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Adang Agustian, Rizma Aldillah, Imam Mujahidin Fahmid, Darmawan Salman, Wahyudi, Benny Rachman, Sri Hery Susilowati, Sumaryanto, Chairul Muslim, Kurnia Suci Indraningsih

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The impact of the Covid-19 pandemic on the Indonesian export and import of food crops

Adang Agustian and Rizma Aldillah*

The Research Center for Behavioral and Circular Economics,
The National Innovation Research Agency,
Jakarta, 12710, Indonesia
Email: aagustian08@gmail.com
Email: rizmaaldillah@gmail.com
*Corresponding author

Imam Mujahidin Fahmid
and Darmawan Salman

Department Agricultural Science,
Graduate School,
Hasanuddin University,
Makassar, 90245, Indonesia
Email: imam.m.fahmid@gmail.com
Email: darsalman1963@gmail.com

Wahyudi

Planning Bureau,
Secretariat General of the Ministry of Agriculture
Republic of Indonesia,
Jakarta, 12550, Indonesia
Email: wahyudingawi25@gmail.com

Benny Rachman, Sri Hery Susilowati,
Sumaryanto and Chairul Muslim

The Research Center for Behavioral and Circular Economics,
The National Innovation Research Agency,
Jakarta, 12710, Indonesia
Email: bn_rachman@yahoo.com
Email: srihery@yahoo.com
Email: sonysumaryanto@yahoo.com
Email: cmuslim2@gmail.com

Kurnia Suci Indraningsih

The Research Center for Social Welfare, Village and Connectivity,
The National Innovation Research Agency,
Jakarta, 12710, Indonesia
Email: kurniasuci@yahoo.com

Abstract: During the Covid-19 pandemic global economic growth including Indonesia decreased up to 5–6%. Trading volume decreased 9.2% and international cargo transportation decreases 23%. The objective of this paper is to understand the impact of Covid-19 on the balance and position of Indonesian Food Crops international trade in ASEAN. Trade value balance for Indonesian food crops before the pandemic in average suffered a deficit of USD 3.309.449. During the pandemic, the projection for the trade value balance was a deficit of USD 2.966.515. There is an optimistic potential of market share development for rice and maize in Malaysia, Thailand, and Vietnam due to the value's position in falling star and rising star quadrant. To enhance competitiveness of food crop's export, several policies needed are: incentives for cultivation, optimisation of farmer institution, tariff regulation, quota system, and import license.

Keywords: Covid-19; competitiveness; export import; export product dynamic; food crops; import license; quota system; tariff regulation; trade value balance.

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Biographical notes: Adang Agustian is a major researcher in the field of agricultural economics.

Rizma Aldillah is a young expert researcher in the field of agribusiness.

Imam Mujahidin Fahmid is a Professor in the Social Field of Agriculture.

Darmawan Salman is a Professor in the Social Field of Agriculture.

Wahyudi is a young planner in the social field of agriculture.

Benny Rachman is a Research Professor in Agricultural Economics.

Sri Hery Susilowati is a principal researcher in the field of agricultural economics.

Sumaryanto is a principal researcher in the field of agricultural economics.

Chairul Muslim is an associate researcher in the field of agricultural economics.

Kurnia Suci Indraningsih is a major research expert in the field of social agriculture.

1 Introduction

The implementation of health protocol with the limitation of space for activities is one of the main policy that has been implemented in some countries in order to mitigate the spread of Covid-19. The policy has a negative impact particularly on economic sector. This can be seen from Indonesian economic growth before the pandemic (on the 1st quarter of 2020) that had reached 2.97% and fall off to –5.32% during the pandemic (on the 2nd quarter of 2020) (State Secretary, 2020). The fall off of Indonesian economic growth is not different than the projected global economic growth that is ranged between –5.2% to –6% (IMF, 2020, World Bank, 2020, OECD, 2020)

The policy to limit space of activities such as lockdown, social distancing, and work from home resulted in number of labour reduction, production reduction, and global supply chain impact reflect in export-import activities. (Barrot et al., 2020; Baqaee and Farhi, 2020). WTO recorded that world trade volume on the 2nd quadrant of 2020 declined of 14.3%, even lower to 9.2% at the end of 2020. This decline caused the decline of transportation sector in quantity. In June 2020, International Air Transportation Association showed that there had been a decline in quantity of international cargo transportation (belly- hold and freighters) until March 2020 of 23% year on year basis and it was predicted to inflict loss of USD 1.6 billion.

Agricultural products particularly food crops are some of the products that has impact on trade. Some of producer countries apply export restriction policy for their food products and prioritise their food security (Lazarov, 2019). The reduction of food crops production and trade caused panic buying. This is due to the change of public food consumption pattern that public would rather eat at home than buy from restaurants (Kerr, 2020). McKibbin and Fernando (2020) presented that there has been a decline on household food consumption of 8.29%. The Global Hunger Index (2019) stated that 8.3% of population cannot access sufficient food and nutrition and 32.7% children under 5 suffer stunting.

According to Gruszczynski (2020) short term impact that is caused by the pandemic Covid-19 on international trade is considered to be serious, although the situation can still be handled. The Government of Indonesia has done several efforts to overcome the negative impact of the pandemic Covid-19 on agricultural commodity trade such as providing business incentive that is providing exemption of income tax 22 for imports of Rp 14.75 trillion (Hartarto, 2020). This incentive needs to be determined on which strategic commodities or products especially food commodities it has to be applied. This similar policy that is the exemption of tariff for food import has also been done by countries like China, El Salvador, Costa Rica, Mauritania, and Morocco (ITC, 2020). In Malaysia, the policymakers have an insight into the vulnerable types of exports during crises so that they would be able to make good strategic decisions to protect the performance of export sectors in the event of future crises (Pouresmaeili, 2015; Zulhafiz, 2015)

The other effort that has been done by the government is to make an agreement to open the path for trade during the pandemic Covid-19. This agreement has been done with 12 other countries like Singapore, Canada, and South Korea (Septiari, 2020). Furthermore, The Ministry of Trade and The Ministry of Foreign Affair need to do diplomacy with the main import countries to maintain the trade with Indonesia. The government has given support to the exporters through enhancing the competitiveness such as innovation, digitalisation, and entrepreneurship (Roeslani, 2020).

Several theories regarding the dynamics of trade in economic growth in developing countries are described below. The market penetration of developing countries is lower than that of developed countries (Fronczek, 2022). Trade policy implementation is a sensitive issue and can be complex. For example, the city of Bangkok tends to be on the defensive against the newly enacted policies (Chancharoenchai and Wuthiya, 2022). Economic integration is an absolute necessity for sustainable economic growth and helps economies to focus on issues that drive trade by reducing the incompetence and incompetence of nations (Kansra et al., 2021). The key to economic growth is to utilise abundant human and natural resources to achieve higher economic growth and exports (Hanif, 2021). The volume of trade between ASEAN countries and South Korea has a positive impact on South Korea's outward FDI, supporting the complementary relationship between trade volume and FDI (Lim et al., 2021).

The objectives of this paper are:

i to find out the impact of Covid-19 on position of Indonesian food crops international trade among exporter countries

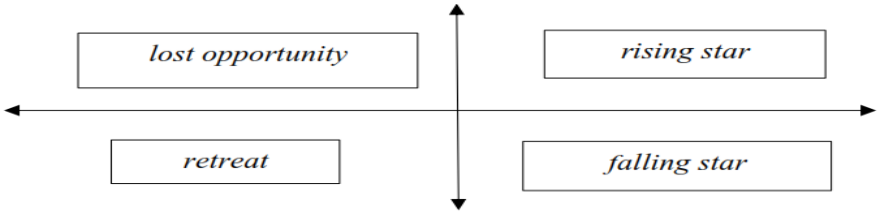
ii to give suggestion on policies need to be taken to enhance the export competitiveness of food crops product during pandemic Covid-19.

2 Methodology

Exporter countries of Indonesian food crops products that had been selected in this study were Vietnam, Thailand, Singapore, Philippines, and Malaysia. The reason for selecting those countries was because their market potential were considered big compare to other ASEAN countries. The food crops that were analysed are rice, wheat, and maize. Those agricultural products were grouped in Harmonised System (HS) goods in two digits; rice (HS1006), Maize (HS1005), and wheat (HS1001).

The data used in this study were sourced from the Center for Agricultural Data and Information Systems, as well as from UN Comtrade. To see the export position of Indonesian food crops in exporting countries, we use Export Product Dynamics (EPD). According to Esterhuizen (2006), the position matrix is categorised into four categories, namely rising star, falling star, lost opportunity and retreat. EPD can be calculated by calculating the market share of total exports (X) and the commodity export market share (Y). Export Product Dynamics (EPD) analysis is one of the competitiveness indicators to show the export performance of agricultural products by measuring the market position of a country for certain market destinations. This method can measure the dynamics of a product in the market. The EPD method consists of a matrix that places the analysed product into four categories (Figure 1).

Figure 1 Matrix on export product dynamics analysis



The EPD matrix consists of market attractiveness and business strength information. Market attractiveness is calculated from the growth of demand for a product for a particular market destination, where business strength information is measured based on the growth of a country's market share in a particular market destination. The combination of market attractiveness and business strength results in the character position of the product being analysed into four categories as mentioned above, namely rising star, falling star, lost opportunity, and retreat. The ideal market position is in the rising stars position, while the unwanted positions are the lost opportunity, falling stars and retreat positions. With the competitiveness matrix using the EPD, it can be seen the competitive position of each commodity.

X-axis: The growth of business strength or so-called export market share

$$\frac{\sum_{t=1}^{t}\left(\frac{X_{ij}}{W_{ij}}\right)t\times 100\% - \sum_{t=1}^{t}\left(\frac{X_{ij}}{W_{ij}}\right)t-1\times 100\%}{T} \tag{1}$$

Y-axis: The growth of market attractiveness or so-called product market share

$$\frac{\sum_{t=1}^{t}\left(\frac{X_{t}}{W_{t}}\right)t\times 100\% - \sum_{t=1}^{t}\left(\frac{X_{t}}{W_{t}}\right)t-1\times 100\%}{T} \tag{2}$$

with the description (*Source*: Esterhuizen, 2006):

X_{ij}: Export value of commodity *i* from Indonesia to export destination countries

X_t: Total export value of Indonesia to export destination countries

W_{ij}: The export value of commodity *i* from the world to the export destination country

W_t: Total world export value to export destination countries

t: Year t

t–1: Previous year t–1

T: Number of years of analysis.

According to Bappenas (2009), EPD is one of the indicators of competitiveness (competitive) to show the export performance of a commodity by measuring the market position of a country's commodity in certain export market destinations (Bappenas, 2009). If a country's exports of a type of goods that have a higher percentage of the country's manufactured exports than the share of exports of the same goods on the total number of world exports, then that country has a comparative advantage over the production and exports of goods (Tambunan, 2004).

The essence of competitiveness is efficiency and productivity which refers to the suppression of production costs (Daryanto, 2009). In addition, competitiveness is also influenced by economic distance (Inayah et al., 2016) and tariff setting in the destination country (Kis-Katos and Sparrow, 2015). In Porter's Diamond Theory (Porter, 1990) there are four determinants that can determine the superiority of national competitiveness, namely:

i factor conditions

ii demand conditions

iii related and supporting industries

iv firm strategy, structure and rivalry.

Meanwhile Basri and Munandar (2010) suggest that the EPD method can be used to see the export performance of certain commodities of a country in world trade. The measured variable is the export performance of a product to the total exports of a region which is then compared with the share of product value in world trade (Tarman et al., 2011). Export performance positions can be grouped into 4 matrices (Table 1), namely: rising stars, falling stars, lost opportunities, and retreats (Esterhuizen, 2006). EPD can be calculated by calculating the market share of total exports (X) and the commodity export market share (Y). Rising star describes the highest market position or can be said to be the most ideal market. Lost opportunity is a condition where the market competitiveness decreases so that the products produced in a country lose the opportunity to reach exports in the international market. Falling star is a condition that is not expected by a country (the same as the lost opportunity condition), but the falling star condition is not as bad as the lost opportunity condition because in this condition there is still an increase in market share even though it does not occur for dynamic goods. Retreat is a condition where the existence of a product is no longer desired by the market.

Table 1 Matrix of competitive position using the EPD method

Share of country's export in world trade	*Share of product in world trade*	
	Rising (Dynamic)	*Falling (Stagnant)*
Rising (*competitive*)	Rising star	Falling star
Falling (*non-competitive*)	Lost opportunity	Retreat

Source: Esterhuizen (2006)

3 Results and discussion

3.1 Export framework for food crops

Rice, wheat, and maize are categorised into staple food products that need to be available on market. If the demand of those products cannot be fulfilled from domestic supply, the government will issue import policy. Import for rice usually comes from Thailand and Vietnam. For the past three years the import value for rice had reached the highest value in 2018 of USD 386.533.704 from Thailand and USD 360.745.642 from Vietnam (Table 2). For maize had experienced the highest import value in 2017 of USD 11.866.199. The maize was imported from Thailand. Rice exporter countries from Indonesia are Malaysia and Singapore and the maize exporter countries from Indonesia are Malaysia, Thailand, and Vietnam.

Table 2 The export-import value for Indonesian food crops to ASEAN countries 2017–2020

Country/Commodity			*Export (000 USD)*				*Import (000 USD)*			
Country	*Commodity*	*Code*	*2017*	*2018*	*2019*	*2020*	*2017*	*2018*	*2019*	*2020*
Malaysia	Rice	1006	14.78	63.36	28.97	60.36	–	–	0.12	0.005
	Maize	1005	79.27	99.60	91.67	94.78	0.004	1.19	0.90	39.29
	Wheat	1001	–	–	–	–	–	–	0.92	0.001
Thailand	Rice	1006	–	–	–	–	60,286.94	386,533.70	38,561.47	76301.64
	Maize	1005	80.19	162	6.24	56.00	11,866.20	392.19	489.89	93.21
	Wheat	1001	–	–	–	–	–	–	0.16	0.012
Vietnam	Rice	1006	–	–	–	–	6761.29	360,745.64	16,609.47	51,107.46
	Maize	1005	162.61	–	4.40	–	–	–	18.91	0.13
	Wheat	1001	–	–	–	–	–	–	–	0.04
Singapore	Rice	1006	185.47	149.27	146.31	124.62	–	0.320	–	0.77
	Maize	1005	–	–	–	367.51	–	–	–	1.35
	Wheat	1001	0.015	–	–	0.011	290.40	3250.51	–	0.12
Philippine		1006	–	0.022	–	60.00	503.45	2.44	1.64	0.77
		1005	–	72,165.39	0.008	14,936.95	15.42	13.98	2.04	0.43
		1001	–	–	–	–	0.11	0.130	–	–

Source: UN Comtrade (http://comtrade.un.org) (2021)

Table 3 The export-import value for Indonesian food crops during the pandemic Covid-19 2020, January-December 2020 (in thousand USD)

Month	*Rice* (Thousand US$)		*Maize* (Thousand US$)		*Wheat* (Thousand US$)	
	Export	*Import*	*Export*	*Import*	*Export*	*Import*
January	0.23	5372.95	47.99	654.10	0.01	204,267.15
February	41.15	0.32	94.77	21,934.36	–	312,357.03
March	23.93	16,902.26	97.80	9369.66	–	310,665.47
April	155.30	17,102.56	62.14	18,620.91	0.001	266,122.40
May	68.16	22,144.92	3180.12	17,878.95	–	167,808.97
June	24.93	22,734.69	4744.38	15,666.63	–	191,117.40
July	110.40	23,873.54	1892.59	12,756.45	–	116,265.80
August	143.93	17,898.55	2979.85	4,606.90	–	179,008.10
September	110.91	10,896.37	3112.45	22,446.19	–	238,352.27
October	92.47	12,199.59	92.46	13,193.25	–	212,141.75
November	70.77	19,428.73	56.28	17,614.30	–	233,403.45
December	170.24	26,854.52	155.51	17,907.62	–	184,526.82

Source: UN Comtrade (processed) 2021

During the Covid-19 pandemic, the value of exports and imports of Indonesian food crops fluctuated. At the beginning of January 2020 the value of rice exports in Indonesia was US$ 0.23 thousand, then increased to US$ 155.30 thousand in April and to US$ 170.24 thousand in December (Table 3). The increase in the value of rice exports was followed by an increase in the value of rice imports, from 5372.95 thousand US$ in January to 17,102.56 thousand US$ in April, and to 26,854.52 thousand US$ in December. For wheat commodities, the value of imports is much more dominant, and the value of exports of wheat seeds is non-existent. This is natural because Indonesia is not a center for producing wheat. The same thing was experienced by corn commodities, where the import value in January was 654.10 thousand US$, then fluctuated the most and occurred in September at 22,446.19 thousand US$, and slightly decreased to 17,907.62 thousand US$ in December. On the other hand, the export value of corn was 47.99 thousand US$ in January, the largest export value occurred in June, which was 4744.38 thousand US$, and decreased to 155.51 thousand US$ in December.

3.2 The analysis results of export product dynamic (EPD)

Based on UN Comtrade (2021) data for 2015–2020, Indonesia has never exported wheat to ASEAN countries. Food crop commodities that are exported are rice and corn. The results of the EPD analysis (Table 4) show the market share position of Indonesia's rice and corn products in the following countries:

i the Philippines is a retreat or is no longer desirable in the country although there is still an opportunity to increase market share

ii Thailand is good at rice commodities and maize the market share position is rising star or in very good condition both in terms of market share and from the opportunity to increase exports

iii Malaysia is also good at rice and corn commodities, its market share position is rising star or in very good condition both in terms of market share as well as opportunities to increase exports

iv Vietnam, for rice commodity the market share position is falling star and corn the market share position is retreat

v Singapore, both for rice and corn commodities, market share position is rising star or in very poor condition. Good both in terms of market share and in terms of opportunities to increase exports.

The previous study by Aliyu and Bawa (2015) in Nigeria, state that market size and price index of destination countries positively drive trade flows in Nigeria, while relative factor endowment, economic similarities and geographical distance negatively affect Nigeria's trade flows. The study by Sukmaya and Saptana (2021) and Purba et al. (2021) reveals that Indonesian agricultural exports to China and the US are influenced primarily by the increase in global demand and the composition of competitiveness. Comparing with food crops, Indonesia estate crops have a more competitiveness on global market (Purba et al., 2021; Wirakusuma, 2021; Tarsilohadi, 2021).

Table 4 The analysis result of EPD for Indonesian rice and maize 2015–2020

Country	*Commodity*	*HS*	*Export market share growth* (%)	*Product market share growth* (%)	*Market share position* (*EPD*)
Philippines	Rice	1006	–2.2944	–1.9426	Retreat
	Maize	1005	–1.0145	–1.9426	Retreat
Thailand	Rice	1006	0.3995	1.1151	Rising Star
	Maize	1005	0.0780	1.1151	Rising Star
Malaysia	Rice	1006	0.6183	0.2040	Rising Star
	Maize	1005	0.0738	0.2040	Rising Star
Vietnam	Rice	1006	0.0001	–2.4237	Falling Star
	Maize	1005	–0.0780	–2.4237	Retreat
Singapura	Rice	1006	12.2776	10.6272	Rising Star
	Maize	1005	0.2801	10.6272	Rising Star

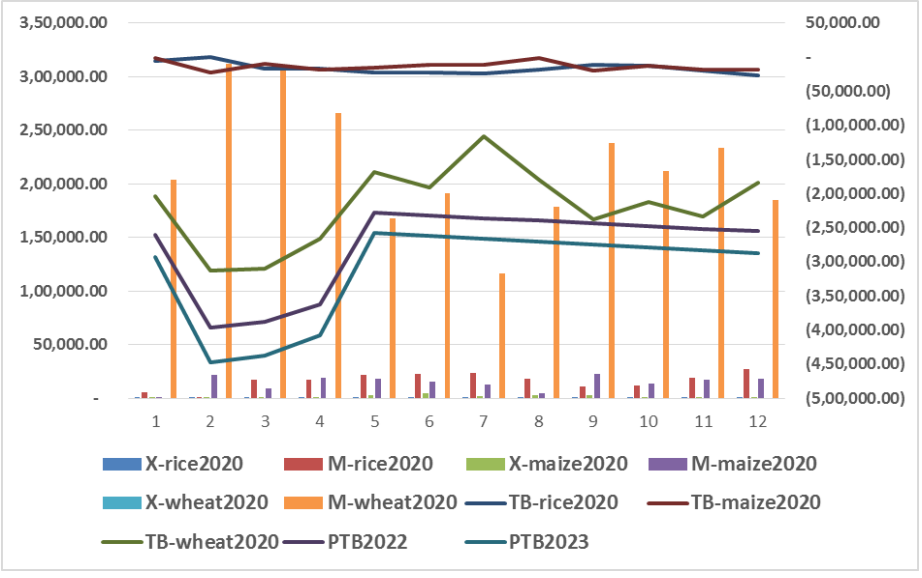
Source: UN-Comtrade (processed) 2021

3.3 The impact of Covid-19 on the import export value of Indonesian food commodities

During the Covid-19 pandemic, the export value of Indonesia's food crops (rice and corn) continued to increase (Table 3 and Figure 2). In 2020, the increase in the value of inter-month exports for rice is around 11.22% per month and for corn is around 3.21% per month. A significant increase in export value occurred in the range of April to September 2020. The average export value in 2020 was 84.37 thousand USD for rice and 1376.36 thousand USD for corn. The highest value of rice exports occurred in December, and the lowest occurred in January. As for corn, the highest export value occurred in June and the lowest in January. In terms of the export-import balance, the two commodities (rice and corn) also experienced an increase of around 7.19% and 3.80% per month. Meanwhile, in terms of the projected value of the trade balance of food crop commodities, both in 2022 and 2023, in aggregate, it has decreased.

Wheat is not native to Indonesia, therefore domestic needs are mostly imported from abroad. The average import value of wheat in 2020 is around 218 million USD (Table 5). The lowest month in the value of wheat imports occurred in May and the highest occurred in February. Wheat is irreplaceable as a raw material for wheat flour, because it contains gluten which gives the dough swellability. However, the irony that has occurred so far is that the raw materials for making wheat flour are still imported from wheat-producing countries, including: Australia, the United States of America., Canada, Argentina, Ukraine, Russia and France. In fact, 60% of Indonesia's wheat needs are supplied from neighbouring countries, namely Australia. According to historical records, Indonesia first officially imported wheat in 1969.

Figure 2 Development of export value, import, trade balance of rice, corn and wheat during the Covid-19 Pandemic, and total projected value of Indonesia's Food Commodity Trade Balance 2022 and 2023 (see online version for colours)



M = import; X = export; TB = trade balance; PTB = trade balance projection.

Source: UN Comtrade (2021), processed

Table 5 Balance of value of export imports of Indonesian food crops to ASEAN countries, 2017–2020

Negara/komoditas			*Ekspor (000 US$)*				*Import (000 US$)*			
Negara	*Komoditas*	*Code*	*2017*	*2018*	*2019*	*2020*	*2017*	*2018*	*2019*	*2020*
Malaysia	Beras	1006	14.78	63.36	28.97	60.36	–	–	0.12	0.005
	Jagung	1005	79.27	99.60	91.67	94.78	0.004	1.19	0.90	39.29
	Gandum	1001	–	–	–	–	–	–	0.92	0.001
Thailand	Beras	1006	–	–	–	–	60,286.94	386,533.70	38,561.47	76301.64
	Jagung	1005	80.19	162	6.24	56.00	11,866.20	392.19	489.89	93.21
	Gandum	1001	–	–	–	–	–	–	0.16	0.012
Vietnam	Beras	1006	–	–	–	–	6761.29	360,745.64	16,609.47	51,107.46
	Jagung	1005	162.61	–	4.40	–	–	–	18.91	0.13
	Gandum	1001	–	–	–	–	–	–	–	0.04
Singapura	Beras	1006	185.47	149.27	146.31	124.62	–	0.320	–	0.77
	Jagung	1005	–	–	–	367.51	–	–	–	1.35
	Gandum	1001	0.015	–	–	0.011	290.40	3250.51	–	0.12
Philipina	Beras	1006	–	0.022	–	60.00	503.45	2.44	1.64	0.77
	Jagung	1005	–	72,165.39	0.008	14,936.95	15.42	13.98	2.04	0.43
	Gandum	1001	–	–	–	–	0.11	0.130	–	–

Source: UN Comtrade (http://comtrade.un.org) (2021)

3.4 The impact of Covid-19 on the projection of trade balance of Indonesian food crops

Indonesia's food crop trade balance from 2017 to 2020 is on average in a negative position (Table 6). This indicates that the need for domestic food crops in that period could not be fulfilled from domestic food crop production. To cover this shortfall, a food import policy was made. The trade balance for food crops on average has a deficit of 3233.09 million USD every year. During the Covid-19 pandemic, the projected trade balance for food crops will increase in deficit compared to before Covid, which is a deficit of 3341.19 million USD (in 2022). During the Covid-19 pandemic, the highest trade balance for food crops occurred in the early and mid-year (Figure 2).

Table 6 Food crops trade balance (Million USD) 2017–2020

Months	*2017*	*2018*	*2019*	*2020*	*Average*	*2022**	*2023**
January	–150.28	–238.23	–279.88	–231.11	–224.87	–260.307	–293.199
February	–245.80	–280.65	–292.98	–352.24	–292.92	–396.751	–446.882
March	–195.71	–196.80	–397.50	–344.73	–283.69	–388.292	–437.355
April	–225.52	–278.63	–295.15	–321.35	–280.16	–361.951	–407.685
May	–299.72	–389.51	–319.49	–202.90	–302.91	–228.54	–257.417
June	–225.37	–266.06	–228.04	–206.15	–231.40	–232.197	–261.536
July	–253.65	–442.72	–215.19	–209.45	–280.25	–235.912	–265.721
August	–234.62	–359.52	–194.16	–212.80	–250.28	–239.686	–269.972
September	–264.06	–367.75	–318.29	–216.20	–291.57	–243.521	–274.292
October	–325.02	–376.98	–321.64	–219.66	–310.82	–247.417	–278.68
November	–246.86	–273.14	–240.69	–223.18	–245.97	–251.377	–283.139
December	–225.34	–297.65	–203.30	–226.75	–238.26	–255.399	–287.67
Total	–2891.94	–3767.64	–3306.29	–2966.52	–3233.09	–3341.35	–3763.55

*Data Projection 2022 and 2023.

Source: Agriculture Data Center and Information System – Ministry of Agriculture, processed

4 Conclusion and recommendations

The trade balance for food crops on average has a deficit of 3233.09 million USD every year. During the Covid-19 pandemic, the projected trade balance for food crops will increase in deficit compared to before Covid, which is a deficit of 3341.19 million USD (in 2022). The same thing is also experienced in the projection of rice, corn and wheat commodities during the Covid-19 pandemic, the increase in the import value of the three food commodities exceeds the increase in the export value.

The market share position of rice and corn commodities has the potential for optimistic market development in Malaysia, Thailand and Singapore. Therefore, the government and rice and corn exporters in Indonesia should prioritise market development in countries that have optimistic market development potential and potential development for these two products. Optimistic market is not only limited to ASEAN

countries but can also be marketed to several countries that have low levels of rice and corn production.

In order to reduce deficit of food crops trade balance some of the policies are needed that has to have impact on the food crops production increase. The supervision and valuation on food policies that are being implemented. The policy to enhance food crops export competitiveness during the pandemic Covid-19 such as:

i providing stimulus, cultivation incentive for farmers and food crops agribusiness actors

ii optimising the function of farmer institution through the formation of working group to overcome the issues of Covid-19 impact

iii executing market operations and providing fiscal stimulus for agricultural sector in order to maintain Indonesian agricultural quality and supervising trade distribution lines

iv reducing the trade barriers particularly on food and agricultural sector such as applying tariffs, quota system, and import licensing during the uncertainty trade during the pandemic Covid-19.

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