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The Role of Cocoa Commodity as a Base Sector in Indonesia's Regional Development

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Abstract

Indonesia's cocoa commodity as one of the leading commodities, has the potential to improve the country's economy. However, the increasing export volume is not matched by the decreasing production due to the decreasing land area. This study aims to identify the mapping of cocoa regions, identify the structure and growth rate of cocoa, and examine the role of cocoa in supporting Indonesia's plantation activities. The research was conducted in 33 provinces of Indonesia using secondary data. The variables used are production and revenue of cocoa and plantation commodities in 2017-2023. The analytical tools used are Location Quotient (LQ), Dynamic Location Quotient (DLQ), Localisation and Specialisation analysis, Shift Share analysis (SSA), BSR analysis, RM, and Multiplier Effect. The results obtained from as many as 19 provinces are included in the base area with an LQ>1 value. The cocoa growth rate structure obtained that the value of National growth (PNij) is positive, Proportional growth (PPij) is negative, and Regional share growth (PPWij) is negative, so the average shift share value is positive and it is said that Indonesian cocoa is growing. The results of the analysis of the value of BSR, RM, and Multiplier Effect are positive so that Indonesian cocoa plays a role in supporting Indonesian plantations.

Keywords: Base region, cocoa, LQ, multiplier, shift share

INTRODUCTION

Cocoa commodity is one of the potential commodities owned by Indonesia because its production has been recognised in the world market. Indonesia is one of the world's cocoa producers and is ranked as the 5th world exporter. The average export volume of Indonesian cocoa (beans, intermediate as well as end products) is 377,059 tonnes/ year with an export value of 1,259,655 USD (Directorate General of Plantations, 2023). The growth of Indonesia's cocoa export volume (all products) experienced a positive growth of 2.47%, but in the same year 2019-2022 cocoa beans production decreased by -4.023%.

The main cause of the decline in cocoa beans production is the decrease in land area. It is also caused by low productivity and quality of cocoa, as well as cultivation management by farmers that is still not optimal (Tunggul *et al*., 2021). Each region in Indonesia has different cocoa beans production results, as seen from the way the region develops the cocoa commodity. Different cocoa beans production in each province will create cocoa commodity base areas, so that it can easily pay attention to which areas need to be prioritised

in supporting cocoa business development (Kusmiati & Windiarti, 2011).

In developing cocoa as a superior commodity, regional planning is needed, especially in the agricultural sector. Regional development planning must look at the potential and diversity of commodities owned by the region, so that development targets can be carried out appropriately (Setianto & Susilowati, 2014). If a superior commodity can play a role in supporting regional economic development, it means that the region is included in the base of a commodity (Zaini, 2019).

Research that examines the role of cocoa commodities as a basic sector in regional development using BSR, RM, and Multiplier Effect analysis has been conducted by Sari *et al*. (2014) and Pasaribu & Soetriono (2009), where in the results the role given by Besuki Na-Oogst commodities and rubber commodities shows that they are able to support the plantation sector in Indonesia. Other research discusses the structure and growth rate of plantation commodities using shift share analysis, which obtained several plantation commodities including cocoa experiencing an increase in real growth (Ronaldo *et al*., 2024).

Research on the role of cocoa commodity as a basic sector in regional development in Indonesia is still rare. Previous researchers found are still researching in specific locations in a region. Therefore, the objectives of this study are (1) to identify the mapping of cocoa base areas in Indonesia, (2) to identify the structure and growth rate of cocoa, and (3) to examine the role of cocoa in supporting plantation activities in Indonesia.

MATERIALS AND METHODS

The research was conducted in 33 provinces of Indonesia purposively with the consideration that Indonesia is a cocoa producing country and has a problem of declining production. The research method is descriptive quantitative using secondary data. The data used as research variables are bean production and revenue of cocoa and plantation commodities for 7 years (2017-2023), with 33 provinces in Indonesia. Data sources were obtained from the Central Bureau of Statistics and the Directorate General of Plantations. Some data analysis used to answer the research objectives are Location Quotient (LQ), Shift Share analysis (SSA), Basic Service Ratio (BSR), Regional Multiplier (RM), and Multiplier Effect.

Location Quotient (LQ) Analysis

Location Quotient (LQ) analysis is an analysis used to determine the contribution of an area said to be a base or non-base area of a sector. In this study, from the calculation of LQ analysis, the results will be obtained whether the cocoa commodity is a base or non-base commodity in each province in Indonesia with the formula used (Manuhutu, 2016):

$$LQ = \frac{vi/vt}{Vi/Vt}$$

Description:

L : Location Quotient
vi : Cocoa bean production in province i (tonnes)
vt : Total production of all plantation commodities in province i (tonnes)
Vi : Cocoa bean production in Indonesia (tonnes)
Vt : Total production of all plantation commodities in Indonesia (tonnes)

Decision-making criteria:

LQ ≥ 1 Province i is a cocoa base region. Cocoa bean production has been able to fulfil the needs in the region and even outside the region.

LQ < 1 Province i is a non-base region. Cocoa bean production is unable to fulfil the demand in its own region.

Shift Share Analysis (SSA)

SSA analysis is an analysis used to determine the effect of cocoa commodity production growth in Indonesia on cocoa in each region. SSA analysis is divided into three growth components, namely National Growth (PN), Proportional Growth (PP), and Regional Share Growth (PPW) (Soepono 1993). The three components when summed up are the results of SSA analysis, namely changes in cocoa commodities in each region or province of Indonesia. According to Prasetyo (1993), the following formula or equation is used in SSA analysis:

$$D_{ij} = PN_{ij} + PP_{ij} + PPW_{ij}$$

Description:

D_{ij} : Change in cocoa commodity in province i (*Shift Share* Value)
PN_{ij} : National growth of cocoa commodity in the province i
PP_{ij} : Proportional growth of cocoa commodity in the province i
PPW_{ij} : Growth in Regional Share of cocoa commodity in the province i

The results of the value of each component and shift share can then be drawn a decision, which is as follows:

D_{ij} (+) Cocoa commodity in the province i experienced growth
D_{ij} (-) Cocoa commodity in the province i has decreased
PP_{ij} (+) Cocoa commodity growth in the province i is higher than cocoa commodity growth in Indonesia
PP_{ij} (-) Cocoa commodity growth in the province i is lower than cocoa commodity growth in Indonesia
PPW_{ij} (+) Cocoa commodity is competitive in the province i
PPW_{ij} (-) Cocoa commodity is not competitive in the province i

Each component of the shift share analysis has a formula that can be calculated as below:

$$PN_{ij} = Ra \; x \; Yij$$

$$PP_{ij} = (Ri - Ra) \; x \; Yij$$

$$PPW_{ij} = (rij - Ri) \; x \; Yij$$

$$Ra = \frac{\Delta Yp' - \Delta Yp}{\Delta Yp}$$

$$Ri = \frac{Yip' - Yip}{Yip}$$

$$rij = \frac{Yij' - Yij}{Yij}$$

Description:

Ra : Production ratio of plantation commodities in Indonesia
$\Delta Yp'$: Indonesia's total plantation commodity production -in 2023 (tonnes)
ΔYp : Indonesia's total plantation commodity production in 2017 (tonnes)
Ri : Production ratio of cocoa commodity in Indonesia
Yip' : Cocoa bean production in Indonesia in 2023 (tonnes)
Yip : Cocoa bean production in Indonesia in 2017 (tonnes)
rij : Cocoa bean production ratio in province i
Yij' : Cocoa bean production in province i in 2023 (tonnes)
Yij' : Cocoa bean production in province i in 2017 (tonnes)

Shift share has advantages including being able to describe in detail the shift in the economic structure of a region, describing the relative position of each sector to the reference region, describing the leading

sectors that are encouraged to encourage economic growth, and describing sectors that are in a weak position. However, shift share also has several weaknesses, namely assuming that the reference economic sector grows at the same rate, and shifts in sector positions are considered linear (Suparmono, 2018) .

Analysis of Basic Service Ratio (BSR), Regional Multiplier (RM), and Multiplier Effect

The role of cocoa commodities in the development of Indonesia's plantation activities can be assessed based on cocoa base and non-base areas in Indonesia. The assessment can be used in BSR, RM, and Multiplier Effect analyses. Basic Service Ratio is a comparison between the base sector and the non-base sector in the region concerned. In this study, BSR analysis is used to compare the ability of cocoa commodities in production indicators to fulfil the needs in the base and non-base regions. The second analysis is the Regional Multiplier which is the relationship between the basic and non-basic sectors and their effects on the sector concerned in a region. RM analysis in this study aims to see the additional effect of the amount of cocoa production. The formula used to see the results of BSR and RM analysis is (Pasaribu & Soetriono, 2009) :

$$BSR = \frac{\Sigma \text{ Base sector}}{\Sigma \text{ Non-base sector}}$$

$$RM = \frac{\Sigma \text{ Base sector} + \Sigma \text{ Non-base sector}}{\Sigma \text{ Non-base sector}}$$

Description:

Σ Base Sector: Total cocoa production in the base region (tonnes).

Σ Non-base Sector: Total cocoa production in non-base areas (tonnes).

Multiplier effect analysis is used to see how the multiplier effect provided by a sector to other sectors in the short term. In this study, the multiplier effect analysis aims to identify the role of cocoa commodities in revenue indicators on regional income (Sari *et al.*, 2014) :

$$ME = \frac{1}{1 - \frac{YN}{Y}} \text{ or } ME = \frac{YB + YN}{YB}$$

Description:

ME: Multiplier Effect (Short Term Multiplier)
YB: Cocoa revenue in the base region (000 IDR/Kg)
YN: Cocoa revenue in non-base region (000IDR/Kg)

Decision-making criteria:

BSR, RM, ME >1 meaning cocoa commodities support the development of plantation activities in Indonesia

BSR, RM, ME <1 meaning that cocoa commodities do not support the development of plantation activities in Indonesia

RESULTS AND DISCUSSION

Mapping of Base Areas of Cocoa Commodity in Indonesia

Cocoa beans is produced in almost all provinces in Indonesia. This is evidenced by the fact that 33 provinces have cultivated and produced cocoa in their regions. Each province has its characteristics in developing the cocoa commodity in its region. Therefore, mapping is needed to see which regions are cocoa base areas. Nationally, based on LQ calculations, it is found that Indonesia is a cocoa base region as evidenced by LQ values of more than 1 (Figure 1).

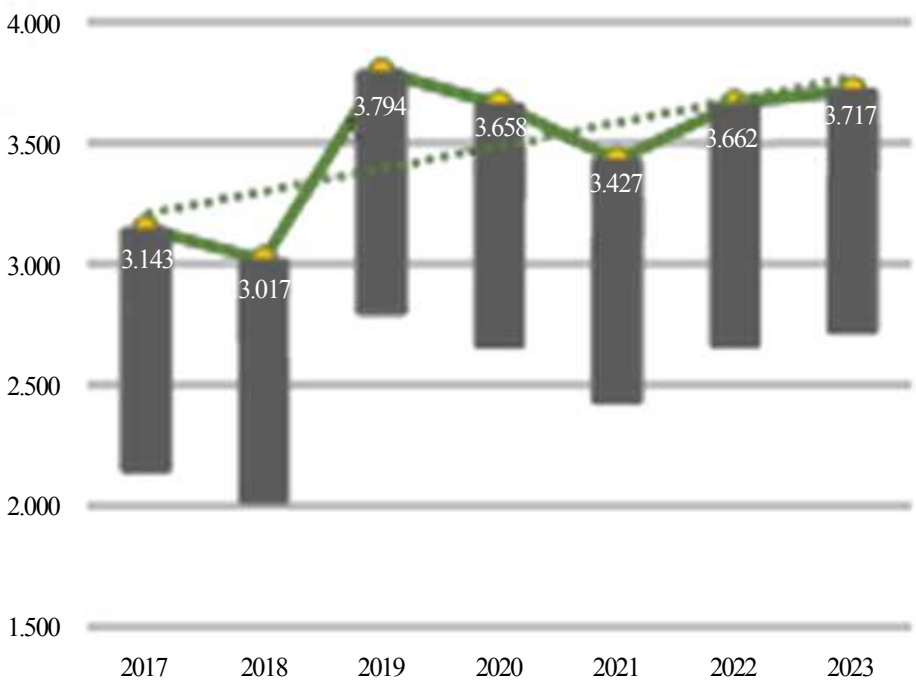

Figure 1. Trends in location quotient value of cocoa commodity in Indonesia (Source: Data processed, 2024)

The average LQ value of cocoa in the production indicator is 3.488 (LQ > 1) which means that Indonesia is a cocoa base country that is able to fulfil the needs of its region and even able to export to other countries. In 2023, the LQ value of 3.717 continued to exhibit a substantial increase, reaching 4.187 by 2028. Despite the decline in the area dedicated to cocoa bean production in Indonesia, there has been an observed increase in productivity, reaching 386 kg/ha in 2017 and 404 kilograms per hectare in 2023. Productivity is a characteristic of a commodity said to be superior (Julianto *et al.*, 2020). Consequently, it can be concluded that the development of cocoa in the province of Indonesia is feasible and has the potential to meet the needs of the region and other regions.

In Figure 2, 33 provinces in Indonesia, 19 provinces are categorised as cocoa base areas, as evidenced by LQ>1. The province with the highest LQ value is Southeast Sulawesi at 28.937, which means that Southeast Sulawesi Province is able to fulfil cocoa needs in its own region and outside the region. Factors determining an area to become a base are influenced by the level of crop productivity, climatic conditions in the region concerned, suitable planting land, and farmer skills in cultivation (Kusmiati & Windiarti, 2011).

There are 14 provinces in Indonesia that fall into the non-base cocoa category with the lowest LQ value in South Kalimantan Province (0.004). One of the reasons why a region is not a base for a sector is the reduction of cultivated land due to land conversion. Factors that cause farmers to change the function

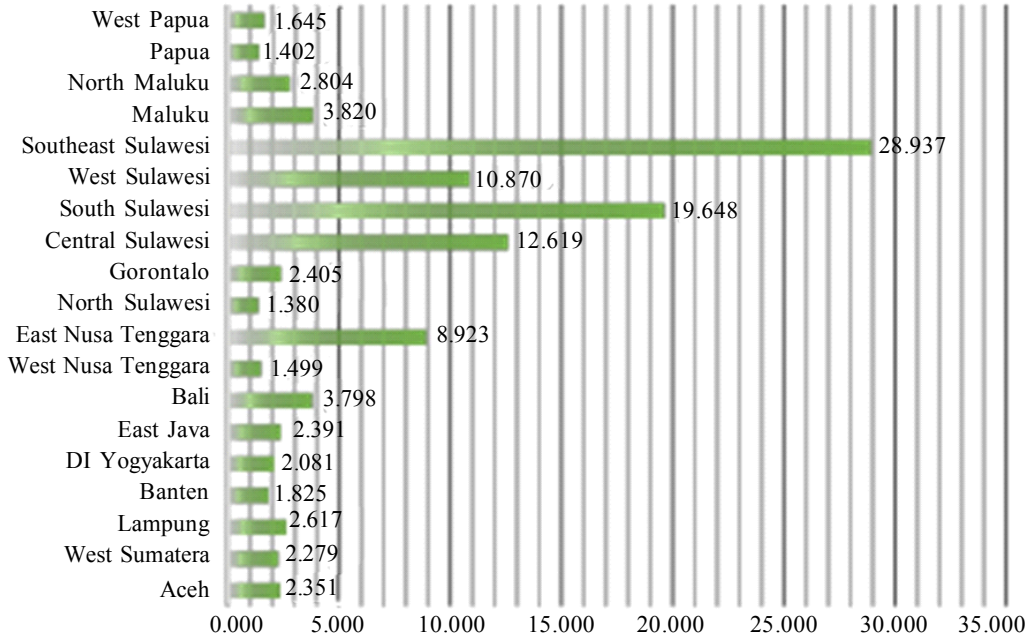

Figure 2. LQ Value of cocoa base areas in Indonesia 2017-2023 (Source: Data processed, 2024)

of cocoa land are floods and pest attacks that disrupt production (Prihantini *et al.*, 2024; Ariningsih *et al*., 2029).

Indonesian provinces that are cocoa base areas need special attention from the government. Cocoa base regions that have good opportunities need to maintain and develop cocoa bean production. This is so that in the future, the region that is currently a base will still be classified as a cocoa base region. This requires government policy support in terms of increasing production and added value of cocoa products to improve welfare for farmers and business actors involved (Rifani & Sa'roni, 2020) .

Structure and Growth Rate of Cocoa Commodity Production in Indonesia

Structure and growth rate aims to look at the growth of cocoa commodities in the province against the growth of cocoa in Indonesia. Shift share analysis is used to help explain the effect of a commodity in a higher region on commodities in a smaller region. Three components need to be seen to determine the shift share value in each region, namely the National Growth (PN), Proportional Growth (PP), and Regional Growth Share (PPW) components. If the three components are summed up, it will produce the value of the shift share itself. According to Goschin (2014), shift share analysis explains a dynamic picture of the contribution of factors affecting national growth, proportional growth that grows faster or slower, and its competitive advantage. Cocoa commodity is said to occur growth in a region if the shift share value is positive, and vice versa if the cocoa commodity has decreased then the resulting shift share value is negative. The following are the results of the calculation of shift share analysis on cocoa commodity production in Indonesia.

4.3.1 National Growth (PN)

The national growth component aims to see the effect of plantation commodity growth in Indonesia on plantation commodities in each province. Nationally, the total national growth value of plantation commodities in Indonesia in 2017-2023 gave a positive contribution of 183,560 (Table 1). The positive value can be attributed to the substantial growth in plantation commodity production in Indonesia between 2017 and 2023. The average annual growth rate was recorded at 4.90%, indicating a consistent and significant increase in the production of plantation commodities in Indonesia on an annual basis. The results of the calculation of the national growth component in all provinces also obtained a positive value, which means that plantations in each province experienced higher growth than plantations nationally. This finding aligns with the research by (R.H. Bangun, 2017), which indicates that the growth of plantation commodities in North Sumatra exceeds the national average, signifying a positive trend. The findings of the research conducted by Ronaldo *et al*. (2024) indicate that cocoa commodities in Jambi Province exhibit a positive National growth value.

4.3.2 Proportional Growth (PP)

The proportional growth component can see the effect of cocoa commodity growth in Indonesia on cocoa in each region. Nationally, the total Proportional Growth value of cocoa commodities in Indonesia made a negative contribution of -75,025. Conversely, the Indonesian cocoa bean market exhibited a decline in production growth during the 2019-2022 period, with a recorded decrease of 3.34%. A comprehensive analysis of the data reveals that all provinces exhibit negative PP values, indicating that the growth rate of cocoa bean production in a province is lower than the growth rate of cocoa in Indonesia (Table 1). As posited by Purba *et al*. (2023), the discrepancy in proportional growth value is attributable to the availability of inputs, policy divergences, and market structure in each region. The government's capacity to formulate suitable development strategies is contingent upon recognizing the heterogeneity inherent in each region. Such strategies may encompass a range of initiatives, including the augmentation of production, the expansion of market reach, technological innovation, the cultivation of farm-level skills, and the development of infrastructural facilities. These measures are designed to stimulate the growth of specific commodities (Marina *et al*., 2024). Research conducted by Ronaldo *et al.* (2024) also stated that the cocoa commodity in Jambi Province has a negative proportional growth value of -60.05, indicating a decline in cocoa bean production compared to the national average.

4.3.3 Regional Share Growth (PPW)

The regional share growth component shows the competitiveness of cocoa commodities in each region. The concept of competitiveness in question is competitive advantage. Competitive advantage is a region that has an advantage over other regions in terms of offering products with greater value at lower prices and being able to provide higher benefits. Based on the calculation of PPW, it is found that Indonesia as a whole has a PPW value of 0, which means that cocoa commodities in Indonesia do not have a competitive advantage. Previous research has found that cocoa commodities in the East Balikpapan Sub-district area do not have competitiveness due to a decline in productivity caused by low human resources and

low selling prices (Safitri *et al*., 2020). In several other areas in research by Mubarak *et al*. (2022) also stated that cocoa is not competitive when compared with other plantation commodities.

In contrast to the results of other studies that cocoa commodities have competitive competitiveness in the Mentawai Islands Regency (Suryani, 2024) and Aceh Province (Samosir *et al*., 2023). Cocoa commodities located in 17 provinces are known to have no competitiveness (negative PPW), while cocoa that has competitiveness is located in 16 provinces (positive PPW). The province with the highest cocoa competitiveness is in Central Sulawesi at 13,008.24, while the lowest competitiveness is in South Sulawesi at -23,525.28. Central Sulawesi which is known as a cocoa production centre with the highest PPW value, indicates an increase in cocoa competitiveness compared to other provinces. Recorded during 2017-2023 the average cocoa production of Central Sulawesi is able to produce 123,793 ton/year with an average existing cocoa land area of 277,391 ha/year (Directorate General of Plantations, 2023). According to Ariyanto *et al*. (2024) a sector or commodity that has a competitive advantage in a region has the potential to be developed, so it requires the main attention of the government to provide facilities to develop and accelerate economic growth in the region concerned.

Another case with the province with the lowest competitiveness is South Sulawesi with a PPW value of -23,525.28. This shows that South Sulawesi does not have competitiveness in cocoa commodities. This is because although South Sulawesi is included in the centre of cocoa production in Indonesia, based on the data obtained, the value of cocoa exported abroad has decreased every year. During 2017-2022 the growth in export value was -34.092 million USD. Initially, in 2016 South Sulawesi was able to export cocoa worth 159.56 million USD, but as the years increased until 2022 it dropped dramatically to 8.86 million USD. This decline in export value was caused by the decline in cocoa production. The decline in production was due to the impact of extreme weather changes in South Sulawesi which made cocoa plants vulnerable to pests and diseases (Badan Pusat Statistik Provinsi Sulawesi Selatan, 2024).

After examining each of these components, the value of shift share can then be determined. The shift share value is obtained from the combination of National Growth, Proportional Growth, and Regional Share Growth. In 2017-2023 based on the results of the shift share analysis, cocoa commodity production in Indonesia experienced growth. This is evidenced by a positive total shift share of 108,535.00 (Table 1). The results of previous research also stated that the cocoa commodity in Aceh Province is included in the advanced and fast-growing sector with a positive shift share value (Samosir *et al*., 2023). In addition, agricultural commodities as a whole experienced an increase or rapid growth in Indramayu Regency (Faqih, 2021).

A total of 21 provinces with positive shift share values indicate that cocoa production is growing. While 12 provinces with negative shift share values mean that cocoa production has decreased. Problems that occur that cause cocoa to have declining growth include (1) pest and disease attacks that still cannot be handled optimally due to the lack of knowledge of farmers, causing a decrease in productivity (Masitah & Hasbiadi, 2022), (2) the number of cocoa trees that are not able to be handled optimally due to the lack of knowledge of farmers. Hasbiadi, 2022), (3) the number of unproductive cocoa trees or classified as old and not producing, (4) the low quality of cocoa beans which has an impact on the selling price,(5) the behaviour of farmers who do not focus on cultivating cocoa because of the many other livelihoods that must be done, (6) information and technology that is

Table 1. Results of shift share analysis of cocoa commodity in Indonesia 2017-2023

No.	Province	Regional share (N_{ij})	Proportional shift (M_{ij})	Differential shift (C_{ij})	*Shift share* (D)
1	Aceh	8,532.40	-3,487.38	8,784.98	13,830.00
2	North Sumatra	7,649.25	-3,126.42	7,809.17	12,332.00
3	West Sumatra	14,518.83	-5,934.16	-11,658.66	-3,074.00
4	Riau	1,084.44	-443.23	-3,092.20	-2,451.00
5	Riau Islands	0.31	-0.13	13.81	14.00
6	Jambi	187.13	-76.49	236.35	347.00
7	South Sumatra	956.75	-391.04	471.30	1,037.00
8	Bangka Belitung	55.67	-22.75	145.08	178.00
9	Bengkulu	995.75	-406.98	-83.76	505.00
10	Lampung	10,842.49	-4,431.57	16,028.07	22,439.00
11	West Java	738.47	-301.83	-1,941.64	-1,505.00
12	Banten	670.54	-274.06	-493.48	-97.00
13	Central Java	573.67	-234.47	-567.20	-228.00
14	DI Yogyakarta	389.37	-159.14	301.78	532.00
15	East Java	8,485.22	-3,468.10	-9,862.13	-4,845.00
16	Bali	1,133.82	-463.42	518.60	1,189.00
17	West Nusa Tenggara	485.61	-198.48	822.87	1,110.00
18	Nusa Tenggara Timur	4,248.43	-1,736.43	4,794.00	7,306.00
19	West Kalimantan	596.00	-243.60	-343.40	9.00
20	Central Kalimantan	195.31	-79.83	895.52	1,011.00
21	South Kalimantan	19.81	-8.10	-16.72	-5.00
22	East Kalimantan	568.01	-232.16	351.15	687.00
23	North Kalimantan	278.66	-113.89	-48.76	116.00
24	North Sulawesi	362.63	-148.22	3,973.58	4,188.00
25	Gorontalo	1,207.10	-493.37	-1,566.73	-853.00
26	Central Sulawesi	31,636.15	-12,930.39	13,008.24	31,714.00
27	South Sulawesi	31,261.57	-12,777.29	-23,525.28	-5,041.00
28	West Sulawesi	17,088.39	-6,984.40	7,036.01	17,140.00
29	Southeast Sulawesi	29,196.48	-11,933.24	-2,325.24	14,938.00
30	Maluku	2,840.99	- 1,161.17	-2,434.81	-755.00
31	North Maluku	2,681.85	-1,096.13	-1,980.72	-395.00
32	Papua	2,501.94	-1,022.60	- 372.34	1,107.00
33	West Papua	1,576.96	-644.54	-4,877.42	-3,945.00
	Total Indonesia	183,560.01	-75,025.01	0	108,535.00

still low and has an impact on the cultivation process to be hampered (Jaweng *et al*., 2016).

Central Sulawesi Province is still the most superior province in producing cocoa as evidenced by producing the highest values of PN (12,930.39), PPW (13,008.24), and shift share (31,714.00) among other provinces. The values obtained are due to the production factors and productivity of cocoa commodities in Central Sulawesi. Cocoa produced in Central Sulawesi is the highest production in Indonesia during 2017-2023 with a total of 871,259 tonnes. Central Sulawesi contributes 17.43% of cocoa production to national production (Ministry of Agriculture, 2022). The achievement of cocoa productivity targeted by (Central Sulawesi Province Plantation and Animal Husbandry Office, 2022) is included in the very high category, which means that the realisation of cocoa productivity level has been achieved by 93% or 699 kg/ha.

The Role of Cocoa Commodity in the Indonesian Economy

Cocoa commodity is one of Indonesia's leading commodities whose products are able to reach the international market. So that cocoa commodity can be said as a contributor to foreign exchange or the country's economy. The role of the cocoa commodity in advancing the economy through plantation activities in Indonesia can be seen from the development

of the region as a result of base sector activities. Provinces in Indonesia that are included in the cocoa commodity base area can have a direct or indirect influence on the development of Indonesian plantation activities. The role of the cocoa commodity as a regional base sector has an impact on plantation activities and the Indonesian economy through the calculation of several analyses, namely the Basic Service Ratio (BSR), Regional Multiplier (RM), and Multiplier Effect.

4.4.1 Basic Service Ratio (BSR)

The carrying capacity of cocoa base areas for plantation activities in Indonesia can be determined through BSR analysis. BSR analysis can show the level of increase received by the base region as a result of an increase in cocoa commodity production. The BSR value is obtained from the ratio of cocoa production in the base region to the non-base region. Thus, based on Figure 3, the BSR value of the cocoa commodity in Indonesia shows a fluctuating trend throughout 2017-2023 with an average of 10.609.

The BSR value generated during 2017-2023 shows a positive value of more than 1 (Figure 3). This means that cocoa base areas in Indonesia are able to fulfil the needs of non-cocoa base areas. Cocoa cultivation has been able to support Indonesia's plantation economy. The highest BSR value occurs in 2018 at 11.908, which means that every 1 part of cocoa commodity production is used to fulfil development needs in the base region, while 10.908 is used to fulfil cocoa development needs in the non-base region. The year of 2021 where BSR produces the lowest value compared to other years, which is 9.429. This means that cocoa production will be used to fulfil development needs in the base region by 1 part, while the remaining 8.429 is used to fulfil development needs in the non-base region.

Similar to the results of previous studies that other plantation commodities such as coffee in the Aceh Provincearea also produce BSR values of more than 1, so it can be said that coffee commodities are able to support plantation activities and regional

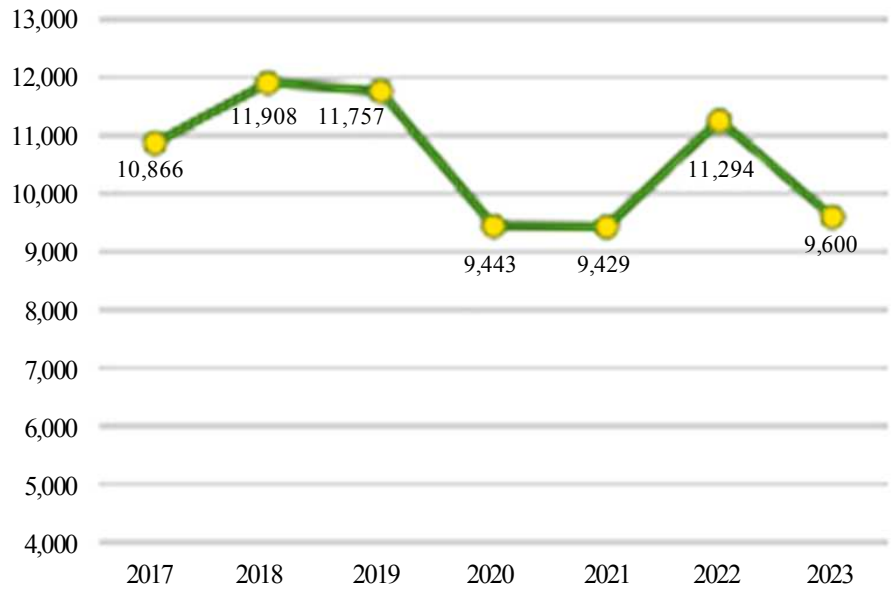

Figure 3. The development of basic service ratio value of Indonesian cocoa commodity 2017-2023 based on production

development in Aceh Province(Zikria, 2020). The development of different BSR values each year can be influenced by production demand factors from its region. In addition to its region, demand from other regions to abroad is also a consideration of the increase in BSR value (Kusmiati & Windiarti, 2011). Because basically Indonesian cocoa is one of the commodities that has export potential to other countries. This is evidenced by the development of the BSR value during 2020-2023, where in 2020 it was 9.443 and continued to increase to 11.259 in 2022, and then stepped on in 2023 and dropped dramatically to 9.600.

Judging from the demand for Indonesian cocoa export volume to the world market has a unidirectional development, where in 2020 the volume of cocoa exports amounted to 377,849 tonnes (all products) continues to increase until 2022, amounting to 385,421 tonnes, then stepping on 2023 has decreased to 339,989 tonnes (Directorate General of Plantations, 2024). The BSR value, which is getting higher and stays above 1, indicates that Indonesia has the potential to provide cocoa commodities to regions in need, or in other words, is able to meet the demand from other regions. Therefore, to maintain the BSR value, the government must implement policies to continue to increase cocoa production in the future.

4.4.2 Regional Multiplier (RM)

RM analysis, which is an integral part of BSR analysis, aims to illustrate directly and indirectly the relationship between the base sector and its addition. Any increase in the base area will have the effect of increasing the non-base area. RM value is obtained from the ratio of total cocoa production in the base and non-base areas to total cocoa production in the base area. The analysis results in the study also show that the RM value of the cocoa commodity fluctuates (Figure 4).

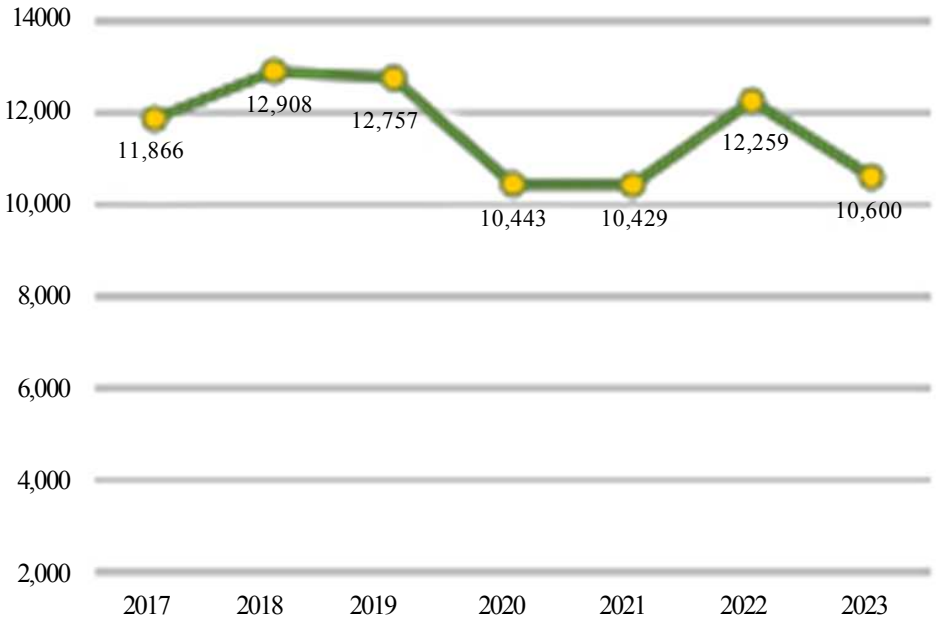

Figure 4. Development of regional multiplier value of Indonesian cocoa commodity 2017-2023 based on production

Based on the results of the RM analysis in Figure 4, it is known that throughout the study years 2017-2023, the RM value is above 1, which means that the cocoa base sector provides an additional effect in supporting Indonesia's plantation development. The average of the RM results of the Indonesian cocoa commodity for the 7 years is 11.609. The higher the RM value, the higher the possibility of regional growth arising from the base sector, in this case, cocoa production in the base area. It can be seen that based on the results of the production LQ analysis, out of 33 Indonesian provinces, 19 provinces are cocoa base areas, while the remaining 14 provinces are cocoa non-base areas (Table 1). In line with the results of research submitted by Zikria (2022), where the cocoa commodity in Parigi Moutong Regency produces an RM value greater than 1, which means that the cocoa commodity is able to support plantation economic activities in the form of multiplier effects caused to the surrounding area. Other research results on other commodities such as coffee, also state that the existence of coffee farms in North Tapanuli Regency has the effect of supporting regional economic activities (Bangun, 2020).

According to Bangun (2020), the multiplier effect generated from the activities of a commodity can be in the form of increased community income and labour absorption in the agricultural sector and other sectors. The high and low value of RM that fluctuates every year is strongly influenced by the amount of cocoa production from the base and non-base areas. The highest value occurred in 2018 at 12.908, which means that 1 part of cocoa production is used for the needs of the base region, while the other 11.908 part is an additional effect on the non-base region. Factors affec-ting this condition are seen from the level of production in 2018, where cocoa commodity production in Indonesia tends to be greater than cocoa production in the base region.

In 2018 Indonesia's total cocoa production was 767,280 tonnes, while cocoa production in the base region was 707,840 tonnes, which is precisely located in 19 provinces of Indonesia. In contrast, the lowest value generated from RM occurred in 2021 at 10.429. Every 1 part of cocoa production will be used for the needs of the base region, and 9.429 parts are an additional effect on the non-base region. This condition is caused by the cocoa production in Indonesia and the base region in 2021 is not much different, or it can be said that the cocoa production in the base region is able to balance the total cocoa production in Indonesia.

4.4.3 Multiplier Effect

Cocoa commodity is one of the leading commodities in demand by foreign markets, which certainly has an important role in improving the economy of the Indonesian region. In knowing how the role of the cocoa commodity is able to have an impact on improving the Indonesian plantation economy, it can be seen from the indicator of the amount of revenue obtained. The concept of the multiplier effect is aimed at seeing the multiplier effect of revenue in the short term provided by the cocoa commodity on revenue in the plantation subsector. The multiplier effect is obtained by looking at the amount of cocoa revenue from base and non-base areas. The assumptions used in the analysis of short-term multiplier effects on revenue indicators are that local investment, income, and community expenditure are fixed. The results of the calculation of the multiplier effect obtained a fluctuating value (Figure 5).

The value of the multiplier effect in the short term in the research years 2017-2023 obtained an average of 1.224. During the 7 year period, the value of the multiplier effect on cocoa commodities all obtained a value greater than 1, which means that cocoa

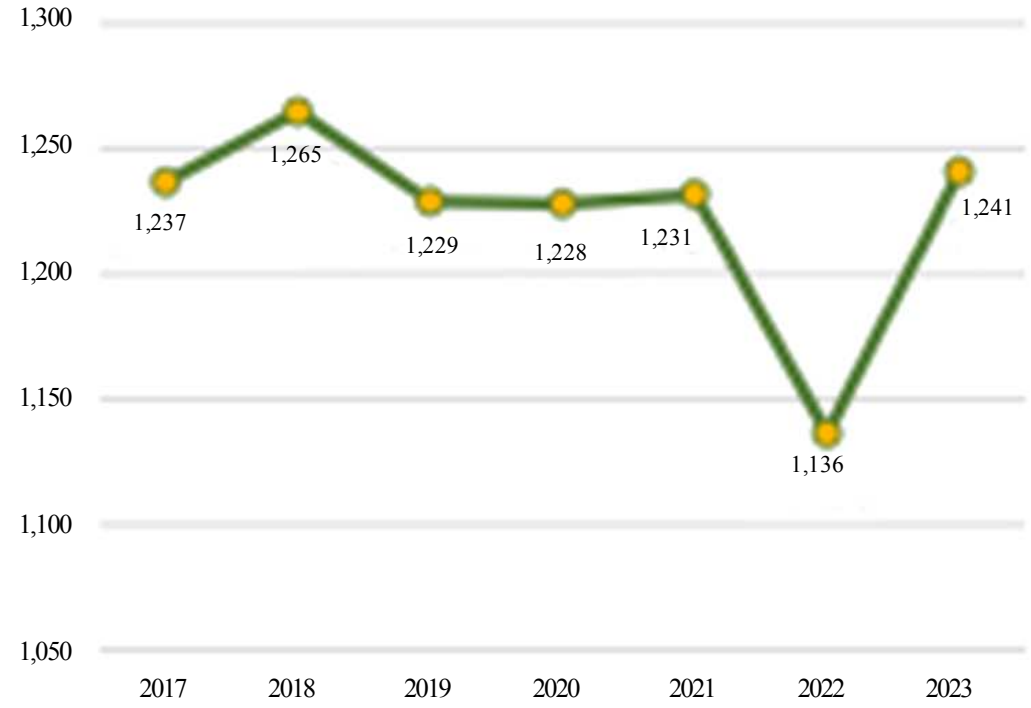

Figure 5. Development of Indonesia's cocoa commodity multiplier effect value 2017-2023 based on revenue

commodities provide a multiplier effect in the form of revenue, so as to provide support in Indonesia's plantation economic activities. Figure 5 also shows the trend of the multiplier effect value which tends to fluctuative. The highest value of the multiplier effect is 1.265 in 2018. This value if interpreted in the short term every revenue generated by the cocoa commodity of IDR1 is able to provide a multiplier effect of IDR1.265 on regional income. Meanwhile, the lowest value occurred in 2022 at 1.136, which means that each cocoa revenue of IDR1 will provide a multiplier effect of IDR1.136 on regional income in the short term. In line with similar research, where the impact of demand in the agricultural sector can have a multiplier effect of 14.5 billion on increasing economic income in Tanggamus Regency (Irfan Affandi *et al.*, 2023).

The trend movement of the Multiplier Effect value is partly due to the movement of Indonesian cocoa prices at the producer level, which fluctuate and tend to increase, causing the value of revenue obtained to also increase. In 2017, the cocoa price was IDR21,110/kg and increased to IDR22,925/kg in 2018. Subsequently, a surge was observed in 2023, with a rise to IDR28,477/kg from the preceding year's value of IDR22,989/kg. The rise in Indonesian cocoa prices can be attributed, at least in part, to the corresponding rise in global cocoa prices. In 2027, the price of cocoa reached USD2.03/kg, and by 2018, it had increased to USD2.29/kg. Consequently, in 2023, it underwent a further increase, reaching USD3.28/kg from the USD2.39/kg recorded in 2022 (Directorate General of Plantation, 2024). The escalation in cocoa prices can

be attributed to the mismatch between the supply of cocoa and the mounting demand. According to the International Cocoa Organization (2024), world market demand for cocoa beans has exhibited an upward trend, with a recorded increase from 4,576,000 tonnes in 2017 to 5,050,000 tonnes in 2022 and 4,751,000 tonnes in 2023. This increase in demand has had ramifications for cocoa exporting countries, such as Indonesia, which has also increased its cocoa prices.

The value of the multiplier effect that fluctuates and tends to increase is influenced by the price and production of cocoa commodities. In order to maintain stability and increase the value of the multiplier effect, several implications need to be made, including maintaining the stability of cocoa prices at the farm level and maintaining production in order to meet demand, so that the revenue that will be obtained later is also stable and remains profitable. In addition to increasing cocoa production, it is imperative to enhance the quality of facilities and infrastructure that support cocoa agribusiness activities. These enhancements can contribute to revenue augmentation and economic growth within the community (Kilateng *et al.*, 2017). A sector that is able to play a role or have a positive impact on other sectors should receive the main attention for development. In this case the role of the government is needed to focus on empowering sectors that are able to provide a multiplier effect for other sectors so that they always increase every year (Renatha, 2022).

Based on the results of the three analyses, namely BSR, RM, and Multiplier Effect, conclusions can be drawn. The cocoa commodity in Indonesia is able to support the economic development of plantation areas in Indonesia. This is evidenced by the results of the BSR, RM, and Multiplier Effect values which are more than one. Although fluctuating, but throughout 2017-2023 was able to survive with a value above 1. So it shows that the cocoa commodity in Indonesia has the potential to continue to be developed in the future with the aim of improving the Indonesian economy, both through fulfilling national and foreign demand.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Mapping of cocoa beans production in 33 Indonesian provinces resulted in 19 provinces being cocoa base areas and 14 provinces being non-cocoa base areas. Southeast Sulawesi is the province with the highest LQ due to the availability of technological and institutional innovation facilities.

Based on a combination of the National Growth (PN), Proportional Growth (PS), and Regional Share Growth (PPW) values, cocoa beans production in 21 provinces experienced growth, while 12 provinces experienced a decline due to pest attacks, many unproductive cocoa trees, low cocoa bean quality, farmers' lack of focus in cocoa cultivation, and low technological information.

The role of Indonesia's cocoa commodity shows that it is able to support the economic development of Indonesia's plantation regions. RM value tends to decrease due to declining cocoa production. While the Multiplier Effect value tends to increase because cocoa revenues are increasing due to the increase in cocoa prices from year to year.

Recommendations

Provinces that are cocoa bases have good potential in promoting cocoa, so the government needs to focus on implementing policies to increase production through extensification or expansion of cocoa land, providing facilities in the form of superior

cocoa seeds or certified seeds so that cocoa always has a prospective in the future.

Farmers as business actors who produce cocoa, especially in the base area, are expected to continue to improve their farming skills to obtain better human resource productivity by attending training and guidance from local extension services.

Indonesia's cocoa price, which tends to increase, needs to be stabilised by increasing production. Maximum increase in cocoa production aims to fulfil the demand for cocoa both domestically and abroad. Because if demand increases while production is insufficient, it will have an impact on the increase in cocoa prices.

Improved cocoa processing skills into derivative products that produce high quality and added value. This will minimise the sale of cocoa as raw materials at a lower price, to semi-finished or finished materials at a higher price.

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