# ANALYSIS OF LEADING COMMODITIES OF PLANTATION CROPS SUBSECTOR IN NORTH ACEH DISTRICT

**Ade Firmansyah Tanjung[*1], Emmia Tambarta Kembaren[2], Suryadi[3], Hafni Zahara[4] , Nadila Agustina[5] , Nanda Juniarni Putri[6]**

[1,3,4,5,]Agribusiness Department, Malikussaleh University, Indonesia
adefirmansyahtanjung@gmail.com*
emmia.tambarta@gmail.com
suryadi@unimal.ac.id
hafni.zahara@unimal.ac.id

**Abstract**

This study aims to analyze the leading commodities and potential of plantation crop subsector in North Aceh Regency. Data and information obtained in this study were analyzed using quantitative methods with Location Quotient (LQ) and Klassen Typology data analysis. In terms of commodity production at the level of North Aceh Regency in the last 4 years from 2018 to 2021 that has consistently increased is oil palm, cocoa, coconut, coffee, while for rubber plants it has experienced situations of increase and decrease in recent years. Based on the results and discussion for the LQ of core plantation commodities in North Aceh Regency, namely for the base there are 2 commodities, coconut and oil palm, while for non-base there are 3 commodities, namely rubber, cocoa and coffee. For the class typology of core plantation commodities in North Aceh Regency, quadrant I is palm oil, quadrant II is coconut, quadrant III is cocoa, and quadrant IV are rubber and coffee.

**Keywords:**
Clasterization,
Commodities,
Potential

## INTRODUCTION

The utilization of the agricul
some people in Aceh Province, esp
economy is partly still dependent on

According to the Aceh Agriculture and Plantation Office (2021) commodities, especially rubber, coconut, oil palm, coffee and cocoa, as well as nutmeg, areca nut, pepper, patchouli, cloves, sugar cane and tobacco are superior plantation commodities that are recognized in the world market. Of the 21 commodities developed in Aceh Province, there are 12 (twelve) main assisted commodities, namely: rubber, coconut, oil palm, coffee, cocoa, cloves, pepper, cashew, sugar cane, tobacco, nutmeg and areca nut.

Table 1. Production of the main commodities of the plantation crops sub-sector in the province of Aceh over the past 10 years

| Year | Production Data of Core Plantation Commodities (Tons) | | | | |
|---|---|---|---|---|---|
| | Palm Oil | Rubber | Cocoa | Coconut | Coffee |
| 2013 | 355366 | 75375 | 34795 | 55434 | 48282 |
| 2014 | 375826 | 69948 | 43749 | 63099 | 44343 |
| 2015 | 385175 | 68809 | 44542 | 63702 | 47444 |
| 2016 | 399618 | 69169 | 42889 | 62752 | 65231 |
| 2017 | 437292 | 66671 | 39296 | 62832 | 68493 |
| 2018 | 440087 | 64926 | 39295 | 63500 | 70774 |
| 2019 | 441603 | 45420 | 41093 | 63772 | 72652 |
| 2020 | 444436 | 63854 | 41648 | 63769 | 73419 |
| 2021 | 456426 | 63736 | 40724 | 66434 | 74329 |
| 2022 | 459727 | 61597 | 36596 | 62778 | 70353 |

*Source: Central Agency of Statistics of Aceh Province, 2013-2023*

From Table 1 production data that commodities that have increased production in the last 10 years from 2013 to 2022 there are only 3 commodities namely oil palm, coconut and coffee. For oil palm commodities in 2013 the amount of production was 355366 tons / year until in 2022 the amount of production increased to 459727 tons / year. For coconut commodities in 2013 with a total production of 55434 tons / year and in 2022 the amount of production increased to 62778 tons / year. For coffee commodities in 2013 the amount of production was 48282 tons / year and in 2022 the amount of production increased to 70353 tons / year. Meanwhile, rubber commodities have experienced a consistent decline continuously in the past 10 years. The rubber commodity in 2013 the amount of production reached 75375 tons/year, then could not maintain the amount of production until it decreased with the achievement in 2022 the amount of production of 61597 tons/year. In general, there are many things that are often a

challenge for rice farmers in increasing their production, ranging from production input problems to product output (Tanjung et al., 2022). although the revenue and cost of farming are in accordance with the desired, it is also very important to increase the planting area and increase capital, especially for farmers who have a narrow planting area so that income has more impact on welfare. To realise the welfare of farmers starts with increasing the economic value and feasibility of income received in accordance with the living needs of farming households, If the income earned by farmers decreases, it can lead to uncertainty about the welfare of farmers, which can lead to the phenomenon of encouraging the conversion of agricultural land (Tanjung et al., 2023). The high cost of production inputs also participates in affecting the stability of income feasibility, especially those who are still classified as farmers with a small scale of land area. (Tanjung et al., 2022). the agriculture forestry and fisheries sector is the best sector that can absorb labour and can improve the welfare of people living in the village (Akbar et al., 2023).

In contrast to cocoa commodities that experience a tendency to fluctuate, the production data shows that in 2013 production was 34795 tons / year until 2015 it increased with the achievement of production of 44542 tons / year, then decreased in 2016 with the achievement of the amount of production of 42889 tons / year until it continued in 2018 with the amount of production of 39295, after which it increased again in 2019 production with the achievement of the amount of production of 41093 tons / year until 2020 to 41648 tons / year, but the increase in production was not so great in that year so it decreased again in 2021 until 2022. The relatively low-efficiency level likely causes the decline in production, so it becomes the central focus seen from the production side, as well as technical efficiency, allocative efficiency, and economic efficiency simultaneously. Efficiency will not only encourage optimal production, but it will also reduce production costs and increase farmers' income (Adhiana et *al.*, 2024). If the increase in the community invests, the greater the hope of increasing economic growth (Harahap et al., 2023). Competition in the industry is also getting tougher, making business actors must be responsive to properly understand what types of products are actually needed by the market (Fadli et al., 2024).

Data on the increase and decrease in production of a commodity is a form of analysis of the description of temporary conditions related to opportunities and potential commodities that will have the opportunity to become superior commodities. With the analysis of several conditions by looking at the development of production data that occurred as well as the state of production increase, then the decline in production and production fluctuations that occurred in the Aceh Province region, it turned out that the situation also occurred in North Aceh District in the last 10 years. For the overall production data of core plantation crop commodities can be seen in the following table:

Table 2. Production of core commodities in the plantation subsector in North Aceh District

| Year | Production Data of Core Plantation Commodities (Tons) | | | | |
|---|---|---|---|---|---|
| | Palm Oil | Rubber | Cocoa | Coconut | Coffee |
| 2013 | 39156 | 4500 | 3222 | 9586 | 187 |
| 2014 | 39348 | 4950 | 3752 | 10593 | 224 |
| 2015 | 39434 | 4977 | 3801 | 10720 | 226 |
| 2016 | 39643 | 4992 | 3676 | 9931 | 220 |
| 2017 | 48361 | 5359 | 3676 | 9931 | 917 |
| 2018 | 48812 | 5344 | 3670 | 9917 | 915 |
| 2019 | 48813 | 3844 | 3704 | 9917 | 920 |
| 2020 | 48688 | 5326 | 3704 | 9917 | 920 |
| 2021 | 61223 | 4971 | 3816 | 9960 | 923 |
| 2022 | 54967 | 4380 | 3327 | 9950 | 923 |

*Source: Central Agency of Statistics of Aceh Province, 2013-2023*

The production data table explains that some of the core commodities of the plantation crop subsector have consistently increased production in the last 10 years starting from 2013 to 2022 such as oil palm, coconut and coffee commodities. The oil palm commodity in 2013 the amount of production was 39156 until 2021 increased to reach a production of 61223 tons / year, although there was a slight decrease in production in 2022 the amount of production became 54967 tons / year. For coconut commodities in 2013 the amount of production was 9586 tons / year, then in 2022 the amount of production was 9950 tons / year. For coffee commodities consistently increased in 2013 the amount of production of 187 tons to 2022 the amount of production of 923 tons / year. As for the other 2 commodities, the production situation fluctuates but the tendency is towards a decrease in production such as cocoa and rubber.

When viewed from these two data between the overall production data of the region in the Aceh Province and the overall data of the region in North Aceh District in the last 10 years, it is suspected to have a similar situation of development and production growth of each core commodity of the plantation crop subsector. But of course, the development and growth also varies between each commodity which in the end will also determine the commodity is a leading or basic sector in the area. The speed of development and growth of commodity production depends on the potential and opportunities of commodities in the production area and of course each commodity is

different. The establishment of this production center area can help in planning, managing, and developing a sustainable agricultural sector, based on the needs and availability of resources (Fastabiqul, 2020).

Determination of non-base production center areas is also needed as a basis for analyzing commodity development potential, knowing sectors that have competitiveness and excellence, can find out sectors that have the potential to be further developed by utilizing existing resources, can determine budget allocation priorities, human resources, and supporting facilities to improve the performance of base sectors and formulate appropriate strategies, programs, and policies to develop base and non-base sectors (Ayuna, 2020).

This research is to analyze the leading commodities and potential of the plantation crop subsector in North Aceh District. By identifying the determination of superior commodities and the potential of each core commodity of the plantation crop subsector, this can certainly be a suggestion for the government or interested parties in determining the right policy.

# METHODS

The research was conducted in North Aceh District. North Aceh Regency has several core commodities of the plantation crop subsector. The object of this research is the core commodities of the plantation crop subsector. The scope of this research focuses on the analysis of superior commodities in an effort to cluster superior commodities in accordance with the development and production growth of each commodity in North Aceh District.

Data collection methods were carried out using interviews, documentation and literature studies. The interview method was conducted directly to the parties involved in the research. Literature study was carried out by collecting articles, relevant theories, and other literature related to the research.

The type of data used in the study is secondary data. The data used in this study are secondary data in the form of*time series*. Based on the data period 2013-2022 in accordance with the availability of the data presented. Data collection using literature studies, besides that the data in this study were obtained from various sources and literature related to the object of research such as from the Central Statistics Agency (BPS), literature, articles, journals, and sites on the internet related to data collection.

Data and information obtained in this study were analyzed using quantitative methods with Location Quotient (LQ) and Klassen Typology data analysis through data processing using the Microsoft Excel program.

1. Location Quetiont (LQ)

Location quotient analysis is required to identify potential plantation crop core subsectors that are included in the base and non-base sectors. Using Location Quotient analysis, it can be known how much the level of specialization of the basic sector in North Aceh Regency. According to Arsyad (2005) Location Quotient is formulated as follows:

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

Commodities that produce LQ values > 1 are normative standards to be designated as superior commodities. And if many commodities produce an LQ value > 1, the degree of superiority is determined based on the higher LQ value in a region, because the higher the LQ value, the higher the potential superiority of the commodity (Hakim & Suhendi, 2021).

2. Klassen Typology

The purpose of further research was carried out with the Klassen typology analysis method, which aims to analyze the development classification of each commodity of the plantation crop subsector in North Aceh Regency. There are 4 (four) typologies resulting from the Klassen Typology analysis (Sjafrizal, 2008). An overview of the Klassen Typology Matrix classification form can be seen in the following table:

Table. 3. Classification of Klassen Typology Matrix

| | |
|---|---|
| Quadrant I<br>Advanced and fast-growing subsectors<br>(Si > s dan gi > g) | Quadrant II<br>Advanced but depressed subsector<br>(si < s dan gi < g) |
| Quadrant III<br>Potential subsectors or can still grow<br>(si > s dan gi < g) | Quadrant IV<br>Relatively lagging subsector<br>(si < s dan gi < g) |

*Source: Arsyad (2005)*

# RESULTS AND DISCUSSION

## Results

Result Analysis Location Quotient (LQ)

From the results of Location Quotient (LQ) analysis generated from the research process of 5 (five) core

commodities of plantation crops divided into 2 (two) classifications, namely base and non-base commodities can be seen in the following table.

Table 4. Results of Calculation of LQ Value of 5 (five) Core Commodities of Plantation Crops

| Number | Commodities | Score Location Questions (LQ) |
|---|---|---|
| 1 | Basis | |
| | Coconut | 2,07 |
| | Palm Oil | 1,10 |
| 2 | Non Basis | |
| | Rubber | 0,76 |
| | Cocoa | 0,91 |
| | Coffee | 0,09 |

*Sumber : data sekunder diolah, 2024*

Result Analysis Typology Klassen

Based on the results of the Klassen Typology analysis through the acquisition of data that has been carried out calculation process in determining the classification of potential based on development of the growth rate and contribution of the core commodities of plantation crops in North Aceh Regency. From the process of analyzing the research data carried out can be seen the growth rate and contribution data at the North Aceh District level and the Aceh Province level in the following table. North District level and Aceh Province level in the following table:

Table 5. Results Growth Rate and Contribution of Plantation Commodities Core Plantation Crops at the North Aceh District Level and Provincial Level Aceh

| Commodities | District-level growth rate (%) | Contribution (%) | Provincial level growth rate (%) | Contribution (%) | Quadrant |
|---|---|---|---|---|---|
| Rubber | -1,67 | 6,67 | 0,877 | 8,74 | IV |
| Palm Oil | 3,24 | 73,04 | 1,009 | 65,51 | I |
| Cocoa | -0, 044 | 5,10 | -1,286 | 5,83 | III |
| Coconut | -0,029 | 13,90 | 0,033 | 9,36 | II |
| Coffee | -0,044 | 1,290 | 0,59 | 10,56 | IV |

*Sumber : data sekunder diolah, 2024*

The difference in the development of the growth rate and the resulting production contribution so that it affects the determination of commodity classification in the advanced, potential, developing and depressed sectors can be seen in the following Klassen typology matrix table:

Table 6. Klassen Typology Matrix

| | |
|---|---|
| Quadrant I<br>Advanced and fast-growing subsectors | Quadrant II<br>Advanced but depressed subsector |
| Palm Oil | Coconut |
| Quadrant III<br>Potential subsectors or can still grow | Quadrant IV<br>Relatively lagging subsector |
| Cocoa | Rubber, Coffee |

*Sumber : data sekunder diolah, 2024*

## Discussion

Contribution and Growth Rate of Production of 5 (five) Commodities from the Whole Subsector of Core Commodities of Plantation Crops in North Aceh District

The development of production of core plantation crop commodities in North Aceh District has different

contributions and growth rates. Of the 5 (five) core commodities, some have experienced a decrease and increase in production and some have also consistently increased in the last 5 years for an explanation of the development of the production contribution of core plantation crop commodities in North Aceh District can be seen in the following table:

Table. Production Contribution of 5 (five) Core Commodities of Plantation Crops

| Number | Commodities | Contribution (%)/Year | | | | |
|---|---|---|---|---|---|---|
| | | 2018 | 2019 | 2020 | 2021 | 2022 |
| 1 | Palm Oil | 9,57 | 6,83 | 9,29 | 9,08 | 8,91 |
| 2 | Rubber | 64,85 | 66,45 | 64,68 | 65,05 | 66,53 |
| 3 | Cocoa | 5,79 | 6,18 | 6,06 | 5,80 | 5,30 |
| 4 | Coconut | 9,36 | 9,60 | 9,28 | 9,47 | 9,08 |
| 5 | Coffee | 10,43 | 10,93 | 10,68 | 10,59 | 10,18 |

Based on the data table above, it explains that the development of the 5 (five) commodities has experienced production fluctuations in the last 5 years. In terms of commodity production at the North Aceh District level in the last 4 years from 2018 to 2021 which has consistently increased is oil palm, cocoa, coconut, coffee, while for rubber plants it has experienced a situation of increase and decrease in recent years. In 2022, of the 5 core plantation commodities, 4 commodities experienced a situation of decreasing production, while only coffee plants still consistently experienced an increase in production and did not experience a decline. The difference in the conditions of the situation of production fluctuations in each commodity, of course, there are many things that cause directly or indirectly that can affect the instability of the production of the 5 (five) commodities in North Aceh District.

Observing the role of the contribution of each commodity, it can be an initial basic consideration in including these commodities into potential commodity groups so that they can be developed and accelerated commodity development that is more sustainable starting from the upstream and downstream sectors. The production contribution role provided by each commodity is also expected to be in line with its positive impact on improving the socio-economy of the community.

Discussion Location Quotient

The results of the Location Quotient (LQ) calculation showing the production of plantation crop subsector commodities obtained different results in several districts, indicating that the plantation crop commodity subsector in North Aceh District has varying potential. Based on the LQ calculation results, the plantation crop commodity subsector in North Aceh District which has an LQ coefficient value > 1 indicates that the commodity is a potential base commodity for the core plantation crop subsector in the area. According to Arsyad (2005) commodities with LQ values > 1 reflect the existence of commodities that are superior and have greater market potential locally, which can be relied upon as a regional economic base.

However, of all the commodities in North Aceh District, only two of the five commodities obtained LQ values > 1, namely oil palm with an LQ value of 1.10 and coconut with an LQ value of 2.07, both of which can be considered as potential base commodities in the estate crop subsector. This is in line with research conducted by Arsyad (2005) which states that commodities with LQ greater than 1 have a significant contribution to the local economy and have the potential for further development. Meanwhile, the other three commodities that obtained LQ values of less than 1 indicate that these commodities do not meet the criteria as leading commodities in North Aceh District, as also explained by Arsyad (2005) who emphasized that commodities with LQ < 1 tend to have lower competitiveness on a regional scale.

Discussion Typology Klassen

Based on the Klassen typology matrix above, oil palm is included in quadrant I of the Klassen typology matrix, which indicates that this commodity is in a leading position with a high growth rate and significant economic contribution in North Aceh District. Oil palm can be considered as a leading commodity in the core plantation crop subsector that has the potential to be developed further. According to (Sjafrizal, 2008) commodities in quadrant I reflect sectors with good growth prospects and can be the main driver in regional economic development. Therefore, palm oil is expected to continue to receive attention in economic development policies, both in terms of increasing productivity and strengthening its competitiveness in local and international markets. These are in line with the findings showing that commodities in this quadrant have the potential to become the main source of income and drive other economic sectors in North Aceh.

Coconut falls into quadrant II of the Klassen typology matrix in North Aceh, indicating that although this commodity has a significant economic contribution, its growth rate is relatively slow compared to other leading commodities. In this quadrant, coconut is classified as a commodity that is still under pressure, where the potential for greater growth is limited by various external and internal factors, such as technological limitations or less than optimal market access. According to (Sjafrizal, 2008), commodities in quadrant II require strategic policy

interventions to improve competitiveness and encourage increased productivity, in order to shift to a more favorable position. Therefore, coconut in North Aceh requires more attention to overcome the existing challenges, in order to develop and contribute more to the regional economy.

Cocoa falls into quadrant III of the Klassen typology matrix in North Aceh, indicating that the commodity is underdeveloped with low growth rates and limited economic contribution. In this quadrant, cocoa faces major challenges in development, both in terms of productivity and competitiveness in the market. According to (Sjafrizal, 2008) commodities located in quadrant III tend to require more intensive policy intervention and support from various parties to encourage the improvement of this sector. With various existing problems, such as lack of access to modern technology and low supporting infrastructure, cocoa in North Aceh requires focused development programs to improve its performance and improve its economic conditions, so that it can transform into a more competitive commodity and have a positive impact on regional economic development.

Rubber and coffee fall into quadrant IV of the Klassen typology matrix in North Aceh, indicating that these commodities are in a depressed condition with low growth rates and minimal economic contribution. These commodities face various constraints, such as declining market prices, limitations in terms of technology and infrastructure, as well as challenges in terms of management and suboptimal processing of products. According to (Sjafrizal, 2008) commodities in quadrant IV generally require a more intensive strategy in development and need special attention from the government and related parties to overcome existing structural problems. In their development, rubber and coffee require innovation, improvements in the distribution system, and an increase in production capacity and product quality in order to compete in a wider market and provide greater benefits to the economy of North Aceh.

The results of the Klassen Typology analysis can be a basis for consideration for the government in developing the economy in the region. With the results of Klassen's typology analysis will also facilitate the determination of the priority scale for the development of superior commodities of the core plantation crop subsector, but does not ignore other plantation crop subsectors that are still in underdeveloped, depressed and undeveloped conditions. By obtaining the results of the classification of conditions in each commodity, it will also make it easier for policy makers or interested parties to take opportunities to encourage the development of core plantation crop commodities that are more sustainable and have a positive impact on economic development.

## CONCLUSION

Based on the results and discussion, it can be concluded that in terms of commodity production at the North Aceh District level in the last 4 years from 2018 to 2021 which has consistently increased is oil palm, cocoa, coconut, coffee, while rubber plants have experienced a situation of increase and decrease in recent years. In 2022, of the 5 core plantation commodities, 4 commodities experienced a situation of decreasing production, while only coffee plants still consistently experienced an increase in production and did not experience a decline.

Based on the results and discussion for the LQ of core plantation commodities in North Aceh Regency, namely for the base there are 2 commodities, coconut and oil palm, while for non-base there are 3 commodities, namely rubber, cocoa, and coffee. For the Klassen typology of core Plantation commodities in North Aceh Regency, quadrant I is palm oil, quadrant II is coconut, quadrant III is cocoa, and quadrant IV is rubber and coffee.

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