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Palm Oil Downstream Strategy: Enhancing Indonesia's Bargaining Position in International Palm Oil Trade

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Abstract

Although Indonesia currently dominates 60% of global palm oil production, Malaysia holds a competitive advantage in certain downstream industries. Indonesia must focus on developing its palm oil industries to process crude palm oil (CPO) into higher-value products, serving both as exports and substitutes for imported goods. This research aimed to highlight the importance of Indonesia's development of downstream palm oil industries. This research employed quantitative methods such as Pearson correlation and Granger causality, as well as qualitative methods.

The result showed that the fluctuation of CPO prices in the international market is closely tied to the volume of CPO exports conducted by Indonesia. Achieving higher domestic CPO production by improving the productivity of independent palm oil farmers is crucial. By enhancing their productivity from 2-3 tons per hectare to 5-6 tons per hectare, CPO supply can increase by 8 million tons annually, equivalent to approximately 16% of the total production. Reducing export should be accompanied by increased domestic CPO utilization through downstream programs.

By capturing half of Malaysia's current market share of HS code 1516 (animal or vegetable fats and oil, hydrogenated, inter-esterified, re-esterified, or elaidinized, whether or not refined but not further prepared), Indonesia has the potential to earn approximately 1 billion USD per year in foreign exchange. The development of biodiesel, transitioning from B30 to B40, holds the potential to save approximately IDR 200 trillion in foreign exchange. This strategic focus on downstream industries would strengthen Indonesia's position in the international palm oil market.

Keywords: *Palm Oil, Value Added, Downstream Industries, Export, Economic Growth.*

INTRODUCTION

Indonesia holds the top position as the world's leading palm oil producer, boasting the largest plantation area. The majority of palm oil plantations in the country are operated by large private companies, covering 54.04% of total large plantations, which corresponds to 7,942,335 hectares and 4.27% or 617,501 hectares of the national plantations. Furthermore, Smallholder farmers (PRI) also play a significant role, contributing

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approximately 5,896,755 hectares or 40.79% of the total palm oil plantation area. Since 1980, palm oil production has continued to increase, with an average annual growth rate of 11.13% (Gartina & Sukriya, 2022).

The flagship palm oil product of Indonesia is Crude Palm Oil (CPO), which falls under the HS Code 15111000. Its official description is "CPO and its fractions, either refined or not, but not chemically modified." Export value of CPO throughout the year 2022 is shown in Figure 1.

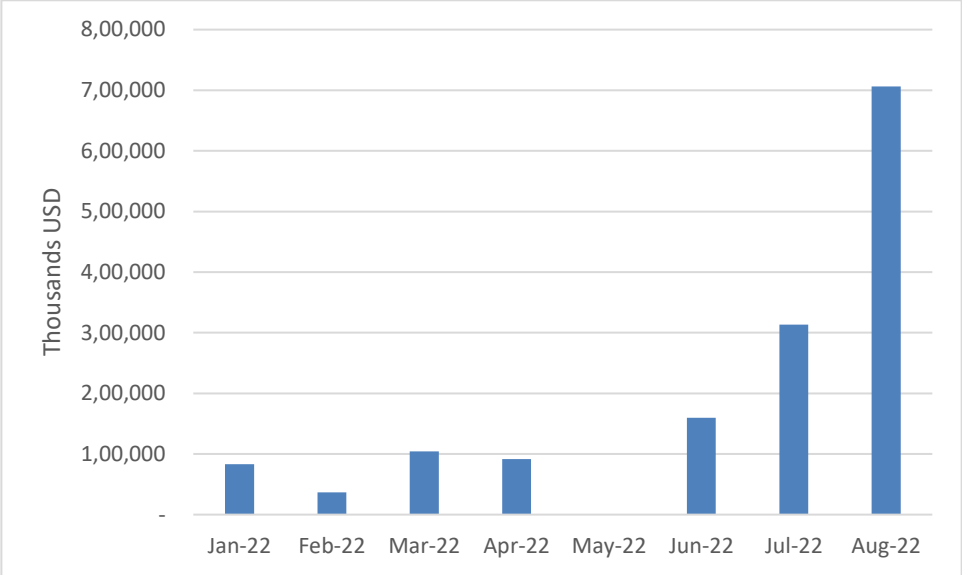

Figure 1 Indonesian CPO Export Throughout 2022

Source: trademap.org

From April 28 to May 22, 2022, the Indonesian government imposed a temporary export ban on CPO May 2022. After ban was lifted, export increased sharply in the following months. This indicates that Indonesia has an abundant palm oil production capacity and can easily meet global demand. The ability of Indonesia to regulate the volume of global CPO export highlights its influential role in palm oil market. Controlling export volume can effectively influence the global CPO price. The greater export volume of palm oil products, the stronger its ability to shape international market prices.

The development of downstream palm oil industries in Indonesia plays a crucial role in regulating the volume of CPO exports in the international market. Balancing the reduction of exports with the promotion of domestic consumption is of utmost importance, achieved through the utilization of CPO to produce value-added downstream products. The growth and expansion of these downstream industries serve as key drivers for the long-term development of Indonesia's palm oil sector. By focusing on downstream palm oil industries, Indonesia aims to transform its position from the "world's CPO king" to the "downstream king" by 2045. This transformation is envisioned through three main pathways, namely the oleofood complex, the oleochemical complex, and the biofuel complex. These pathways involve processing CPO into higher value-added products that serve export purposes and act as substitutes for imported goods such as diesel, vehicles, premium products, plastics, lubricants, etc. Economic benefits of developing downstream industries, particularly in palm oil sector, extend beyond the foreign exchange generated from export. Import substitution is also a significant aspect, leading to potential cost savings. The gateway to downstream palm oil is the refinery industries, which processes CPO and CPKO (crude palm kernel oil) into intermediate products such as olein, stearin, and PFAD (palm fatty acid distillate). The refinery industries are vital in producing intermediate products that can be further processed to obtain higher value-added palm oil products. In Indonesia, downstream palm oil industries are currently being developed

through three main pathways, namely the oleofood complex, the oleochemical complex, and the biofuel complex. 1. The oleofood complex processes intermediate products from the refinery industries to produce a wide range of intermediate and end the oleofood products. Indonesia has successfully produced various ole food downstream products, including cooking oil, margarine, vitamin A, vitamin E, shortening, ice cream, creamer, cocoa butter/specialty fats, etc. 2. The oleochemical complex involves industries that process the intermediate products from the refinery industries to produce oleochemical basic products and end products. These include biosurfactant products (detergent products, soaps, shampoos), biolubricants, and biomaterials (bioplastics). 3. The biofuel complex encompasses industries that process the intermediate products from the refinery industries to produce biofuel intermediate and end products, including biodiesel, biogas, biopremium, and bioavtur. The development of downstream palm oil industries through these three pathways is an integral part of Indonesia's industrialization strategy, which combines export promotion (EO) and import substitution (SI). From an export promotion perspective, downstream palm oil industries are implemented in two phases, including EO1 and EO2. In the EO1 phase, the aim is to transform export of CPO products into semi-finished downstream products such as refined, bleached, and deodorized (RBD) olein, RBD stearin, PFAD, fatty acids, fatty alcohols, glycerol, etc (Perindustrian, 2021).

Due to the existing market dynamics, Indonesia possesses significant potential for the development of downstream palm oil industries. Despite negative campaigns against CPO and its derivatives, the global demand for palm oil continues to rise steadily. The availability of land, labor supply, and cultivation technology strongly support this potential. However, four key challenges need to be addressed to fully realize the benefits of downstream palm oil industries. These challenges include limitations in infrastructure and financing, restricted access to local authorities, conflicts related to land use, and environmental pressures. Overcoming these hurdles requires the government to implement prioritized policies that foster competitiveness, integration, and sustainability within downstream palm oil industries (Azahari, 2019)

Palm oil plantations have witnessed rapid expansion across numerous provinces in Indonesia. The establishment of palm oil downstreaming in technopolis areas provides a conducive environment for exploring ideas, innovations, and expertise in harnessing the potential of its high-value derivative products. Downstream palm oil sector supports the government, academia, businesses, and society in implementing Good Agricultural Practices (GAP). To ensure the success and sustainability of downstream palm oil industries, adopting an integrated, competitive, and sustainable approach to governance (Rusli et al., 2022).

Indonesia views Malaysia as its primary competitor in palm oil industries. According to the Revealed Comparative Advantage (RCA) approach, Malaysia competes more than Indonesia in most downstream palm oil industries. However, both countries exhibit alignment between developing specific palm oil industrial products and their respective upstream industrial activities. As the largest palm oil producers, both countries should focus more on downstream industries that have higher value-added, leveraging their comparative advantages in the upstream industries (Arip et al., 2013)

Palm oil trade in Indonesia holds considerable sway, as evidenced by the behavior of Indonesian exporters who ramp up their palm oil export in response to rising prices. The impact of palm oil prices on strengthening the Indonesian rupiah exchange rate surpasses that of the Malaysian ringgit. On average, Indonesia exhibits a stronger correlation between palm oil prices and exchange rate movements compared to Malaysia. Regardless of the prediction model employed, the Indonesian exchange rate appreciates as palm oil prices increase. In contrast, the Malaysian exchange rate appreciates only after factoring in oil prices (Salisu & Sikiru, 2021).

This research aimed to highlight the importance of Indonesia's development of downstream palm oil industries and the potential benefits associated with producing high-value downstream products from CPO. By actively participating in downstreaming, Indonesia not only gains better control over its exports but also enhances its capacity to influence international CPO prices. Additionally, the research explored the potential for increasing the productivity of independent farmers to meet the needs of downstream palm oil industries.

RESEARCH METHOD

This research collected data from multiple sources within palm oil industries. The primary data was export and import data of palm oil and its derivative products obtained from trademap.org, a platform that provides data through Trade Statistics for International Business Development. The data was then processed and analyzed using descriptive statistical analysis.

This method was selected to provide insight into the paradoxical situation where Indonesia, despite being the world's leading exporter of CPO, still imports its derivatives from Malaysia. Subsequently, a simulation was conducted to estimate the foreign exchange earnings that Indonesia could generate by producing a specific derivative product from CPO and capturing 50% of Malaysia's market share for that particular product.

By conducting additional calculations, it is possible to assess the potential increase in CPO production assuming the productivity of independent smallholder farmers can be enhanced to match that of partner smallholder farmers. Indonesia would have an additional CPO supply to obtain downstream products and potentially increase CPO export volumes when necessary.

Paired correlation analysis was employed to determine the strength of the relationship between export volume and export prices. This calculation utilized statistical software such as STATA, which provides Pearson correlation coefficients between 0 and 1. The relationship between the variables becomes stronger as the coefficient approaches 1. Additionally, STATA provides the significance level (α) of the coefficient, which indicates the level of confidence or statistical significance of the correlation coefficient is 1-α.

When the correlation coefficient approaches 1, it statistically indicates that the decisions of exporters to increase or decrease CPO export depend on international price. However, the Pearson correlation coefficient alone cannot establish a cause-and-effect relationship. To carry out further investigation, Granger Causality analysis is employed, providing the significance level of the cause-and-effect relationship between the two variables.

The Granger causality test was conducted using EVIEWS software to assess the null hypothesis that prices do not have a causal effect on export and vice versa. The decision to reject or accept the null hypothesis provides a conclusion about the cause-and-effect relationship between price and export volume. When the Prob. The f-Statistic value is lower than α, the null hypothesis is rejected, with a confidence level of 1-α, indicating the presence of a cause-and-effect relationship between price and export volume.

Other qualitative analyses were conducted using various data and additional information.

RESULT AND DISCUSSION

Indonesia is the largest palm oil producer globally, with the latest data indicating that it contributes approximately 60% to global palm oil production. Its closest competitor is Malaysia, whose production output is only one-third of Indonesia's.

Table 1 Palm Oil Production Year 2021/2022

No	Country	Production (Thousand Ton)	Percentage
1	Indonesia	45,300	60%
2	Malaysia	18,300	24%
3	Thai	3,150	4%
4	Columbia	1,747	2%
5	Nigeria	1,400	2%
6	Other	6,223	8%
7	Total	76,120	100%

Source: Statista 2022

Despite being the largest palm oil producer, the country faces relative weakness in terms of its position in international trade compared to Malaysia and the Netherlands. The price of Indonesian palm oil has not become the benchmark in the global palm oil trade because traders often consider prices in Malaysian Ringgit and Rotterdam as more influential. While Indonesia produces palm oil for various high-value products consumed worldwide, the fact that it still imports its related products indicates the presence of downstream products yet to be developed domestically. Figure 1 shows that since 1981, Indonesia has continued to import palm oil derivative products. In 2019 alone, the country's palm oil import amounted to 47.1 million USD.

The dynamics of Indonesia's palm oil trade underwent a significant shift in 1998. Following that year, palm oil import became minimal but persisted to some extent. From 1981 to 1998, the average import-to-export ratio stood at 12.71%, drastically decreasing to 0.10% from 1998 to 2019. The year 1998 marked a period of substantial economic changes with a continuous decrease in the exchange rate of the Indonesian Rupiah against the US dollar until the government decided to adopt a flexible system. Exporters benefited from the depreciated Rupiah under this new exchange rate system. Figure 2 shows that export increased rapidly and continued to increase yearly, with almost no decline.

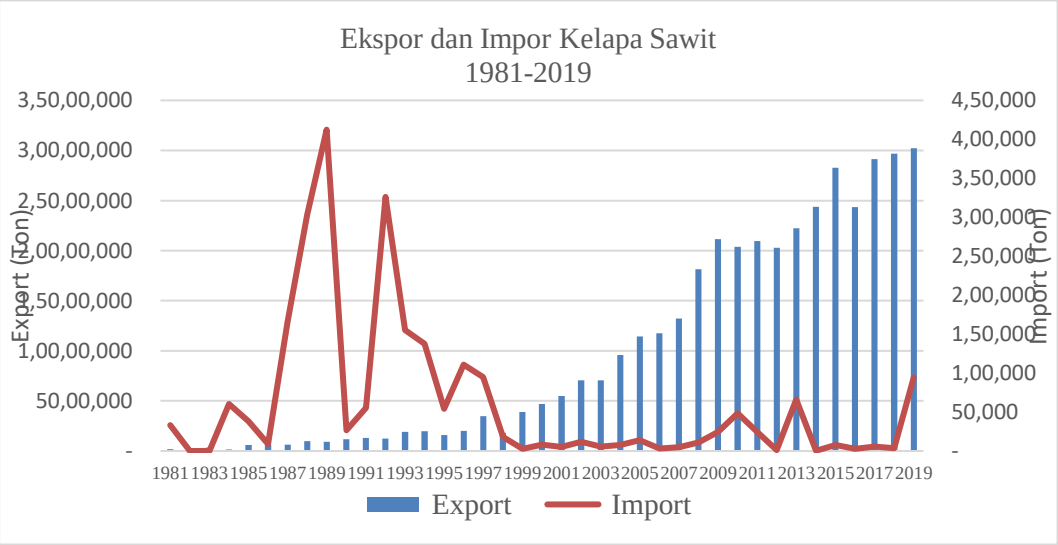

FIGURE 2

Source: National Leading Plantation Statistics 2019-2021

Palm oil is renowned as the most efficient vegetable oil-producing crop compared to soybean, rapeseed, and sunflower oil. The crop holds this distinction due to its year-round fruiting cycle and the fact that it is cultivated primarily in developing countries. In

contrast, other vegetable oil-producing crops are seasonal and predominantly cultivated by developed countries. The global consumption of palm oil spans more than 160 countries, where it finds applications in various industries such as cooking oil, margarine, food ingredients, cosmetics, detergent soaps, biofuels, etc. Palm oil supply chain is shown in Figure 3.

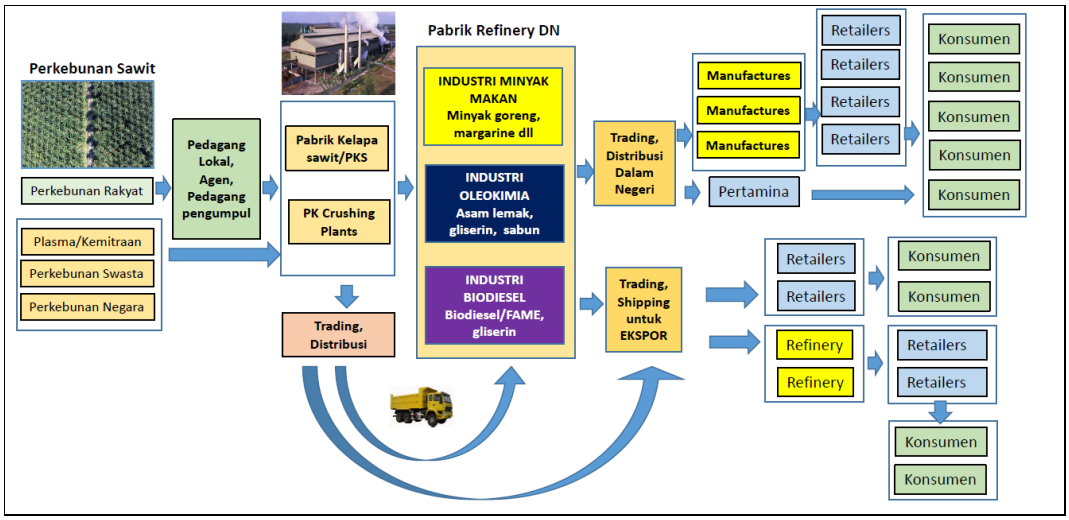

Figure 3 Palm Oil Industries Supply Chain

Source: (GAPKI, 2021)

Figure 3 shows that downstream products of palm oil are classified into three main categories, namely the edible oil industries, the oleochemical industries, and the biodiesel industries. Through the utilization of international trade data associated with HS codes, the potential for the development of downstream palm oil industries can be demonstrated effectively. Palm oil downstream map, shown in Figure 4, includes HS codes representing various products. The objective of developing downstream palm oil industries is to reduce the reliance on import for specific products and simultaneously boost their export.

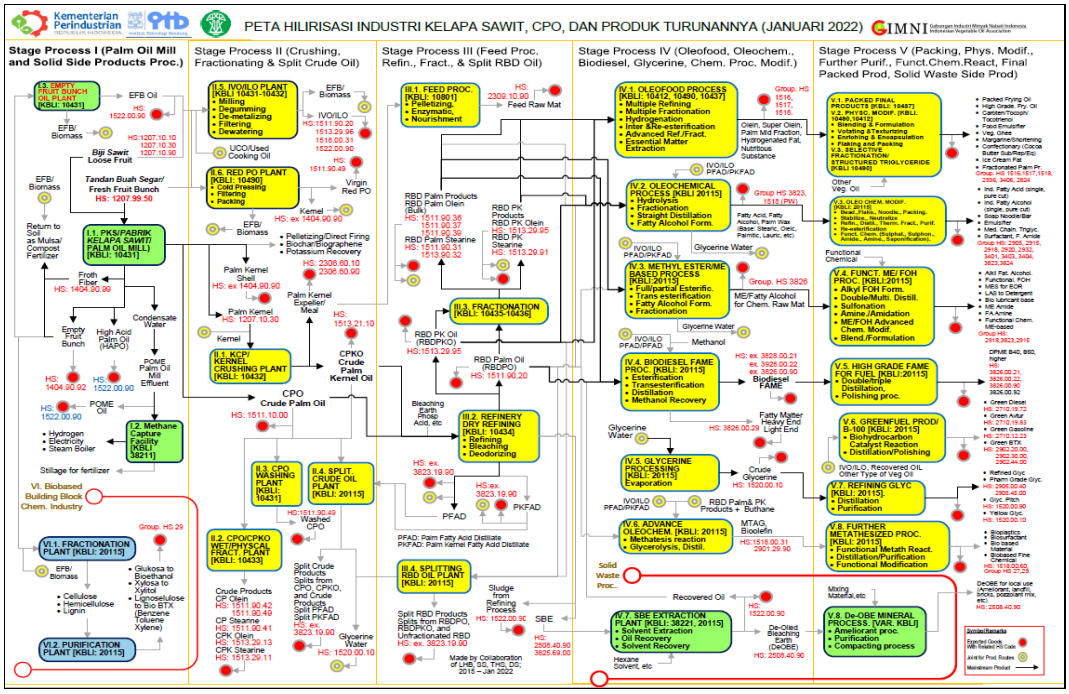

Figure 4 Downstream Palm Oil Industries Map

Source: Ministry of Industries (2022)

Some examples highlighting the benefits that can be derived from the development of downstream industries with a focus on products description based on 4-digit HS codes are shown in Table 2.

Table 2 Description of Palm Oil Products

HS Code	Product Description
Upstream Products	
1511	Palm oil and its refined or unrefined fractions, without chemical modification.
Downstream Products	
1513	Coconut (coprae) oil, palm kernel oil, or babassui dani fractions thereof, either refined or unrefined, without chemical modification.
1516	Fatty and animal or vegetable oil and their fractions, partially or wholly hydrogenated, interesterified, reesterified, or elaidinized, either refined or unrefined, without further processing.
1517	Margarine; edible mixtures or preparations of animal or vegetable fats or oil with fractions of fats or oil different in this pork, other than edible fats or oil or their fractions of heading 15.16.

Source: (trademap.org, n.d.)

Comparing export and import value with its main competitor Malaysia can help identify the specific palm oil products that Indonesia needs to focus on for developing its downstream industries. Table 3 presents export and import data for the four aforementioned palm oil products.

Table 3 Export and Import Value of Indonesia and Malaysia 2017-2022

HS Code	Year	1511	1513	1516	1517
Indonesian Export (Thousand USD)	2017	18,513,121.0	3,028,314.0	315,787.0	908,761.0
	2018	16,527,848.0	2,424,405.0	283,343.0	856,747.0
	2019	14,716,275.0	1,711,900.0	254,420.0	731,197.0
	2020	17,364,812.0	1,877,160.0	288,508.0	861,880.0
	2021	26,665,128.0	2,885,380.0	838,065.0	1,633,847.0
Malaysian Export (Thousand USD)	2017	9,717,007.0	1,037,352.0	1,934,212.0	410,397.0
	2018	8,675,170.0	814,946.0	1,657,244.0	376,251.0
	2019	8,332,324.0	638,869.0	1,497,985.0	413,341.0
	2020	9,785,074.0	913,883.0	1,640,537.0	380,875.0
	2021	14,212,037.0	1,411,722.0	2,265,573.0	546,546.0
Indonesian Import (Thousand USD)	2017	1,812.0	14,148.0	29,704.0	38,443.0
	2018	915.0	16,950.0	25,584.0	34,317.0
	2019	45,529.0	25,306.0	21,593.0	32,080.0
	2020	939.0	42,266.0	27,542.0	28,745.0
	2021	694.0	106,994.0	28,869.0	38,687.0
Impor Malaysia (Thousand USD)	2017	403,355.0	535,009.0	242,265.0	11,750.0
	2018	457,124.0	490,281.0	197,666.0	14,355.0
	2019	549,312.0	343,309.0	164,405.0	28,461.0
	2020	657,124.0	454,022.0	195,094.0	17,672.0
	2021	1,148,925.0	775,751.0	429,510.0	27,275.0

Source: (trademap.org, n.d.)

The data in Table 3 shows Indonesia consistently outperforms Malaysia in export for the upstream product 1511 and downstream products 1513 and 1517. However, for downstream product 1516, export by Malaysia are significantly larger than in Indonesia. The comparison of export value using the 2021 data is shown in Figure 5.

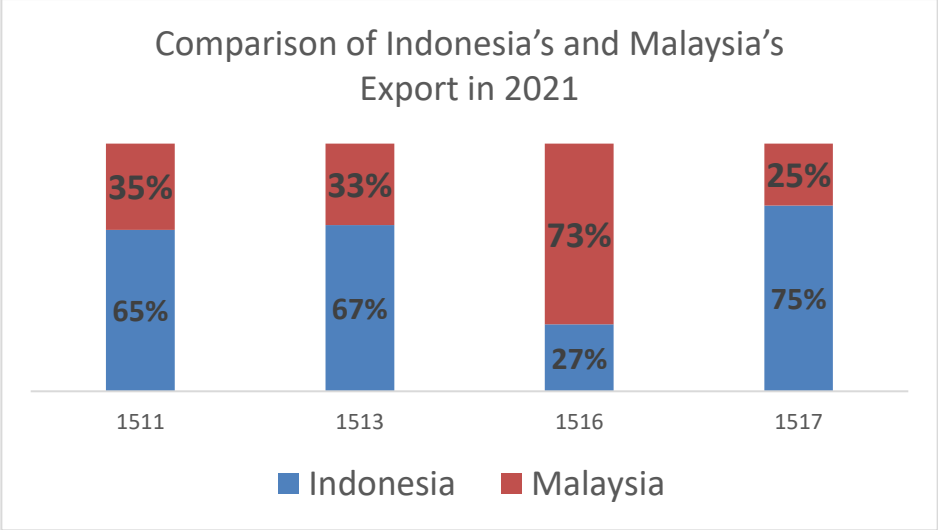

Figure 5

Source: (trademap.org, n.d.) processed data

The country's ability to develop downstream industries specifically for product 1516 can potentially eliminate the need to import that particular product. The average yearly import value for product 1516 amounts to 26.7 million USD. However, when Indonesia further enhances its industries and captures only half of Malaysia's market share, it can generate an estimated additional export value of around 900 million USD annually. This represents a significant potential for foreign exchange earnings, reaching 1 billion USD annually, solely from developing a single downstream product. Considering the potential impact of developing downstream industries for multiple products, such as food, oleochemical, and biofuels, the possibilities for increased foreign exchange earnings and economic growth become even more significant.

Currently, Indonesia is still a net importer of diesel fuel, mainly from Singapore, with import value of automotive diesel fuel (HS code 27101971) in 2021 shown in Table 4.

Table 4 Import Value of Diesel Fuel for Motor Vehicles

No.	Exporter Country	Import value (Thousand USD)
1	Singapore	845,995
2	Malaysia	447,412
3	Korea, Republic of	232,171
4	India	65,886
5	Russian Federation	9,439
6	Thai	5,220
7	France	56
8	Total	1,606,179

Source: trademap.org

In 2021, import value of automotive diesel fuel reached a substantial amount of 1.6 billion US dollars. This indicates the continued significance of diesel fuel import for Indonesia. However, the Ministry of Energy and Mineral Resources (ESDM) estimates that the implementation of B40 in 2023 holds the potential to save approximately 200 trillion Indonesian Rupiah in foreign exchange .

In addition to reducing import and increasing export to boost foreign exchange earnings, downstream development plays a crucial role in improving the productivity of palm oil farmers. By enhancing productivity, Indonesia can increase the supply of palm oil to

support downstream industries without expanding palm oil plantation area. Independent smallholder palm oil farmers have significantly lower productivity compared to large plantations owned by private companies.

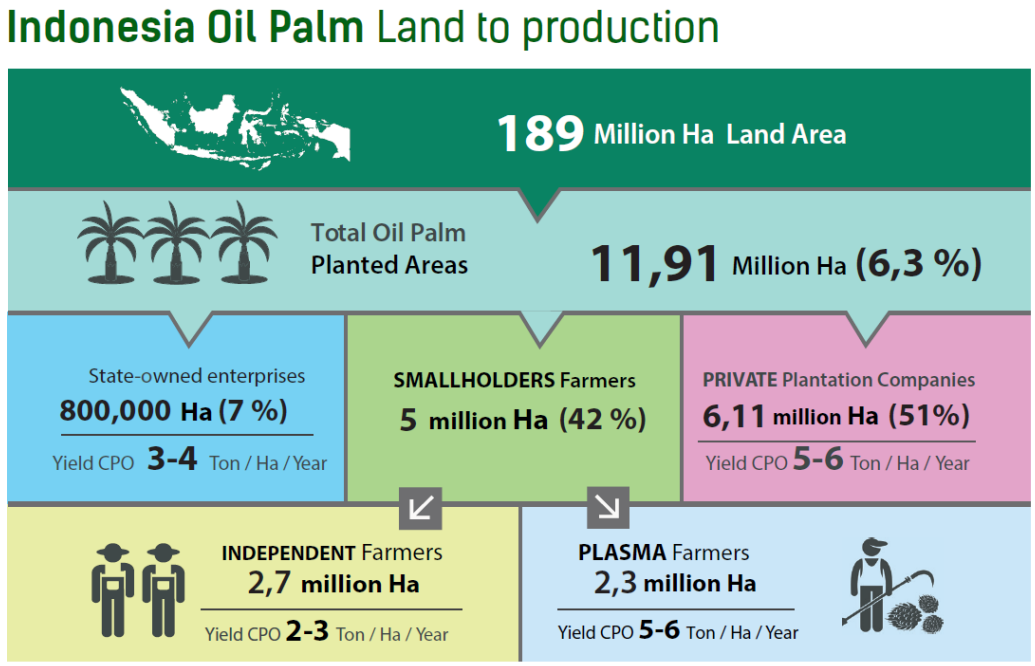

Figure 6 Comparison of Palm Oil Land Productivity

Source: GAPKI (2018)

According to Figure 6, the productivity of independent smallholder farmers remains considerably low, ranging from 2-3 tons per hectare. In contrast, private companies have achieved a much higher productivity level of 5-6 million tons per hectare. It is important to note that independent smallholder farmers hold a significant portion of land, accounting for approximately 42% of the total ownership. When the productivity of independent smallholder farmers is increased to match that of private companies, reaching 5-6 tons per hectare without the need for expanding the land area, it will lead to an additional supply of 8 million tons of CPO per year. This additional supply represents approximately 16% of the total CPO production, based on the data from 2021, which amounted to 49.7 million tons.

Palm oil is the most productive oil-producing crop, as shown in Figure 7.

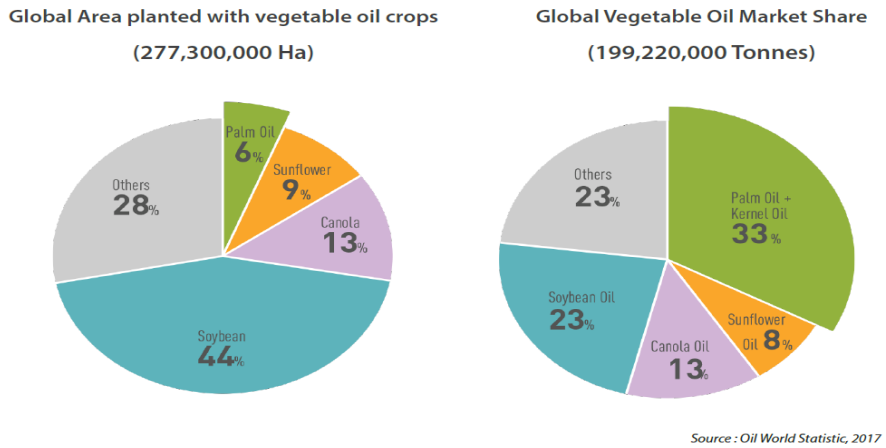

Figure 7 Comparison of Land Area and Market Share of Palm Oil with Other Crops

Palm oil, with just 6% of the land utilized, dominates the global vegetable oil market, accounting for an impressive 33% market share. In contrast, soybean, which occupies 44% of the land, only commands a 23% market share, while sunflower, utilizing 9% of the land, holds a modest 9% market share. This stark contrast in market share has generated jealousy and concern among competing vegetable oil producers outside of palm oil industries.

Increasing the productivity of palm oil holds great importance in improving the livelihoods of farmers and strengthening Indonesia's position in the global trading market. Currently, the country's role in influencing international prices remains limited. The supply of CPO from Indonesia aligns with price trends, as producers respond to price fluctuations by adjusting their supply accordingly. Through the application of the Pearson correlation test, it has been determined that there is a positive and significant correlation between price and export quantity. The results of this test, conducted using STATA software, are shown in Table 5.

Table 5 Pearson Correlation Test

```
. pwcorr v_ex p_ex, sig print (10) star (5)

             |     v_ex     p_ex
-------------+------------------
        v_ex |   1.0000
             |
             |
        p_ex |   0.8368* 1.0000
             |   0.0000
             |
```

The correlation coefficient ranges from 0 to 1, and a coefficient of 0.837 indicates a strong and statistically significant correlation between CPO price and export volume. However, it is important to note that correlation testing alone cannot establish a cause-and-effect relationship between the two variables. To further investigate this relationship, the Granger Causality test was employed. The results of the Granger Causality test, conducted using EVIEWS software, are shown in Table 6.

Table 6 Grangeri Causalityi Testi

Pairwise Granger Causality Tests
Date : 12/01/22 Time: 14:57
Sample: 1981 2019
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Null Hypothesis:	Obs	F-Statistic	Prob.
P_EX does not Granger Cause EXPORT	37	1.97083	0.1559
EXPORT does not Granger Cause P_EX		3.11369	0.0581

The test results accepted the hypothesis that export prices do not cause changes in export volume and rejected the hypothesis stating its volume does not cause price changes. This implies that the volume of export plays a significant role in determining export prices, but export prices do not have a causal effect on the volume of export. Therefore, it can be inferred that Indonesia has the ability to influence international palm oil prices by controlling its export volume. The assumption that palm oil prices determine global palm oil supply from Indonesia is not statistically proven.

Indonesia can influence international palm oil prices by effectively managing its export volume. The country can reduce its export to stabilize the market when prices are deemed too low. Conversely, export volume needs to be increased when prices are already too

high and need to be lowered. This requires effective stock management within the country.

The development of downstream palm oil products enables the country to effectively address any potential reduction in CPO export by utilizing them in the domestic market. By increasing CPO productivity, the country can build a substantial domestic CPO stock, allowing for greater flexibility in export levels when needed. International market prices will follow the quantity of CPO supply regulated by Indonesia, thereby strengthening its position in international market.

CONCLUSION

In conclusion, it is essential to prioritize the development of downstream industries in Indonesia to strengthen its position in international palm oil market. By regulating CPO export, Indonesia can effectively control the global CPO price. This is because the increase in prices reduces CPO export and vice versa. The establishment of downstream industries helps absorb CPO production during periods of reduced export.

The Indonesian government does not need to implement policies to reduce or stop CPO export for downstream programs with increased palm oil production. This can be achieved without expanding palm oil plantations. Enhancing the productivity of independent palm oil farmers is a crucial factor in the success of palm oil downstream program and contributes to regulating international CPO prices.

By increasing the productivity of independent farmers from 2-3 to 5-6 tons per hectare with the same land area, Indonesia can boost CPO production by 8 million tons annually. This increase in production generates a multiplier effect, leading to job creation, higher income, and improved welfare for farmers.

Furthermore, by focusing on the development of downstream industries for specific products, such as palm oil-based fats and oil, with HS code 1516, which is traditionally produced and exported by Malaysia, Indonesia can save $26.7 million in foreign exchange per year by eliminating the need for importation of palm oil-related products. Expanding further and capturing just half of the market share of Malaysia can enable Indonesia to achieve additional export revenue of approximately $900 million annually. This would result in a potential foreign exchange inflow of $1 billion per year solely from developing one downstream product. The potential becomes even more significant when considering the establishment of downstream industries for various products, including food products, oleochemicals, and biofuels.

Import value of automotive diesel fuel is still substantial, amounting to $1.6 billion in 2021. Therefore, the development of biodiesel, particularly from B30 to B40, becomes crucial in saving approximately IDR 200 trillion in foreign exchange. Increasing the use of biodiesel and developing the biodiesel industries are crucial steps to take.

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