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Research article

Economic Transformation: How Does the Agricultural Sector Performance in Indonesia's Regional Economic Structure?

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Abstract: This study aims to analyze the performance of the agricultural sector on the structure of the regional economy in Indonesia. The data used is secondary data in the form of the 2016 Indonesian Inter-Regional Input-Output Table, classified for 52 sectors and 34 provinces. Contribution analysis in the IRIO approach is used to answer research objectives. The research results show that the agricultural sector in producing output, allocating input to other sectors, providing final demand, absorbing the output of other sectors, and forming primary input in each region in Indonesia has different contributions. These different contributions are adjusted to the resource potential of each region. In particular, the agricultural sector in North Maluku Province has a significant role in the economic structure of North Maluku. The North Maluku agricultural sector has a contribution in producing output, providing final demand, absorbing intermediate inputs, and forming primary inputs that are higher than the average contribution of other provinces in Indonesia.

Keywords: agricultural sector, economic growth, IRIO, regional economic structure

JEL Classification: O13, O18, R11, R12, R15

Abstrak: Penelitian ini bertujuan untuk menganalisis kinerja sektor pertanian terhadap struktur perekonomian daerah di Indonesia. Data yang digunakan adalah data sekunder berupa Tabel Input-Output Antar Daerah Indonesia Tahun 2016 yang diklasifikasikan pada 52 sektor dan 34 provinsi. Analisis kontribusi pada pendekatan IRIO digunakan untuk menjawab tujuan penelitian. Hasil penelitian menunjukkan bahwa sektor pertanian dalam menghasilkan output, mengalokasikan input untuk sektor lain, menyediakan permintaan akhir, menyerap output sektor lain, dan membentuk input primer pada setiap daerah di Indonesia mempunyai kontribusi yang berbeda-beda. Kontribusi yang berbeda-beda tersebut disesuaikan dengan potensi sumber daya masing-masing daerah. Secara khusus, sektor pertanian di Provinsi Maluku Utara mempunyai peranan yang sangat penting dalam struktur perekonomian Maluku Utara. Sektor pertanian Maluku Utara mempunyai kontribusi dalam menghasilkan output, menyediakan permintaan akhir, menyerap input antara, dan membentuk input primer yang lebih tinggi dibandingkan rata-rata kontribusi provinsi lain di Indonesia.

Kata kunci: sektor pertanian, pertumbuhan ekonomi, IRIO, struktur ekonomi daerah

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1. INTRODUCTION

Economic transformation refers to a significant change in the sector composition of a country or region's economy, from traditional sectors such as agriculture and heavy industry to more modern and technology-based sectors such as services and information technology (Junarti & Yasin, 2023). Indonesia has transformed its economic structure over the past few decades resulting in a shift from the agricultural sector to the industrial and service sectors (Word Bank, 2016). According to Awaliyyah et al. (2020), due to economic transformation, there has been a relative decline in the contribution of the agricultural sector to the Gross Domestic Product (GDP).

While agriculture's contribution to GDP continues to decline along with the growth of manufacturing and service industries, it is still a source of livelihood for most rural people and has the potential to contribute to food security, regional economic growth, and poverty alleviation. The practice of transformation in agriculture must be carried out innovatively, this tendency needs to be understood i1n light of various problems such as unlimited land resources, and labor decreasing year by year (Nasedkina et al., 2023). The study of the performance of the agricultural sector in the regional economic structure is considered important to understand the changes and challenges faced by the sector so that developing regional economic growth strategies through agriculture and food policies can be right on target (Anderson & Ponnusamy, 2023).

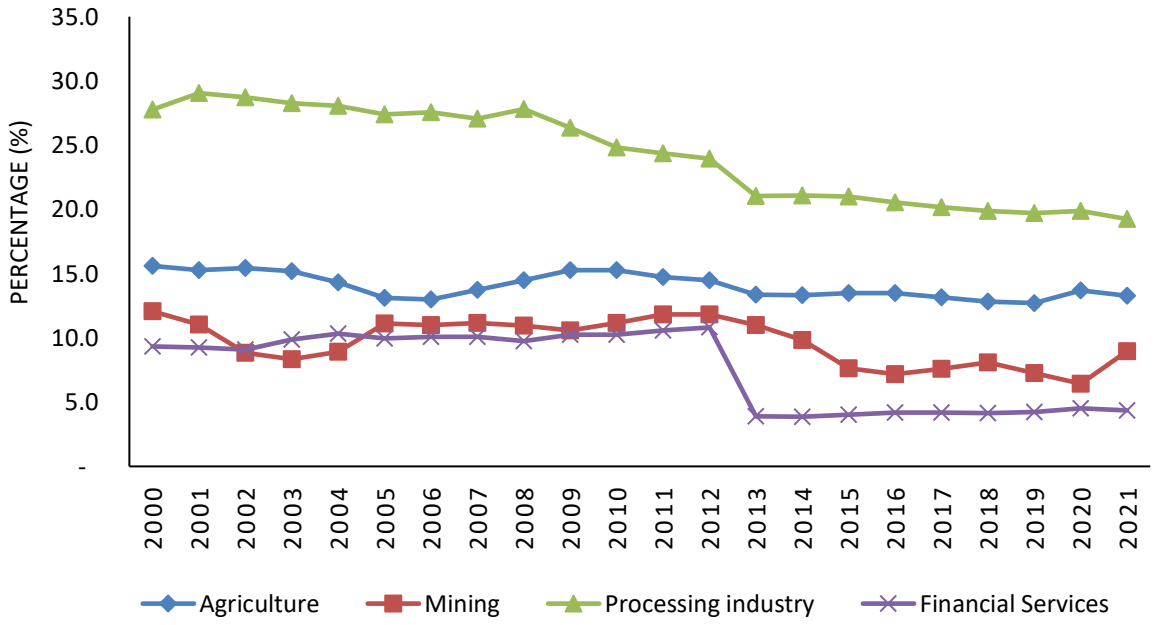

Figure 1. Trend of the contribution of the agricultural, mining, industrial, and financial services sectors to Indonesia's GDP, 2000-2021

Source: BPS Indonesia (2023)

Based on the data in Figure 1, it can be seen that, for the period 2000 to 2010, the contribution of the agricultural sector to the formation of Indonesia's GDP showed a downward trend of -0.3 percent. For the period 2011 to 2021, the declining trend in the contribution of the Agricultural Sector is -1.43 percent, and if seen from the overall development of its contribution or over the last two decades, the downward trend is -2.32 percent. The industrial sector also shows a downward trend in its contribution to GDP formation. However, the difference between the contribution of the industrial sector and the agricultural sector over two decades averaged 10.20 percent. This means that over the last two decades, the industrial sector has contributed more to Indonesia's GDP. The most obvious negative impact of Indonesia's economic structural transformation is the shift of human resources and capital from the agricultural sector to the non-agricultural sector (Deininger et al., 2022). This results in a decrease in the labor force, which can lead to a decrease in the productivity of the agricultural sector.

Structural changes in the national economy can have a significant impact on regional economic structures. Regional economic structure is influenced by many factors, including government policy, investment levels, and market conditions. So if there is a change in the national economic structure, such as a shift from the agricultural sector to the industrial sector, then the regional economic structure can also change (Deininger et al., 2022).

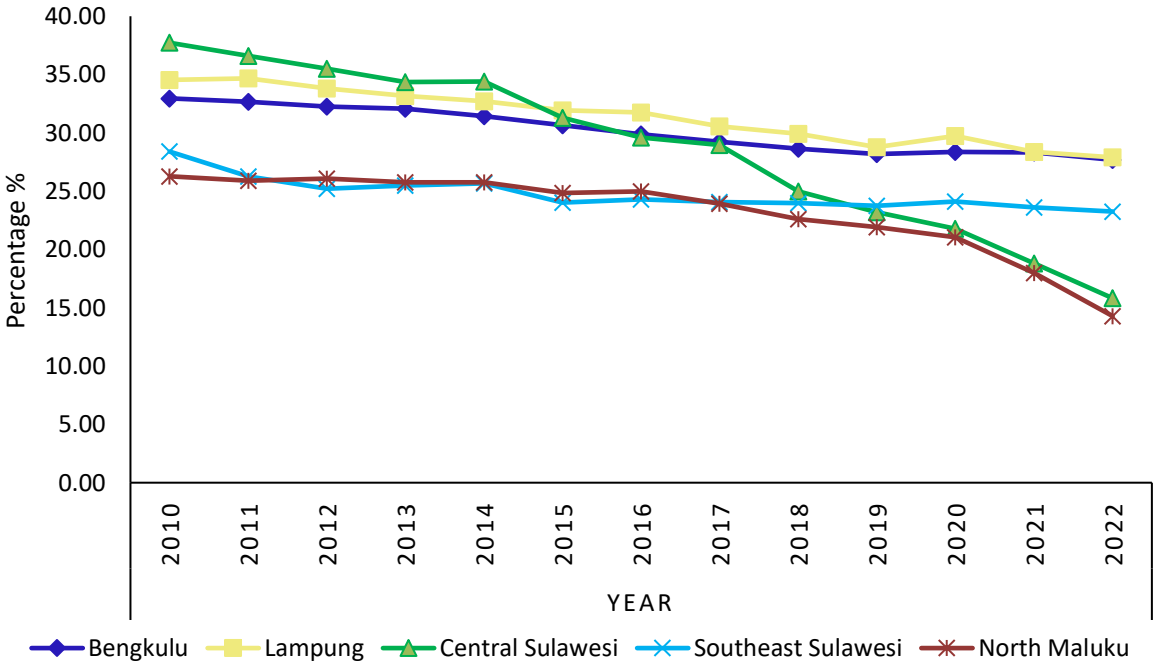

Figure 2. Trend of Five Provinces in Indonesia with the lowest agricultural sector contribution to GRDP from 2010 to 2022

Source: BPS Indonesia (2023)

Figure 2 shows that the impact of structural changes in the national economy also affects the economic structure at the regional level (Andriansyah et al., 2023). It can be seen that the agricultural sector continues to show a trend of decreasing contribution to GRDP from each province. This trend of decreasing contribution is inversely proportional to the growth rate of GRDP, especially in North Maluku Province, where from 2010 to 2021 there was an increase of 14.99 percent. Meanwhile, the agricultural sector in North Maluku itself from 2010 to 2021 saw a decline in its contribution to GRDP by 11.98 percent. Based on the background described previously, it is deemed important to analyze the performance of the agricultural sector on the regional economic structure in Indonesia.

Based on the background that has been described previously, it is considered important to analyze the performance of the agricultural sector on the structure of the regional economy in Indonesia. Research on the performance of the agricultural sector to the regional economy has been carried out a lot like Dewi et al. (2022) which uses a review literature approach and finds that although the agricultural sector of a region is not superior, it should be considered because it is closely related to food security, employment, the source of industrial raw materials, and the source of community income. The dynamics of economics will lead to various levels of economic structure growth in each region based on the agricultural potential of each region (Ahmad et al., 2023). Research conducted by Ferreira et al. (2022) concerning the role of the agricultural sector in the development of Ghana by using the Social Accounting Matrix (SAM) approach shows that the primary sector (agriculture) will play a very important role in opening jobs and economic growth in the country. The allocation of measurable resources from the agricultural sector to other sectors in the long-term economic structure is very good for the economic performance of a country (Stoycheva, 2023).

The purpose of this study is to analyze the performance of the agricultural sector on the structure of the regional economy, especially in North Maluku Province. This study's novelty is looking at the economic structure based on the Indonesian Inter-Regional Input Output (IRIO) table. This perspective is considered important because the IRIO table performance from the agricultural sector can be analyzed according to its portion in the economic structure of a region.

2. RESEARCH METHODS

2.1. Data

The data used in this study are secondary data, namely the Table of Inter-Regional Input-Output (IRIO) Indonesia based on producers according to 34 provinces and 52 industries in 2016 sourced from the Indonesian Central Statistics Agency (BPS) in 2021. Based on the research objectives, data were analyzed using contribution analysis to see the performance of the agricultural sector in North Maluku and other provinces in Indonesia based on the perspective in the Indonesian Input-Output-Output (IRIO) table. The contribution of a sector to the economic structure can be analyzed based on the perspective of input-output structures (Daryanto & Hafizrianda, 2010a; Miller & Blair, 2009). The focus of the area in North Maluku Province is based on the elaboration of the background of the problem in which the North Maluku agricultural sector which has decreased contribution to GRDP 2010-2022 is the most significant compared to 33 other provinces in Indonesia.

Table 1. Basic Structure of Inter-Regional Input-Output Table for product transactions between 3 sectors between 2 regions

			Buyer Sector *j*						**Final Deman**		**Total Output**
			Region A			**Region B**					
			1	**2**	**3**	**1**	**2**	**3**			
Seller Sector *i*	**Region A**	**1**	Z_{11}^{AA}	Z_{12}^{AA}	Z_{13}^{AA}	Z_{11}^{AB}	Z_{12}^{AB}	Z_{13}^{AB}	Y_1^{AA}	Y_1^{AB}	X_1^A
		2	Z_{21}^{AA}	Z_{22}^{AA}	Z_{23}^{AA}	Z_{21}^{AB}	Z_{22}^{AB}	Z_{23}^{AB}	Y_2^{AA}	Y_2^{AB}	X_2^A
		3	Z_{31}^{AA}	Z_{32}^{AA}	Z_{33}^{AA}	Z_{31}^{AB}	Z_{32}^{AB}	Z_{33}^{AB}	Y_3^{AA}	Y_3^{AB}	X_3^A
	Region B	**1**	Z_{11}^{BA}	Z_{12}^{BA}	Z_{13}^{BA}	Z_{11}^{BB}	Z_{12}^{BB}	Z_{13}^{BB}	Y_1^{BA}	Y_1^{BB}	X_1^B
		2	Z_{21}^{BA}	Z_{22}^{BA}	Z_{23}^{BA}	Z_{21}^{BB}	Z_{22}^{BB}	Z_{23}^{BB}	Y_2^{BA}	Y_2^{BB}	X_2^B
		3	Z_{31}^{BA}	Z_{32}^{BA}	Z_{33}^{BA}	Z_{31}^{BB}	Z_{32}^{BB}	Z_{33}^{BB}	Y_3^{BA}	Y_3^{BB}	X_3^B
Input Primer			V_1^{AA}	V_2^{AA}	V_3^{AA}	V_1^{AB}	V_2^{AB}	V_3^{AB}			
			V_1^{BA}	V_2^{BA}	V_3^{BA}	V_1^{BB}	V_2^{BB}	V_3^{BB}			
Total Input			X_1^A	X_2^A	X_3^A	X_1^B	X_2^B	X_3^B			

Source: Miller & Blair (2009)

2.2. Analysis Method

Based on the product flow framework between 3 sectors and between regions A and B shown in Table 1, it can be said that transactions between seller sector i and buyer sector j within one region A and B is called intraregional interindustry with the notation Z_{ij}^{AA} and Z_{ij}^{BB}. Meanwhile, transactions between seller sector i and buyer sector j between region A and region B can be referred to as interregional interindustry with the notation Z_{ij}^{AB} and Z_{ij}^{BA}. The gross added value resulting from transaction activities between sector i and sector j in regions A and B is written using the notation V_j^{AA} and V_j^{BB}. Based on the notation in the input-output transaction table, the mathematical equation that describes the input-output transaction structure which refers to the total output of each region from Table 1 can be written as follows:

$$
\begin{aligned}
X_1^A &= Z_{11}^{AA} + Z_{12}^{AA} + Z_{13}^{AA} + Z_{11}^{AB} + Z_{12}^{AB} + Z_{13}^{AB} + Y_1^{AA} + Y_1^{AB} \\
X_2^A &= Z_{21}^{AA} + Z_{22}^{AA} + Z_{23}^{AA} + Z_{21}^{AB} + Z_{22}^{AB} + Z_{23}^{AB} + Y_2^{AA} + Y_2^{AB} \\
X_3^A &= Z_{31}^{AA} + Z_{32}^{AA} + Z_{33}^{AA} + Z_{31}^{AB} + Z_{32}^{AB} + Z_{33}^{AB} + Y_3^{AA} + Y_3^{AB} \\
X_1^B &= Z_{11}^{BB} + Z_{12}^{BB} + Z_{13}^{BB} + Z_{11}^{BA} + Z_{12}^{BA} + Z_{13}^{BA} + Y_1^{BA} + Y_1^{BB} \\
X_2^B &= Z_{21}^{BB} + Z_{22}^{BB} + Z_{23}^{BB} + Z_{21}^{BA} + Z_{22}^{BA} + Z_{23}^{BA} + Y_2^{BA} + Y_2^{BB} \\
X_3^B &= Z_{31}^{BB} + Z_{32}^{BB} + Z_{33}^{BB} + Z_{31}^{BA} + Z_{32}^{BA} + Z_{33}^{BA} + Y_3^{BA} + Y_3^{BB}
\end{aligned} \tag{1}
$$

In accordance with equations (1), the performance of the agricultural sector is analyzed by calculating the contribution of the agricultural sector as a component in the economic performance of a region. This contribution can be calculated using the following formula (Daryanto & Hafizrianda, 2010b):

Contribution of the agricultural sector as output

Output share sector to $i = \frac{XS_i}{\Sigma X_i} \times 100\ \%$ (3)

Contribution of the agricultural sector as intermediate demand

Intermediate demand share sector to $i = \frac{IDS_i}{\Sigma X_i} \times 100\ \%$ (4)

Contribution of the agricultural sector as final demand

Final demand share sector to $i = \frac{FDS_i}{\Sigma X_i} \times 100\ \%$ (5)

Contribution of the agricultural sector as an intermediate input

Intermediate input share sektor to $j = \frac{IIS_j}{\Sigma X_i} \times 100\ \%$ (6)

Contribution of the agricultural sector as primary input or added value

Primary input share sector to $j = \frac{PIS_j}{\Sigma X_i} \times 100\ \%$ (7)

where, X_i is amount agricultural sector output, ΣX_i is the total amount of all sectors output with region A or region B, IDS_i is amount of intermediate demand the agricultural sector of i, FDS_i is amount of final demand the agricultural sector of i, ISS_j is amount of intermediate inputs the agricultural sector of j, PIS_j is the amount of added value the agricultural sector of j.

3. RESULTS AND DISCUSSION

3.1. The role of the agricultural sector in the structure of the regional economy

The role of the agricultural sector in shaping the regional economic structure is seen from the ability of the agricultural sector to produce output, then the output of the agricultural sector is allocated to intermediate demand and final demand. Intermediate demand consists of demand from various production sectors in a region and also various production sectors in other regions that have economic interactions within them. Final demand consists of household consumption, government consumption, investment and exports. The next role of the agricultural sector is the absorption or use of goods and services from various sectors both within one region and from other regions as input in agricultural sector production activities, this is referred to as intermediate input. The role of the agricultural sector can also be seen from the amount of remuneration from the agricultural sector for elements of production activities. Remuneration usually consists of wages or salaries, business surplus, depreciation and indirect taxes. The role of the agricultural sector in the formation of economic structure is implemented from data from the Indonesian Interregional Input

Output Table (IRIO) based on conditions in 2016, so that it can describe the agricultural structure in the regional economy as a whole from 34 provinces in Indonesia.

The agricultural sector in Indonesia's national and regional sectors has economic interaction with other sectors through various ways. Agriculture creates markets for inputs such as fertilizers and pesticides, supporting the distribution and logistics industry, providing raw materials for the food processing sector, and affecting the consumer market (Baumüller et al., 2022). The success of the agricultural sector can help regional economic growth, increase exports, and create jobs (Sarajwati et al., 2022), and thus, interactions between the agricultural sector and other sectors not only affect the local economy but also have a significant impact on the overall economic structure in a country or region (Le et al., 2022). The agricultural sector depends on input from other sectors such as fertilizers and agricultural equipment. Agricultural products enter the processing sector and affect the consumer market. Intermediary input includes goods and services used by the agricultural sector, but is not produced directly by it. The concept of intermediary input reflects interdependence and dependence between sectors in the economy (Jannah & Junaidi, 2022). Remuneration in the agricultural sector, involving wages, business surplus, depreciation, and indirect taxes, plays a key role in supporting sustainability and economic growth. Fair wages encourage worker productivity and welfare, while business surplus support investment and economic resilience. Good -managed depreciation ensures equipment efficiency, while taxes indirectly help financing development projects and support regional economy. A good remuneration creates a healthy economic environment and contributes to the welfare of all agricultural sectors.

3.2. The role of the agricultural sector in producing output

The output in the IRIO Table is the value of goods and services produced by all economic sectors contained in the IRIO Table, but in this case it only refers to the output of the agricultural sector which is broken down into several parts, namely food crop farming, horticulture, plantations, animal husbandry, services. agriculture and hunting, forestry, and fishing. The role of the agricultural sector in producing output can be seen in Figure 3. It can be said that the subsectors of food crops, horticulture, plantations, animal husbandry, agricultural services, forestry, and fisheries from 34 provinces in Indonesia have different percentage levels of contribution according to the potential of natural resources and human resources owned by each province. These results are also reinforced by the results of research conducted by (Gong, 2018) which suggests that the four segments in agriculture (agriculture, forestry, livestock, and fisheries) have different production processes and techniques so that the agricultural aggregate production function can vary between provinces. Gong also stated that in the aggregate production function, inputs make a larger contribution to output, which implies that a broader pattern of economic growth associated with technological innovation is needed to increase productivity. Based on the description in Figure 3, when looking at North Maluku Province, it can be seen that North Maluku's agricultural sector produces the highest output compared to the other 33 provinces in Indonesia.

Agriculture in North Maluku Province contributed 17.96 percent of output to the total GRDP, with food crops producing 0.91 percent of output, horticulture 0.99 percent, plantations 7.98 percent, livestock 0.67 percent, agricultural services 0.21 percent, forestry 0.53 percent, and fisheries 6.66 percent. The breakdown of the output percentage of the seven North Maluku agricultural subsectors, it turns out that the plantation and fisheries subsectors have an output percentage above the average. Based on this, it means that the North Maluku agricultural sector is more dominant in plantation and fishery products, even so in general agriculture can contribute above average to North Maluku's economic growth. This result is also confirmed by Meyer (2019) where agriculture is a very important sector of economic growth because the agricultural sector can be a source of input supply for local industrial production and other regions, ensuring a stable food supply, and ensure a decent standard of living for farmers.

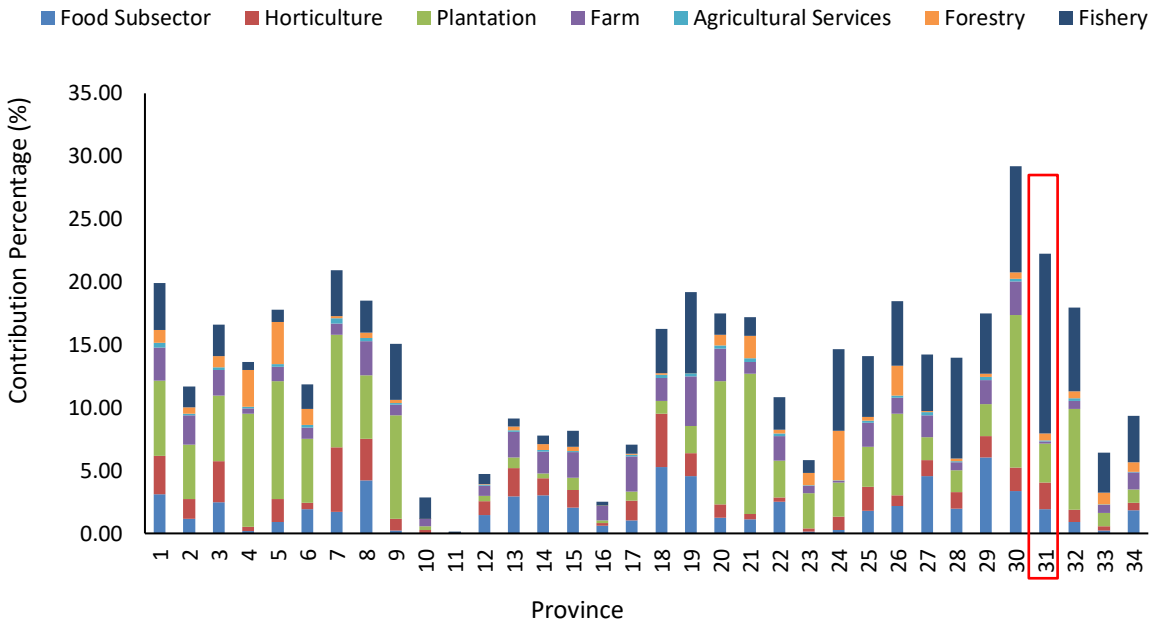

Figure 3. Percentage contribution of the agricultural sector of 34 Provinces in Indonesia in producing output

Source: Indonesian IRIO table in 2016 classification of 52 sectors and 34 provinces, Data Processed, (2023)

Another statement that also supports the results of this study is Ableeva et al, (2019) areas with above-average agricultural yields in a country are characterized by high levels of production equipment, the introduction of technological innovation, production supply chain management, and high sales of agricultural products. According to Kozlovskyi et al. (2018), indicate that the sustainability of agricultural production in the economy is influenced by the availability of resources needed by agricultural producers. Based on this, the development of the agricultural sector in 34 provinces in Indonesia should not only focus on several aspects such as the availability of resources, but need to pay attention to aspects of the development of the agricultural sector as a whole. According to Li et al., (2019), improving equipment is one of the important ways to achieve comprehensive mechanization or technological innovation in agriculture, in addition to subsidizing the purchase of agricultural machinery from the government also needs to be increased. Meanwhile, according to Liu et al., (2021), an important way to improve total agricultural productivity and promote inter-regional coordinated agricultural development and high-quality economic development is to promote clean agricultural production, strengthen research and development of agricultural science and technology, expand the level of agricultural land clearing, and encourage deep integration of agricultural industrialization and modernization. Also suggested that the influence mechanism, different regional models, incentive mechanism for farmers, impact evaluation, and sustainable design of agricultural intensification system should be strengthened in the future (Xie et al., 2019).

3.3. The Role of the Agricultural Sector in Providing Intermediate Demand

The output produced by the agricultural sector is then used as input for production activities in other sectors, which in the implementation of the IRIO table is included in the intermediate demand structure. The role of the agricultural sector, in this case food crop farming, horticulture, plantations, animal husbandry, agricultural services, forestry and fisheries as input providers, is not only seen from demand between sectors in one region but can occur from sectors in other regions.

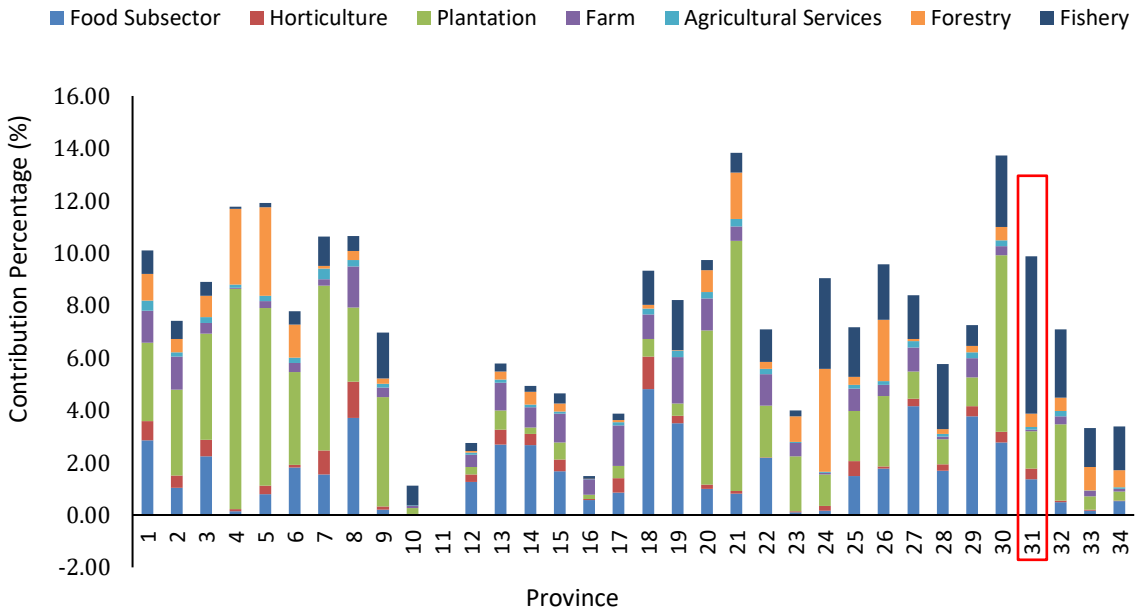

Figure 4. Percentage contribution of the agricultural sector of 34 Provinces in Indonesia in providing intermediate demand

Source: Indonesian IRIO table in 2016 classification of 52 sectors and 34 provinces, Data Processed, 2023

The role of agricultural sector output as a provider of intermediate demand for other production sectors is shown in Figure 4. It can be said that there are still half of the provinces in Indonesia whose agricultural sector output has a below-average contribution to intermediate demand for other production activities. The analysis shows that there are 17 provinces whose agricultural sector output contributes below average or less than 7.28 percent to intermediate demand. According to Suh & Moss, (2021), this result is still normal in the agricultural sector of developing countries because the output of the agricultural sector in developing countries is still inelastic to input demand or intermediate demand. This nature occurs due to the flexibility of the agricultural sector in adjusting production or output with input demand or intermediate demand when responding to changes in prices of both outputs and inputs in production activities. Whereas in developed countries such as the European Union, the agricultural sector plays a key role in providing raw materials for agricultural industries, while the production activities of other sectors such as the food industry make the agricultural sector a supplier for each food product in meeting final demand (Mrówczyńska-Kamińska & Baer-Nawrocka, 2018).

North Maluku Province is one of the provinces whose agricultural sector output has a contribution to intermediate demand below the average of 7.08 percent of total output of 17.96 percent. This result is a comparison between the agricultural sector output of all provinces in Indonesia. This comparison needs to be seen to determine which provinces have more agricultural sector outputs used as inputs for the production of other sectors or into final demand such as household consumption, because according to Ameh et al., (2017), the role of agriculture in an economy is very important, this is because, in addition to providing food, the output of the agricultural sector is also the only source of raw materials that serve as inputs for other sectors in the production process.

In comparison in general, the North Maluku agricultural sector has a contribution to intermediate demand in production activities between sectors is still relatively low, but it is also necessary to see the contribution of each subsector in North Maluku agriculture. Based on the results of the analysis, it can be seen that the North Maluku agricultural subsectors that have a high enough contribution as intermediate demand are Plantations and Fisheries, with a contribution of 2.92 percent and 2.61 percent respectively from the total contribution of the North Maluku agricultural sector in general. These results show that locally or regionally, Plantations and Fisheries in North Maluku are agricultural subsectors that are quite good at encouraging downstream

industries in the regional economic structure. This result is also supported by the statement of Katti et al., (2019), The agricultural sector plays an important role in increasing regional competitiveness by increasing productivity and efficiency, supporting other sectors, and contributing to regional and national economic growth. Based on this, the plantation and fisheries subsectors should be the main concentration of the North Maluku Province government in improving the performance of the agricultural sector in the regional and national economic structure. According to Arias et al., (2017), improving production performance in the agricultural sector will potentially provide inputs that can contribute to efforts to increase the productivity of other sectors in the economy.

3.4. The Role of the Agricultural Sector in Providing Final Demand

The output produced from the agricultural sector is not only allocated for intermediate demand, but a portion of the output is also allocated for final demand, which includes household consumption, government consumption, fixed capital formation, changes in stocks, and exports. Based on the results outlined in Figure 5, the role of the agricultural sector as a provider of final demand in North Maluku. It can be said that the food crops, plantations, forestry and fisheries subsectors have a contribution above the average of 33 other provinces in Indonesia. This means that in general the food crops, plantations, forestry and fisheries subsectors can fulfill household consumption, gross fixed capital formation and exports in North Maluku Province. Based on these results, the ratio of total final demand to total output of 10.88 percent, was more dominated by household consumption, which amounted to 4.25 percent. The sector that contributes the most to household consumption is the fisheries sector at 2.59 percent, but this is not supported by government attention, where it can be seen that investment in this sector only amounts to 0.0013 percent of total input costs. The sector that receives the most government attention is the plantation sector, with the amount of investment going into the sector amounting to 2.52 percent of total production input costs. This investment indicator can be seen from the sum of inventory changes with gross value added.

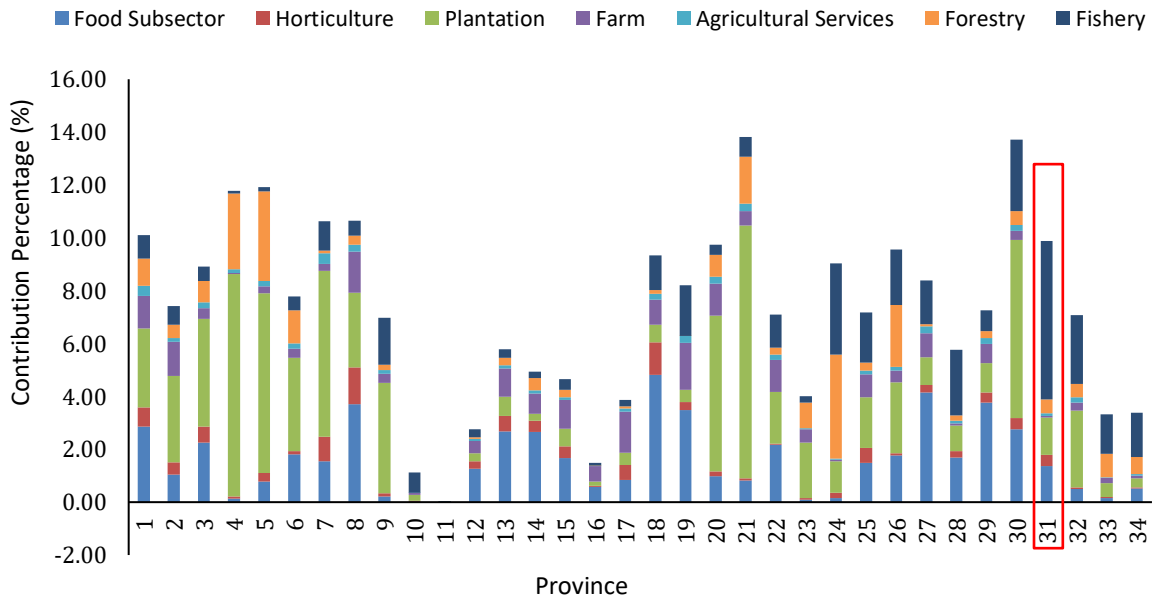

Figure 5. Percentage Contribution of the Agricultural Sector of 34 Provinces in Indonesia in Providing Final Demand

Source: Indonesian IRIO table in 2016 classification of 52 sectors and 34 provinces , Data Processed, 2023

According to (Pasara & Garidzirai, 2020), Gross capital formation directly has a positive effect on unemployment and economic growth in a region. Thus, gross capital formation is seen as a catalyst for employment and economic growth. The horticulture and livestock subsectors in North Maluku Province have contributions below the average of the other 33 provinces in Indonesia, this can be seen from their total output allocated to household consumption, which amounted to 0.85

percent and 0.12 percent, respectively. Meanwhile, the output of agricultural services in North Maluku is not allocated to final demand. According to (Opitz et al., 2016), Urban and sub-urban agriculture differ in most of their characteristics and consequently also in their ability to fulfill food needs in an area. Urban agriculture still meets food needs mainly at the household level, while peri-urban agriculture can provide larger quantities and has wider distribution channels than urban agriculture. Therefore, the government can support the growth of the agricultural sector by providing economic incentives for local agricultural production actors. So that through the interaction between the government, agricultural producers and consumers in the form of households that have food needs and the government directing policies to promote food security, North Maluku Province can achieve a balance that supports the growth of the agricultural sector in its economic structure in accordance with the statement (Loizou et al., 2019), with the right policies from the government, the agricultural sector will become an important driver of economic growth throughout the region.

3.5. The role of the agricultural sector in absorbing intermediate inputs

The output produced by the agricultural sector in a region or province requires input in production activities, which input is within the framework of the IRIO table, one part of the input structure is Intermediate input. These intermediate inputs are composed of three parts, namely, domestic intermediate inputs, intermediate inputs from foreign imports, and intermediate inputs from inter-provincial imports. The role of the agricultural sector in the performance of an economy can be seen from the amount of input absorbed in its production activities to produce the expected output. This role can be analyzed by calculating the percentage of intermediate input from the agricultural sector to the total input between all sectors in a region.

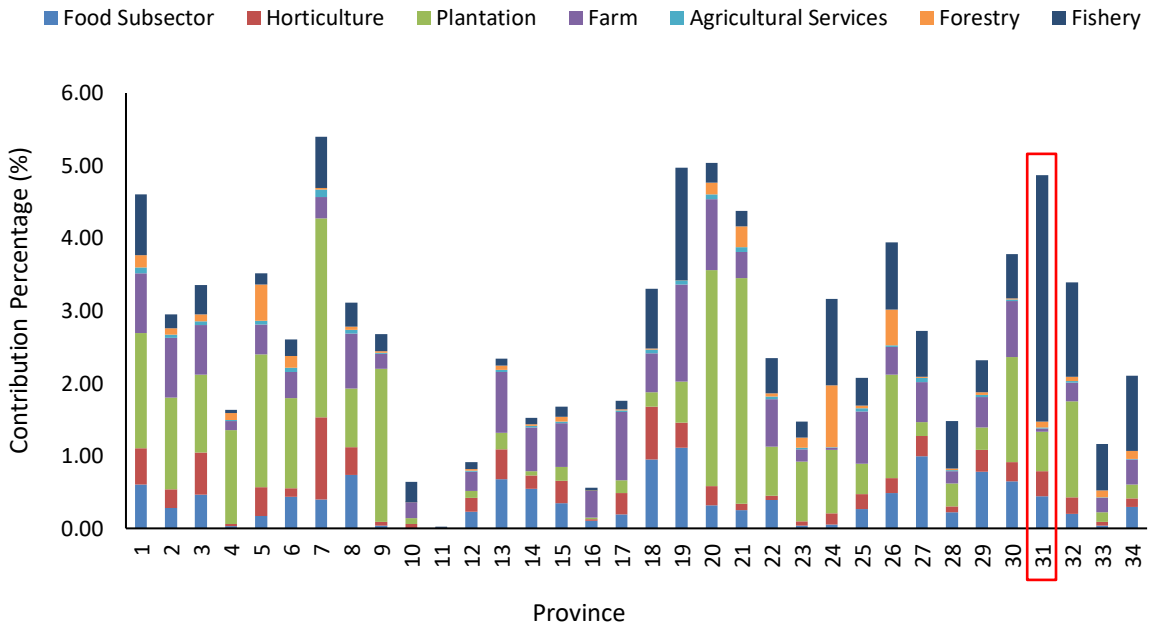

Figure 6. Percentage contribution of the agricultural sector of 34 Provinces in Indonesia in absorbing intermediate inputs

Source: Indonesian IRIO table in 2016 classification of 52 sectors and 34 provinces, Data Processed, 2023

Based on the description of the role of the agricultural sector in absorbing input between production sectors in 34 provinces in Indonesia, both input between sectors within a region and between sectors between regions. Based on the results of the analysis, shows that as many as 16 provinces in Indonesia whose contribution from the agricultural sector absorbs inputs is above average, or more than 2.70 percent. Meanwhile, there are 18 other provinces in Indonesia with contributions from the agricultural sector that absorb inputs that are below average or less than 2.70 percent. These results show that in general, the agricultural sector in most provinces in

Indonesia is less able to encourage the development of its upstream industry, this is represented through the utilization or ability of the agricultural sector of each region which is not good at absorbing production inputs from outside the agricultural sector itself.

These results also represent that the Indonesian agricultural sector is still in the agricultural position of a developing country, where the productivity of the agricultural sector itself is still hampered by inadequate input resources. According to Suh & Moss, (2021), productivity and production results in the agricultural sector of developing countries are very dependent on all input resources needed in limited conditions, such as labor, capital, and other inputs. Capital is a big influence on the performance of the agricultural sector, according to Bachewe et al., (2018), the expansion of the use of modern inputs in the agricultural sector needs to be driven by high government spending in the agricultural sector, including agricultural expansion, but also by a good road network. better quality, higher levels of rural education, and favorable international and local price incentives. Highlighting the limited labor input in developing countries such as Indonesia in general and regionally in particular, Mundia et al., (2019) stated that the increase in input demand in each agricultural sector which is also accompanied by population growth or accelerated economic development should have a major influence on production and productivity of the agricultural sector.

North Maluku is one of the provinces in Indonesia that has agricultural sector output above the average of 34 other provinces in Indonesia. The North Maluku agricultural sector generally has an above-average contribution in absorbing intermediate inputs in its production activities, namely 3.39 percent. These results are also in line with Liao & Wang, (2019) who stated that inputs in the agricultural sector are very positively correlated with agricultural productivity in various countries and regions, causing differences in agricultural productivity and regional aggregate productivity. Based on the results of the analysis, it can also be seen specifically for each subsector in North Maluku agriculture, where those with contributions above the average are the plantation and fisheries subsectors with a total percentage of 1.32 percent and 1.30 percent of the total contribution of agriculture in general in North Maluku. Meanwhile, contributions from the food crops, horticulture, livestock, agricultural services, and forestry subsectors have very low contribution percentages, namely 0.20 percent, 0.23 percent, 0.26 percent, 0.02 percent, and 0.06 percent. These results indicate that the contribution in absorbing intermediate inputs from most agricultural subsectors in North Maluku still needs to be increased because according to Donovan, (2021), the low intensity of intermediate inputs in agricultural sector production activities in developing countries in general or regional will limit sector performance agriculture in the form of production and productivity in producing output.

3.6. The role of the agricultural sector as gross value-added

Production activities carried out by a sector to produce output, in general the sector will provide remuneration in the form of gross added value or primary input. The role of the agricultural sector can also be seen from the remuneration which is divided into compensation for labor (wages/salaries), gross business surplus, and net tax subsidies on production. Based on the results outlined in Figure 7, the role of the agricultural sector is in forming gross added value in North Maluku Province. It can be said that the food, horticulture, livestock, agricultural services and forestry subsectors are subsectors that have below average contributions. Although the agricultural sector in an area is not a leading sector, it does not mean that the agricultural sector can be ruled out because of its important role in the process of economic growth and is closely related to food security, employment, the source of industrial raw materials, and the source of community income which then has an impact on growth The economy of a region (Dewi et al., 2022). Based on the results of the analysis, it is known that the North Maluku agricultural sector has a total inpul production form of production is 29.14 percent, where the allocation for labor compensation is 5.54 percent, a business surplus of 8.95 percent, and net tax on production of production of 0.07 percent, then the contribution to Buto added value is 14.57 percent. These results indicate that remuneration in the agricultural sector is an important aspect that affects the elements of production activities. A fair and competitive remuneration system can provide incentives to agricultural workers to increase

their productivity. Appropriate wages can be a motivational factor for labor, which in turn contributes to increasing agricultural output. This means that this result is also in line with research (Mbotiji et al., 2023) that agricultural added value has a positive effect on economic development, which implies a direct and significant relationship between agricultural added value and economic development.

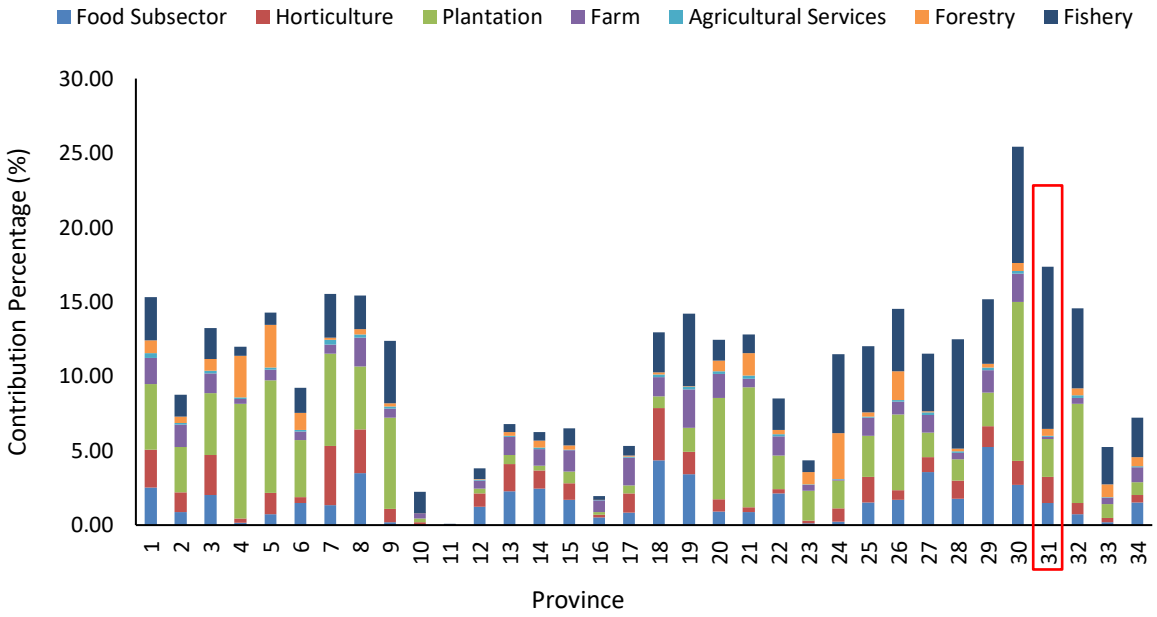

Figure 7. Percentage of contribution of the agricultural sector in 34 Provinces in Indonesia as gross value-added

Source: Indonesian IRIO table in 2016 classification of 52 sectors and 34 provinces, Data Processed, 2023

According to (Donati & Tukker, 2022), the high difference in the value added ratio of the agricultural sector between one country and another is a direct impact of the large dependence for final consumption in that country's agricultural sector on the natural resources of other countries. Apart from that, differences in value added ratios in the agricultural sector are also influenced by significant trade imbalances. Mean while, the plantation and fisheries subsectors have above average contributions to the formation of gross added value in North Maluku Province. This high contribution indicates that the plantation and fisheries subsector has a potential orientation in both inter-regional and international trade. According to (Elfira et al., 2022) there is a positive and significant relationship between increasing the export value and exchange rate of farmers on increasing the added value of the agricultural sector. (Salimova et al., 2020) have another opinion where, at the same time there is a situation where a high share of the agricultural subsector in gross value added does not mean a high level of development of the industry itself.

4. CONCLUSIONS

Based on the performance of the agricultural sector in the formation of regional economic structure through its contribution to the Indonesian Interregional Input Output Table Structure. It is concluded that the agricultural sector in producing output, providing intermediate demand, providing final demand, absorbing intermediate inputs, and forming primary inputs in each region in Indonesia has different contributions. These different contributions are adjusted to the resource potential of each region. In particular, the agricultural sector in North Maluku Province has a very important role in the economic structure of North Maluku. The North Maluku agricultural sector has a contribution in producing output, providing final demand, absorbing intermediate inputs, and forming primary inputs which is higher than the average contribution of other provinces in Indonesia. Recommendations that can be given primarily to the North Maluku Provincial

Government in developing the agricultural sector need to pay attention to the contributions of each sub-sector in agriculture. This attention aims to ensure that every policy in developing the agricultural sector can be effective, efficient and targeted appropriately to the existing potential. The appropriate sub-sector to be developed in terms of increasing regional aggregate demand is the sub-sector of food crops and fisheries. Other recommendations for the North Maluku Provincial Government and other provinces in Indonesia that have the potential of natural resources, especially the agricultural sector, are to improve their regional economic performance through the agricultural sector. Policy implications expected from the Government of North Maluku Province and other provinces in Indonesia in making policies that support agriculture, such as futures subsidies to farmers, tax incentives, and market protection, to influence agricultural inputs and regional that provide facilities or permits for the growth of agricultural enterprises. These regulations may encompass aspects such as the rule of law, accessibility to credit, and the the expansion of domestic market for agricultural products. So that these regulations can attract an investment climate in the agricultural sector.

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