is a double sword to China's agricultural commodities market. It impacted negatively on China's food supply but also accelerated the transition to smart agriculture. China's policy is showing a sustainable agriculture mode for the future, paying attention to economic benefits and the environment at the same time.

6 Limitations and suggestions

In this paper, we mainly listed China's policy respondents to the post COVID-19 era from pricing and supply chain. As we know, COVID-19 accelerated the transition from traditional extensive agriculture to smart agriculture. Therefore, future research about the adoption of automation and information technology in agriculture and its effects in China will be worthwhile. And the comparison research about digital agriculture between developed countries with mature experience in digital agriculture and China will provide valuable suggestions for China's future agricultural development.

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