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A Dynamic System Model: Flat Export Duty of Cocoa Beans (Hs 180100) For Downstreaming of Indonesian Cocoa Industry and Farmers

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Abstract

Indonesia's progressive export duty of 0–15% on cocoa beans aims to protect raw materials, enhance value-added processing, and strengthen domestic industry competitiveness. While this policy has boosted exports of cocoa derivative products, it has also negatively impacted cocoa bean production and domestic prices. This study employs needs analysis, Day Competitiveness Analysis, and a conceptual model incorporating causal loop and stock-and-flow diagrams. Model validation uses structural and performance validity tests, including Root Mean Square Percentage Error (RMSPE), Absolute Mean Error (AME), and Absolute Variance Error (AVE). Key variables analyzed include cocoa bean production and processed cocoa output.Revealed Comparative Advantage (RCA) values from 2010 to 2023 indicate a decline in Indonesia's cocoa competitiveness. The study projects that a flat export duty policy would positively influence farmer income, cocoa bean exports, production levels, competitiveness, and national cocoa stocks. Higher farmer income is expected to strengthen the agro-industrial system and ensure long-term sustainability. To enhance domestic cocoa bean absorption, increasing the involvement of micro, small, and medium enterprises (MSMEs) in processing activities is essential. This strategy will reduce reliance on imports, boost cocoa derivative exports, and create a more resilient and competitive cocoa industry aligned with national and global market demands.

Kata Kunci: *Business development, Export marketing, Regulatory policy, Sustainability*

Abstrak

Indonesia menerapkan bea keluar progresif 0–15% pada biji kakao untuk melindungi bahan baku nasional, meningkatkan nilai tambah, dan memperkuat daya saing industri pengolahan kakao domestik. Kebijakan ini meningkatkan ekspor produk turunan kakao, tetapi berdampak negatif pada produksi dan harga biji kakao domestik. Penelitian ini menggunakan analisis kebutuhan, Day Competitiveness Analysis, serta model konseptual dengan diagram kausal (causal loop) dan stok-aliran (stock-and-flow). Validasi model dilakukan dengan uji struktural dan kinerja menggunakan RMSPE, AME, dan AVE. Nilai Revealed Comparative Advantage (RCA) 2010–2023 menunjukkan tren penurunan daya saing kakao Indonesia. Studi ini memproyeksikan

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bahwa kebijakan bea keluar tetap akan meningkatkan pendapatan petani, ekspor, produksi, daya saing, dan stok kakao nasional. Pendapatan petani yang lebih tinggi diharapkan memperkuat sistem agroindustri dan keberlanjutan jangka panjang. Untuk meningkatkan penyerapan biji kakao dalam negeri, keterlibatan UMKM dalam pengolahan harus ditingkatkan. Hal ini akan mengurangi ketergantungan pada impor, meningkatkan ekspor produk turunan kakao, serta menciptakan industri kakao yang lebih tangguh dan kompetitif sesuai permintaan pasar nasional dan global.

Keywords: *Pengembangan bisnis, Pemasaran ekspor, Kebijakan regulasi, Keberlanjutan.*

INTRODUCTION

Agriculture contributes significantly to No.'s gross No. product (GDP), with the agricultural sector contributing 12.40% to GDP at current prices in 2022. This figure is predicted to increase by 0.77% the following year (year-on-year/yoy). Several subsectors support the contribution. The plantation subsector is the most significant contributing subsector, which is 3.76% of GDP in 2022 and 30.30 percent of the Agriculture, Forestry, and Fisheries sectors or the first place in the sector (Statistics-No., 2023). Plantation commodities, No.'s leading export commodities, such as palm oil, cocoa, coconut, coffee, and rubber, are still primarily exported in the form of primary commodities support in (Suprihatini, 2004). So, the price of plantation commodities tends to fluctuate, and the exchange rate of commodities goes down (Suprihatini et al., 2004). This is the case with cocoa, which is still partly exported as cocoa beans.

Cocoa is one of the commodities produced in No., a country with a tropical climate. Therefore, the number of cocoa-producing countries is limited in the international market. Cocoa is a plantation commodity that is vital to the Indonesian economy. Cocoa is also one of the commodities with a high export value, so it plays a role as a state division earner. It is recorded that No.'s cocoa exports amounted to 385,981 tons, valued at US$ 1.26 billion in 2022. This export amount increased by 0.85% from the previous year 2021. Cocoa is a leading commodity issued by the Ministry of Trade . Cocoa is usually exported as beans and derivative products such as cocoa butter, cocoa paste, and cocoa powder.

Over the past five years, No. has seen a decline in cocoa output; in 2022, the country produced 650,612 tons, a 15.20% fall from 2018. Through the Regulation of the Minister of Finance of the Republic of No. Number 67/PMK.011/2010 for export products, the government established export tariffs and export duty (ED) rates to maintain No. pricing and consumption in 2017. Cocoa beans are among the export commodities impacted by ED. Following several revisions, this Permenkeu RI was changed to become Regulation of the Minister of Finance of the Republic of No. Number 39 / PMK.010 / 2022 concerning the Determination of Export Goods Subject to Export Duty and Export Duty Tariffs and Regulation of the Minister of Finance of the Republic of No. column 2 Appendix II Letter B Number 13 / PMK.010 / 2017.

The application of ED on cocoa beans is progressive at 0-15% and does not use a flat ED. In 2019, the Ministry of Trade (MOT) released Regulation of the Minister of Trade (MOT) No. 123/2019 on the Determination of Export Benchmark Prices (HPE) for Agricultural and Forestry Products subject to Export Duty (ED). In this

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regulation, the export duty on cocoa beans is 5%. The reference price of cocoa beans was set in July 2019 at US$ 2,454.93/MT (metric ton), up 5.49% from the previous month at US$ 2,327.27/MT. This resulted in an increase in the HPE of cocoa beans in July 2019 to US$ 2,169/MT or an increase of 6.12% compared to the previous period at US$ 2,044/MT. The increase in HPE was due to the strengthening of the international price of cocoa beans at the New York terminal.

The ED requirement is a type of protection for the availability of national raw materials, as well as to boost the added value and competitiveness of the domestic processing sector, which will influence the downstream cocoa industry. Related stakeholders, such as cocoa entrepreneurs and farmers, are directly affected by this execution. The value of Indonesia's cocoa exports has decreased since part of them are still reliant on primary items such as cocoa ore. Only cocoa beans are subject to export duty; other derivative and processed cocoa products are not.

The derivative product that has increased rapidly is cocoa butter or cocoa butter. Research by Hanafi (2015) states that the cocoa derivative product with the highest competitiveness is cocoa butter, so it can focus on products with the highest competitiveness, such as cocoa butter and cocoa powder. The increasing export value of cocoa-derived products indicates that the ED policy successfully or effectively suppresses cocoa exports in the form of primary products or raw products (cocoa beans) and can increase the production of domestic downstream industries. This will affect export performance in the international market, as there is a change in the type of exports by exporting countries.

In this case, the opportunity and potential of Indonesian cocoa and the downstream cocoa sector are still very high. They will continue to be developed with various policies that can benefit and minimize all problems in the cocoa and chocolate processing industry, such as optimizing the capacity of the cocoa processing industry, increasing chocolate consumption, and bean-to-bar chocolate opportunities in Indonesia for all parties involved so that they can be competitive. The export duty (ED) policy can suppress the export volume of Indonesian cocoa beans. There is an increase in the performance of the Indonesian downstream cocoa industry sector, enabling Indonesia to balance production and processing so that it can suppress the import of cocoa beans, which has increased from year to year, to meet the needs of the domestic downstream industry. Indonesia's cocoa bean production has started to decline. In addition, considering the industry's needs and the high domestic demand for the processing and consumption of cocoa consumers, this problem must be addressed immediately. Furthermore, Indonesia has to import cocoa beans. In recent years, the increasing import of cocoa beans could be one of the impacts of the decline in Indonesia's cocoa production (cocoa beans).

METHOD

Analytical Framework and System Dynamic Model of Indonesia Cocoa

Pioneered in 2009, the Gernas cocoa program through the Directorate General of Plantations has increased the productivity and quality of national cocoa for three years in 2009 - 2011 in 9 central provinces and 40 target districts, with an increase in smallholder cocoa crops to 450,000 ha, empowerment of 450,000 farmers, increased cocoa productivity to 1500 kg/ha/year cocoa production to 675,00 tons/year and

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farmer income to Rp. 30,000,000/ha/year and foreign exchange to US$ 1,485 million. Some of these programs have been achieved, but some programs have also experienced a decline due to the implementation of some of these policies. There is a decline in prices at the farm level due to export duties.

Some of the world's largest cocoa bean-producing countries are still experiencing political turmoil and domestic issues, causing global cocoa exports to decline and ultimately affecting prices. Increased international prices will affect cocoa prices and reduce cocoa consumption, reducing the number of domestic cocoa stocks growing, and prices will decline further. In the long run, production will decline. The cocoa agribusiness policy implemented must be based on the policy of Law No. 18 of 2004, namely (i) increasing community income, (ii) increasing state revenue, (iii) increasing state foreign exchange earnings, (iv) providing employment, (v) increasing productivity, added value and competitiveness; (vi) meeting the needs of domestic consumption and industrial raw materials; and (vii) optimizing sustainable natural resource management. Based on this, increasing farmers' income is a priority and should also be prioritized over state revenues Wilkinson and Rocha (2009).

Need Analysis

The assessment of a system must consider needs analysis because it begins with the relevant parties and stakeholders Wang, Ning and J. (2005). By looking at the various needs of all actors as a priority for the sustainability of the Indonesian cocoa agro-industry system. Cocoa bean export duty is subject to a progressive tariff; if the reference price is less than USD 2000, a tariff of 0 percent will be imposed; if more than USD 2000 and less than USD 2750, a tariff of 5 percent will be imposed and if more than USD 2750, the tariff is set at 10%. If more than USD 3,500, the tariff is 15%. For the cocoa agro-industry, the government must be able to balance business profits and social responsibility, in this case, prioritizing the situation of farmers. However, some farmers are experiencing a downturn and eventually must switch commodities due to uncompetitive prices receiving unreasonable prices. Hence,

No	Business Actors	Needs
1	Farmers	Fertilizer price, harvested area, land area

farmers think there are no sustainable prospects for cocoa commodities.

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		Price received by farmers Cocoa productivity Farmer revenue	**Table 1. Indonesia's Cocoa Agro-Industry Needs Analysis**
2	Industry	Cocoa bean quality/cocoa been quality Cocoa bean supply Performance of manufacturing Industry Processed plant capacity Demand for processed products Refined cocoa price Adequate processing industry adventages	
3	Government	Export value of downstream cocoa products increased by the export duty Competitive cocoa bean and processed cocoa market Increased and adequate farmer revenue Sufficient domestic supply Foreign exchange increases and the economy improves	

Source: Processed data

All stakeholders and actors involved in the cocoa agro-industry business cycle and flow must have their own needs and wants. In addition, the effect of government policies that change due to a change in government will cause the value and prospects to change or fluctuate. The government, in this case for the cocoa agro-industry, must be able to balance and prioritize the situation of farmers for the welfare of the people in the country. However, currently, some farmers are experiencing a downturn and finally have to switch commodities because they get uncompetitive prices, so farmers think that there are no sustainable prospects for cocoa commodities because the revenue received is not worth it to reduce the number of exports and increase the domestic cocoa processing industry.

Formulation of Dynamic Hypothesis

The causal loop diagram (CLD) model below shows the influence of interrelated variables to achieve the goal Bala, Arshad, and Noh (2016). Indonesian cocoa subject to export tariffs will affect domestic prices, potentially affecting farm gate prices and farmer revenues, which in turn will affect the competitiveness and absorptive capacity of the domestic cocoa processing industry. Problem-solving can be started from anywhere by looking at each factor due to the impact of export duties, forming a complex model, and representing variables in solving existing problems.

The price at the farm level influences farmer acceptance (Rifin, 2020). The effect of the success farmers feel will have a good impact on cocoa bean production, which is currently experiencing a downward trend. The decline in production will result in imports to fulfill domestic consumption and stock for the cocoa bean processing industry. The higher domestic imports will affect the domestic economy and make us dependent on countries that export the cocoa we need for domestic consumption.

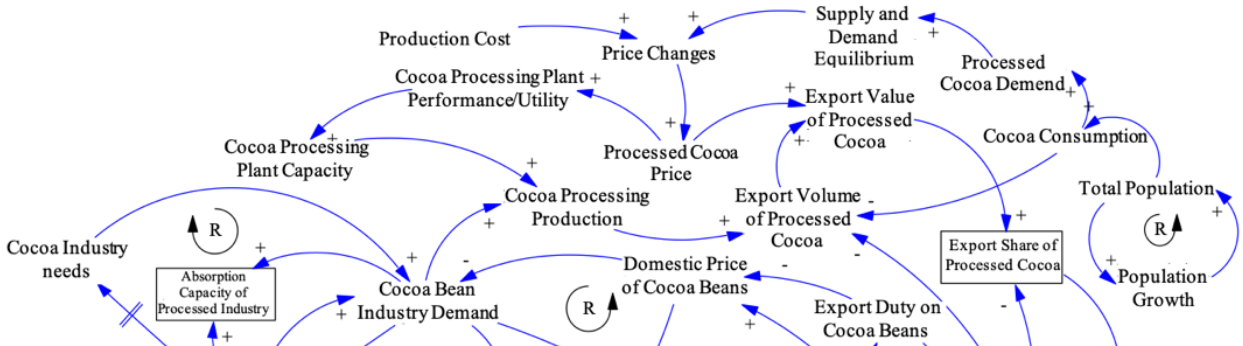

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Figure 1. Causal Loop Diagram (CLD) Effect of export duty on Indonesian cocoa competitiveness

The above variables are significant and interrelated to improving the Indonesian economy. The government makes imports to meet domestic demand that cannot be met. The more imports there are, the more dependent the country is on other countries for domestic production (Aboah & Setsoafia, 2022). National stocks that affect the amount of cocoa at the world level will affect international prices, which will also impact the price received by farmers, although not directly (Permani, 2013). However, this is interrelated and will also impact the application of progressive export duty rates that increase or decrease along with the reference price or benchmark price of cocoa exports worldwide.

A stock and flow diagram (SFD) is a way in dynamic modeling to describe the structure and shape physically by connecting exogenous and endogenous variables and other supporting variables (Sterman, 2000). The results of the Stock Flow Diagram using Think 9.0.3 software regarding the effect of export duty on cocoa beans using data from UNComtrade, FAOstat, ICCO, Kemekeu, Ditjebun, and some BPS data for the years 1969 to 2018 (Figure 2).

The SFD model aims to see how export duties affect the performance of cocoa exports and processed cocoa industry products in Indonesia. The volume of cocoa exported is the difference between the existing production minus the needs of the cocoa processing industry and the inclusion of cocoa imports to form the cocoa stock. The national cocoa stock is assumed to be all exported because domestic demand is met or there is a surplus due to the difference in several production support variables (Figure 2).

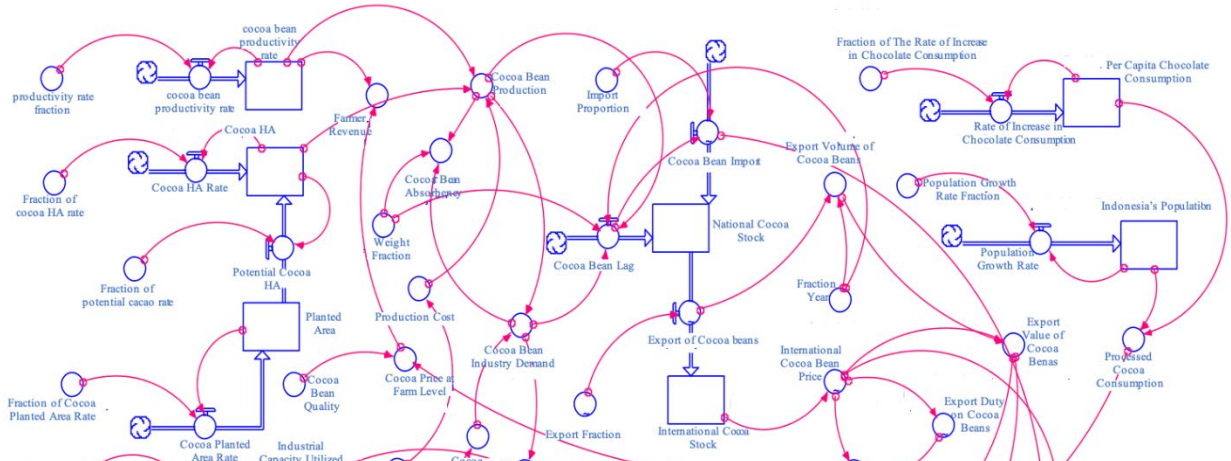

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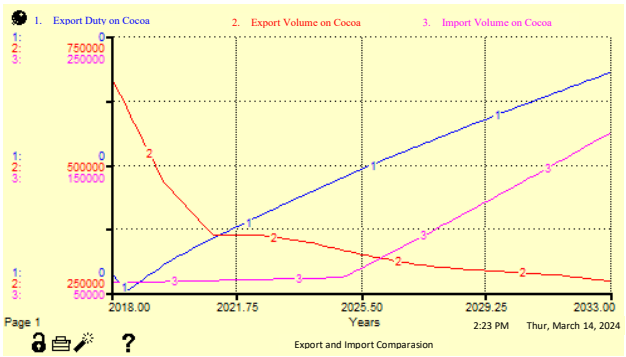
Figure 2: Indonesian Cocoa Stock & Flow Diagram (SFD)

Cocoa processing in the SFD diagram (Figure 2) determines the level of processed cocoa production and the number of raw materials the industry requires for processing. The processing industry is based on the capacity of machines to process cocoa beans so that other cocoa derivative products can be made. In this case, we can see how the absorption capacity of cocoa beans by the cocoa processing industry (Kouassi et al, 2023). The absorption capacity is shaped by the processing industry's demand for cocoa beans and the production of cocoa beans made by cocoa farmers. The availability of farmers' production is usually a barrier to production (Somarriba et al, 2021). They usually have to import at a higher cost in order to produce. The cocoa industry will add value to cocoa (Osei et al., 1998). However, the availability of raw materials for the industry without having to import is an important thing that must be considered so that the sustainability of the domestic cocoa agro-industry will be sustainable without importing cocoa beans.

The higher the export benchmark price (HPE), the more positively it will affect the export duty. A progressive export duty policy of 0 - 0.15 or 0 - 15% depends on the HPE or international cocoa price. This export duty on cocoa beans will indeed reduce the number of exports periodically. However, domestic demand will increase depending on the increasing demand for cocoa consumption due to Indonesia's increasing population and also Indonesia's chocolate consumers being young, where Indonesia is currently experiencing a demographic bonus, with a larger population with a productive age.



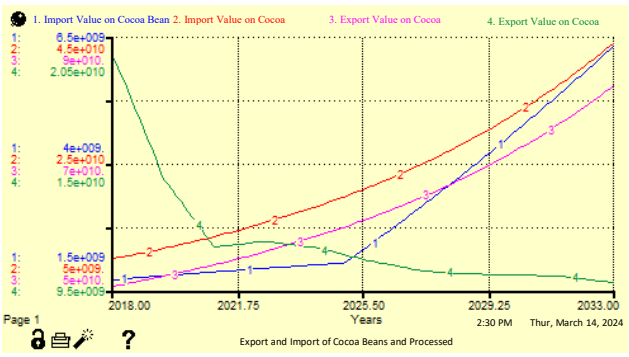


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Figure 3. Graph of progressive export duty, export volume, import volume, export value, and import value of cocoa beans in actual condition

Therefore, cocoa beans are imported and opened to meet the consumption and needs of the Indonesian people and the cocoa processing industry. Declining export volume will reduce the amount of state revenue. Along with the declining export volume, there is a decline in the amount of domestic production, which is decreasing day by day, the amount of planted area and the amount of harvested area along with farmers who change commodity planting due to declining farmer income. Cocoa bean exports are declining due to the export duty on cocoa beans (International Cocoa Organization, 2023). Although the competitiveness value of Indonesian cocoa is still above 1, which is the competitiveness indicator if >1, then it is competitive; it is experiencing a downward trend. The cocoa industry's absorption of domestic cocoa beans is declining due to higher imports to fulfill the supply of raw materials for the processing industry, namely cocoa beans.

The farmer's revenue, shown in Figure 4, depicts a decreasing graph due to the costs imposed on exports. Domestic stocks will increase when exports are not maximized, causing cocoa prices to decline. In addition, whether the export fee is charged to the farmer or the exporter is still unknown, but the effect on the farmer is apparent here. The export share of cocoa beans is decreasing, but the export share of industrial cocoa is also increasing. An increase in the number of industries in the current actual conditions will maximize the absorption of cocoa beans that are not exported. However, cocoa production is declining, so cocoa beans must be imported to fulfill this.

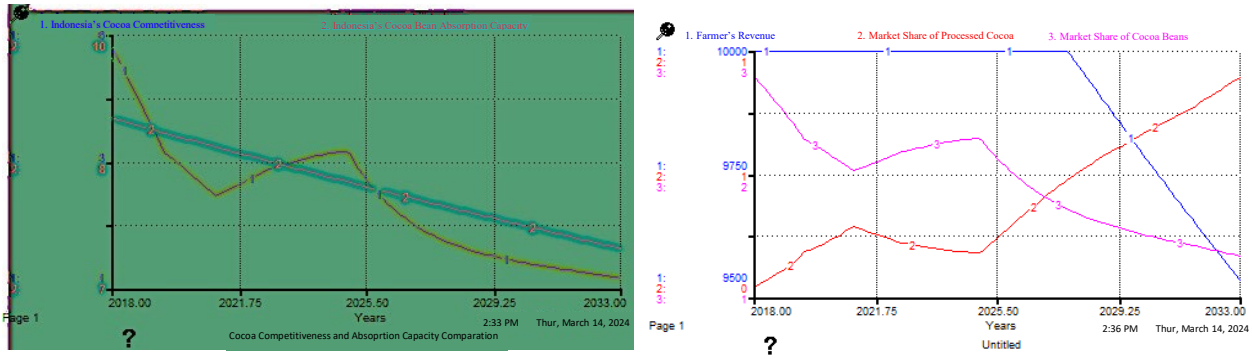

Figure 4. Competitiveness, Absorbability, Farmer Receipts, and Market Share of Indonesian Cocoa Beans under Actual Conditions

The model validation carried out is the structure validity test and the model's performance/output validity test. Validation tests to measure the accuracy of simulation output used are Root Mean Square Percentage Error (RMSPE), Absolute Mean Error (AME), and Absolute Variance Error (AVE). In contrast, the variables tested are cocoa bean production and processed cocoa production. Tests to build confidence in system dynamics models include validation, sensitivity, and policy analysis (Bala, 1999), (Bala and Hossain, 2010). Model validation includes structural and performance/output validity tests (Cavana and Maani, 2000) and (Muhammadi, Aminullah, and Soesilo, 2001).

THE DATA AND EMPIRICAL RESULT

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Testing and Analysis Results are divided into several sections, including testing and analyzing the competitiveness of Indonesian Cocoa, the Model Validation Process, Model Interpretation and testing, policy design, and Evaluation analysis.

Competitiveness Analysis of Indonesian Cocoa Beans

Analysis of the competitiveness of a country's products is a way to see the performance or ability of the commodity and or product to dominate the international market and how the product can compete and sustain or survive in the market (Gobel, Baruadi, & Rauf, 2019). The comparative advantage of a product in a country can be measured through Revealed Comparative Advantage (RCA) analysis, which is reflected in the export value of the commodity (Hasan, Reed, Marchant, 2001). The RCA analysis in this study focuses on Indonesian cocoa beans. This is because the competitiveness of processed cocoa has been studied, which shows that Indonesia has an advantage in processed cocoa in the international market and an advantage as an exporter of processed cocoa. (Tresliyana, Fariyanti, & Rifin, 2015).

The basic concept of RCA analysis is to examine the commodity's export value. The following equation can be used to determine a commodity's competitiveness.

$$\text{RCAit Index} = \frac{\text{Xij/Xit}}{\text{Wj/Wt}}$$

Description:
Xij is the export value of commodity j from country i;
Xit is the total export value of country i;
Wj is the world export value of commodity j; and
It is the total value of world exports.

The indexes used in the RCA measurement are

a. If the RCA value > 1, then the share of commodity i in exports for country j is greater than the average share of that commodity in the world. This indicates that country j has a comparative advantage and is competitive.
b. If the RCA value is <1, the share of commodity I in the world export market is smaller than average. So, it does not have a comparative advantage or is weakly competitive.

Indonesia became the third-largest cocoa producer in 2023 (15 percent of the world's total production) and the fifth-largest exporter of cocoa beans and derivatives. In 2010, Indonesia was the sixth-largest cocoa-exporting country before the progressive export duty on cocoa beans was introduced. In 2010, the total export value was USD 1,643,649,000, but in 2023, the export value of cocoa and cocoa derivative products decreased to USD 1,240,625,000, with an export volume of 385 thousand tons, or 0.71 percent from 2021.

The export duty policy significantly impacts Indonesia's cocoa bean export performance. Therefore, reviewing and paying more attention to the policy is necessary. Based on some of the problems above, the following is the Revealed Comparative Advantage (RCA) value to measure the comparative advantage of Indonesian cocoa bean commodities in the international market.

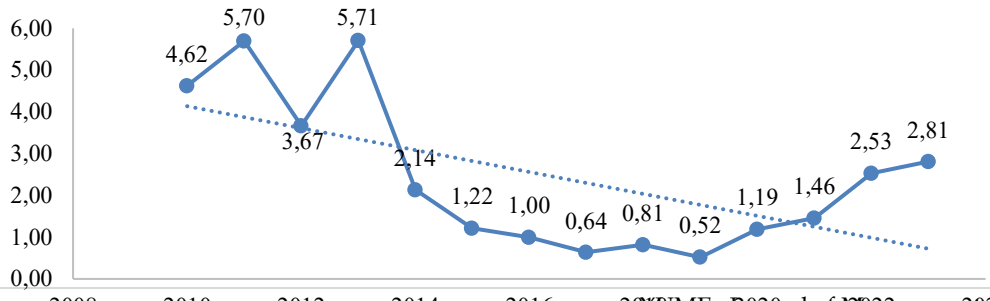

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Figure 5. RCA Values of Indonesian Beans

The RCA value of cocoa beans was below 1 in 2017, 2018, and 2019. This means that cocoa beans must be more competitive and have a comparative advantage in the international market. The RCA value increased again after 2019 until 2023, when the RCA value was 2.81. However, the overall RCA value of Indonesian cocoa beans shows a downward trend. One of the factors causing this is

Component	Production Cocoa Beans	Processsed Cocoa
RMPSE	2,5	3,79
AME	0,69	3,26
AVE	1,88	4,91

the implementation of export duty on cocoa beans, as support by (Hasibuan, 2012). This policy affects the change in the composition of Indonesian cocoa bean exports. In 2009, the composition of cocoa beans amounted to 75%, and in 2011, it decreased to 51%, as in (ITC, 2012). On the other hand, the result is that the contribution of processed cocoa, such as cocoa butter, cocoa powder, and cocoa paste, is slowly increasing. (Rifin & Nauly, 2013).

Improving cocoa beans' quality is necessary to increase their competitiveness significantly. It is known that the contribution of cocoa derivative products has increased (Akiyama and A. Nishio, 1997). However, the number of imports also needs to be reduced so that Indonesia can avoid dependence on other exporting countries to meet the supply of raw materials for the cocoa processing industry. In addition to export duties, Indonesian cocoa beans are not competitive because fermentation is not carried out, so they have relatively low quality and cause automatic price detention (Schaad, N. and Fromm, 2018). In addition, Indonesian cocoa has yet to dominate the European market. ([ICCO], 2012).

Validation Test of Indonesian Cocoa Beans Dynamics System Model

The validity tests carried out on this model are the structure and performance/output validity tests. The validity test in this model consists of Root Mean Square Percentage Error (RMSPE), Average Mean Error (AME), and Average Variance Error (AVE) Bala, and Hossain (2010). The following are the test results:

Table 2. Model Performance Validity Results

Based on the validation results above, the cocoa bean dynamic model's performance can represent the reality level of the actual position in the real world. The test results show that the RMSPE, AME, and AVE values for cocoa bean production are 2.5%, 0.69%, and 1.88%, respectively. At the same time, the values for processed cocoa production variables are 3.79%, 3.26%, and 4.91%. The above figure has stayed within the maximum limit of 5%, meaning it can represent conditions and

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circumstances in the real world so that the cocoa agro-industry system dynamics model is declared valid.

Testing The Dynamical System Model of Indonesian Cocoa Beans

Based on some of the data above and the actual simulation results, several tests are compared with simulations, which will later be used in policy making or policy design. The policy is a flat or stable export duty of 10 percent in this testing or simulation. Because a 5 percent export duty can decrease Indonesian export prices and negatively impact domestic prices (2.51 percent). Finally, it had a negative impact on the cocoa harvested area that smallholders cultivate, as the price only partially satisfies the farmers who want to expand their plantation area (Arsyad, 2007).

The selection of each column is based on the reference price level per ton determined by the Minister of Trade based on the Intercontinental Exchange average CIF cocoa price. According to Minister of Finance Regulation No. 13/PMK.010/2017, cocoa beans are subject to tariffs ranging from 0%- 15% based on the reference price. For reference prices up to USD 2000, the export duty rate for cocoa beans is 0%. For reference prices of USD 2000 up to USD 2750, cocoa beans are subject to a 5% tariff. For cocoa beans with a reference price of USD 2750 up to USD 3500, a tariff of 10% is imposed. Meanwhile, for reference prices exceeding USD 3500, a tariff of 15% is imposed. The calculation formula is ED (Export Duty) = Tariff x Number of Units x Estimated Export Price x Rupiah Exchange Rate.

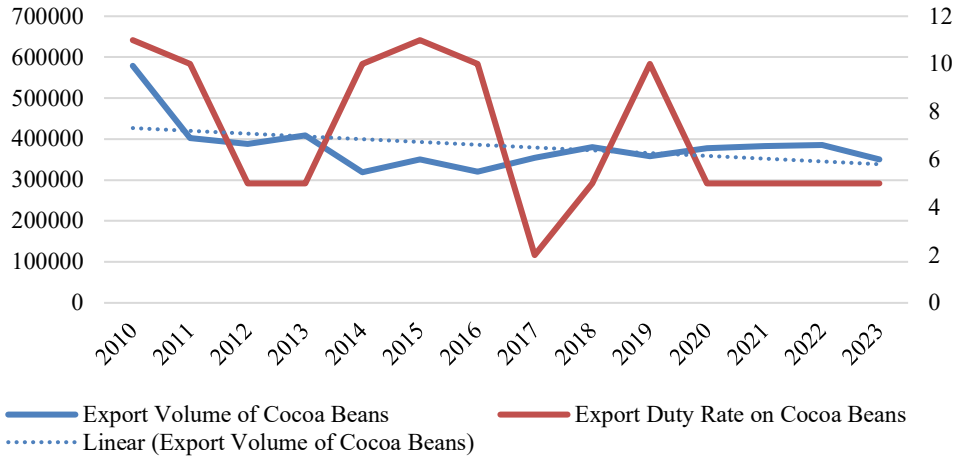

Figure 6. Development of Export Duty Tariffs and Exports of Indonesia Cocoa Beans

The export tariff policy is being implemented to boost the competitiveness of processed cocoa goods in the worldwide market. As a result, the implementation of the export tariff policy is only meant to prevent cocoa bean exports. Cocoa beans that are not exported due to export duties are processed and used in the domestic sector (Wessel et al. 2015). The processed products are subsequently exported or utilized for domestic purposes. The rise in cocoa exports under the export tariff regime is due to processed cocoa exports.

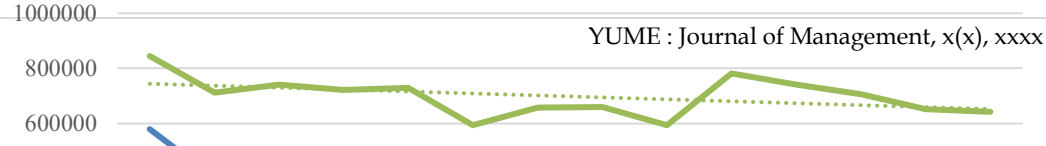

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Figure 7. Comparison of Indonesian Cocoa Variable Condition (5V) After Implementing Progressive Export Duty (tons).

The export duty policy was created because cocoa exports are still in the form of raw materials or raw cocoa beans. So, in this case, the government protects the domestic cocoa bean processing industry for the fulfillment of raw materials and can also develop the cocoa bean processing industry. Exports of raw materials such as cocoa beans have no added value. This added value has a positive impact on the commodity's competitiveness. However, this policy will impact other things, such as increased production and imports.

The above-interrelated variables will also influence each other and be affected by export duties, although not directly. Several variables, such as Indonesian cocoa bean production and export volume, are trending downward. Conversely, exports of cocoa derivative products and imports of Indonesian cocoa beans increased.

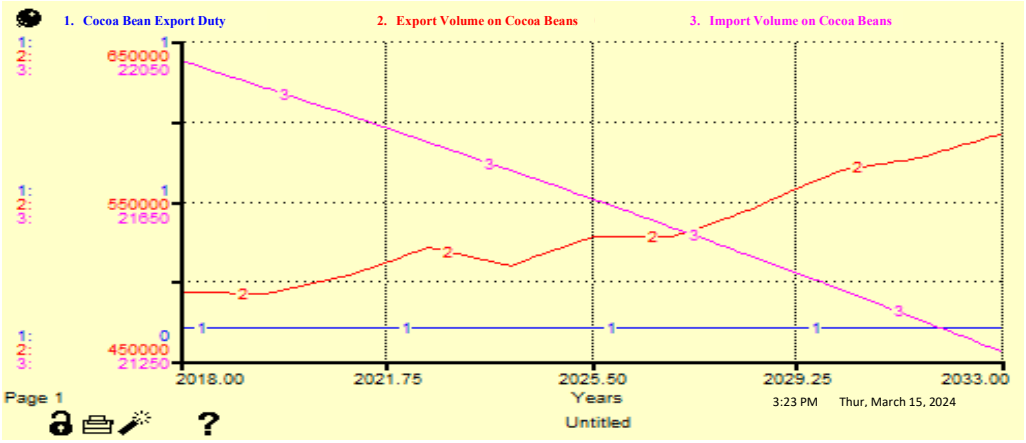

Figure 8. Simulation 1 of Flat Export Duty Implementation and its Impact on Indonesia's Cocoa Bean Exports and Imports

Simulation 1 above was conducted with a flat cocoa export duty policy at 0.1 or 10% of the HPE applicable to cocoa beans. Based on this, there will be a periodic increase in the export volume of Indonesian cocoa beans. A slow decline in the volume of cocoa bean imports will accompany this. The government will still receive the export duty tax from the state revenue. A flat export duty of 10% makes imports decline because domestic demand is met by increased production. Implementing an

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export duty of 10% will also impact farmers because the prices received by farmers will be more competitive and have long-term prospects.

Currently, cocoa is not a significant ingredient in Indonesia's food Oladokun (1999). However, as the population grows, the demand for raw materials for making chocolate will increase; plus, chocolate is one of the always available flavors and is the leading food, such as sweets or desserts. Indonesia's cocoa shortage is characterized by the unmet needs of the cocoa processing industry and declining production to date. Cocoa production in Indonesia is considered to have a bright and promising future, although it has recently decreased due to land conversion and crop conversion by farmers.

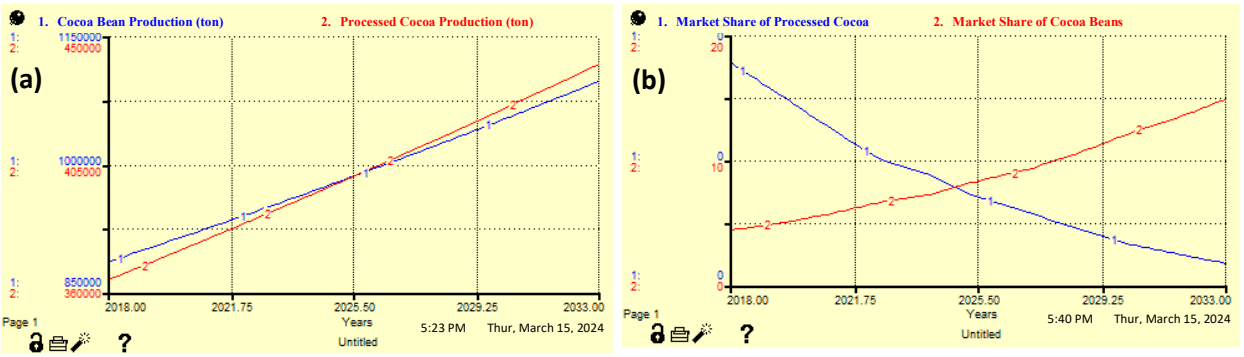

Figure 9. (a) Simulation 2 of Flat Duty Application on Cocoa Beans and Indonesian Cocoa Production. (b) Simulation 3. Market Share of Processed Cocoa and Cocoa Beans.

Simulation 2 (a) answers the question of the condition of cocoa beans and processed cocoa production after implementing export duty on cocoa beans. Along with several assistance policies and empowerment of cocoa farmers' human resources, replanting cocoa that has declined in productivity and the enthusiasm of farmers to cultivate cocoa due to increasingly competitive prices, making cocoa bean production increase to 850,000 tons and increase until the following year also support in Perdagangan (2024). In addition, the processed cocoa industry is currently experiencing growth, and the prospects for processed cocoa will remain strong as the raw materials for the industry in the form of cocoa beans are being replenished domestically. So, there is sustainability of production, and there are also bright prospects, as in Hermawan (2019).

Furthermore, simulation 3 (b) shows a decrease in the export share of processed cocoa due to the increase in the share of cocoa beans. When the 10% flat duty is applied, it will make farmers and exporters smarter in organizing and managing in the long term. The decline in the export share of processed cocoa does not rule out the possibility that it can still be increased through MSMEs. MSMEs, as an industry that can absorb processed cocoa products, will strengthen the competitiveness of processed cocoa in Permani, Vanzetti, and N. (2011). The absorption of the domestic MSME industry will increase, so Indonesia does not need to look for markets with high negotiations in the international market. Therefore, Indonesia can send and cooperate with countries that have long partnered to absorb processed cocoa from Indonesia.

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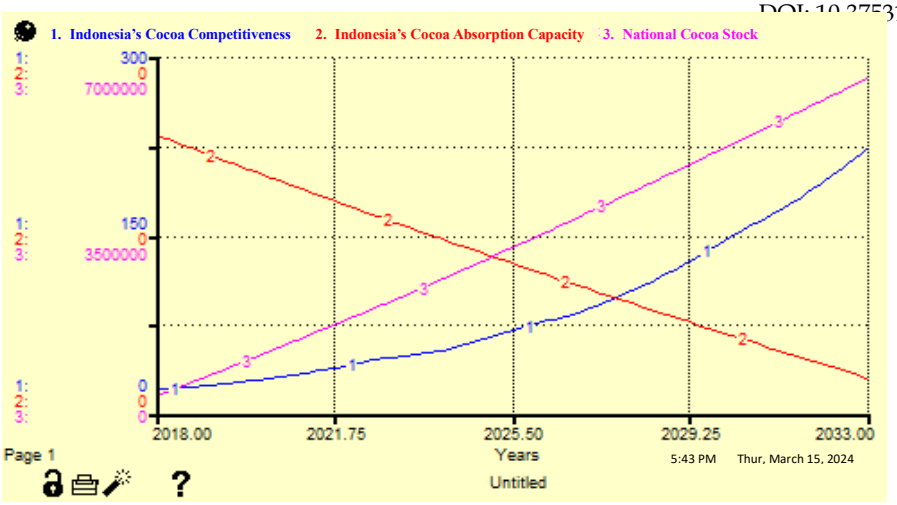

Figure 10. Competitiveness, Absorbability, and Stock Condition of Indonesia's National Cocoa Beans

From the above simulation, Indonesia's cocoa competitiveness will increase with the development of cocoa bean exports and domestic cocoa bean processing industries. This competitiveness is seen in the share of cocoa beans and Indonesian processed cocoa, as shown by Rifin (2012). However, from the simulation above, it can be seen that the absorption capacity of cocoa beans has decreased due to an increase in cocoa bean exports. This must continue to be considered, along with the development and increase of Indonesia's MSMEs and cocoa processing industries in David (2013).

In addition, increasing farmer revenue affects the performance of cocoa commodities in Indonesia. The upstream of cocoa is the farmer; when there is injustice or inequality upstream, it will damage the rest of the system and interfere with the success of achieving the desired target in (Haifan, 2015). Therefore, farmer revenue must be considered; implementing this flat export duty will increase farmer revenue as measured by the prevailing price at the farmer level. In the graph above, it can be seen that farmer revenue is at Rp. 15,473 / Kg. This increases every year from Rp—11,000 in 2018. The effect on production will be more positive, and crop conversion will have a negative effect. The higher the farmer's revenue, the lower the crop conversion for cocoa commodities.

CONCLUSION AND POLICY DESIGN

Applying a flat export duty of 10% will reduce the volume of exports periodically. The export duty policy increases the value of cocoa exports (Suryana et al., 2014) and (Maulana et al., 2017). The imposition of an export tax (export duty) on Indonesian cocoa beans significantly affects the increase in the value of Indonesian cocoa exports in the long term (Yudyanto et al., 2017; Permani, 2013). The competitiveness of Indonesian cocoa will be more than 1, which means it will affect the performance of cocoa at the world or international level and how this commodity can survive with several other competing countries such as Gadding Beach, Ghana, and Malaysia.

The export duty policy is implemented to increase the competitiveness of processed cocoa products in the international market. So, implementing the export duty policy is only intended to inhibit cocoa export in the form of cocoa beans. Cocoa

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beans that are not exported due to the implementation of the flat export duty are then processed and utilized by the domestic processing industry, resulting in the development of a downstream cocoa processing industry in the country. In addition to encouraging the reopening of the domestic cocoa processing industry, implementing the export duty on cocoa beans has also encouraged many foreign investors to invest in Indonesia.

More importantly, the increase in farmer revenue has increased cocoa farmers' happiness index and welfare. When the upstream of a cocoa agro-industry system is good, the system's sustainability and prospects will be good (Ameyaw et al., 2012). The increase in farmer revenue will undoubtedly affect the increase in production.

In this case, the ease of opening a chocolate processing industry in the form of MSMEs will significantly contribute to the absorption of cocoa bean production. This absorption aims to avoid the accumulation of stock and excess production so that it will not affect the price that is decreasing if there is an excess stock of raw materials for the Indonesian cocoa processing industry. Cocoa consumption programs or creative processing of chocolate and other food combinations will increase the absorption of cocoa beans.

Conflict of interest: There is no conflict of interest

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