



The Dynamics of Indonesia's Pepper Exports in International Market: A Case Study on the Impact of the COVID-19 Pandemic

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Abstract. Indonesia ranks fourth in the global list of pepper exporters. This commodity contributes the largest foreign exchange from spices, and thus, the sustainability of Indonesia's pepper exports is crucial. However, the presence of the COVID-19 pandemic poses several constraints, such as the decline in the global economy, the decrease in purchasing power of the global community and the export barriers due to lockdowns. This paper aims to describe the dynamic in Indonesian pepper exports before and during the COVID-19 pandemic. This study employed the quadratic trend method and the average growth in the average volume and value of Indonesia's pepper export. The results showed that the trend of Indonesian pepper export volume increased, while the trend of pepper export value tends to decrease. In more details, the trend of pepper export volume before and during the COVID-19 pandemic had an increasing trend with an average growth of 6% and 14%, respectively. So in the short term the COVID-19 pandemic gave positive impact for the volume of Indonesia's pepper exports. While in the new normal era, the trend was declining with an average growth of 10%. The value of pepper export showed a declining trend in all period with an average growth 5,04% before the COVID-19 pandemic, 4,4% during the COVID-19 pandemic, and 8% in the new normal era. This result showed that the COVID-19 pandemic reduce Indonesia's income from pepper export.

Keywords: Sustainability · Pepper · Export · COVID-19 · International market

1 Introduction

Pepper is one of the spices with great potential for export commodities. This commodity is commonly used in the food, beverage, cosmetic, and pharmaceutical industries. It is even known as “The King of Spices” since it is widely used throughout the world [1]. Countries with tropical climates are very suitable for pepper cultivation, one of them is Indonesia [2]. It is evident that 12.5% of the global pepper supply comes from Indonesia, making Indonesia the world's fourth-largest pepper exporter after Vietnam, India, and Brazil [3]. The export value of this commodity reached USD 141.84 million in 2019, the highest one among other types of spices [4]. From 2010–2019, global pepper imports

grew by 54% or an increase of 0.43 million tons [5]. This fact shows that pepper exports have great potential as a source of foreign exchange for Indonesia in the future. However, the sustainability of Indonesia's pepper exports is faced with a threat due to the COVID-19 pandemic. The pandemic resulted in global economic contraction of 2.04% [6]. The purchasing power of the global community also declined by 2.95% [7].

China, the United States, and European countries as the main global pepper importers experienced a severe wave of COVID-19 to apply the COVID-19 pandemic lockdown [8]. This then reduced world demand for pepper imports up to 0.32% or 4,270 tons in 2020 [9]. In Indonesia, the social restrictions during the COVID-19 pandemic caused a delays in export shipments [10]. The obstacles during the COVID-19 pandemic were also experienced by other exporting countries, such as Vietnam and India in the form of restrictions and supplies chain disruption, which lead to delays in exporting pepper [11].

The risk of the spread of COVID-19 in the future may continue since the virus can easily mutate [12]. Therefore, a trend analysis is needed to describe the dynamic in Indonesia's pepper exports before and during COVID-19 pandemic. The results can be a source of information for the government to formulate policies on pepper exports.

2 Methods

This paper employed secondary data obtained from the UN COMTRADE in the form of data on the volume and value of Indonesia's pepper exports for 91 months from January 2015 to July 2022. The data were limited to pepper exports with the HS (Harmonized System) code 0904. The destinations included various countries in the international market. Thus, there was no special destination country.

2.1 Volume and Value Trend of Inonesia's Pepper Exports

The analysis used quadratic trend method by using minitab16 application. This method is suitable for non-linear data or data that forms a parabolic curve when they are displayed on a scatter plot diagram [13, 14]. The quadratic trend will relate the dependent variable to t and t^2 . The equation model is formulated as follows [15]:

$$Y_t = a + bt + ct^2 \quad (1)$$

Description:

Y_t : Value of data in month t (volume and value of Indonesia's pepper export)

A : Constant (trend value in the base period)

b, c : Coefficient of variable t

t : Month of observation

2.2 Average Growth in Volume and Value of Indonesia's Pepper Exports

To find out the impact of the COVID-19 pandemic in more details, an analysis was performed on the average growth in the value and volume of Indonesia's pepper export

from January 2015 to July 2022. The data were divided into three periods: 1) before the COVID-19 pandemic (January 2015–February 2020), 2) during the COVID-19 pandemic (March 2020–May 2020), and 3) the new normal era (June 2020–July 2022). The new normal era is a condition of easing social activities during the COVID-19 pandemic while still implementing health protocols. Thus, it is hoped that during this period Indonesia's pepper exports will be better than the period of the COVID-19 pandemic [16]. The average growth is formulated as follows [17]:

2.2.1 The Period Before the COVID-19 Pandemic

$$Re1 = \frac{\sum_{t=1}^{t=61} (E_t - E_{t-1}/E_{t-1}) \cdot 100\%}{61} \quad (2)$$

Description:

Re1 : average growth of pepper exports before the COVID-19 pandemic (%)

E_t : value/volume of pepper exports in month t (USD; ton)

E_{t-1} : value/volume of pepper exports in month t-1 (USD; ton)

2.2.2 The Period During the COVID-19 Pandemic

$$Re2 = \frac{\sum_{t=1}^{t=3} (E_t - E_{t-1}/E_{t-1}) \cdot 100\%}{3} \quad (3)$$

Description:

Re2 : average growth of pepper exports during the COVID-19 pandemic (%)

2.2.3 The Period of New Normal

$$Re3 = \frac{\sum_{t=1}^{t=25} (E_t - E_{t-1}/E_{t-1}) \cdot 100\%}{25} \quad (4)$$

Description:

Re3 : average growth of pepper exports in the new normal era (%)

3 Result and Discussion

3.1 Trend and Average Growth in the Volume of Indonesia's Pepper Exports

3.1.1 Volume Trend of Indonesia's Pepper Exports

Figure 1 shows that the volume of Indonesia's pepper exports fluctuated. The largest export volume occurred in August 2015 by 12.920 tons in response to rising prices and

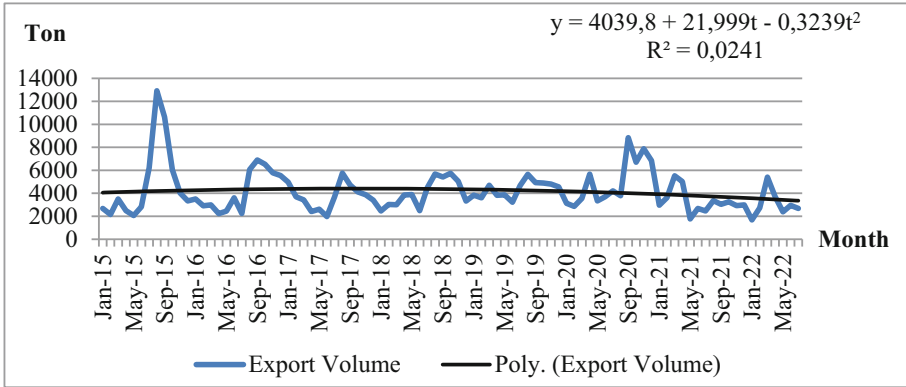


Fig. 1. Trend of Indonesia’s Pepper Exports Volume. Source: Analysis of secondary data (UN COMTRADE, 2022)

world demand for pepper [18, 19]. Meanwhile, the lowest volume of pepper exports occurred in January 2022 with a total of 1.684 tons due to delays in delivery and the pepper drying process which was disrupted due to high rainfall [20]. On average, the volume of Indonesia’s pepper exports is 4.143 tons.

The trend analysis confirms that overall in 91 months the volume trend of Indonesia’s pepper exports shows a positive result. Based on the trend line that is curved up, the result of the trend equation is $y = 4039,8 + 21,999t - 0,3239t^2$ with a value of $R^2 = 0,0241$. The coefficient value of the variable t is 21,999, meaning that in the short-term period, the volume of pepper exports increases by around 22 tons every month. The coefficient value of the t^2 variable is -0,3239, indicating that in the long-term period, the volume of Indonesia’s pepper exports will decrease by -0.3239 tons.

In more details, by entering the t variable into the trend equation showed that, the trend of Indonesian pepper export volume before the COVID-19 pandemic (January 2015–February 2022) and during the COVID-19 pandemic (March 2020–May 2020) was positive or increasing. Meanwhile, at the new normal era (March 2020–May 2020) shows a decrease or negative trend. This result is in line with the research by Hobbs (2020) that the COVID-19 pandemic caused panic buying by consumer thus the demand of the consumer goods and agriculture product increase [21].

As one of the most widely use spices, pepper became more important spices during the pandemic especially for cooking. According to the research in Italy and European Countries, lockdown makes people tend to cook more thus the demand for pepper increase [22, 23]. In addition, pepper can also be used as a traditional medicine, especially during the Covid-19 pandemic. Pepper is a natural source of antioxidants. This commodity contains anti-complementary polysaccharides which can increase the effectiveness of white blood cells or the body’s immune system to fight infections and diseases [24].

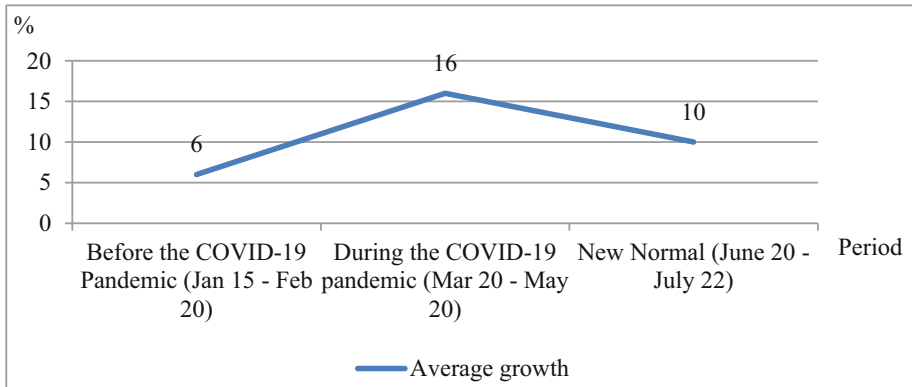


Fig. 2. Average growth in the volume of Indonesia's pepper exports. Source: Analysis of secondary data (UN COMTRADE, 2022)

3.1.2 Average Growth in the Volume of Indonesia's Pepper Exports

Before the COVID-19 pandemic, the volume of Indonesia's pepper export grew by 6%. However, during the COVID-19 pandemic, the growth of the export volume rose sharply to 16% (Fig. 2). The condition is underlined by two factors. (1) The lockdown in Vietnam as the world's main pepper exporter has impeded the supply of world's pepper exports, and thus, the demand for Indonesia's pepper exports increased. (2) The uncertainty of world pepper absorption and prices, prompted the fulfillment of Indonesia's pepper stocks to avoid the risk of restrictions during the COVID-19 pandemic [25]. So the period of the COVID-19 pandemic gave positive impact for the volume of Indonesia's pepper exports.

In the new normal period, the growth in the volume of Indonesia's pepper exports fell to 10%. The decline was caused by (1) the black pepper harvest which fell by 13% YoY in 2021. (2) Main harvest was also impeded due to high rainfall in July–October 2021, making it difficult for the pepper drying process. (3) Delays in pepper shipments due to restrictions mainly in 2021 during the great wave of COVID-19 pandemic reduced the volume of Indonesia's pepper export. (4) Vietnam's pepper export returned to normal so that demand for Indonesian pepper export start to decline [25].

3.2 Trend and Average Growth in the Value of Indonesia's Pepper Exports

3.2.1 Value Trend of Indonesia's Pepper Exports

Figure 3 presents the fluctuating value of Indonesia's pepper exports. The value reached its highest in August 2015 at USD 12.9 million due to the increase in world pepper prices which reached a peak in the last three years of USD 11.33/kg for black pepper and USD 6.50/kg for white pepper [26]. Meanwhile, the lowest one occurred in June 2018 at USD 821 thousand due to an oversupply of pepper. This condition was caused by several things such as (1) world pepper prices began to fall 2%.5% since 2016, (2) Vietnam, Brazil, and Indonesia have expanded their pepper crops following the increase in global pepper prices over the last 10 years. In addition, new pepper-producing countries have

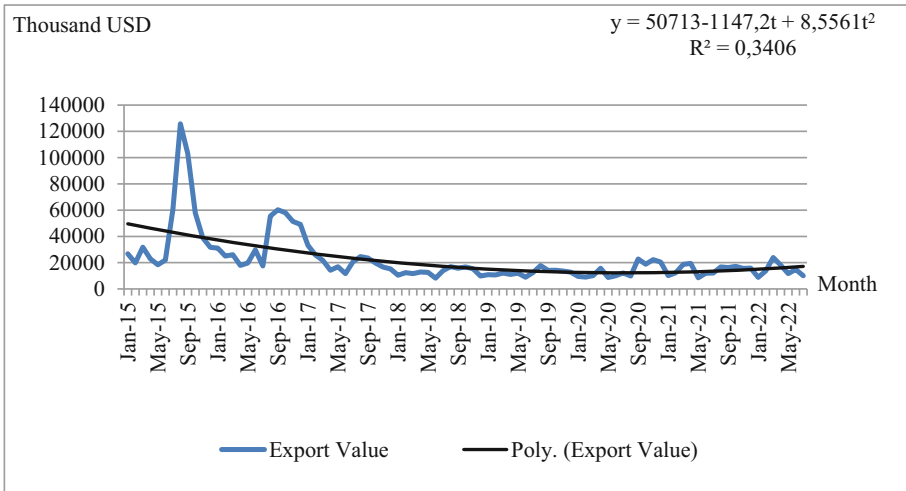


Fig. 3. Trend of Indonesia’s Pepper Exports Value. Source: Analysis of secondary data (UN COMTRADE, 2022)

emerged, such as Malaysia, Sri Lanka, and China [27]. (3) A 2% increase in world pepper consumption has not balanced with an average increase in world pepper production of 7% [28]. On average, the value of Indonesia’s pepper exports stands at USD 2.1 million.

The resulting trend equation is $y = 50713 - 1147,2t + 8,5561t^2$ with a value of $R^2 = 0.3406$ (Fig. 3). The coefficient value of the variable t is $-1147,2$ meaning that in the short-term period, the value of pepper exports falls by USD $-1147,2$ thousand every month. Meanwhile, the coefficient value of the t^2 variable is $8,5561$ meaning that in the long-term period, the value of Indonesia’s pepper exports increases by USD $8,5561$ thousand. The formed trend line is convex upwards or shows an increase in the long-term period. In more detail by entering the t variable into the trend equation, showed that before the COVID-19 pandemic (January 2015-February 2022), during the COVID-19 pandemic (March 2020-May 2020), and in the new normal period (March 2020-May 2020) experienced a downward or negative trend. This situation needs serious attention from the government to increase the trend of pepper export value. Most of Indonesia’s pepper exports are in ground pepper so the price was cheap. It’s necessary to provide added value to increase the price.

3.2.2 Average Growth in the Value of Indonesia’s Pepper Exports

The growth in the value of Indonesia’s pepper exports reached 5% before the COVID-19 pandemic and decreased to 4.4% during the COVID-19 pandemic. The decline was caused by several factors. (1) The condition of oversupply due to reduced demand from China and India that had pushed down the global pepper price, (2) the application of a 5%–7% price discount for pepper, and (3) the depreciation of the IDR against the USD [25]. These results are in line with previous study, that the COVID-19 pandemic has significantly reduced export performances, especially for plantation commodities at the beginning of the pandemic period [17]. During the new normal period, an increase was

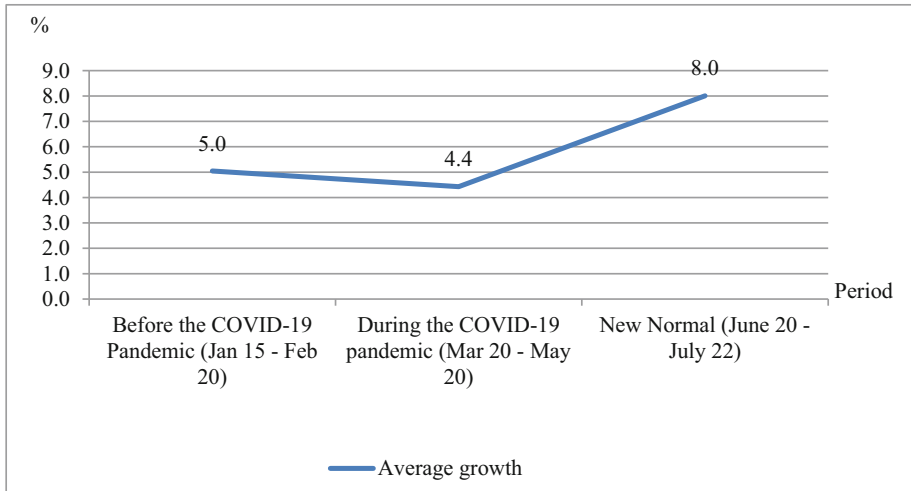


Fig. 4. Average growth in the value of Indonesia's pepper exports. Source: Analysis of secondary data (UN COMTRADE, 2022)

found in the average growth of the pepper export value to 8%. It's caused by the rising prices due to speculative demand as the result of fears of supply delays or the fall of global pepper supply [29]. This condition has pushed the price of pepper. As a result, the value of exports rose again.

4 Conclusion

The results confirm that the trend of Indonesian pepper export volume increased, while the export value of pepper showed a declining. In more details, the trend of pepper export volume before and during the COVID-19 pandemic had an increasing trend with an average growth of 6% and 16%, respectively. While in the new normal era, the trend was declining with an average growth of 10%. So in the short term the COVID-19 pandemic gave positive impact for the volume of Indonesia's pepper exports. The trend of Indonesian pepper export value showed a declining in all period with an average growth 5,04% before the COVID-19 pandemic, 4,4% during the COVID-19 pandemic, and 8% in the new normal era. This result showed that the COVID-19 pandemic reduce Indonesia's income from pepper export.

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