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THE EXISTENCE OF THE AGRICULTURAL SECTOR IN THE ECONOMIC STRUCTURE OF CENTRAL SULAWESI PROVINCE

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ABSTRACT

Central Sulawesi's agricultural sector is classified as a substantial sector. This study aims to identify the existence of the agricultural sector in the economic structure of Central Sulawesi. Data analysis used Location Quotient (LQ), Dynamic Location Quotient (DLQ), and Shift Share Analysis methods. The data used is based from the Central Statistics Agency for Central Sulawesi and Indonesia in 2015-2020 based on constant prices. The results showed that the agricultural sector of Central Sulawesi was classified as the base sector with the highest average LQ value and was followed by the mining and quarrying sector. Meanwhile, the results of the DLQ analysis show that the agricultural sector is threatened with repositioning in the future. The combined analysis of LQ and DLQ indicates that the agricultural sector in Central Sulawesi is on a basic non-prospective. The results of shift-share analysis (Nij) show that the highest performance in the agricultural sub-sector is produced by the plantation sub-sector and the fishery sub-sector. The industrial mix value (Mij) from the agricultural sector and all sub-sectors mostly shows negative numbers, so only three agricultural sub-sectors, including the developed sector in Central Sulawesi Province include the horticulture sub-sector, livestock sub-sector, and fishery sub-sector. Based on the value (Cij) of the agricultural sector, it shows a negative number, so the sub-sectors that need to be improved include the food crops sub-sector, the horticulture sub-sector, the plantation sub-sector, and the fisheries sub-sector. It is necessary to pay attention to increasing labor wages in the agricultural sector and improving the performance of agro-industry in Central Sulawesi to create added value.

Keywords*:* Agricultural Sector, Basic Non-Prospective, Central Sulawesi

INTRODUCTION

The agricultural sector is very substantial for the economic growth of a country because it contributes to economic prosperity in developed countries and economic progress in less developed countries. In other words, countries with low real per capita income will prioritize agriculture (FAO, 2018; Praburaj, 2018). The agricultural sector contributes to the food supply, job creation, increased export income, increased savings and funds for investment, preservation of traditions and community involvement, protection of the environment and biodiversity, and produces primary commodities for industrial expansion. (Cheong et al., 2013; Meijerink & Roza, 2007). Food crops, livestock, fisheries, and forestry are part of the strategic agricultural sector (FAO, 2018). The production of this sector will affect the continuity of production in the industrial sector. The reduction in agricultural production has an impact on the slack in industrial production, increasing product prices. This reduction harms the economic growth of a country (Praburaj, 2018). In addition, the agricultural sector contributes to improving food security, which is still a significant issue, especially in developing countries (Pawlak & Kołodziejczak, 2020).

The agricultural sector encountered many obstacles over time. The first is the decreasing proportion of workers. Initially, agriculture absorbed much labor. However, currently experiencing a shift to the non-agricultural sector due to the influence of increasingly modern agricultural technology and a decreasing agricultural area. (Praburaj, 2018; Rauf et al., 2010; Widyawati, 2017). From 1985 to 2015, the proportion decreased by 20.7%, in contrast to the industrial and service sectors, which increased by 6.3% and 13%, respectively. These changes impact on the second problem, namely the decline in the agricultural sector's contribution to GDP. The grant from 1985 to 2015 decreased by 9.8%, while the industry increased by 26% (ADB, 2016). The third problem is the threat of land-use change (Hikmatullah & Suryani, 2014), and the last is climate change. An increase in temperature of 1° is found to reduce the GRDP of the agricultural sector by 2.46% (Priyanto, 2021).

Many studies have shown that the agricultural sector is the leading sector in Indonesia (Hidayat & Darwin, 2017; Tanjung et al., 2021). This information is important to trace because the leading sector economic activities can encourage economic growth, contribute to the economic viability of other sectors, and become the mainstay of the political system. This relationship will be strengthened or diminished according to the innovation and investment life cycle of the leading sector (Reuveny & Thompson, 2001). Innovations and investments in the agricultural sector include developing agro-industry, genetic engineering of commodities, utilizing technology to be more efficient, improving agricultural infrastructures such as roads, warehousing, transportation, and many others. (FAO, 2018; Praburaj, 2018).

We try to fill the gap in previous research by exploring the agricultural sector's role in Central Sulawesi Province's economic performance. When the agricultural sector encounters many obstacles, we validate whether the sector is still relevant and contributes to the economy of Central Sulawesi. Central Sulawesi Province was chosen because it is an agricultural area where agriculture is the main source of income for most of the population. In 2014 the agricultural sector still dominated the economic structure of Central Sulawesi, followed by the construction and mining sectors. Plantations (cocoa, oil palm, rattan), agriculture, fisheries, and marine are some of the potential sectors that make it possible (Bapennas, 2015). However, the contribution of this sector has tended to decline over the last three years (2015-2017), while the mining sector has experienced a significant increase

(Kadir et al., 2020). Central Sulawesi has a potential land area of 1,146,373 Ha which is used for agriculture of irrigated, rainfed and dry land. (Hikmatullah & Suryani, 2014).

The government has also assisted in the form of Urea subsidies; NPK; 2 wheel tractors; 4 wheel tractors; and water pumps which show an increasing trend of 72.28 tons; 2513.8 tons; 46 units; 9 units; and 61 units (Kementan, 2020). Rice is the main staple food for the people of Central Sulawesi. From 2015 to 2019, the average daily per capita calorie consumption in urban and rural areas reached more than 900 calories. The high-calorie intake indicates that the demand for rice in Central Sulawesi Province is still strong (Norfahmi et al., 2021). However, Central Sulawesi is becoming increasingly popular as a mining destination, especially with the enforcement of Peraturan Presiden Nomor 2 Tahun 2015. Central Sulawesi (Morowali) is designated as a priority industrial development area in the mining industry due to this Presidential Regulation. Besides providing positive benefits for increasing the income of SMEs, mining is reported to be disturbing the lives of the surrounding community due to environmental damage and pollution (Kadir et al., 2020).

Based on this description, this study aims to determine the existence of the agricultural sector in the economic structure of Central Sulawesi. This research is expected to be a consideration in the formulation of policies and economic development, especially in the agricultural sector, in many obstacles that interfere with the performance of the agricultural sector.

RESEARCH METHODS

This study uses a descriptive analytical method that describes the object under study through data or samples, and then the data is processed and interpreted to conclude. (Sugiyono, 2009). The data used in this study is secondary data, namely GRDP and GDP at constant prices in 2010 sourced from the Central Statistics Agency for Central Sulawesi Province and the Central National Statistics Agency from 2015 to 2020.

Location Quotient (LQ) dan Dynamic Location Quotient (DLQ). Economic basis analysis is used to identify GRDP in determining the base sector in the economic activities of a region. The LQ technique is divided into two components, namely (Sjafrizal, 2018):

1) Basic Industry, namely economic or industrial activities that serve the market in the region itself and outside the region concerned.
2) Non-basic, namely economic or industrial activities that only serve the market in the area.

Location Quotient (LQ) analysis can show the size of the role of the economic sector in Central Sulawesi Province against the same economic sector in the national scope which can be seen from the contribution side of the sector. This analysis uses the GRDP value approach with the following formula :

$$LQ = \frac{E_{ij}/E_j}{E_{in}/E_n}$$

Notes :

LQ = Coeffisient of Location Quotient (LQ)
Eij = GRDP sector i in Central Sulawesi Province
Ej = Total GRDP in Central Sulawesi Province
Ein = GRDP sector i in national
En = Total GRDP in national

The measurement criteria for the LQ value are:

1) If the LQ value > 1, the sector is a base sector
2) If the value of LQ < 1, the sector is a non-basic sector

Furthermore, Dynamic Location Quotient (DLQ) analysis is carried out to determine whether a sector can potentially become a base sector in the future. The formula used in the DLQ method is as follows (Widodo, 2006)

$$DLQ = \left[\frac{\left(\frac{1+gij}{1+gj}\right)}{\left(\frac{1+Gi}{1+G}\right)} \right]^t$$

Notes:

gij = Sector/sub-sector i growth rate in Central Sulawesi Province

gj = Average sector/sub-sector growth rate in Central Sulawesi Province

Gi = Sector/sub-sector i growth rate at the national level

G = Average sector/sub-sector growth rate at the national level

t = Time of analysis

Based on the formula above, there are DLQ measurement criteria that are basically the same as the LQ method, except that the DLQ measurement emphasizes the comparison of growth rates. The measurement criteria for the DLQ method are as follows:

1) If DLQ > 1, then the sector/subsector has the potential to become the base sector in the future
2) If DLQ 1, then the sector/subsector does not have the potential to become the base sector in the future.

Shift share. The analytical model divides regional GRDP growth as changes in a regional variable, such as changes in income, production, or labor. According to (Sjafrizal, 2018), changes in a region can be divided into three components of growth, namely:

1) N is the regional growth component. If the value is positive, the sector in the Central Sulawesi Province grows faster than the sector growth at the national level.
2) M is a mix growth component industry. If the value is positive, it indicates that the sector in the Central Sulawesi Province is an advanced sector than the sector at the national level.
3) C is the regional share growth component. Shows the competitiveness of a sector in the Central Sulawesi Province which is then compared to the same sector at the national level.

According to Soepono (1993), the purpose of shift share analysis is to determine the magnitude of regional economic performance based on sectoral competitive advantages. To analyze sector i in the province of Central Sulawesi, it can be done using the following formula :

1) The impact of regional economic growth and the effect of national growth:

$$D_{ij} = N_{ij} + M_{ij} + C_{ij}$$

2) National growth component of sector i in the province of Central Sulawesi:

$$N_{ij} = E_{ij}.r_n$$

3) The component of proportional growth or industry mix sector i in Central Sulawesi Province:

$$M_{ij} = E_{ij}\,(r_{in} - r_n)$$

4) Components of sector i competitive advantage in Central Sulawesi Province:

$$C_{ij} = E_{ij}\,(r_{ij} - r_n)$$

r_n shows the total national growth rate, r_{in} shows the national growth rate per sector, while r_{ij} is the growth rate of Central Sulawesi Province per sector, each of which is formulated as follows:

1) Total GDP growth rate at the national level (r_n)

$$r_n = \frac{E^*n - En}{En}$$

2) The growth rate of sector i at the national level (r_{in})

$$r_{in} = \frac{E^*in - Ein}{Ein}$$

3) Growth rate of sector i Central Sulawesi Province (r_{ij})

$$r_{ij} = \frac{E^*ij - Eij}{Eij}$$

Notes :

En = National GDP

Ein = GDP of sector i at the national level

Eij = GRDP sector i in Central Sulawesi Province

* = final year of analysis

RESULT AND DISCUSSION

Sector Based on Location Quotient (LQ) Analysis Results. To determine the development priorities of a region, this research recommends that local governments to make a systematic study that examines sectors that have the potential to be developed and sectors that lack the potential to be given attention in their regions. It can be used as a master plan for regional development so that it can be more focused and have an impact on the welfare of the community. The Location Quotient (LQ) analysis of all economic sectors in Central Sulawesi Province from 2015 to 2020 shows that seven sectors are classified as basic sectors. These sectors include of the agricultural sector, the mining and quarrying sector, the water supply sector, waste management, waste and recycling, the construction sector, the government administration sector, defense and compulsory social security, the education services sector, and the health and social activities sector.

Based on Table 1 shows that from all base sectors, the agricultural sector is the sector that has the highest average LQ value (2,20), which is followed by the mining and quarrying sector (1,86). This shows that these two sectors are sectors that play an important role in the economy in Central Sulawesi. Although the agricultural sector has a fairly large role in the economy in Central Sulawesi, one thing that needs attention is the decline in the value of LQ in this sector which means there has been a decline in its contribution over the last five years.

Meanwhile, the mining sector has seen an increase in the value of LQ in the last 5 years which also means that the contribution of the mining sector to the economy of Central Sulawesi has increased. One of the reasons for the decline in the contribution of the agricultural sector was due to the structural transformation, in which the transformation showed a decrease in the share of the agricultural sector and an increase in the share of the industrial sector (Nurdiyanto et al., 2020).

The increase in business activity in the mining sector in Central Sulawesi can absorb a higher workforce which makes reduction employment in the agricultural sector (Tobigo, 2019). The minimum wage and GRDP factors in the agricultural sector are also the main factors affecting the level of employment in the agricultural sector (Manurung, 2020).

Results of Dynamic Location Quotient (DLQ) Analysis. Dynamic Location Quotient (DLQ) analysis is used to describe the movement of the growth rate of a sector or subsector. The DLQ method can project the repositioning of a sector of the economy in the future, whether it is still classified as a basic sector or a non-basic sector. The results of the DLQ analysis for the agricultural sector and sub-sector in Central Sulawesi can be seen in Table 2. The DLQ value is obtained from the GRDP growth rate of the agricultural sector of Central Sulawesi Province compared to the growth rate of the same sector at the national level.

Based on the results of the analysis in Table 2 using the DLQ method shows that the agricultural sector is threatened with repositioning from the base sector to non-base (0.003) in the future. This indicates that the agricultural sector GRDP growth rate at the Central Sulawesi Province level is slower than the agricultural sector GDP growth rate at the national level. The agricultural sector has no potential to become the basic sector in Central Sulawesi Province in the future. The agricultural sector is still the source of livelihood for the majority of people in rural areas, even though there is a tendency to increase household income in the non-agricultural sector, which puts the agricultural sector in danger of being abandoned (Priebe et al., 2010)**.**

Furthermore, when described based on their respective sub-sectors, it can be seen that all agricultural sub-sectors experienced a repositioning from the base

sector to non-base sectors including the food crops sub-sector (0.00003), horticultural crops sub-sector (0.005), plantation crops sub-sector (0.003), livestock sub-sector (0.04), agriculture and hunting services sub-sector (0.03), forestry and logging sub-sector (0.03), fisheries sub-sector (0.001).

Table 1. Results of Location Quotient (LQ) Analysis of the Economic Sector of Central Sulawesi Province in 2015-2020.

Sector and Subsector	LQ						Avg	B/NB
	2015	2016	2017	2018	2019	2020		
1. Agriculture, Forestry and Fisheries	2,44	2,31	2,27	2,26	2,18	1,72	2,2	B
a. Food Crops	1,52	1,44	1,42	1,4	1,35	1,06	1,36	B
b. Horticultural Plants	2,12	2,05	2,04	1,99	1,88	1,44	1,92	B
c. Plantation Crops	3,66	3,36	3,27	3,24	3,13	2,53	3,2	B
d. Livestock	1,25	1,24	1,24	1,25	1,2	0,98	1,19	B
e. Agriculture and Hunting Services	2,02	1,98	1,97	2	1,93	1,59	1,91	B
f. Forestry and Logging	2,86	2,87	2,91	2,94	2,83	2,25	2,78	B
g. Fisheries	2,52	2,45	2,41	2,4	2,34	1,72	2,3	B
2. Mining and Quarrying	1,3	1,66	1,86	1,94	2,18	2,23	1,86	B
3. Processing Industry	0,46	0,56	0,59	0,61	0,64	1,32	0,7	NB
4. Procurement of Electricity and Gas	0,05	0,04	0,05	0,05	0,05	0,04	0,04	NB
5. Water Supply, Waste Management, Waste and Recycling	1,72	1,64	1,63	1,62	1,48	1,15	1,54	B
6. Construction	1,31	1,16	1,11	1,08	1,14	0,88	1,11	B
7. Big and Retail Trading; Repair of Cars and Motorcycles	0,71	0,68	0,67	0,66	0,63	0,5	0,64	NB
8. Transportation and Warehousing	1,03	0,96	0,93	0,93	0,88	0,56	0,88	NB
9. Provision of Accommodation and Drinking	0,18	0,17	0,17	0,17	0,15	0,12	0,16	NB
10. Information and Communication	0,82	0,78	0,75	0,76	0,75	0,59	0,74	NB
11. Financial Services and Insurance	0,55	0,57	0,57	0,55	0,5	0,43	0,53	NB
12. Real Estate	0,67	0,64	0,63	0,64	0,59	0,47	0,61	NB
13. Company Services	0,16	0,14	0,14	0,13	0,12	0,1	0,13	NB
14. Mandatory Government, Defense and Social Security Administration	1,71	1,68	1,72	1,76	1,74	1,41	1,67	B
15. Educational Services	1,23	1,19	1,19	1,18	1,12	0,87	1,13	B
16. Health Services and Social Activities	1,28	1,21	1,21	1,22	1,19	0,92	1,17	B
17. Other Services	0,52	0,48	0,46	0,44	0,4	0,34	0,44	NB

Source: Secondary Data Analysis, 2022

Note: B= Basic, NB= Non-basic

Table 2. Results of Dynamic Location Quotient (DLQ) Analysis of Agricultural Sector/Sub-Sector of Central Sulawesi Province 2015-2020

Sector and Subsector	LQ	DLQ	Description
Agriculture, Forestry and Fisheries	2,20	0,003	basic non-prospektif
a. Food Crops	1,36	0,00003	basic non-prospektif
b. Horticultural Plants	1,92	0,005	basic non-prospektif
c. Plantation Crops	3,20	0,003	basic non-prospektif
d. Livestock	1,19	0,04	basic non-prospektif
e. Agriculture and Hunting Services	1,91	0,03	basic non-prospektif
f. Forestry and Logging	2,78	0,03	basic non-prospektif
g. Fisheries	2,30	0,001	basic non-prospektif

Source: Secondary Data Analysis, 2022.

Table 3. Results of Shift Share Analysis of Agriculture Sector/Sub-Sector of Central Sulawesi Province 2015-2020.

Sector and Subsector	Shiftshare			
	Nij	Mij	Cij	Dij
Agriculture, Forestry and Fisheries	5.093.922	-454.040	-1.344.048	3.295.835
a. Food Crops	761.088	-435.148	-239.154	86.787
b. Horticultural Plants	481.571	152.716	-239.198	395.088
c. Plantation Crops	2.255.428	-49.603	-861.990	1.343.835
d. Livestock	305.092	41.680	135.803	482.575
e. Agriculture and Hunting Services	63.330	-10.819	26.592	79.103
f. Forestry and Logging	309.812	-241.945	110.839	178.706
g. Fisheries	917.600	245.598	-433.449	729.749

Source: Secondary Data Analysis, 2022.

This indicates that the agricultural sub-sector GRDP growth rate at the Central Sulawesi Province level is slower than the agricultural sector GDP growth rate at the national level. Morowali Regency and Banggai Regency are regions that have a significant impact on the rate of economic growth in Central Sulawesi. The economic growth rate of these two regions is dominated by the mining sector and the manufacturing industry which has been able to shift the dominance of the agricultural sector in the area since 2015 (Rauf et al., 2021). The increase in the share of the agricultural sector can be increased if the government gives more focus and attention to the expansion of agricultural land, expansion of employment in the agricultural sector, development of agro-industry, and stabilization of prices for agricultural products. (Muhardi et al., 2020).

Combined Analysis of Location Quotient (LQ) and Dynamic Location Quotient (DLQ). Based on Table 2, it can be seen from the LQ indicator that all agricultural sub-sectors in Central Sulawesi belong to the basic sector (LQ > 1), but the DLQ value shows that the agricultural sub-sector in Central Sulawesi is not prospective (DLQ < 1). In other words, the condition of the agricultural sector in Central Sulawesi is on a non-prospective basis. This is because the agricultural sector in Central Sulawesi has a role as the basic sector during 2015-2020 but in the future, the position of the agricultural sector has the potential to turn into a non-basic sector. This condition occurs because the growth rate of the

agricultural sector and its sub-sectors at the provincial level is slower than the growth rate at the national level. In this condition, it is very necessary to improve the performance of all sub-sectors so that the agricultural sub-sector does not experience repositioning to become a non-base sector in the future. Efforts to increase the wages of workers in the agricultural sector are expected to become the main focus and priority of the government because so far there has been a gap between the wages received by agricultural sector workers and non-agricultural workers, which places the agricultural sector receiving lower wages than other sectors (Busman et al., 2016). Development and guidance in the agro-industry sector also need to be improved and can become a superior program in the effort to absorb agricultural products (Tanjung et al., 2021).

Changes in Agricultural Sector Economic Structure (Shift Share Analysis). The shift-share method can provide an overview of the performance or productivity of the economy in an area by making comparisons between the regional and national levels or wider and its effect on growth through the accumulation of output (Arsyad, 2010). Based on Table 3, it can be seen that the results of the analysis using the shift-share method show that changes in the GRDP of Central Sulawesi Province during the 2015-2020 analysis period are influenced by provincial and national growth (N_{ij}), industry mix (M_{ij}), and competitive advantage (C_{ij}). The real impact of provincial economic growth shows a positive value for each agricultural sector/sub-sector in Central Sulawesi. This means that all agricultural sub-sectors have a positive impact on the GRDP of Central Sulawesi Province.

The increase in economic performance in the agricultural sector in Central Sulawesi Province during the 2015-2020 period increased by 3.295.835 (in a million). Increased performance of the agricultural sector is supported by improved performance of all sub-sectors. The highest performance of the agricultural sub-sector was produced by the plantation sub-sector and the fishery sub-sector, which were 1.343.835 (in a million) and 729.749 (in a million).

According to Rauf et al., (2017), the plantation sub-sector and the fisheries sub-sector have a strong influence on the production and income side. The high economic value of the plantation sub-sector has a significant influence in reducing the poverty level of the population because the market share in the plantation sub-sector can reach overseas so investment opportunities need to be increased. The potential of fishery resources in Central Sulawesi is also quite abundant and spread in almost all provinces.

The economic growth of the agricultural sector/sub-sector of Central Sulawesi can be categorized as growing faster than the growth of the agricultural sector nationally. This can be seen from the value (N_{ij}) of the sector and each sub-sector which shows a positive number. The total influence of national economic growth on the agricultural sector reached 5.093.922 (in a million), with the sub-sector category giving the largest contribution being the plantation sub-sector and the fishery sub-sector. This condition also illustrates that general policies in the agricultural sector nationally have a positive effect on the development of the agricultural sector in Central Sulawesi (Abidin, 2015).

The industrial mix value (M_{ij}) from the agricultural sector and all sub-sectors mostly showed a negative number, namely -454,040 (in a million), and there were only three sub-sectors that showed a positive number, namely the horticulture sub-sector, livestock sub-sector, and fishery sub-sector. This indicates that the agricultural sector in Central Sulawesi lags behind the agricultural sector nationally and the majority of sub-sectors do not

specialize in regional income in Central Sulawesi. The positive values of the three sub-sectors indicate that economic activity in the agricultural sector in Central Sulawesi is focused on the three sub-sectors. The acceleration of economic growth of coastal communities in Central Sulawesi in supporting the development of bay-based fishery areas, the majority of its potential is supported by fishery resources from Poso Regency, Parigi Moutong Regency, Tojo Una-Una Regency, and Banggai Regency (Muzakir & Suparman, 2016). Meanwhile, according to Saputra & Nurdayati (2020), 76% of the area in Central Sulawesi is the base area for the livestock sub-sector, especially beef cattle. The highest contributor to horticultural commodities in Central Sulawesi comes from Poso Regency with the main commodities being cabbage, mustard greens, tomatoes, spinach, and others (Mardial et al., 2020).

Based on the C_{ij} value from the agricultural sector shows a negative number, namely -1,344,048 (in a million) which indicates that the agricultural sector in Central Sulawesi does not yet have a competitive advantage. However, several sub-sectors show positive numbers, such as the livestock sub-sector, the agriculture and hunting services sub-sector, and the forestry and logging sub-sector. The growth rate of the sector which shows a positive number is faster than the growth rate of the same sub-sector at the national level. Increasing the competitiveness of agricultural products can be pursued by focusing on creating added value from agricultural products with agro-industry development (Tope, 2021).

CONCLUSION AND SUGGESTION

Conclusion

Based on the result and discussion, this research conclude that the agricultural sector and sub-sector in Central Sulawesi are included in the basic sector (LQ>1) but in the future, it can potentially change to non-basic (DLQ<1) if it is not focused on strategic program support from local government. Three agricultural sub-sectors are classified as advanced sectors in Central Sulawesi Province, which include the horticulture sub-sector, livestock sub-sector, and fishery sub-sector. Meanwhile, several sub-sectors that need to be competitive include the food crops sub-sector, horticulture sub-sector, plantation sub-sector, and fishery sub-sector as well as several other sub-sectors that are still relatively low in terms of competitive advantage, so strategies are needed to increase the competitiveness of the sub-sectors which is still low.

Suggestion

Efforts that policymakers can make to increase the existence of the agricultural sector in regional economic development, one of which is to increase the wages of workers in the sector so that it is expected to provide encouragement and motivation to stakeholders who want to pursue business in the agricultural sector. In addition, there is a need for sustainable development and guidance efforts in the agro-industry sector so that agricultural products can be well absorbed and can provide added value to agricultural products.

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