



Analysis of Industry-Based Plantation Commodity Development in the Area of Jambi Province

Analisis Pengembangan Komoditas Perkebunan Berbasis Industri di Wilayah Propinsi Jambi

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Article Info	Abstract
<p><i>Article History :</i> Received: 13 June 2022 Accepted: 11 July 2022 Published: July 2022</p>	<p>The purpose of this study is to analyze the advantages of plantation commodities in Jambi Province. Shift-Share Analysis and Location Quotient Analysis were used to analyze data. The research results conclude several things. First, there are the comparative advantages of oil palm and rubber throughout Jambi. Second, rubber and palm oil in the commodity base sector in Kerinci, Merangin, Batang Hari, Bungo; coffee and cinnamon are the base sectors in Kerinci, Merangin, Sorolangun; and, chocolate in Bungo and Kerinci. Third, palm oil and rubber are dominant and their growth potential in all areas in Jambi; coffee, cinnamon, cocoa plantations are dominant and their growth potential are in Kerinci, Merangin, Bungo; and, clove, coconut, areca nut, candlenut, kapok, sugar palm, vanilla, sugar cane, patchouli are less developed. Finally, there are three clusters oriented towards ease of market access, proximity of raw materials and availability of labor.</p>
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<p>Keywords: Industrial Clusters, Location Quotient, Plantation Commodities, Shift-Share Analysis.</p>	

Info Artikel	Abstrak
<p><i>Riwayat Artikel :</i> Diterima: 13 Juni 2022 Disetujui: 11 Juli 2022 Dipublikasikan: Juli 2022</p>	<p><i>Tujuan penelitian ini yaitu menganalisis keunggulan komoditas perkebunan di Provinsi Jambi. Metode analisis data menggunakan Analisis Shift-Share dan Analisis Location Quotient. Hasil-hasil penelitian menyimpulkan beberapa hal. Pertama, terdapat keunggulan komparatif kelapa sawit dan karet di seluruh Jambi. Kedua, komoditas karet dan kelapa sawit memiliki basis di Kerinci, Merangin, Batang Hari, dan Bungo; kopi dan kayu manis berbasis di Kerinci, Merangin, dan Sorolangun; serta, coklat berbasis di Bungo dan Kerinci. Ketiga, kelapa sawit dan karet memiliki potensi pertumbuhan yang dominan di semua wilayah di Jambi; kopi, kayu manis, dan kakao bersifat dominan di Kerinci, Merangin, Bungo; namun demikian, cengkeh, kelapa, pinang, kemiri, kapuk, aren, vanili, tebu, dan nilam kurang berkembang di area Jambi. Keempat, terdapat tiga klaster yang berorientasi pada kemudahan akses pasar, kedekatan bahan baku, dan ketersediaan tenaga kerja.</i></p>
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<p>Kata Kunci: <i>Klaster Industri, Location Quotient, Komoditas Perkebunan, Analisis Shift-Share.</i></p>	



INTRODUCTION

Agriculture and plantation-based industries in Indonesia and various countries currently believe that they can contribute to the economy of their nation. Several studies have been conducted to see the development and progress of the agricultural-based industrial sector in the economy. O'Neill (2022) stated that in 2000, in the United Kingdom, the contribution of agriculture-based industries to GDP was 27.9% and growth was 9%. In New Zealand, the contribution of agriculture-based industry to GDP was 33.1%. Australia's agriculture-based Industry contribution to its GDP is 23.3% (MPI, 2017). Indonesia sees that the plantation commodity agricultural-based industrial sector is a potential industrial sector to be developed (Anonymous, 2012).

In 2008–2012, the average contribution of the agricultural industry in Indonesia was IDR 104.638 trillion or 6.3% of Indonesia's GDP, capable of absorbing a workforce of 5.4 million workers with a labor participation rate of 5.8%, and labor productivity work reached 19.5 million rupiah per worker each year. This productivity is higher than the national productivity which reaches less than IDR 18 million per worker per year. Meanwhile, the growth of the creative industry reached 7.3% per year, higher than the national economic growth of 5.6% per year. On the other hand, Becuț & Craciun (2017) stated agriculture-based creative industries grew and were resistant to economic crises.

Jambi Province has territories 5,100,000 ha of land areas, covering an area of 2,179,440 ha (42.73%) are forest and agricultural areas, and non-agricultural areas covering 2,920,560 ha (52.27%). Has a large enough plantation, where there are 7 mainstay plantation commodities. First, rubber plantations covering an area of 669,521 hectares, with the designation: community plantations

covering an area of 665,303 hectares or 99.37%, and private plantations covering an area of 4,218 hectares or 0.63%. Second, oil palm plantations have an area of 791,025 ha, with the designation: Smallholder plantations = 527,297 ha or 66.66%, State plantations = 23,810 ha or 3.01%, and private plantations = 239,918 ha or 30.33%. Third, coconut with an area of 118,994 Ha (people's plantation). Fourth, coffee with an area of 25,847 Ha (people's plantation). Fifth, cocoa with an area of 2,354 Ha (people's plantation). Sixth, casiavera area of 46,132 Ha (people's plantation). Seventh, pinang area of 20,694 hectares (smallholder plantations) with a contribution of 649,959 household workers, PDRB 17.2% of the total GDP of Jambi Province with a value of Rp. 26.3 billions. Production of the people's mainstay rubber commodity was 326137 tons in 2015, palm oil production was 1,555,697 tons, and coconut in production was 106,698 tons 2014 (Statistics Bureau, 2017).

Plantations in Jambi Province are spread across all districts, so as to encourage the creation of a plantation commodity industry or agro industry. This structural change, in addition to causing an increase in per capita income, also has an impact on the workforce, reducing unemployment, advancing technology and increasing human resources which will lead to the discovery of new innovations in plantation commodity-based industries in producing new products. In supporting this, the plantation policies in the province of Jambi in 2019, namely the supervision of FFB and Bokar trade; improved processing and quality of results (UPPB Model); rejuvenation of Oil Palm, Rubber; facilitation of plantation business disruption; development of the quality of plantation seeds; and, development of coffee, cocoa and deep coconut, patchouli, sugarcane.

Discussing the plantation commodity industry that needs to be developed in the country/region, means paying attention to the availability and how to use plantation commodity resources. The availability and utilization of plantation commodities for industry can meet domestic consumption and exports in encouraging increased economic growth. In order to increase economic growth in Jambi in the future, it is necessary to plan for regional development by developing a commodity-based industry or agro industry. The purpose of this study is to analyze the advantages of plantation commodities in Jambi Province.

Industrial Economics Theory

Industrial development to increase national income and the welfare of the population must be in line with the potentials of various regions with all the problems that exist in the region concerned and must be integrated between the agricultural-plantation and industrial sectors as an effort for the welfare of the local people concerned. National income is one of the economic variables used to measure the welfare of a country (Aitken, 2019). To make it happen, therefore, efforts are needed to explore natural resources in a planned manner to further maximize the added value of the economy by paying attention to environmental aspects (Jainah *et al.*, 2020).

Various agro-based industrial clusters (12 Industrial clusters) that can be made into the plantation raw material industry are oil palm processing industry cluster; rubber industry cluster and rubber goods; cocoa industry cluster; coconut processing industry cluster; coffee processing industry cluster; sugar industry cluster; tobacco products industry cluster; fruit processing industry cluster; furniture industry cluster; fish processing industry cluster; paper industry

cluster; and, industrial cluster milk processing (Doronina *et al.*, 2016).

Regional Development Planning and Development Theory

The difference in the level of wages between the agricultural sector and the industrial sector ($W_p < W_i$) encourages the movement of labor from the agricultural sector to the industrial sector, hence urbanization. Labor moving from the agricultural sector to the industrial sector will get higher income ($Y_i > Y_p$), so that the demand for agricultural products (food) increases. This is what drives output growth in that sector, seen from the AD side, and in the long run the rural economy will experience growth. A study in Bangladesh found that the supply of labor in the agricultural sector decreased along with the increasing use of agricultural technology, so the labor wages in this sector tended to stagnate (Taslim & Taslim, 2018).

On the other hand, there has been a change in the pattern of public demand which has experienced an increase in income, by consuming a large portion of their income for various industrial products and services. This change in consumption patterns is the driving force behind output growth and product diversification in the industrial and service sectors. Meanwhile, the Chenery theory of structural transformation theory (pattern of development) focuses on structural changes in the stages of the process of economic change in developing countries (NSB) which are undergoing a transformation from traditional agriculture to the industrial sector as the main engine of economic growth (Agbenyo, 2020).

Economic Growth Theory

Basically, regional growth uses the concepts of economic growth as an aggregate placed on factor movements. The flow of capital and labor that flows from one region

to another opens up opportunities for differences in growth rates between regions. The economic potential of a region is a regional economic capacity that is feasible and feasible to develop, so it will continue to develop into a source of livelihood for the local people, even helping the regional economy as a whole to develop independently and sustainably (Suparmoko, 2020).

The potential economic sector is a commodity that has advantages, namely comparatively superior and competitively superior (Cahyono *et al.*, 2016). Meanwhile, the theory of economic growth was developed from the growth model popularized by Harrod-Domar based on the neoclassical growth theory model. According to the model, it is argued that a country's economic growth is not only influenced by macro-economic policies taken by the government but also by financial market conditions both domestically and abroad (Najeb, 2014).

Theory of Commodity Excellence and Position

Development priorities become more concrete and sharp, so each region or country can determine the regional or state superior commodity that can be developed. This view is in line with the government's policy strategy with the regional development concept of superior industrial commodities based on agriculture and plantations. Discussing superior products or commodities that need to be developed in the regions means paying attention to the availability and how to use agricultural and plantation resources as input for product development, especially the development of regional superior commodities (Syahza *et al.*, 2021).

The shift-share method can identify shifts in the role of the economy, observing a shift in the structure of the economy in relation to an increase in the regional

economy, where the regional economy which is dominated by a slow growth sector will grow below the level of regional economic growth above it. With this Shift-Share technique, besides being able to observe deviations from various comparisons of economic performance between regions, competitive advantage and commodity specialization and can also detail the causes of changes in several variables and isolation of various factors that cause changes in the economic structure of a region in its growth, from one period of time.

The Shift-Share model can also be referred to as industrial mix analysis, because the existing industrial composition greatly affects the growth rate of the region. This means whether the industry located in the region is included in the rapidly developing industrial group, or it is suitable to be located in that region or not (Destiningsih & Achsa, 2018; Khusaini, 2015).

Industrial Location Theory and Economic Sector Basis and Non-Basis Sectors

The location of the industry is close to raw materials if the raw materials used are easily damaged, transportation of finished goods is easier than transportation of raw materials, and the raw materials used are heavier than the products produced. Market-based industrial location if the production produced is heavier than the raw material, the raw material used is not easily damaged, the market area is large, the resulting production is more easily damaged after processing, and prestige factor.

Industrial locations based on transportation costs. Industrial locations as far as possible in areas with smooth transportation both the amount of production and the raw materials needed. Industrial locations are labor-oriented, namely the quantity or number of workers accommodated by the industry,

and the quality or quality of the workforce owned by the industry. Industrial location that follows economic factors, availability of labor, proximity to markets, availability of raw materials, transportation costs, marketing areas and others (Fatmawati, 2013).

Location quotient (LQ) is generally used to determine the base and non-base sectors, with the aim of seeing the comparative advantage of a commodity in an area, namely the basic sector and non-basic sector (Niyimbanira, 2018; Rismayanti, 2021; Rusli *et al.*, 2021; Tutupoho, 2019). The basic sector is the economic sector capable of meeting the needs of both the domestic market and markets outside the region itself and can be used as a leading commodity; and, the non-basic sector is an economic sector that is only able to meet the needs of the region itself, which is known as a non-superior commodity.

Growth Ratio Theory, Overlay Theory and Cluster Theory

The Growth Ratio Model is to compare the growth of an activity both on a wider scale and on a smaller scale and is an analytical tool used to see the description of potential economic activities (economic sector), especially the regional economic structure based on the criteria for the growth of both regional economic structures. internal and external (Gafur *et al.*, 2016; Yusuf, 1999). Overlay analysis to describe potential economic activities based on growth and contribution criteria. This analysis is used to identify leading sectors both in terms of contribution and growth by combining the results from the LQ analysis and the MRP analysis. This analysis, therefore, consists of three components, namely Location Quotient (LQ), Reference Area Growth Ratio (RPr), and Study Area Growth Ratio (RPs) (Kharisma *et al.*, 2021).

Cluster analysis is classifying objects based on the similarity of characteristics among these objects. Thus, the characteristics of a good cluster are internal homogeneity (within cluster) which is the similarity between members in one cluster; and, external heterogeneity (between cluster) that is the difference between one cluster and another (Thrun, 2018). Giancarlo *et al.* (2014) explained the clustering step in cluster analysis includes the following the things, that is measuring the similarity of distances, forming a cluster hierarchically, and determine the number of clusters.

The method of grouping in cluster analysis is Hierarchical Method. The method start by grouping with two or more objects which have the closest similarity. Then, forwarded to other objects, and so on until the cluster will form a kind of 'tree' where there are clear levels (hierarchy) between objects, from the most similar to the least similar. A tool that helps to clarify this hierarchical process is called a dendogram.

METHOD

The data collection method in this study was obtained through a secondary survey. The secondary survey consists of institutional survey and literature survey (Iba *et al.*, 2014). Secondary survey data in this study include administrative data region, demographic data, district, provincial and national plantation commodity production data, gross regional domestic product (GRDP) districts and provinces, data on the selling price of Jambi plantation commodities, data on Jambi area infrastructure, and others related data. According to some experts, this GRDP measures the economic performance of a country in a certain year (Feriyanto, 2014; Leasiwal, 2015; Oktaviana & Amalia, 2018).

The stages of research on industrial cluster analysis for importing superior plantation commodities in the development planning of Jambi province are carried out as follows. First stage is determining the relative position and competitive advantages of plantation commodities using the Shift-Share analysis technique. Second, determine the base sector and non-plantation commodity base using the Location Quotient analysis technique and Klassen Typology. Third, determine the potential for plantation commodities using the Growth Ratio Model (MRP) and Overlay Analysis technique. Fourth, determine the potential of plantation commodities by combining the previous 1-3 analysis results. Last stage, determine the cluster of Jambi's plantation commodity industrial areas using the Quartile and Hierarchical Cluster analysis techniques.

Determining Competitive Advantages and Position of Plantation Commodities

Shift-share analysis divides growth (D) as the change of a variable in a province such as GRDP, value added, income or output, over a certain period of time. National growth (N), proportional growth (M) and competitive advantage (C). The effect of national growth is called the share effect, the proportional growth effect is called the proportional shift and the effect of competitive advantage is called the differential shift or regional share.

$$D_{ij} = N_{ij} + M_{ij} + C_{ij} \quad N_{ij} = Y_{ij} \cdot r_n \quad M_{ij} = Y_{ij} \cdot (r_{in} - r_n) \quad C_{ij} = Y_{ij} \cdot (r_{ij} - r_{in})$$

This growth element is a regional competitive advantage that can drive regional export growth. Through these three components, it can be seen which components or elements of growth have driven regional economic growth.

$$D_{ij} = Y_{ij} \cdot r_n + Y_{ij} \cdot (r_{in} - r_n) + Y_{ij} \cdot (r_{ij} - r_{in})$$

$(N_{ij}) = Y_{ij} \cdot (Y_n, t - Y_n) / Y_n$, is a Regional Share

$$M_{ij} = Y_{ij} \cdot (Y_{in, t} - Y_{in}) / (Y_{in} - r_n)$$

represents Proportional Shift (PS)

$$C_{ij} = Y_{ij} \cdot (Y_{ij, t} - Y_{ij}) / (Y_{ij} - r_{in})$$

is a Differential Shift (DS)

DS is used to see changes in growth from an activity in the study area to that activity in the region reference, while the PS for see in the reference area between the change in the growth of an activity against total activity (GRDP), if PS 0 = (+) and PS 0 = (-) if and DS 0 = (+) and Ds 0 = (-). Of the four categories, it can determine the relative position of plantation commodities as shown in Table 1.

The Estaban-Marquillas Modification Criteria for shift-share analysis is aim to determining the competitive advantage and specialization are as follows (Destiningsih & Achsa, 2018). The impact of allocations in Table 2 below will likely occur.

$$D_{ij} = Y_{ij} \cdot (r_n) + Y_{ij} \cdot (r_{ij} - r_n) + Y_{ij} \cdot (r_{ij} - r_{in}) + (Y_{ij} - Y_i \cdot j) \cdot (r_{ij} - r_{in})$$

Determination of the Type of Plantation Comparative Leading Commodities

The determination of the comparative superior commodity types of plantations in Jambi district was carried out by using the Location Quotient (LQ) analysis technique. The Location Quotient model has the following formula (Niyimbanira, 2018; Rismayanti, 2021):

$$LQ = (v_i / v_t) / (V_i / V_t)$$

The output formulation for the LQ value is as follows. $LQ > 1$ means the plantation commodity i is the economic base, and has a comparative advantage; $LQ < 1$ means the plantation commodity i is not the base sector in district k and not has a comparative advantage; and, $LQ = 1$ means the plantation commodity has the same growth rate as the reference area.

Table 1. Position of District Level Plantation Commodities in Jambi Province

Differential shift (DS)	Proportional shift (PS)	
	Negative (-)	Positive (+)
Positive (+)	Tend to be Potential (Highly Potential)	Fast Growing
Negative (-)	Retarded (Depressed)	Develop (Developing)

Source: Secondary data processed, 2022.

Table 2. Evaluation Criteria Esteban-Marquillas Modification of Shift Share Analysis

Commodity	$r_{ij} - r_{in}$	$Y_{ij} - Y * ij$	Competitive advantage	Specialties
1	> 0	> 0	√	√
2	> 0	< 0	√	X
3	< 0	> 0	X	√
4	< 0	< 0	X	X

Source: Destiningsih & Achsa, 2018.

Table 3. Trend of Growth in Plantation Sector (for each District/City)

Plantation Sub Sector	LQ	RPS	RPR	Classification
1	+	+	+	Dominant
	-	+	+	Potential
2	+	+	-	Potential
	+	-	-	Saturated
3	+	-	+	Saturated
	-	-	-	Marginal
4	-	-	+	Marginal

Source: Secondary data processed, 2022.

Table 4. Potential Classification of Plantation Commodity Industry

Plantation Sector	Commodity Relative Position	Excellence Competitive	Excellence Comparative	Specialization Level	Trend of Development	Classification Industry Potential
Rapid Growth	Competitive	Comparative	Specialties	Dominant	Main/Priorits Indispensable Industry	
Tend to Potential	Competitive	Comparative	No Specialization	Potential	Second Industry Required	
Developing	Competitive	Comparative	Not a specialty	Saturated	Third Industry Not Required	
Backward	Competitive	Not Comparative	Not a specialty	Marginal	Fourth Still No Industry Required	

Source: Secondary data processed, 2022.

Trend Analysis of Commodity Growth

Growth Ratio Model (MRP) analysis is divided into two criteria, namely the Study Area Growth Ratio (RPs) and Reference Area Growth Ratio (RPr).

Next, we conduct the overlay analysis. According to Ali (2017), overlay analysis is used to identify leading sectors both in terms of contribution and growth by combining the results of LQ analysis and MRP analysis. This

analysis consists of three components, namely Location Quotient (LQ), Reference Area Growth Ratio (RPR), and Study Area Growth Ratio (RPS). The classification results are as shown in Table 3.

Determine whether or not an input-based industry is needed for plantation commodity in the Jambi area by referring to and guided by the results of the Shift-Share Analysis, Location Quotient analysis and Growth Ratio Model, that is relative position of commodities, competitive and comparative advantages of commodities, level of commodity specialization, and commodity development priority. The determination of the input-based industry for plantation commodity in Jambi is shown in Table 4.

Determination of industrial cluster development areas based on raw material input for plantation commodities, using analysis techniques Quartiles and Hierarchical Cluster. In particular, the purpose of cluster analysis is to classify data into small groups of data based on similarity of entities. Indicators of cluster formation for industrial development areas include: (1) Proximity of raw material sources; (2) Availability of labor and (3) Ease of Market Access. The cluster formation stage for industrial development based on raw materials oriented to raw materials is carried out using Quartil analysis techniques. The area grouping is based on the output value of LQ and DS in the results of the previous analysis and the value of the contribution of commodity production. So that a regional cluster will be formed which is a group of areas that have $LQ > 1$, $DS \geq 0$, and high production contribution values.

RESULTS

Administratively, the number of sub-districts and villages or wards in Jambi Province in 2010 was 131 districts and 1,372 villages, with the highest number of Districts

and villages in Merangin Regency, namely 24 Districts and 212 Villages. Topographically, Jambi Province consists of 3 (three) groups of altitude variations. Lowland areas 0-100 m (69.1%), located in the eastern to central region. This lowland area is located in Jambi City, West Tanjung Jabung Regency, East Tanjung Jabung Regency, part of Batanghari Regency, Bungo Regency, Tebo Regency, Sarolangun Regency and Merangin Regency, Plain's areas with a moderate height of 100-500 m (16.4%), in the middle region. This area of moderate altitude is located in Bungo Regency, Tebo Regency, Sarolangun and Merangin Regencies as well as parts of Batanghari Regency; and upland areas > 500 m (14.5%), in the western region. This mountainous area is located in Kerinci Regency, Sungai Penuh City and parts of Bungo Regency, Tebo Regency, Sarolangun Regency and Merangin Regency.

Determining the Relative Position and Competitive Advantages of Plantation Commodities

The results of Differential Shift (DS) and Proportional Shift (PS) of the shift-share are as shown in Table 5. Based on the results in the table, it is explained as follows. First, rubber and palm oil are commodities with a potential position in all districts in Jambi province. Second, the coconut commodity tends to have the potential in Tanjung Jabung Barat and Tanjung Jabung Timur Districts. Third, the coffee commodity tends to have the potential in Kerinci, Merangin and Bungo Districts. Fourth, cocoa commodity tends to have the potential in Kerinci, Merangin and Tanjung Jabung Barat Districts. Fifth, the pinang commodity tends to have potential in Merangin, Bantang Hari, Muaro Jambi, Tanjung Jabung Timur and Bungo Districts. Sixth, patchouli commodity with rapid growth in Kerinci and Sarolangun Regencies.

The analysis results of modification *Shift-Share* in deciding competitive advantage and level of specialization of the plantation commodities as shown in Table 6. From the results in the table, it is explained as follows. First, rubber and palm oil are specialty commodities and have competitive advantages in all districts in Jambi Province. Second, coconut is a specialty commodity and has competitive advantages in Tanjung Jabung Barat, Merangin, Sarolangun, Tanjung Jabung Timur and Bungo Regencies. In Kerinci Regency, coconut is a specialty commodity and has no competitive advantage. Third, coffee is a specialty commodity and has competitive advantages in Kerinci and Merangin Regencies; but in Kerinci Regency, coffee commodity is only a specialty commodity and has no competitive advantage. Fourth, chocolate is a specialty commodity and has a competitive advantage in Kerinci Regency, Merangin and Tanjung Jabung Barat; but in the districts of Tanjung Jabung Timur and Bungo, the cocoa commodity is only a specialty commodity and does not have any competitive advantage.

Next, pinang is a specialty commodity and has a competitive advantage in Merangin Regency; but in Batang Hari District, Muaro Jambi and Bungo, the Pinang commodity has competitive advantages. Sixth, patchouli has a competitive advantage and specialization commodities in Kerinci and Sarolangun Regencies. However, in Merangin, West Tanjung Jabung, East Tanjung Jabung and Bungo Regencies, patchouli is a specialty commodity; but in Batang Hari District, Muaro Jambi and Bungo, the pinang community has a competitive advantage. Seventh, patchouli has a competitive advantage and specialization commodities in Kerinci and Sarolangun Regencies and in Merangin, West Tanjung Jabung, East Tanjung Jabung and Bungo Districts; but in Batang Hari District, Muaro Jambi and Bungo, pinang community has a competitive advantage. Eight, patchouli has a competitive advantage and specialization commodities in Kerinci and Sarolangun Regencies; and in Merangin, West Tanjung Jabung, East Tanjung Jabung and Bungo Regencies, patchouli is a specialty commodity.

Table 5. Results of Differential Shift (DS) and Proportional Shift (PS)

Plantation Commodities	Kerinci	Merangin	Sorolangun	B. Day	M. Jambi	West Tanjab	East Tanjab	Tebo	Bunggo
Rubber	CB	CB	CB	CB	CB	CB	CB	CB	CB
Palm oil	CB	CB	CB	CB	CB	CB	CB	CB	CB
Inner Coconut	TB	TB	TB	TB	B	CB	CB	TB	CB
Cinnamon Bark	CB	CB	TB	CB	TB	TB	TB	TB	CB
Coffee	CB	TB	TB	TB	TB	CB	TB	TB	CB
Pepper	TB	B	TB	CB	TB	CB	TB	TB	TB
Clove	TB	B	TB	CB	TB	TB	TB	TB	TB
Chocolate	CB	PP	TB	TB	TB	TB	TB	TB	TB
betel nut	TB	CB	TB	TB	CB	TB	CB	CB	CB
Candlenut	TB	CB	TB	TB	CB	TB	TB	TB	TB
Kapok	TB	TB	CB	CB	TB	TB	TB	TB	TB
Aren	TB	TB	TB	TB	B	TB	TB	TB	TB
Vanilla	TB	B	TB	TB	TB	TB	TB	TB	TB
Tea	TB	B	TB	CB	TB	TB	TB	TB	TB
Cane	B	B	TB	TB	TB	TB	TB	TB	TB
Tobacco	B	TB	TB	TB	TB	TB	TB	TB	TB
Patchouli	PP	TB	TB	TB	TB	TB	TB	TB	TB

Note: CB = Potential Tendent; PS = Rapid Growth; TB = Underdeveloped; B = Developing.

Source: Secondary data processed, 2022.

Table 6. Competitive Advantage and Specialization Level of Jambi Plantation Commodities

Commodity	Kerinci		Merangin		Sorulangun		B. Day		M. Jambi	
	R	Y	R	Y	R	Y	R	Y	R	Y
Rubber	0.06	54.01	0.05	15.29	0.08	11.34	0.002	32.01	0.31	32.43
Palm oil	0.15	59.86	0.002	25.67	0.07	16.32	0.01	40.34	0.29	14.55
Coconut	-0.27	64.22	0.04	17.46	0.02	12.99	-0.31	-15.16	-0.22	-13.19
K. Sweet	0.004	67.62	-0.08	018	0.009	13.55	0.01	-79.21	-0.19	-66.93
Coffee	0.06	70.35	0.09	18.76	-0.68	13.99	-0.50	-17.16	-0.43	-14.82
Pepper	-0.31	71.12	2.19	0.92	-1.11	0.11	0.06	30.45	-1.61	-38.42
Clove	-0.03	71.11	0.35	2.92	0.35	4.21	0.35	-5.38	0.15	-45.44
Chocolate	0.66	71.09	0.25	5.91	-0.34	14.10	-0.64	-3.52	-0.22	-56.59
Betel nut	-0.59	70.14	0.007	6.71	-0.23	13.95	0.57	-21.90	7.08	-18.63
Candlenut	-0.08	2.12	0.20	0.92	-0.35	1.31	-0.31	-23.06	1.15	-25.26
Kapok	0.31	1.12	-0.20	18.92	0.31	0.11	0.59	8.09	-0.69	-61.90
Aren	-0.52	71.11	0.023	8.03	0.08	4.11	-0.61	17.89	-0.68	-92.9.1
Vanilla	0	71.12	-6.8	18.92	-6.8	3.11	-6.8	-0.14	-7.00	-11.65
Tea	0	70.75	0.46	6.84	0.47	0.06	0.46	-81.69	0.27	-69.03
Cane	-0.01	70.97	-2.35	2.89	-2.35	14.09	-2.35	-33.98	-2.55	-28.72
Tebkau	-0.7	71.12	-35.1	1.92	-5.08	14.11	-35.1	-6.61	-3.27	-55.92
Patchouli	37.43	71.11	-2.32	18.92	1.39	14.11	-2.80	-14.20	-3.21	-12.01

Commodity	West Tanjab		East Tanjab		Tebo		Bunggo	
	R	Y	R	Y	R	Y	R	Y
Rubber	0.18	74.03	0.707	63.21	0.12	52.04	0.13	46.97
Palm oil	0.16	34.13	1.82	29.01	0.06	23.91	0.24	21.68
Coconut	0.02	28.56	0.06	24.61	-0.01	-20.22	0.03	18.09
K. Sweet	0.01	-13.4	0.01	-11.7	0.01	-96.15	0.01	-84.5
Coffee	0.03	-12.6	-0.41	-14.4	-0.25	-11.26	-0.02	-74.1
Pepper	0.19	21.81	0.92	14.85	-0.60	12.85	-0.60	14.48
Clove	0.35	21.79	0.35	14.83	0.35	12.83	0.35	14.47
Chocolate	3.71	20.51	-0.20	13.74	-0.58	11.94	-0.34	13.65
Betel nut	-0.04	-21.5	0.08	-21.9	-0.23	-17.5	0.01	-13.1
Candlenut	0.05	21.31	0.05	14.42	0.05	12.49	0.05	14.16
Kapok	0.31	21.75	0.31	14.79	0.31	12.80	0.31	14.44
Aren	-0.52	21.67	-0.52	14.73	-0.52	12.75	-0.52	14.39
Vanilla	-6.80	21.89	-6.80	14.92	-6.8	12.91	-6.80	14.53
Tea	0.47	58.22	0.46	12.76	0.46	16.61	0.46	43.23
Cane	-2.36	15.21	-2.35	92.44	-2.35	82.29	-2.35	10.28
Tebkau	-4.08	21.77	-35.07	14.81	-35.1	12.82	-2.07	14.45
Patchouli	-1.01	21.62	-3.01	14.68	-2.00	12.71	-4.00	14.36

Note: R = rij-rin; Y = Yij- Y* ij.

Source: Secondary data processed, 2022.

Determining the Base Sector and the Comparative Advantages of Jambi Plantation Commodities

The results of the Location Quotient (LQ) analysis are as shown in Table 7. From the results, it is explained as follows. First, rubber and palm oil sector base and is a commodity of comparative advantage in all

Districts in Jambi Province. Second, coconut is the base sector and is a commodity of comparative advantage in the districts of Kerinci, Tanjung Jabung Barat, Tanjung Jabung Timur and Bungo. Third, basic sector coffee and is a commodity of comparative advantage in Kerinci and Merangin Districts.

Table 7. Results of Average Location Quotient (LQ) of Plantation Commodities in Jambi

Plantation Commodities	Kerinci	Merangin	Sorolangun	B. Day	M. Jambi	West Tanjab	East Tanjab	Tebo	Bunggo
Rubber	1.53	1.48	1.85	1.61	1.81	1.14	1.01	1.81	2.94
Palm oil	2.58	2.76	1.75	1.81	1.04	1.02	1.06	1.74	2.55
Inner Coconut	1.52	0.07	0.03	0.03	0.05	3.23	3.73	0.06	1.67
Cinnamon Bark	1.07	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.02
Coffee	2.95	3.89	0.01	0.02	0.03	0.73	0.99	0.20	0.06
Pepper	0.74	0.55	0.40	0.77	0.02	0.61	0.07	0.00	0.00
Clove	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chocolate	1.67	0.55	0.00	0.71	2.52	1.40	2.57	0.27	1.21
betel nut	0.52	0.11	0.07	0.01	0.02	2.38	2.24	0.04	1.51
Candlenut	0.67	0.71	0.03	0.25	0.60	0.04	0.05	0.00	0.00
Kapok	0.93	0.65	0.00	0.74	0.08	0.00	0.00	0.00	0.00
Aren	0.51	0.24	0.34	0.67	0.87	0.00	0.00	0.00	0.00
Vanilla	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tea	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cane	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tobacco	0.19	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Patchouli	1.13	1.56	1.04	0.00	0.00	0.00	0.00	0.00	0.00

Source: Secondary data processed, 2022.

Fourth, based on Table 7, cocoa is the base sector and is a commodity of comparative advantage in the districts of Kerinci, Muaro Jambi, Tanjung Jabung Barat, Tanjung Tajung Timur and Muaro Bungo. Fifth, pinang is the base sector and is a commodity a comparative advantage in the Tanjung Jabung Barat, Tanjung Tajung Timur and Muaro Bungo districts. Sixth, patchouli is the base sector of commodity and is a of comparative advantage in the districts of Kerinci, Merangin and Sarolangun.

Determination of Priority for The Development of Plantation Commodities for Each District in Jambi

The results of the overlay identification analysis in identifying the dominant, potential, saturated, and marginal sectors of the plantation commodities of each regencies in Jambi Province are as follows. Rubber and oil palm are the dominant commodities in all districts in Jambi Province, and coffee are the dominant commodities in the Kerinci and Merangin districts. This is because these commodities are superior and have high growth in the study district and have strong

growth. high also in the reference area of Jambi Province.

Coconut is a potential commodity in the districts of Kerinci, Tanjung Jabung Barat, Tanjung Jabung Timur and Bungo; and, pinang is a potential commodity in West Tanjung Jabung Regency. This is because it is a superior commodity and has high sectoral growth in the study area of the Regency and does not have low commodity growth in the reference area of Jambi Province. Cocoa is a saturated commodity in the districts of Kerinci, Muaro Jambi, Tanjung Jabung Barat, Tanjung Jabung Timur and Bungo; whereas Patchouli is a saturated commodity in Kerinci, Merangin and Sarolangun Regencies. Other commodities are marginal in Jambi Province. See the results of the analysis Table 8.

Analysis Determination of Industrial Development Zone Clusters Plantation Commodity

The cluster determination of the plantation commodity industrial development area in Jambi Province was carried out using Quartile and Hierarchical Cluster analysis techniques.

Table 8. Trend and Growth of Plantation Commodities in Jambi Province

Score	Kerinci Regency						
	Rubber	Palm oil	Coconut	Coffee	Chocolate	Betel nut	Patchouli
Average LQ	1.53	2.58	1.52	2.95	1.67	1.52	1.13
RPs	6.21	8.19	1.27	4.55	0.01	0.17	0.39
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	++ -	+++	+ - +	+ - -	+ - +
Classification	Dominant	Dominant	Potential	Dominant	Marginal	Marginal	Saturated
	Merangin Regency						
Average LQ	1.48	2.76	0.07	3.89	0.55	0.11	1.56
RPs	1.12	3.60	3.11	1.85	0.02	6.15	0.05
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	- - -	+++	- - +	- + -	+ - +
Classification	Dominant	Dominant	Marginal	Dominant	Marginal	Marginal	Marginal
	Sarolangun Regency						
Average LQ	1.85	1.75	0.03	0.01	0.00	0.07	1.04
RPs	5.73	3.32	5.45	0.01	0.00	0.01	0.03
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	- - -	- - +	- - +	- - -	+ - +
Classification	Dominant	Dominant	Marginal	Marginal	Marginal	Marginal	Saturated
	Batang Hari Regency						
Average LQ	1.61	1.81	0.03	0.02	0.71	0.01	0.00
RPs	7.77	3.59	7.97	0.01	0.00	5.37	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	- ++	- - +	- - +	- + -	- - +
Classification	Dominant	Dominant	Potential	Marginal	Marginal	Marginal	Marginal
	Muaro Jambi Regency						
Average LQ	1.81	1.04	0.05	0.03	2.52	0.02	0.00
RPs	3.60	5.71	1.26	6.01	0.06	0.09	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	- - -	- ++	+ - +	- - -	- - +
Classification	Dominant	Dominant	Saturated	Potential	Saturated	Marginal	Marginal
	West Tanjung Jabung Regency						
Average LQ	1.14	1.02	3.23	0.73	1.40	2.38	0.00
RPs	5.12	2.38	3.22	2.42	0.007	3.29	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	++ -	- ++	+ - +	+ + -	- - +
Classification	Dominant	Dominant	Potential	Potential	Saturated	Potential	Marginal
	East Tanjung Jabung Regency						
Average LQ	1.01	1.06	3.73	0.99	2.57	2.24	0.00
RPs	6.24	5.40	1.01	0.01	0.16	0.00	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	++ -	- - +	+ - +	+ - -	- - +
Classification	Dominant	Dominant	Potential	Marginal	Saturated	Marginal	Marginal
	Tebo Regency						
Average LQ	1.81	1.74	0.06	0.20	0.27	0.04	0.00
RPs	1.94	1.52	3.20	0.01	0.03	0.01	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	- - -	- - +	- - +	- - -	- - +
Classification	Dominant	Dominant	Marginal	Marginal	Marginal	Marginal	Marginal
	Bungo Regency						
Average LQ	2.94	2.55	1.67	0.06	1.21	1.51	0.00
RPs	3.79	1.51	3.47	0.00	0.00	0.00	0.00
RPr	1.05	2.03	0.9	1.24	1.76	0.92	2.03
Overlay	+++	+++	++ -	- - +	+ - +	+ - -	- - +
Classification	Dominant	Dominant	Potential	Marginal	Saturated	Marginal	Marginal

Source: Secondary data processed, 2022.

Table 9. Quartile Analysis Output Description

District	Contribution Value (%)	
	Low	High
Rubber	≤ 2.43	2.44 - 3.15
Palm oil	≤ 2.75	2.74 - 3.16
Coconut	≤ 3.62	3.63 - 4.52
Coffee	≤ 3.75	3.76 - 4.69
Chocolate	≤ 2.51	2.52 - 3.14
betel nut	≤ 2.32	2.33 - 2.90
Patchouli	≤ 1.25	1.26 - 1.88

Source: Secondary data processed, 2022.

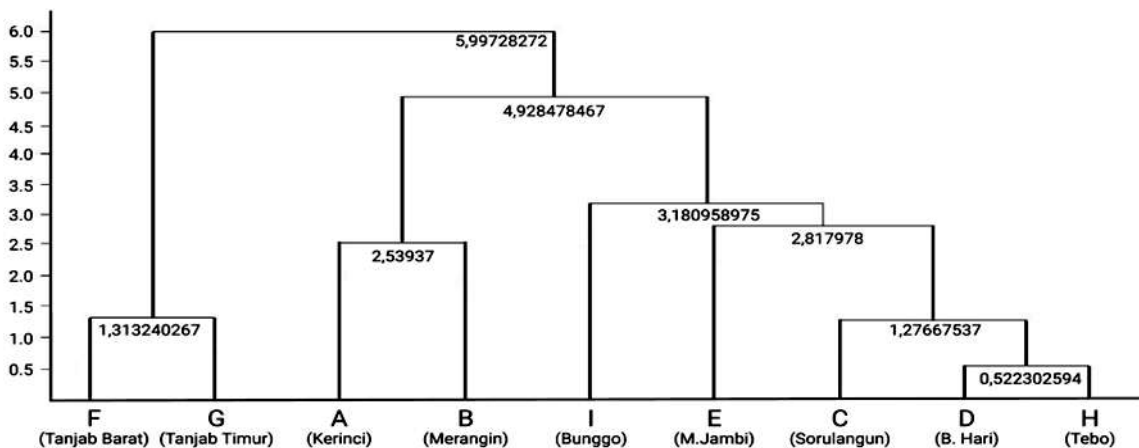


Figure 1. Dendrogram

Source: Secondary data processed, 2022.

The cluster division of plantation-based industrial development areas is classified as follows. First, industrial development areas are oriented towards the proximity of raw material sources. Second, industrial development areas are oriented towards easy market access. Third, industrial development areas are oriented on the availability of labor.

The cluster formation stage for plantation-based industrial development areas oriented to raw materials for production is carried out using Quartil analysis techniques. The grouping of these regions is based on the output value of LQ and Differential Shift (DS) in the results of the previous analysis as well as the value of the contribution of commodity production. So that a regional cluster will be formed which is a group of regions with $LQ > 1$, $DS \geq 0$, and high

production contribution values. Table 9 showed the results of the calculation of Quartil analysis using Excel.

Based on the compilation of $LQ > 1$ values, $DS \geq 0$, and the production contribution value of each commodity, areas with high potential for raw materials and geographically adjacent to each other are classified as clusters of industrial development areas oriented towards raw material sources. The regional cluster consists of the districts of Kerinci, Merangin, Sorulangun, Batang Hari, Muaro Jambi, Tanjung Jabung Barat, Tanjung Jabung Timur, Tebo and Muaro Bungo.

Next step, cluster formation of industrial development areas that are oriented towards the proximity of raw materials, availability of labor sources and easy market access is

carried out using Hierarchical Cluster analysis techniques. The results of the hierarchical cluster technique for leading commodity areas of plantation development area. Cluster classification as shown in the dendrogram (Figure 1).

From the dendrogram, a cluster of areas for prime commodity plantations in Jambi

Province can be created, as showed in Table 10. From the results of determining the industrial area in this table, the conclusions for each regency-city in the province of Jambi above will be clarified using a map of the area. The map of the area for the industry related to the plantation sub-sector is like the map of the area (Figure 2).

Table 10. Industrial Development Area Cluster

Development Area Cluster Classification	
Regional Characteristics	Cluster 1
The cluster of areas for the development of the leading plantation commodity industry oriented towards ease of market access	Bungo Regency M. Jambi Regency Sorolangun Regency District B. Day Tebo Regency
Regional Characteristics	Cluster 2
development of the leading plantation commodity industry oriented towards proximity to raw materials	Kerinci Regency Merangin Regency
Regional Characteristics	Cluster 3
The cluster of areas for the development of the leading plantation commodity industry oriented to the availability of labor	West Tanjab Regency East Tanjab Regency

Source: Secondary data processed, 2022.



Figure 1. Dendrogram

Source: Secondary data processed, 2022.

Discussion

The results of this study are relevant to Niyimbanira (2018) research that to determine the main industries in South Africa using location quotient analysis and shift-share analysis. With this LQ and SS analysis, it will be found which commodities and sectors have comparative and competitive advantages, especially in Jambi Province. This study also supports the findings of Rismayanti (2021), that to make regional development planning it is necessary to map the potential of the local area to build regional competitiveness. Mapping the potential of this area is considered important to be able to identify regional advantages so that the direction of development can be focused on certain sectors. This study is also relevant to the research of Wijaya & Marseto (2022) that in Wonogiri Regency, Central Java Province, economic growth increased as a result of the rapid growth of economic sectors such as the manufacturing industry sector and the trade sector, both large and small trade.

Accelerated development of the economic and agricultural sectors can be realized with the support of adequate infrastructure. The results of this study support the findings of Rusli *et al.* (2021) that infrastructure is very important, and even becomes a top priority for the implementation of development in the agricultural sector and the economic sector in general. The LQ and SS methods are very important in this case, where the LQ method is used to determine the basis and non-base sectors, while the SS method is useful for determining which agricultural industrial sectors are advanced and become regional advantages and sectors that are of concern to be improved.

This study also supports the findings of Maspaitella & Parinussa (2021) that the LQ and LS methods are very useful for finding important aspects of an area so that certain

leading sectors can become economic drivers, especially in Teluk Bintuni Regency, West Papua Province. The advantages in question are not only comparative advantages but also competitive advantages based on empirical findings that can increase Gross Regional Domestic Product and economic growth over a certain period of time.

Based on the research findings, it can be stated four main arguments. First, comparative advantages of oil palm and rubber throughout Jambi. Second, rubber and palm oil in the commodity base sector in Kerinci, Merangin, Batang Hari, Bungo; coffee and cinnamon are the base sectors in Kerinci, Merangin, Sorolangun; and, chocolate in Bungo and Kerinci. Third, palm oil and rubber are dominant and their growth potential in all areas in Jambi; coffee, cinnamon, cocoa plantations and their dominant growth potential are in Kerinci, Merangin, Bungo; while clove, coconut, areca nut, candlenut, kapok, sugar palm, vanilla, sugar cane, and patchouli are less developed. Fourth, there are three clusters oriented towards ease of market access, proximity of raw materials and availability of labor.

The results of the study that palm oil is the leading sector in Jambi Province are relevant to the Purba (2018) theory, that palm oil is Indonesia's leading commodity which is also the world's largest supplier of Crude Palm Oil (CPO). The importance of oil palm as a leading commodity supports the studies of Purba & Sipayung (2017) and Yuliani (2019) that oil palm is Indonesia's strategic commodity, so the maximum production management is needed to build sustainable development for the product.

CONCLUSION

The results of the study can be concluded as follows. First, the leading plantation commodities are further developed

in support of industrial sector activities in Jambi is rubber, oil palm, coconut, coffee, chocolate, areca nut and patchouli. Second, three clusters of plantation-based industrial development areas were formed in regional Jambi. Third, cluster formation supports the development of industrial sector activities by adjusting potential territory owned.

Jambi Province, with the plantation sector as a regional superior commodity and very suitable for palm oil, rubber, coconut, coffee and so on, is not only a national leading commodity, but also a producer of CPO to meet consumption needs or the world market. The scarcity of domestic cooking oil some time ago, for example, economically in terms of supply of cooking oil, had implications for cooking oil prices, so this had implications for price increases and inflation. However, in-depth studies related to cooking oil prices, inflation and economic growth in this study have not been carried out with empirical support that can be fought for.

The magnitude of the impact of the scarcity of cooking oil which uses palm oil as the main raw material on the national economy, it is certain for future researchers to thoroughly examine the relationship between the micro-economic sector, namely the price of cooking oil; and the macroeconomic sector, namely inflation and economic growth using research data with a long series to find a model of the relationship between variables for a certain thing related to a featured object.

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