



UDC 332; DOI 10.18551/rjoas.2023-06.11

## ANALYSIS OF THE AGRICULTURAL SECTOR'S CONTRIBUTION TO ECONOMY OF CENTRAL KALIMANTAN PROVINCE, INDONESIA

Fauzi Ahmad\*, Ferrianta Yudi, Fajeri Hairin

Master's Program in Agricultural Economics, Faculty of Agriculture,  
University of Lambung Mangkurat, Banjarbaru, South Kalimantan, Indonesia

\*E-mail: [fauzialkaisan@gmail.com](mailto:fauzialkaisan@gmail.com)

### ABSTRACT

The aim of economic development is to achieve prosperity for all people equally by improving their quality of life to a better level. Economic dynamics give rise to varying levels of economic growth in each region, in accordance with the potential of each region. The development of the region's superior potentials is expected to be able to increase economic growth. Central Kalimantan continues to experience an increase in GRDP from year to year, one of which is in the field of agricultural sector businesses, including sub-sectors of food crops, horticulture, plantations, livestock, agricultural services/hunting, and forestry. This research is conducted to identify which sectors and sub-sectors are the superior (base), to understand their roles and shifts in the economy, to determine the typology of agricultural sector growth in each district/city, and to examine economic development disparities in Central Kalimantan Province. The research results show that the agricultural sector and the sub-sectors of plantations, agricultural services/hunting, and forestry are the base sectors. Economic growth shifts show that almost all sub-sectors have positive values (+), indicating *progressive* development. However, the slow growth of the forestry sub-sector is influenced by competitiveness factors. The Klassen typology analysis indicates a shift from quadrant I (*rapidly growing*) to quadrant II (*stagnant growth*) during the period of 2012-2021 due to the influence of the COVID-19 pandemic. However, the level of economic development inequality in Central Kalimantan Province, using the Williamson index, still falls into the low category, indicating that the regional development level is still relatively even.

### KEY WORDS

Base, economic structure, typology, economic development inequality.

Economic development cannot be separated from the aspect of community welfare. Therefore, the goal of economic development is to achieve equal prosperity for all people in a country. Mulyani (2017) is in line with Amalia (2022), who states that the goal of economic development is to create the highest possible level of GNP (*gross national product*) growth, but accompanied by poverty reduction, income inequality alleviation, and job creation.

Most of the Indonesian population works in the agricultural sector which indirectly impacts both the regional and national economy. This is in accordance with Downey's (1987) view that the agricultural sector, within the scope of the current economy, encompasses various commercial enterprises that use a heterogeneous combination of labor, raw materials, capital, and technology. This pattern is constantly changing and tends to adapt to consumer demand in providing agricultural products for both domestic and foreign markets.

A strong synergy in the agricultural sector will shape an efficient economy and drive regional economic growth, as stated by Sjafrizal (2008). According to Purba (2021), regional economic growth is an increase in the overall income of the community that occurs in the region with an increase in the total added value. It is hoped that the potential of regional resources will increase the productivity of the regional economy. The rate of economic growth of the Gross Regional Domestic Product (GRDP) of Central Kalimantan province in the last decade (2012-2021) showed the highest growth in 2013 with a value of 7.37%, followed by a sharp contraction in 2020 with a value of -1.44%, which indicates the impact of the COVID-19 pandemic. However, in 2021, the economy bounced back and grew by 3.38%.



Good management of regional potential is based on good planning, organizing, implementing activities, and control, which will lead to increased productivity of the regional economy. Fluctuations in the Gross Regional Domestic Product (GRDP) are an indication of the region's economy in a certain period with a dynamic value, and due to limited natural and human resources, there are disparities within the region. Therefore, a more in-depth study is needed to analyze the economic conditions of Central Kalimantan province, especially in the agricultural sector. This includes examining the shift in the economic structure from year to year, which sectors and sub-sectors are more competitive, and how the economic classification affects regional disparities. Such analysis is essential for regional development planning to align with the region's potential.

Purpose of study:

- Analyzing the basis and non-basis sub-sectors of agriculture in Central Kalimantan province;
- Analyzing changes in the economic structure of the agricultural sector and sub-sectors;
- Analyzing the typology of agricultural sectors in districts/cities and regional development disparities in Central Kalimantan province.

As one of the inputs and references for local governments in making policy decisions regarding the preparation of the Regional Long-Term Development Plan (RPJPD) and the Regional Medium-Term Development Plan (RPJMD) in the agricultural sector.

## METHODS OF RESEARCH

This research was conducted in Central Kalimantan Province, and the research was carried out from October 2022 to February 2023.

The data used in this study are secondary data, sourced from BPS Pusat, BPS Kalimantan Tengah, BAPPEDA LITBANG Kalimantan Tengah with time series data from 2012-2021. The data were obtained from regional GDP documents and national GDP data, as well as references from various sources related to the research.

The *Location Quotient* (LQ) analysis is used to identify the leading sectors and sub-sectors of the region, by measuring the economic sector activities in the region compared to its role in the regional economy with the role of similar economic sector activities in the national economy.

$$LQ = \left( \frac{E_{ij}/E_j}{E_{in}/E_n} \right) \quad (1)$$

Where:  $E_{ij}$  - Gross Regional Domestic Product (GRDP) of agricultural sector/subsector in Central Kalimantan Province;  $E_j$  - Total GRDP of Central Kalimantan Province;  $E_{in}$  - Gross Domestic Product (GDP) of agricultural sector/subsector in National level;  $E_n$  - Total GDP in National level.

Criteria: If the value of  $LQ > 1$ , it means BASIS and if the value of  $LQ < 1$ , it means NON-BASIS.

The *shift-share* analysis method is used to analyze the changes in the economic structure of Central Kalimantan Province compared to the higher economic structure of another region (national) as a comparison. The components of the analysis consist of the influence of national growth (N), the influence of industrial mix (M), the influence of competitive advantage (C), and (D) as the total change in the PDRB variable of a region.

$$D = N + M + C \quad (2)$$

With:

$$N = E_{ijo} \left( \frac{E_{nt}}{E_{no}} \right) - E_{ijo}; M = \left[ \left( \frac{E_{int}}{E_{ino}} \right) - \left( \frac{E_{nt}}{E_{no}} \right) \right] E_{ijo}; C = E_{ijt} - \left( \frac{E_{int}}{E_{ino}} \right) E_{ijo}.$$

Where:

- D: Total output change;



- N: Impact of national growth;
- M: Impact of industry mix;
- C: Impact of competitiveness;
- E<sub>ijo</sub>: Agriculture sector/subsector GDP in Central Kalimantan Province in the initial year;
- E<sub>ijt</sub>: Agriculture sector/subsector GDP in Central Kalimantan Province in the final year;
- E<sub>ino</sub>: National agriculture sector/subsector GDP in the initial year;
- E<sub>int</sub>: National agriculture sector/subsector GDP in the final year;
- E<sub>no</sub>: Total national GDP in the initial year;
- E<sub>nt</sub>: Total national GDP in the final year;
- i: Agriculture sector/subsector;
- j: Central Kalimantan Province;
- n: National;
- o: Initial year;
- t: Final year.

Criteria:

- If N (*National share / national growth effect*);
- N (+) Rapid growth of sector i in the province;
- N (-) Slow growth of sector i in the province;
- If M (*Proporsional shift / manufacturing effect / sectoral mix effect*);
- M (+) indicates a higher specialization of sector i in the Province;
- M (-) indicates a lower specialization of sector i in the Province;
- If C (*Differential shift / competitive effect*);
- C (+) The sector I has a higher competitiveness in the provincial region;
- C (-) The sector I has a lower competitiveness in the provincial region.

Based on the *Klassen matrix*, a regional sector can be grouped by comparing the growth (g) and contribution (s) of a particular sector to the total regional GDP of one level above it. Each district in the agricultural sector is classified into four quadrants.

Table 1 – Typology of Classes

Growth	Contribution	
	S <sub>ik</sub> < S <sub>ij</sub>	S <sub>ik</sub> ≥ S <sub>ij</sub>
G <sub>ik</sub> ≥ G <sub>ij</sub>	Quadrant III Potential for Development	Quadrant I Rapidly Growing
G <sub>ik</sub> < G <sub>ij</sub>	Quadrant IV Relatively Left Behind	Quadrant II Under Pressure to Grow

Criteria:

- I: Regencies/cities with rapid growth;
- II: Regencies/cities under pressure to grow;
- III: Regencies/cities with potential for development;
- IV: Regencies/cities that are left behind.

The Williamson Index analysis is a method for analyzing the disparities in regional development within a certain area, based on calculations using the regional GDP per capita data and population numbers per region. The statistical formulation of the Williamson Index can be presented with the following formula:

$$I_w = \frac{\sqrt{\frac{\sum_k^n (E_k - E_j)^2 m_k}{m}}}{E_j} \quad (3)$$

Where: I<sub>w</sub> = Williamson Index; E<sub>k</sub> = GDP per capita of each regency/city; E<sub>j</sub> = GDP per capita of Central Kalimantan Province; m<sub>k</sub> = Population of each regency/city; m = Population of Central Kalimantan Province.

Criteria:



- $IW < 0.3$ , the regional development disparity is categorized as low;
- $IW$  is between 0.3 and 0.5, the regional development disparity is categorized as moderate;
- $IW > 0.5$ , the regional development disparity is categorized as high.

## RESULTS AND DISCUSSION

The Location Quotient (LQ) analysis is used to measure the economic base and non-base of the agricultural sub-sectors in Central Kalimantan Province by comparing the value of the sub-sector's GDP to the one level above it (national). If the LQ value is greater than 1, it is considered a base sub-sector, and if the LQ value is less than 1, it is considered a non-base sub-sector.

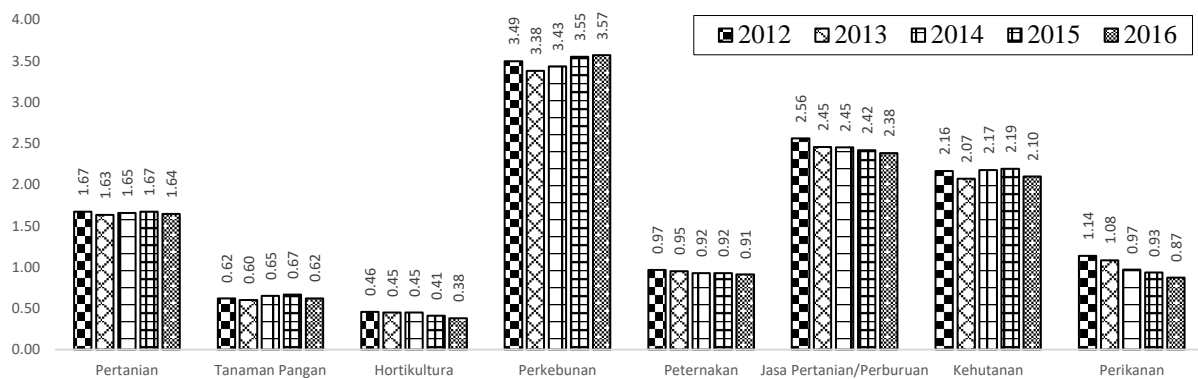


Figure 1 – Result of Location Quotient analysis from 2012-2016

In Figure 1, the LQ analysis results from 2012-2016 show that the plantation, agriculture/hunting services, and forestry sub-sectors are considered base sub-sectors. The same pattern is observed in Figure 2 for the observation period from 2017 to 2021. The fishery sub-sector was considered a base sub-sector in 2012 and 2013 but has since declined and has been classified as a non-base sub-sector from 2014 to 2021. This is because of the rampant *illegal fishing* activities that disturb the fishery ecosystem, thus affecting the economy. The decline in fish catches by fishermen has implications for the decrease in added value from the processing industry and the inflation of fish prices from 2014 to 2021.

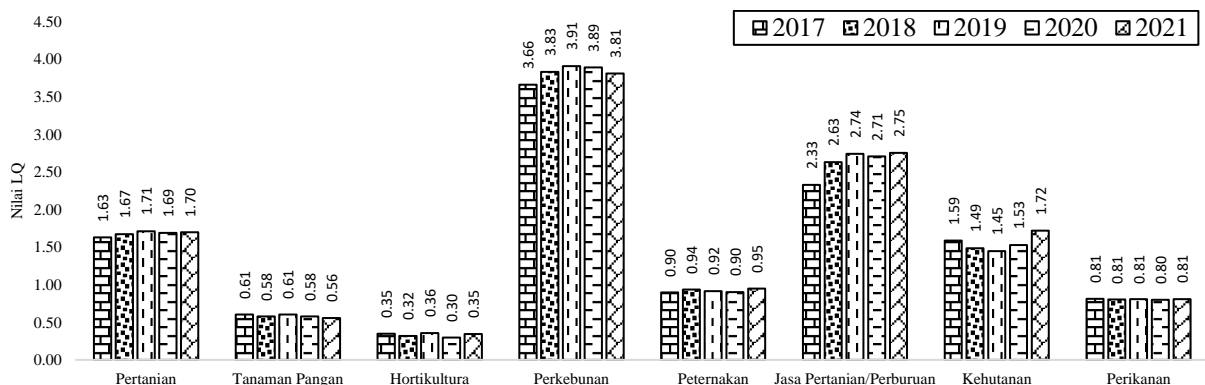


Figure 2 – Results of location quotient analysis for the years 2017-2021

Consistency of basis subsectors in two observation periods in 2012-2016 and 2017-2021 shows a competitive advantage, particularly in the plantation subsector with the highest LQ value. This condition is due to the potential of natural resources (land area, soil type, and



water) which are suitable for plantation subsectors, especially the palm oil commodity. In addition, palm oil plantation businesses are the largest in terms of employment, starting from primary, secondary, and tertiary sectors.

The role of basis is a surplus of agricultural subsector products that can fulfill the needs within the region and also meet the needs outside the region (*export*). Basis subsector can be a *trigger* for economic development of other business sectors in the region and can be a priority in regional development policies that impact the region's income and increasing demand for non-basis products, thereby encouraging investment in non-basis subsectors. This is in accordance with the opinion of Sjafrizal (2008), that if a certain region can encourage the growth of sectors and sub-sectors that have competitive advantages as a basis for export, then regional growth can be enhanced because the basis sector has a double impact (*multiplier effect*) on the regional economy.

The existence of the COVID-19 pandemic in the year 2020 falls within the observation period of 2017-2021 and has an insignificant impact on the agricultural subsector of Central Kalimantan Province. This is also reinforced by the results of the research UNIDO-United Nations Industrial Development Organization (2020), The research found several economic impacts caused by the Covid-19 pandemic, One of them is a decrease in the Human Development Index (IPM) (*human development index*), (*reduced trade global*), (*increase unemployment*), (*increase the extreme of the poor*) and (*the majority of countries hit by a crisis*). Middle and upper-income countries were greatly affected, and many sectors experienced a decline compared to *health and food security/agriculture*.

The shift share analysis provides an overview of the performance of the agricultural sector and sub-sectors in Central Kalimantan Province compared to the performance of the same sector and sub-sectors in the national level, thus changes in the economic structure of Central Kalimantan Province can be identified with components (N) the influence of National growth, (M) the influence of industrial mix and (C) the influence of competitiveness, the accumulation of these components results in (D) which is the total output change of Central Kalimantan Province. The shift share analysis results can be seen in table 1.

Table 1 – Results of shift-share analysis on the agriculture sector and sub-sectors

Sector/Subsector	N	M	C	D
Agriculture	6.380,80	-1.286,49	2.289,58	7.383,88
Food Crops	598,78	-413,89	-16,47	168,42
Horticulture	196,62	-32,57	-102,05	62,00
Plantation	3.863,16	-7.763,12	10.000,41	6.100,45
Livestock	423,47	-1.220,97	1.296,25	498,75
Agricultural/ Hunting Services	145,88	874,67	-828,98	191,58
Forestry	467,85	3.317,67	-3.852,54	-67,02
Fisheries	685,04	5.564,89	-5.820,22	429,71

The influence of National economic growth policy (*national growth effect*) has an impact on the growth of the agriculture sector and sub-sectors in Central Kalimantan Province. This can be seen from the value of N in the agricultural sector which is positive with a value of IDR 6.38 trillion and in the plantation sub-sector amounting to IDR 3.86 trillion. This condition indicates that general monetary and fiscal policies that apply nationally and specific policies such as the food estate program in Central Kalimantan Province have an impact on the economic development of Central Kalimantan in the agriculture sector and sub-sectors.

The influence of *industry mix effect* does not show the specialization of the agriculture sector in Central Kalimantan Province, which is a source of regional income, as seen in the negative value of M. This indicates that the influence of industry mix on the agriculture sector in Central Kalimantan Province is lower compared to the agriculture sector at the national level. However, if viewed partially, the agricultural/hunting services, forestry, and fisheries sub-sectors have a positive impact (+). This condition indicates that the influence of industry mix on these sub-sectors is higher compared to the influence of industry mix on the same sub-sectors at the national level.



The influence of competitive advantage (*competitive effect*) is seen in the agriculture sector, plantation sub-sector, and livestock sub-sector, showing a positive value (+) in component C. This indicates that the agriculture sector, plantation sub-sector, and livestock sub-sector in Central Kalimantan Province have a higher competitive advantage compared to the same sector and sub-sectors at the national level.

Based on the results of the shift-share analysis, the net change (D) in the agriculture sector in Central Kalimantan Province is positive (+) and experienced a total increase in economic output of IDR 7.38 trillion, followed by the performance of the plantation sub-sector with a value of IDR 6.1 trillion. This indicates that the economic growth of the agriculture sector and sub-sectors in Central Kalimantan Province has increased during the period of 2012-2021. However, the forestry sub-sector has a negative value (-), indicating a low competitiveness of the forestry sub-sector in Central Kalimantan Province compared to the same sub-sector at the national level.

The Klassen typology method is used to describe the typology of the agricultural sector economy in the Central Kalimantan Province, comparing the growth and contribution of the agriculture sector in each district/city with the growth and contribution of the same sector in higher areas (national) as a comparison based on the Gross Regional Domestic Product (GRDP) in each region.

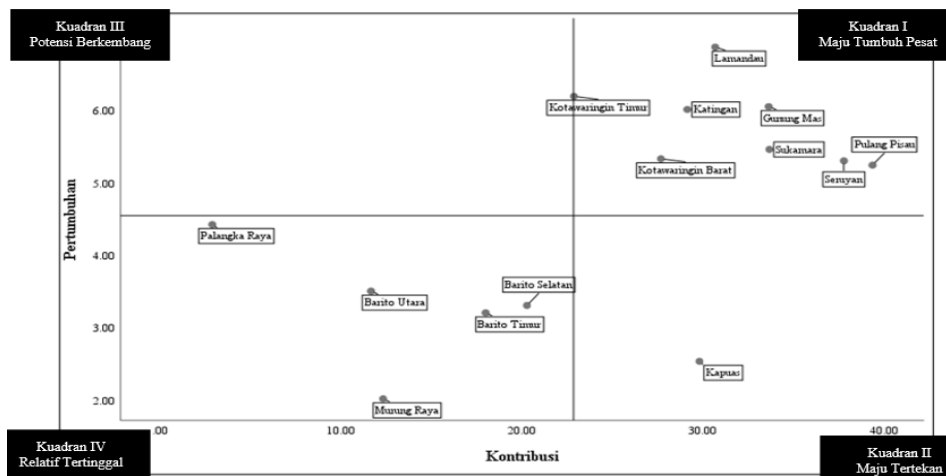


Figure 3 – Quadrants of Agricultural Sector in Districts and City in 2012-2016

The classification of the agricultural sector economy in 13 (thirteen) districts and 1 (one) city is divided into 4 (four) quadrants using the Klassen typology method: Quadrant I (rapid growth and development), Quadrant II (growth under pressure), Quadrant III (potential for development), and Quadrant IV (relatively underdeveloped). The Klassen typology analysis uses the average PDRB data from 2012-2016, as shown in Figure 3, and from 2017-2021, as shown in Figure 4.

The boundary lines that divide each district/city into 4 (four) classifications in the Klassen typology are based on the vertical axis which represents economic growth and the horizontal axis which represents the contribution of the agricultural sector in Central Kalimantan Province. It should be noted that this classification is dynamic, as continuous growth and contributions can result in future changes in classification, especially for areas that are close to the boundaries of the quadrants. Basically, this grouping depends on the growth of the economic structure of the area at a certain time.

Based on figure 3, it can be seen that several districts/cities belong to quadrant I (growing and developing rapidly) including Kotawaringin Barat, Kotawaringin Timur, Sukamara, Lamandau, Seruyan, Katingan, Pulang Pisau, and Gunung Mas, while the classification of quadrant II (developing under pressure) is only in Kapuas Regency, and the quadrant IV classification (relatively underdeveloped areas) includes Palangka Raya City, Barito Utara Regency, Barito Timur Regency, Barito Selatan Regency, and Murung Raya



Regency. In figure 4, there are changes in the classification of several areas including Sukamara, Lamandau, Kotawaringin Barat, Lamandau, and Pulang Pisau in quadrant I (growing and developing rapidly), Seruyan, Kotawaringin Timur, Katingan, and Kapuas in quadrant II (developing under pressure), only Palangka Raya in the quadrant III (potential for development) category, while Barito Selatan, Barito Timur, Barito Utara, and Murung Raya Regencies are in quadrant IV (relatively underdeveloped areas) classification.

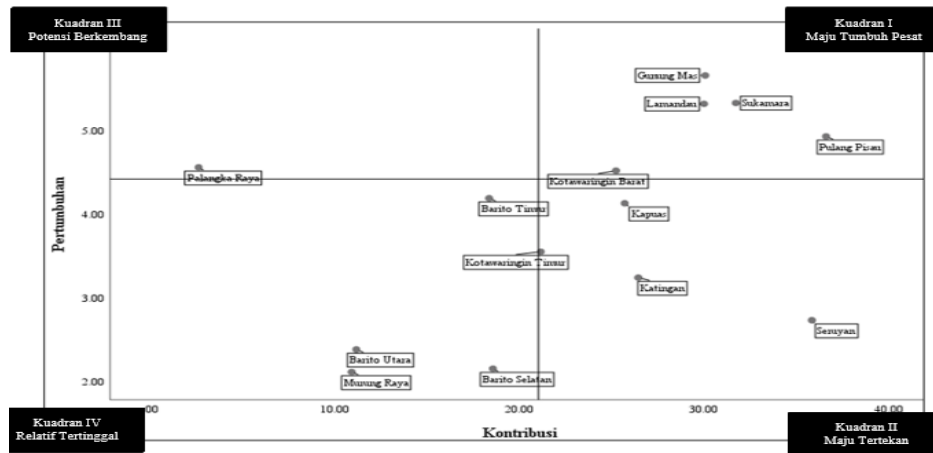


Figure 4 – Quadrant of Agriculture Sector in Districts and City in 2017-2021

If we compare the two observation periods reflected in Figure 3 and Figure 4, it shows a shift and decline from quadrant I to quadrant II in the areas of Kotawaringin Timur, Katingan, and Seruyan. The change of areas classified from quadrant I to quadrant II has an average contribution to the agricultural sector above the reference area (Central Kalimantan), but the economic growth of the agricultural sector is below the reference area average. This condition signals the influence of the decline in several main economic activities of those regencies, which were triggered by the Covid-19 pandemic that hit the Central Kalimantan region. As a consequence, the local government took a policy decision that impacted the regional economy, namely the implementation of Large-Scale Social Restrictions (PSBB) in the Central Kalimantan region. This policy is a derivative of the central government's policy, which certainly has an impact on layoffs or work from home, resulting in a reduction in output generated from business fields and on the workers' side, it affects the level of income, which subsequently has implications for people's purchasing power. This is in line with Sukirno's (2011) statement that economic growth is a continuous long-term process of increasing output per capita. This opinion is reinforced by Kuznets' theory, which states that the transformation of economic structure is characterized by changes in the percentage contribution of various sectors and subsectors in economic development, caused by the intensity of human activity and changes in technology (Amalia, 2022).

This is also in line with the LQ value of the plantation subsector, which is a special basis category, especially the palm oil commodity that dominates the business sector in 3 districts, namely Kotawaringin Timur, Seruyan, and Katingan, which contribute the most to the economy in several districts, both in terms of employment absorption and land area in the plantation subsector. The area of palm oil plantations in the districts can be seen in figure 13. If the production and prices of palm oil commodities in these 3 districts increase or decrease, it will greatly affect the economy in several districts.

The subsequent change in quadrant III is occupied by the city of Palangka Raya, which previously occupied quadrant IV. This condition shows an improvement in the economic recovery during the COVID-19 pandemic in the agricultural sector, which is gradually improving.

The inequality of regional development has implications for regional development policies because the ability of each region to drive the development process varies according to its potential and resources.



Based on Figure 5, the value of the Williamson index in the past 10 years, from 2012 to 2021, shows that the level of regional development inequality is still categorized as low with a range of values between 0.222 and 0.226 units of the index. From 2012 to 2019, there was a tendency for a decrease in the level of regional development inequality, then, from 2019 to 2021, there was a trend of increasing Williamson Index values, from 0.192 in 2019 to 0.206 in 2020, and further increasing to 0.222 in 2021. Although the Williamson Index value is still in the low category, the trend from 2019 to 2021 shows an increasing tendency towards the medium category of regional development inequality. Without acceleration of development, it is highly likely that the level of inequality will reach an even higher level.

Based on Figure 5, it can be seen that at the end of 2019, the COVID-19 pandemic hit the world and in early 2020, the COVID-19 pandemic spread to Indonesia, resulting in a slowdown in economic growth in all business sectors which affected the economic growth rate of Central Kalimantan Province. It is apparent that from 2019 to 2022, there is a trend of increasing regional development inequality. The government's policy of Large-Scale Social Restrictions (PSBB) during the COVID-19 pandemic has resulted in the less smooth mobility of goods and services, causing excess production in one region to be unable to be sold to other regions in need, thus affecting the revenue side. According to Sjafrizal (2008), factors that influence regional development inequality are: a) differences in natural resources, b) demographic and labor factors, c) allocation of development funds between regions, both government and private investments, d) concentration of economic activities in certain regions, and e) mobility of goods and services.

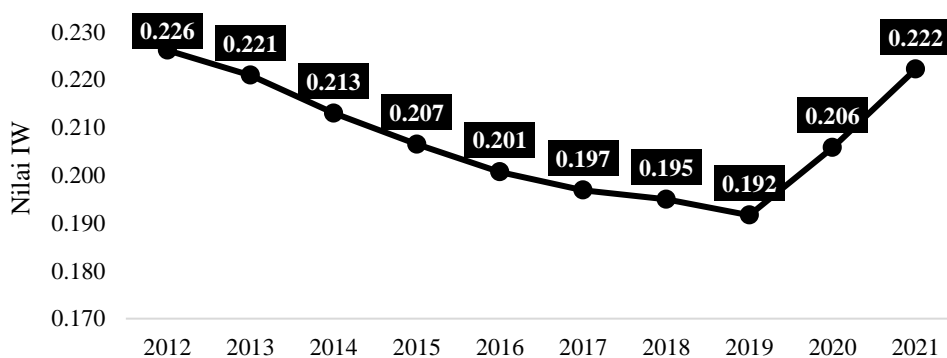


Figure 5 – Williamson index from 2012-2021 in Central Kalimantan Province

#### Criteria:

- $IW < 0,3$ : Low category of regional development inequality;
- $IW 0,3-0,5$ : Moderate regional development inequality;
- $IW > 0,5$ : High category of regional development inequality.

### CONCLUSION

Based on the results and discussion, a conclusion is obtained:

1. The subsectors of agricultural/hunting services, forestry, and plantations are the base subsectors, with the plantation subsector being the main contributor to the economy in Central Kalimantan Province in the years 2012-2016 and 2017-2021;
2. The net change value (D) of the agricultural sector is positive (+). This indicates that the sector is considered advanced (progressive) and is followed by sub-sectors of food crops, horticulture, plantations, animal husbandry, agricultural services/hunting, and fisheries, while the forestry sub-sector has a negative (-) value indicating low competitiveness at the national level;
3. Based on the results of klassen typology analysis, the comparison between observations in 2012-2016 and 2017-2021 shows a shift from quadrant I (rapidly growing) to quadrant II (growing under pressure) in Kotawaringin Timur, Seruyan, and Katingan Districts. This





indicates the influence of Large-Scale Social Restrictions during the Covid-19 pandemic. And the city of Palangka Raya experienced a change from quadrant IV (relatively underdeveloped area) to quadrant III (potential for development), indicating the influence of the acceleration of economic recovery during the covid-19 pandemic on the agricultural sector. And based on the index of regional development inequality in Central Kalimantan Province from 2012 to 2021, it is classified as low development inequality with a range of 0.222 to 0.226 index units (IU), indicating a fairly even distribution of development in the region of Central Kalimantan Province.

*Suggestions:*

1. Serious attention is needed from local government for planning that can be poured into the RPJPD and RPJMD for the development of the plantation subsector, which is a leading subsector in Central Kalimantan Province, both in terms of developing plantation areas that adjust to land availability and developing processing industries using raw materials from the plantation subsector, especially palm oil commodities, to provide a double effect on the economy of Central Kalimantan Province, which will ultimately improve the welfare of the people.
2. In areas classified as (rapid growth), the local government is expected to maintain stable and controlled inflation to accelerate regional economic growth. In areas classified as (under pressure), there is a need for product development (downstreaming) in terms of competitiveness and comparability. In areas classified as (developing potential), it is hoped that they can develop innovation and regional promotion to attract investments that have a positive impact on economic growth in the agricultural sector. In areas classified as (relatively backward), intensive and sustainable cooperation needs to be developed with surrounding areas, especially bordering areas, for optimal economic development in the agricultural sector.
3. For future researchers, it is hoped that they can continue similar research focused on the sub-sector of smallholder palm oil plantations by adding observations on the Human Development Index (HDI) and Farmer Exchange Rate (FER) in Central Kalimantan Province.

## REFERENCES

1. Amalia, Fitri, et al, (2022), Development Economics, Bandung, Widina Bhakti Persada.
2. Downey, W, David, et al, (1987), Agribusiness Management Second Edition, Jakarta, PT Erlangga.
3. Mulyani, E, (2017), Development Economics (First), Yogyakarta, UNY Press.
4. Purba, Bonaraja, et al, (2021), Development Economics, Medan, Yayasan Kita Write.
5. Sjafrizal, (2008), Regional Economics, Padang, BADUOSE MEDIA.
6. United Nations Industrial Development Organization. 2020. Coronavirus: The Economic Impact. Accessed via the <https://www.unido.org/stories/coronavirus-economic-impact>.