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RESEARCH PAPER

Analysis of the Effect of the COVID-19 Pandemic on the Prices of Basic Food Sold in Traditional Markets: The Case of Jakarta Province, Indonesia

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Abstract

The purpose of this study was to analyze the development and fluctuation of basic food prices in traditional markets in Jakarta before and during the coronavirus disease (COVID-19) pandemic. The study used performance reports from the Indonesian Central Statistical Institute (BPS), National Center for Food Price Information (PHPI), various government agencies, the latest news from reliable online media, and similar studies. The scope of the research focused on the development of basic food prices in traditional markets from January 2019 to May 2021 in Jakarta, Indonesia. The basic food prices discussed in this study were shallots, rice, red chili, and garlic. Results showed that, the impact of the COVID-19 pandemic on the price fluctuations of shallots in the traditional markets of Jakarta was not significant. During the COVID-19 pandemic, rice prices remained stable due to the government's welfare program. The price of red chili in traditional markets tended to decrease due to the COVID-19 outbreak. The COVID-19 pandemic caused fluctuations in garlic prices in traditional markets in Jakarta, and this was because garlic imports from China faced logistical difficulties.

1. Introduction

The World Health Organization has declared a global emergency status for the COVID-19 outbreak. The world is becoming aware of this virus outbreak. Not only alert to the spread of the disease but also alert to the possible impact on the world economy. According to the Managing Director of the International Monetary Fund (IMF), Kristalina Georgieva, the coronavirus outbreak will cause a global economic slowdown in the short term. Global economic growth in early 2020 began to show signs of decline, starting with a decrease in economic growth in developed countries, even in developing countries. This situation is further exacerbated by the COVID-19 pandemic that has experienced almost all countries in the world; the World Trade Organization (WTO) noted that 80 countries had implemented export restrictions (Rahmayani, 2021).

The COVID-19 pandemic has caused significant changes in several sectors in Indonesia, including the food and agriculture sectors. The problem of food availability and fluctuations in the price of basic foodstuffs occurred in various regions; this was due to the implementation of the COVID-19 handling policy in the form of physical distancing and Large-Scale Social Restrictions (PSBB) (Gloria, 2020).

The impact of the COVID-19 pandemic on the agricultural sector covers various aspects, ranging from production, distribution, and consumption of food products. The price of food needs has become erratic. Shallots and garlic are some commodities that experienced an increase in prices; on the other hand, other commodities such as chilies experienced a decrease in selling value. Prices

become erratic, some go up, but some prices go down. Partly this is because demand is falling while supply is steady, so prices are starting to fall (Gloria, 2020). Under Presidential Regulation of the Republic of Indonesia, Number 71 of 2015, rice, chili, and shallots are the basic food needs of the Indonesian people. Basic food needs *are goods related to* the lives of many people with a large scale of the fulfilment of needs and become a supporting factor for the community's welfare. Garlic is the main ingredient for the basic spices of Indonesian cuisine and one of the new sources of economic growth in Indonesia's agricultural development (Rahmawati, 2012). Garlic is one of the horticultural crop commodities whose market demand continues to increase in line with the rapid increase in population, improving economic development and increasing public knowledge about the meaning of nutritional needs. In 2018, Indonesia was listed as the largest importer of garlic in the world. This fact is obtained from the compilation of foreign trade worldwide compiled by United Nations Comtrade (Adharsyah, 2019).

This study aims to analyze the development and fluctuation of basic food prices in traditional markets in Jakarta before and during the COVID-19 pandemic.

1.1. The development of the COVID-19 pandemic in Jakarta

Jakarta is the nation's capital and largest city in Indonesia, with an area of approximately 664.01 km² (ocean: 6 977.5 km²), with a population of 11 100 929. Jakarta is the largest metropolitan city in Southeast Asia and the second in the world. Jakarta is the center of the Indonesian economy. Currently, more than 70% of state money circulates in Jakarta. Jakarta's economy is mainly supported by the trade, services, property, creative industries, and finance sectors (Wikipedia, 2021).

Jakarta is the first province in Indonesia to implement a total lockdown or Large-Scale Social Restrictions (PSBB) because it is the epicenter of the spread of COVID-19 in Indonesia (Ahdira, 2021). Large-Scale Social Restrictions (PSBB) is one of the government's efforts to break the chain of the COVID-19 spread. The implementation of PSBB is regulated in Indonesian Government Regulation Number 21 of 2020, which President Jokowi signed. The implementation of PSBB in Jakarta has been carried out since the beginning of the spread of COVID-19, namely in April 2020, and this PSBB is carried out periodically. Jakarta is the province with the highest number of COVID-19 cases in Indonesia, and the number of people infected with COVID-19 in Jakarta continues to grow from March 2020 to June 2021 (Wijaya, 2020; DKI Jakarta Official Portal, 2021).

Based on the Figure 1, we can see that the number of COVID-19 cases in Jakarta increases from March 15, 2020, to June 8, 2021. The highest number of positively infected people with COVID-19 occurred in January and February 2021, which was 26,029 cases. Then the number of COVID-19 cases decreased in March 2021 after the government imposed a total lockdown. In June 2021, the number of positive people for COVID-19 in Jakarta was 19 096, those who were being treated were 7,856, and those who died were 7,856. At the same time, the number of people who have recovered from COVID-19 is 424 088. Overall, the number of positive COVID-19 cases in Indonesia is 1 927 708, and in Jakarta, 452 295 cases. The death rate from COVID-19 in Indonesia is 2.8%, while it is 1.7% in Jakarta. The cure rate in Indonesia is 91.2%, while in Jakarta, it is 94.1% (Jakarta Smart City, 2021).

Jakarta Governor Anies Baswedan said the increase in COVID-19 cases was due to a decrease in the level of public compliance in implementing health protocols such as wearing masks, maintaining distance, and washing hands.

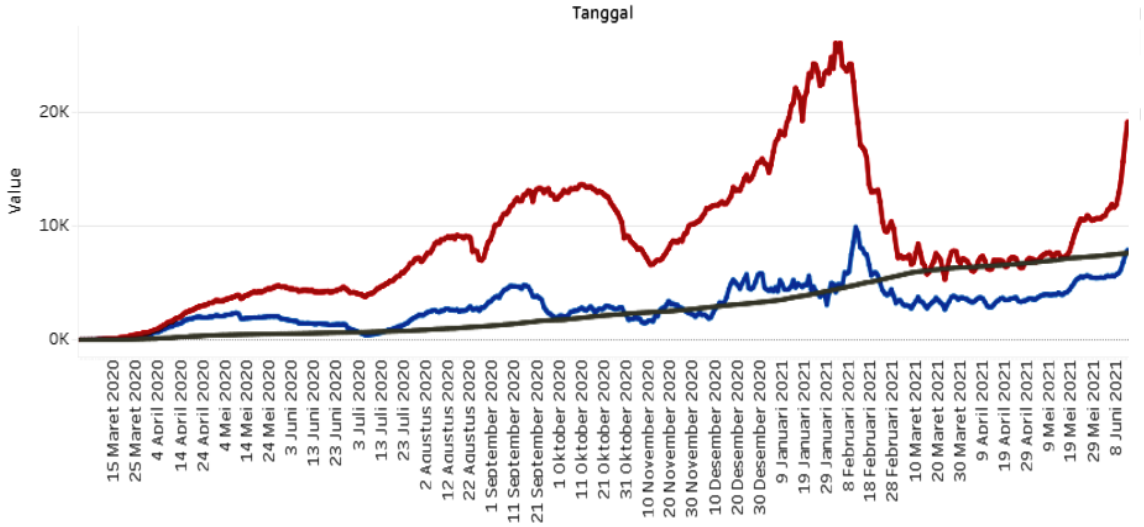

Figure 1. Positive Covid-19 cases in Jakarta (Red line: Positive for Covid-19, Blue line: Under treatment, Black line: Died, Source: Jakarta Smart City, 2021).

Therefore, the Jakarta government has extended the lockdown activities until May 31, 2021, intending to suppress the potential spread of COVID-19 (Wahyudi, 2020). During the PSBB, there were many layoffs (Work termination). Employees are laid off by receiving a reduction in salary/income, receiving money waiting for some time, and other forms that, in principle, reduce people's income. The Indonesian Ministry of Manpower, on June 7, 2020, stated that there were 3.05 million layoffs nationwide until June 2020. This number continues to grow until it is estimated to reach 5.23 million people (Cahyani, 2020). Of course, along with reduced income, people's purchasing power will also decrease. It is believed that after the decline in household income, the demand for basic foodstuffs, including rice, sugar, cooking oil, meat, eggs, also fell. If demand/consumption is low, it will result in low prices, especially if production is constant.

1.2. The impact of the COVID-19 pandemic on traders in traditional markets

Traditional markets are where the activities of sellers and buyers are carried out directly in the form of retail for a temporary or permanent time with a limited level of service. Traditional markets are also meeting centers, folk art activities, information exchange centers and become a unifying social relationship in the community. The COVID-19 case is a global pandemic that has raised concerns from various groups, especially traders in Jakarta's traditional markets. Traders' concerns are increasingly felt when they see the number of positive cases of COVID-19, which continues to increase every day. However, this certainly does not reduce the enthusiasm of the traders to make a living or sell. Because if they wait until this pandemic ends, it will be complicated for traders to meet their household needs (Nuzula, 2021). Traditional market trading activities are still carried out because the community most needs traditional markets to get their daily basic needs. Traders who sell in traditional markets must continue to apply health protocols such as wearing masks, washing hands, and maintaining distance to prevent the spread of COVID-19 (Nuzula, 2021). The impact of the pandemic on traders is a decrease in income due to a lack of buyers. Because during the COVID-19 pandemic, people are required to reduce activities outside the home that affect the economy of traders. The Indonesian Market Traders Association (Ikappi) released the fact that the turnover of traditional market traders in the past month continued to decline by 60 percent during the COVID-19 pandemic (Nuzula, 2021).

1.3. Impact of the COVID-19 pandemic on basic food prices

Regional closures to prevent the spread of the COVID-19 virus have an impact on food logistics disruptions (FAO, 2020a). Several cases show an impact, namely the disruption of marketing access for small farmers to markets so that urban communities find it difficult to access fresh fruits and vegetables, milk, meat, and fish (FAO, 2020b; ACIAR, 2020). Likewise, in Indonesia, the establishment of the PSBB policy creates supply disruptions and delays in food distribution, which can affect food scarcity and rising prices. Moreover, according to Rahma (2020), one week before the PSBB was set in Jakarta, the delivery of rice from the provinces of West Java, Central Java, and East Java to Jakarta had experienced delays, not because of limited food stocks but because of the fear of entering areas classified as the central spread of the virus (Ariani et al., 2020).

Implementing the PSBB regulations for the first time caused panic or fear, especially for people in Jakarta, so panic buying occurred (Fadjarudin, 2020). People who have enough money buy various essential foods and food/drinks in supermarkets in excessive quantities. However, in line with the government's and police's appeal, this only happened for a few days. In the PSBB regulations, food is not one of those that is hampered by its movement because food is a basic need. However, in practice, food distribution experienced a few obstacles due to restrictions on the use of toll roads, ports, airports issued by the Ministry of Transportation through Law Number 25 of 2020. This regulation is specifically related to areas with PSBB status, including regulating a temporary ban (April 24) until May 31, 2020) exit and enter the PSBB area/red zone for land vehicles, trains, ships, and planes users. For logistics/goods, transportation of essential materials and emergency matters are excluded. Then there is a rapid test for people leaving/entering the red zone, Jakarta residents are prohibited from going home, and there are penalties for vehicles that violate; this affects the distribution of food to be less smooth. Food stocks between regions are less evenly distributed because regions experience a food deficit, and some excess experience production. Food distribution constraints are also a result of policy changes from exporting countries trying to save production for domestic needs so that imports of agricultural and food products are delayed or not smooth (Coordinating Ministry for Economic Affairs, 2020).

The PSBB regulations have an impact on food distribution and have an effect on increasing food prices, thus affecting people's income (Celik et al., 2020). Moreover, this is reflected in economic growth performance in the first quarter of 2020, which decreased by 2.97% (BPS, 2020a). This economic contraction affects the narrowing of employment opportunities (decreased working hours and layoffs), impacting income and purchasing power. Around 44.7% of male respondents and 38.6% of female respondents admitted that they experienced a decrease in

income (BPS, 2020b). A decrease in income will undoubtedly affect a decrease in food demand; although the magnitude will vary according to income, group and food function (as basic food, luxury food, or substitute food). The analysis conducted by Suryani et al. (2016) using data from the 2014 National Socio-Economic Survey (conditions before the COVID-19 pandemic) shows the income elasticity for rice, chicken meat, beef, and eggs, fish, shallots, and red chilies is positive. However, the elasticity value at low-income households is smaller than wealthy households. An increase in income will increase food demand, and conversely, a decrease in income will reduce food demand.

An increase in food prices will cause a decrease in demand, but the percentage of the decline depends on the type of food. An increase in prices and a decrease in income due to the COVID-19 pandemic will undoubtedly cause a decrease in food demand. According to researcher from the Center for Strategic and International Studies (CSIS) Department of Economics, Haryo Aswicahyono, people's purchasing power has decreased due to the outbreak of COVID-19 in Indonesia since March 2020 and this has led to relatively low movements in the consumer price index (CPI). The decline in people's purchasing power is inseparable from the decline in people's incomes, especially those with irregular incomes (Ramli and Djummena, 2020). According to the Minister of Finance, Rahma (2020) reported that Indonesia's economic growth in the third and fourth quarters was negative, one of which was caused by a decline in household consumption. The purchasing power of the people lost during the pandemic is estimated at around USD 25.4 billion. This calculation is based on the number of working hours lost due to the PSBB policy (Ariani et al., 2020).

Producers of fresh and processed food must address the decline in demand. For food produced by farmers to be sold at a reasonable price, the Ministry of Agriculture must re-calculate the supply of food originating from domestic production. If it is estimated that the products produced by farmers exceed their needs, some things can be done, namely by asking farmers to plant other commodities or processing food into semi-finished food temporarily. If the demand for chili decreases, the excess chili production is processed into ground chili by farmers (gapoktan) or in collaboration with chili processing business actors who are also partners in marketing the ground chili (Ariani et al., 2020).

2. Materials and Methods

This study uses secondary data obtained from survey results from the Indonesian Central Statistics Agency (BPS), the National Center for Food Price Information (PHPI), performance reports from several government agencies, the latest news from trusted online media, and similar studies. The scope of the research focuses on the development of basic food prices in traditional markets in Jakarta, Indonesia, from January 2019 to May 2021. The basic food prices discussed in this study were shallots, rice, red chilies, and garlic. The discussion was carried out in a qualitative descriptive manner, comparing monthly prices, in the period before the COVID-19 pandemic from January 2019 to February 2020 and during the COVID-19 pandemic from March 2020 to May 2021.

3. Results and Discussion

3.1. Shallot price development

Shallots (*Allium ascalonicum* L.) is one of the basic foods of the Indonesian people following Presidential Regulation no. 71 of 2015. Shallots are Indonesia's leading vegetables that have a significant role and need to be cultivated intensively. Shallots are used as a spice. In addition, shallots are used as traditional medicine (Dewi and Sutrisna, 2016). The monthly price of shallots in 2019, before the COVID-19 pandemic, was relatively stable, with fluctuations between 13% to 47%. The highest price of shallots in 2019 occurred in April, which was 3.14 USD kg^{-1}. Moreover, the lowest price of shallots in 2019 occurred in September, which was USD 1.72 USD kg^{-1} (Figure 2). During the beginning of the COVID-19 pandemic, from March 2020 to June 2020, the price of shallots continued to increase, but from August to September, the price decreased. The highest price of shallots in 2020 occurred in May, which was 4.09 USD kg^{-1}. The lowest price in September was 2.35 USD kg^{-1}. From Figure 2, it can be seen that the price of shallots during the pandemic fluctuated highly and reached the highest price in May 2020. According to the National Food Price Information Center (PHPI), the price of shallots was high from April to June 2020 due to reduced shallot stocks because the planting schedule was postponed due to high rainfall (PHPI, 2021). High rainfall causes many shallots to be damaged, thereby reducing the number of shallot seeds that will be used the following year. In addition, high rainfall causes the productivity of shallots to decrease. Usually in 1 hectare can produce 12 tons of shallots, but 1 hectare can only produce 6-7 tons of shallots due to high rainfall. Shallot production is reduced while demand is high, causing the price of shallots during the pandemic to be high. The price of shallots is stable again from January to May 2021 (Yuniarta and Mahadi, 2020).

3.2. Rice price development

Rice (*Oryza sativa* L.) is a basic food for most Indonesian people. Rice consumption in Indonesia

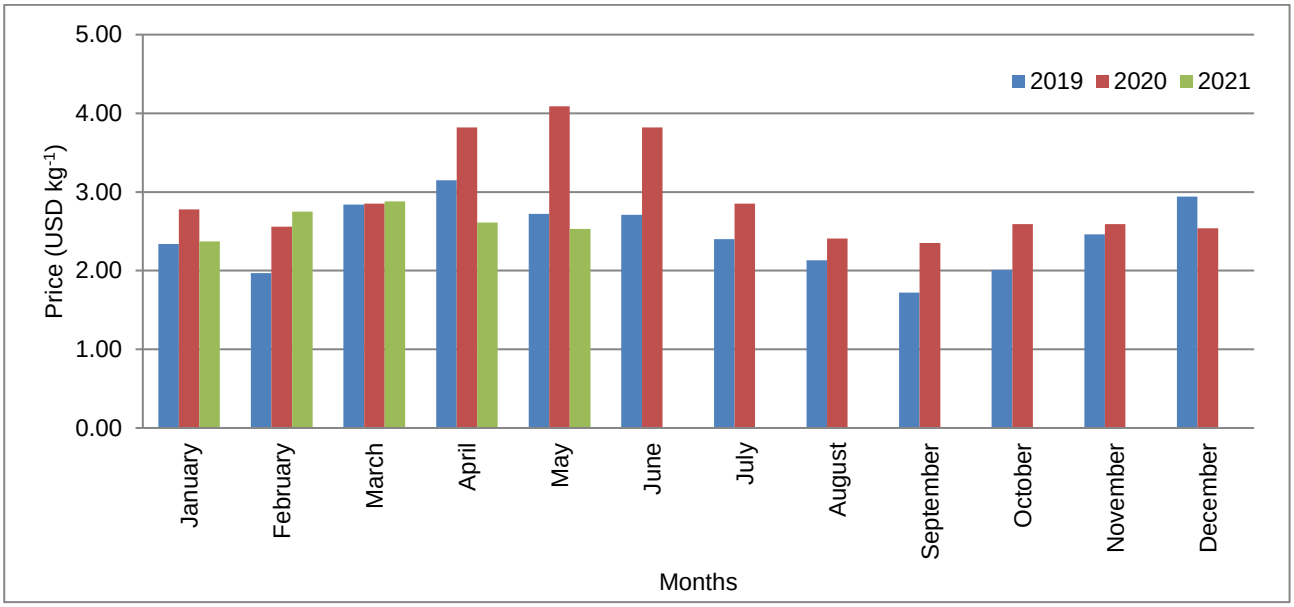

Figure 2. Monthly prices of shallots (USD kg^{-1}) in Jakarta from January 2019-May 2021 (Source: Own calculation).

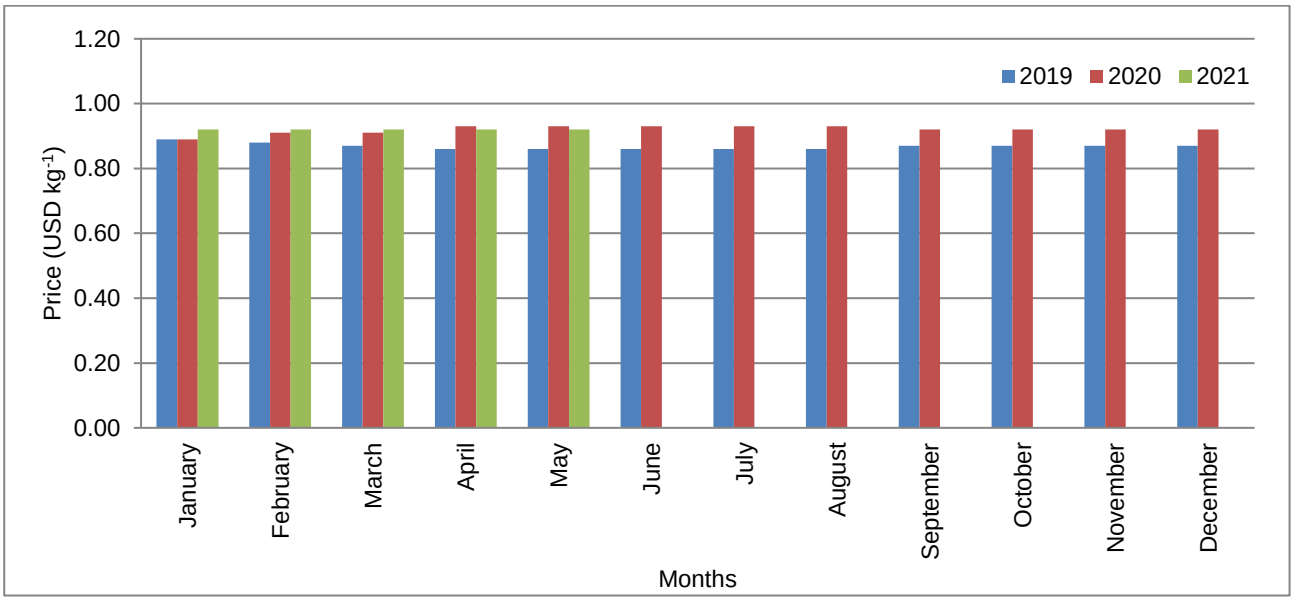

Figure 3. Monthly price of rice (USD kg^{-1}) in Jakarta from January 2019-May 2021 (Source: Own calculation).

is increasing every year along with the increasing population of Indonesia. National rice consumption in 2019 was 94.9 kg $capita^{-1}$ $year^{-1}$. National rice consumption in 2020 will increase by 111.58 kg $capita^{-1}$ $year^{-1}$ (BKP, 2020).

Based on Figure 3, it can be seen that the monthly price of rice in 2019, before the COVID-19 pandemic was relatively stable. During the COVID-19 pandemic, the rice price was also stable from early 2020 to May 2021. Currently, rice is the most stable basic food commodity. Rice prices have been stable during the COVID-19 pandemic due to the government's social assistance program. The government provides social assistance in the form of rice supplies sent to each community's homes in Jakarta. Many people received rice assistance, thus reducing the demand for rice in the market. Rice prices are predicted to be stable until early 2022. This is driven by optimism for a rice surplus in 2020 of 6 million tons. This amount is sufficient to meet the national rice needs in 2021. In addition, in April 2021, the rice supply will increase again as it enters the main harvest. The current condition of rice prices is excellent because there is no price decline at the farmer level and no high price increase at the consumer level (Uly, 2021).

3.3. Red chili price development

Before the COVID-19 pandemic in 2019, the price of red chili (*Capsicum annum* L.) fluctuated every month. The highest price of red chili in 2019 occurred in August, which was 5.39 USD kg^{-1}. Moreover, the lowest price in 2019 occurred in

February, which was 2.03 USD kg^{-1}. Monthly price increase during 2019 between 3% to 58% (Figure 4). The volatility of red chili prices is difficult to control because of consumer preferences who prefer fresh chilies that do not last long in storage compared to processed chilies. The price of red chili is high from June to August 2019 due to fewer farmers growing chilies and planting disturbances due to the dry season. At that time, chili farmers were constrained by land that did not have a sufficient water supply. So that the production volume is not maximized and farmers switch to other crops. From September to December 2019, the price of chili decreased due to abundant production (Andri, 2019).

The price of red chili at the beginning of 2020 increased again, with an increase of 71.5% compared to January 2019. At that time, the rainfall was high, so that the red chili stock was reduced from the farmers (Figure 4). During the COVID-19 pandemic in March 2020, the price of red chili tends to decrease. Red chili prices experienced a sharp decline from April to September. The lowest price of red chili in 2020 occurred in July, which was 1.97 USD kg^{-1}. According to Susilowati and Gunawan (2020) the price of red chili decreased during the COVID-19 pandemic due to the decline in people's income, which caused the demand for red chili to drop drastically. Because during the PSBB (Lockdown), many people lost their jobs and employees were laid off by receiving a reduction in salary/income. Of course, along with reduced income, people's purchasing power will also decrease. Red chili prices have decreased during the COVID-19 pandemic, which is very detrimental to chili farmers. Because the price received is not commensurate with the production costs incurred. In addition, the demand for red chili decreases when farmers are harvesting. From the end of December 2020 until March 2021, red chili prices began to improve. The price of red chili at the consumer level has reached the highest level during the COVID-19 pandemic, 4.60 USD kg^{-1} (Figure 4). Although the price of red chili rose at the consumer level, unfortunately, farmers have not been happy. Due to the price increase from the end of December 2020 to May 2021, it has not covered the losses suffered by farmers due to the deep price decline during the COVID-19 pandemic. The increase in the price of red chili from the end of December 2020 to May 2021 was caused by a lack of stock because several chili plants were attacked by plot disease and fruit rot; this happens every year during December-March 2020 due to high rainfall. Not to mention the contribution of the La Nina phenomenon during October 2020-March 2021, which also contributed to increasing rainfall; when the rainfall is high, chili plants are susceptible to pests and diseases (Thomas, 2021).

3.4. Garlic price development

Garlic (*Allium sativum* L.) is one of the vegetable plants needed by households in Indonesia every day as a cooking spice. Currently, garlic is also one of the new sources of economic growth in agricultural development. Indonesia is China's most significant market share for garlic. Every year Indonesia receives imports of garlic commodities from Jining City, Shandong Province, China. Currently, 90% of garlic sold in the Indonesian market comes from imports (Gunawan and Sayaka, 2020).

Indonesia is only able to produce approximately 4% of the total national demand for garlic every year. This condition is the leading cause of the increase in Indonesian garlic imports (Syafina, 2019).

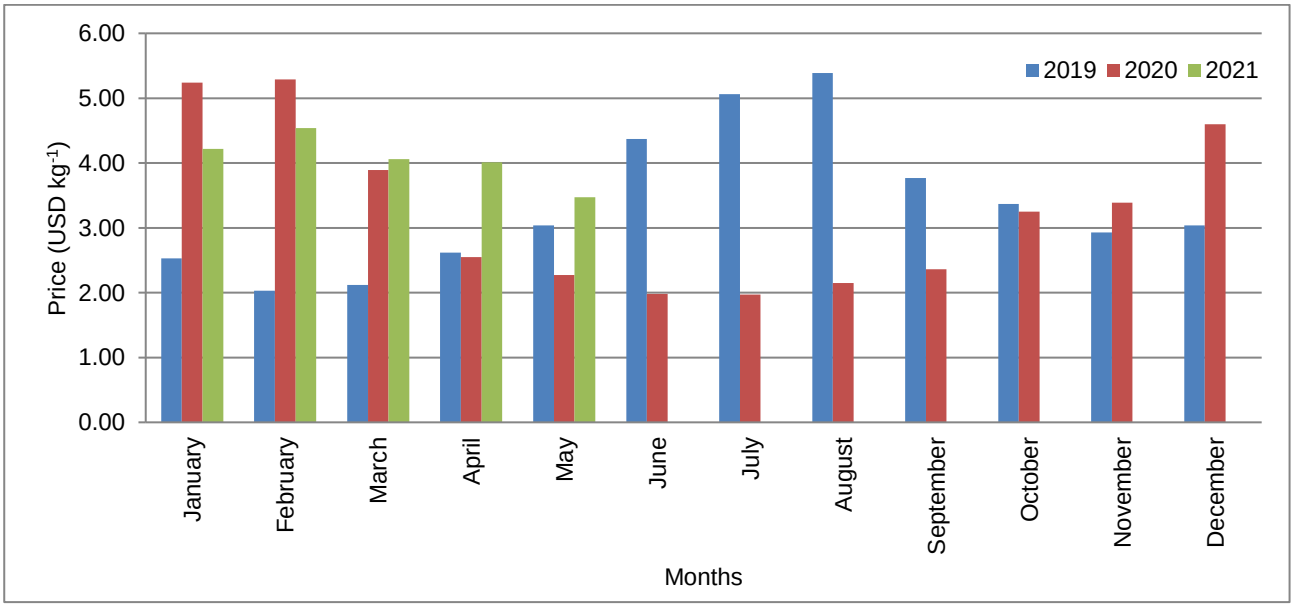

Figure 4. Monthly price of red chili (USD kg^{-1}) in Jakarta from January 2019-May 2021 (Source: Own calculation).

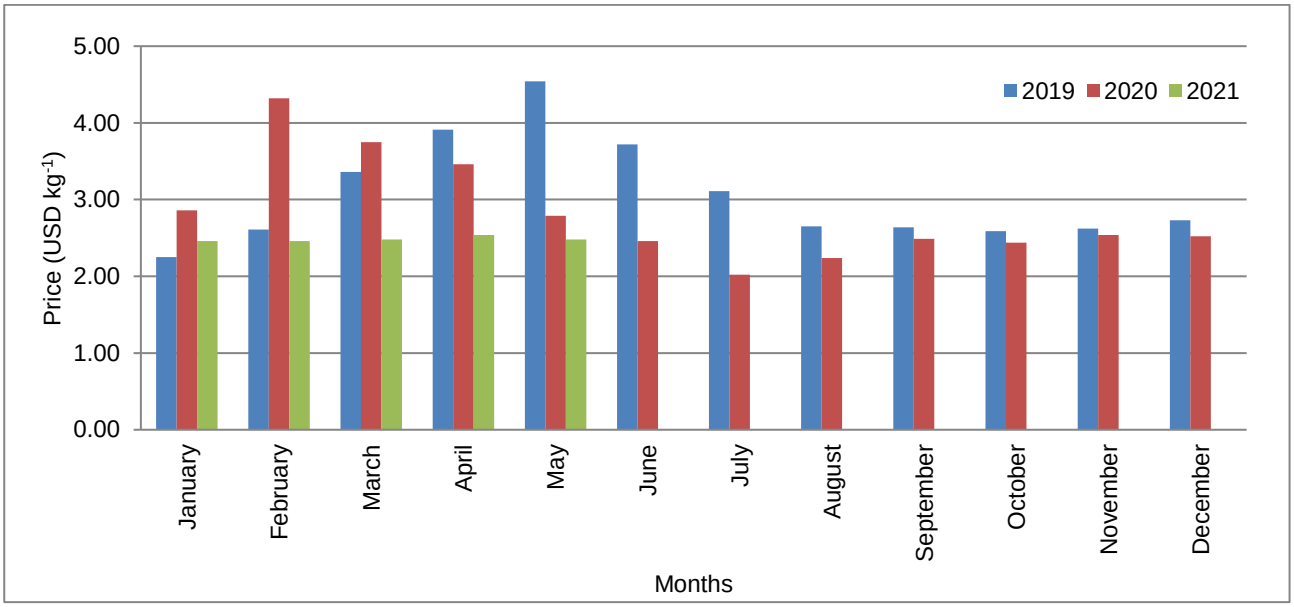

Figure 5. Monthly price of garlic (USD kg^{-1}) in Jakarta from January 2019-May 2021 (Source: Own calculation).

In 2019, before the COVID-19 pandemic, the price of garlic fluctuated every month. The highest price of garlic in 2019 occurred in May, which was 4.54 USD kg^{-1}. The lowest price in 2019 January was 2.25 USD kg^{-1}. The price of garlic was high from April to July 2019 due to the lack of garlic stock (Figure 5) due to delays in distributing imported garlic stocks to traditional markets. There are many imported garlic stocks, but they are late in the distribution process to the market, so prices are high (Widyastuti, 2019). Although it has issued a garlic import permit to maintain the commodity price stability, the government is deemed necessary to monitor the price and circulation of one of these staple commodities. The government must also ensure sufficient stock of garlic.

At the beginning of 2020, the price of garlic rose sharply. In February, the highest price was 4.32 USD kg^{-1} (Figure 5); this happened because the primary source of garlic imports in China was in lockdown, resulting in logistical difficulties to import in early 2020. Based on data from the Central Statistics Agency (BPS), throughout the first semester of 2020, Indonesia imported 284 363 tons of garlic. This figure increased by 141% compared to the same period in the previous year of 117 827 tons (Thomas, 2021). The increase occurred during the coronavirus pandemic. The Indonesian Trade Minister released a new policy that loosened restrictions on garlic imports to contain soaring garlic prices. Therefore, the price of garlic from June 2020 to May 2021 is stable.

Meanwhile, garlic production in Indonesia continued to decline throughout the year. The government should make a program to develop garlic cultivation in Indonesia to not depend on China because the agricultural area in Indonesia is still quite large and has the opportunity to increase garlic productivity. The government needs to provide superior varieties with high yields to increase garlic production. In addition, the government must also raise the enthusiasm of farmers to return to planting garlic.

4. Conclusions

Based on the data that has been researched, the impact of the COVID-19 pandemic is not a significant factor in the price fluctuations of shallots in Jakarta's traditional markets. The main factor causing fluctuations in the price of shallots is the reduced stock of shallots; this is due to the postponement of the planting schedule due to high rainfall. High rainfall caused many damaged shallots. Eventually, the seeds that were deviated by farmers to be planted the following year were reduced. In addition, high rainfall causes the productivity of shallots to decrease.

Farmers must use the rain shelter method in planting shallots when rainfall is high. The rain shelter method can overcome fusarium disease so that shallot plants do not get moldy and do not rot and reduce labor costs when caring for onion plants in the rainy season (Budi, 2018). In addition, the cost of sanitation is cheaper and economical. Other benefits include supporting the application of environmentally friendly cultivation because it reduces the use of pesticides in the field, ensures a successful harvest during the rainy season, maintains humidity, fertilizers in the land are not easily lost due to rain, and cultivation will become more economical and efficient.

It was found that the price of rice during the COVID-19 pandemic has remained stable. Rice prices have been stable during the COVID-19 pandemic due to the government's social assistance program. The government provides social assistance in rice supplies sent to each community's homes in Jakarta. Many people

received rice assistance, thus reducing the demand for rice in the market. Rice prices are predicted to be stable until early 2022. This is driven by optimism for a rice surplus in 2020 of 6 million tons. This amount is sufficient to meet the national rice needs in 2021. In addition, in April 2021, the supply of rice will increase again as it enters the main harvest. The current condition of rice prices is excellent because there is no price decline at the farmer level, and there is no high price increase at the consumer level.

Results showed that the price of red chili in traditional markets tends to decrease due to the COVID-19 pandemic. The price of red chili decreased during the COVID-19 pandemic due to the decline in people's income, which caused the demand for chili to drop drastically. Because during the PSBB (lockdown), many people lost their jobs, and employees were laid off by receiving a reduction in salary/income. Of course, along with reduced income, people's purchasing power will also decrease. Chili prices have decreased during the COVID-19 pandemic, which is very detrimental to chili farmers. Because the price received is not commensurate with the production costs incurred. In addition, the demand for red chili decreases when farmers are harvesting.

According to the analysis results, the COVID-19 pandemic has affected the price fluctuations of garlic in traditional markets in Jakarta. At the beginning of 2020, the price of garlic rose sharply. This happened because the primary source of garlic imports in China was under lockdown, resulting in logistical difficulties to import to Indonesia. China is the leading importer of garlic to Indonesia. Ninety percent of the garlic sold in the Indonesian market comes from Chinese imports. The Indonesian government should make a program to develop garlic cultivation in Indonesia to not depend on China because the agricultural area in Indonesia is still quite large and can increase garlic productivity. The government needs to provide superior varieties with high yields to increase garlic production. In addition, the government must also raise the enthusiasm of farmers to return to planting garlic. Farmers are also advised to improve the production system and efficiency of garlic cultivation to be more resilient in facing market dynamics.

There are three implications of this research; the first is that this research is expected to be a reference for other researchers who will research the same topic further. The second implication is a consideration for the government in making policies. The third implication is knowledge for people who want to know the causes of fluctuations in basic food prices before and during the COVID-19 pandemic in Jakarta, Indonesia.

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