



THE ROLE OF PLANTATION SECTOR ON REGIONAL INFRASTRUCTURE IN NORTH SUMATERA PROVINCE

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Abstract

North Sumatra Province is one of the five largest oil palm producing in Indonesia, it deals with with the considerable contribution in the plantation sector which is a major driver in the economy in North Sumatra with superior commodity palm oil however, its growth is still low. This research aims to determine the role and position of the agricultural sector and the plantation sub-sector towards regional infrastructure in North Sumatra Province. This research conducts quantitative methods by using contribution analysis, Location Quotient (LQ), Dynamic Location Quotient (DLQ) and income multipliers. In 2016 the plantation sector contributed 24.90% to the total North Sumatra Province GRDP which can be used as a benchmark in regional development in terms of economic growth, with two agricultural subsectors that also have the largest contribution, namely the annual plantation subsector with the value of contributions 13.34% and followed by the food crops sub-sector 3.84% of the total GRDP. By one of the leading commodities in the annual plantation subsector in North Sumatra, namely oil palm. The position of the plantation sector in 2016 remains in the base sector and in the future it can still be expected to become a base sector. When it is seen from the value of the plantation sector income multiplier in 2016, a value of 81.82 was obtained, which means that each one-dollar income in the agriculture sector would have an effect on income changes in the province of North Sumatra, where most of the regions are mainly in rural areas. Most of the people work in the agricultural sector with 44.50 percent of workers.

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Key-word: - Contribution, Plantation Sector, Palm Oil, Regional Development

1. Introduction

Since 2012-2016, one of the sectors that contributed significantly to economic development in North Sumatra Province was that agriculture sector. One of the plantation sub-sectors that are widely developed or cultivated in almost all regions of Indonesia was that oil palm. North Sumatra Province is one of the five largest oil palm producing regions in Indonesia. Because this plant has characteristics that are suitable for soil conditions in the territory of Indonesia, especially North Sumatra. The development of oil palm plantations aims to eliminate poverty, underdevelopment, and improve the welfare of people's lives, especially in rural areas, while also paying attention to the economic equality between groups and regions in such a place so that there is a change in the lives of the surrounding communities. Previous research conducted by Jessi S Tampun (2014) with the title Role of the Agricultural Sector in Tomohon City Regional Development concluded that agriculture is one of the sectors that is the main driver of economic activity in Tomohon City, one of which is regional development activities, the GRDP value of the agricultural sector experienced an increase in contributions starting from 2011-2013 at 14.45%. The highest number of income multipliers in 2013 was 6.92, which means that each one-dollar income of the agricultural sector will affect changes in the income of the Tomohon City area of Rp 6.92. The influence of changes in income which is a contribution from the agricultural sector is evidence that the agricultural sector has a role in the economic development of Tomohon City as seen from the income multipliers obtained. The contribution of the agricultural sector in North Sumatra's GRDP is ranked first with a figure of 24.9% with an average growth of 4.9%, followed by the manufacturing and trade industries of 19.4% and 17.6%.

The largest area of smallholder plantations in 2016 is oil palm, which is around 417,809 ha with a total production of around 5.7 million tons, but there are still problems faced by the plantation sector, namely the productivity of smallholder plantations is still low, on average only 3.5 tons per ha, even though the area of community oil palm plantations reaches 40% or 3.4 million ha of total oil palm plantations in Indonesia, the slowdown is due to lack of investment in the plantation sector, lack of innovation to make quality agricultural tools and seeds, and lack of infrastructure at the plantation center. Solutions that can be done by the government in supporting the plantation sector development program, for example by re-engineering, revitalizing the plasma core system, improving agricultural facilities and infrastructure, besides that the government also has to reconstruct agricultural downstream (Kompasiana, 2016). Based on the above data it can be concluded that the plantation sector is one of the important sectors in the economy in the North Sumatra region, but for its growth is still relatively slow compared to other sectors, research needs to be carried out with the title "The Role of the Plantation Sector in Regional Development in Sumatra Province North 2012-2016 Period"

2. LITERATURE STUDIES

Economic Development According to Seers (Sun'an, 2015: 45), interpreting that economic development as a means of self-realization of a person. For self-realization to be achieved, development must include three things (1) reduce poverty, (2) reduce unemployment, (3) reduce inequality. Regional Economic Development According to Arsyad (2017: 374), regional economic development is a process in which the regional government and its people manage each of the existing resources and form a partnership pattern between the local government and the private sector to create a new job opportunity and stimulate the development of economic activities (economic growth) in the region. Regional Development Understanding the area according to Nugroho (Sunan, 2015: 44) "An area is a geographical area that has certain characteristics and is a media location to interact "Basic Economic Theory Arsyad (2015: 376) economic base theory states that the main determinant of economic growth in a region is directly related to the demand for goods and services from outside the region. The growth of industries that use local resources, including labor and raw materials for export, will produce regional wealth and create job opportunities. Role of the Agriculture Sector. In terms of According Arsyad (2017: 406) the size of the agricultural sector makes this sector have an important role in providing input, namely labor, for the industrial sector and other modern sectors. Most (70 percent or more) of the population in the agricultural sector is the main source of labor needs in the urban sector. If there are restrictions on the release of workers from agriculture, then economic development will be lame. The Role of the Plantation Sector in Regional Development in North Sumatra Province (Sofiyanto, 2015, 25) the role of the agricultural sector in the main development of which is related to the following considerations:

1. Most of the population in developing countries have businesses that depend their lives on the agricultural sector
2. The agricultural sector in developing countries is the main source for meeting basic needs, especially food
3. The agricultural sector is a source or provider of very large labor inputs to support the development of other sectors, especially industry
4. The agricultural sector can also play a role as a major source of funds and power in mobilizing and spurring economic growth in most developing countries
5. The agricultural sector is a potential market for the output of the modern sector in urban areas that is developed

Methodology

This research applied quantitative research methods. The data was designed by Microsoft Excel 2007 by applying some data analysis models, such as; Plantation contribution sectors, Plantation contribution sectors on PDRB of North Sumatera Province. In this research, the researcher used PDRB ADHK data in 2010 during 2012-2016 period. By calculating:

$$\text{Contribution} = \frac{\text{DRGP Score} - i}{\text{Total DRGP}} \times 100\%$$

1. Location Quotient (LQ)

The score of LQ is gained from this following equation:

$$LQ = \frac{v_i/v_t}{V_i/V_t}$$

2. Dynamic Location Quotient (DLQ)

It is used to test basic economic performance of an area which means that this analysis is used to test priority economic sectors.

$$DLQ = \left\{ \frac{(1 + g_{ij}) / (1 + g_j)}{(1 + G_i)(1 + G_j)} \right\}^t$$

According to Arsyad (2017, 395) "multiplier income score (k) is such calculating income raising potentials of a new economic activity in community.

$$MS = \frac{Y}{Y_P}$$

4.1. Results and Discussion

a. General Description of Oil Palm Plantations in North Sumatra Province

The development of oil palm plantations in North Sumatra Province from year to year when seen as a whole has increased although the increase is not in large numbers. Commodity of oil palm plantations can be divided into three parts based on age and condition of the plant namely, Immature Produce Plant (IPP), Productive Plant (PP), unproductive Plant (UP).

Table 4.1. Oil Palm Plantation and Production in the four largest oil palm producing district in North Sumatera

Year	Regency/City	Plant Area (ha)			Total	Production (ton)
		IPP	PP	UP		
2013	Asahan	10.578	60.645	1.114	72.337	1.275.466
	Langkat	5.851	39.188	374	45.413	755.352
	Labuhanbatu Selatan	1.928	40.130	600	42.658	767.591
2014	Labuhanbatu Utara	5.901	61.645	615	68.161	1.071.216
	Asahan	7.018	66.222	1.592	74.832	172.591
	Langkat	6.300	39.570	421	46.291	146.521
	Labuhanbatu Selatan	1.762	40.170	608	42.540	142.421
2015	Labuhanbatu Utara	4.632	59.660	624	64.916	192.222
	Asahan	10.612	60.685	1.119	72.416	1.026.418
	Langkat	5.912	39.234	382	45.528	606.864
2016	Labuhanbatu Selatan	1.961	40.171	606	42.738	619.736
	Labuhanbatu Utara	5.940	61.680	618	68.238	862.727
	Asahan	6.958	64.892	1.085	72.935	1.050.159
	Langkat	6.633	39.907	291	46.831	633.473
	Labuhanbatu Selatan	1.766	40.210	595	42.571	619.327
	Labuhanbatu Utara	4.639	59.724	620	64.983	860.045

Source: author (2018)

Based on Table 4.1 above it can be seen that Asahan Regency is the highest producer of oil palm plants in North Sumatra with production value of more than 1 million tons of fresh fruit bunches, in 2014 there was a decline in overall palm oil production which decreased very drastically in 2014 with production value was only 172,591 tons in Asahan Regency, 146,521 tons in Langkat Regency, 142,421 tons in South Labuhanbatu Regency, 192,222 tons in North Labuhanbatu Regency.

b. Population and Employment

The total population in the North Sumatra region in 2016 was 14,102,911, with 7,037,326 men and 7,065,585 people. In North Sumatra, the absorption of labor in the agricultural sector in 2015 reached 40.30%. The population of the workforce in 2015 was 6.39 million people consisting of 5.96 million people who were categorized as working and 428.79 thousand people categorized as unemployed. Role of the Plantation Sector in the Infrastructure of the North Sumatra Region Plantation is one of the sub-sectors that has become the main driver of economic activity in regional development in North Sumatra, especially in the oil palm commodity. This can be seen from the agriculture sector in the Gross Regional Domestic Product (GRDP) of North Sumatra Province which experienced a significant increase each year from 2012-2016 which can be seen in Table 4.2.

Table 4.2 Domestic Regional Gross Product (DRGP) on constant Price Based (CPB) north Sumatera Province

DRGP Categories	[Seri 2010] Domestic Regional Gross Product (DRGP) on constant Price				
	According to Business area (million rupiahs)				
	2012	2013	2014	2015	2016
Agriculture, Forestry and Marine/Fishery	95.405.417	99.894.566	104.262.830	109.962.980	115.308.877
Mining and excavation	4.135.255	5.211.647	5.480.374	5.814.939	6.144.995
Processing industry	76.922.411	80.648.618	83.069.088	86.081.396	89.941.989
Electricity and gas	553.396	531.398	580.715	593.969	616.388
water, recycling rubbish	353.746	373.844	396.429	421.958	450.271
Construction	44.718.288	48.144.382	51.411.361	54.248.910	57.286.443
Micro and macro trade car and motorcycle workshop	65.384.605	69.025.208	73.812.642	77.037.549	81.467.721
Transportations and warehousing	16.827.858	18.075.247	19.082.061	20.165.191	21.389.011
Accommodation and consumption	8.035.636	8.663.610	9.225.424	9.866.776	10.512.201
Information and communication	8.930.584	9.625.107	10.321.292	11.055.361	11.913.127
Financial service and insurance	11.581.048	12.691.885	13.024.097	13.957.947	14.531.038
Real Estate	15.030.055	16.072.860	17.132.221	18.119.226	19.187.892
Company service	3.182.590	3.395.102	3.624.699	3.836.940	4.065.405
Government administration, defense mandatory social security	12.522.710	12.940.560	13.835.997	14.642.062	14.931.577
Education service	7.357.221	7.970.451	8.478.261	8.904.742	9.341.370
Health service and social humanity	3.207.547	3.554.517	3.793.269	4.066.722	4.366.281
Other services	1.775.773	1.908.140	2.042.553	2.179.185	2.320.879
Gross regional domestic product	375.924.139	398.727.143	419.573.309	440.955.853	463.775.465

Source: BPS SUMUT

In Table 4.2, it can be seen that the agricultural sector is the sector with the highest PDRB acquisition value in North Sumatra, which means that this sector still holds considerable control for economic contributors in North Sumatra, which continues to experience a significant increase each year with a value of 115,308,877 in 2016. The manufacturing industry sector is also the second highest sector after agriculture with a value of 89,941,989, third place there is a large trade sector with a value of 81,467,721, in the fourth there is a construction sector with a value of 57,286,443, and fifth there is a sector transportation and warehousing with a value of 21,389,011, for the other twelve sectors only contribute to the province's income of less than 20 million. Contribution is used as a measure in seeing how big the role of the plantation sector and other sectors is towards regional development in North Sumatra.

Table 4.3 The comparison of Plantation subsector contribution between current price and constant price in 2016

DRGP Categories	CPB (Million Rupiahs)	2016		Change
		BPS Contribution price (%)	Constant price contribution (%)	
Formula		(DRGP SCORE per subsector/ Total DRGP*100%)		
Agriculture, Forestry, and Marine/Fishery	115.308.877	21,65	24,86	-3,21
1. Agriculture, Husbandry, Hunt and agriculture services	101.270.275	18,42	21,84	-3,42
a Crops	17.811.353	3,85	3,84	0,01
b Annual horticultural plants	701.389	0,15	0,15	0
c Annual plantation	275.862	0,06	0,06	0
d Annual horticultural plants and others	10.722.002	2,16	2,31	-0,15
e Regular plantation	61.848.541	10,15	13,34	-3,19
f Husbandry	9.046.404	1,85	1,95	-0,1
g Agriculture service and hunt	864.724	0,2	0,19	0,01
2. Forestry and logging	4.013.318	0,9	0,87	0,03
3. Marine/Fishery	10.025.284	2,33	2,16	0,17
GROSS REGIONAL DOMESTIC PRODUCT	463.775.465			

Source: author (2018)

Table 4.3 shows that the plantation sector has an important role in the development of the North Sumatra region, this can be evidenced by the value of the contribution of the agricultural sector to the total North Sumatra DRGP of 24.86%. The agriculture sector is the highest compared to other sectors with a contribution from the Agriculture, Animal Husbandry, Hunting and Agricultural Services sub-sector of 21.84%, the forestry and logging sub-sector of 0.87%, and the fisheries subsector of 2.16%. However, there is a difference between the calculation results calculated using the formula and the results obtained from the Central Statistics Agency, the contribution of the agricultural sector has a difference of 3.21 from calculations using the contribution formula, as well as the annual plantation subsector which has a difference of 3.19, this is because the data used differently, the Central Statistics Agency uses GRDP data at current prices, while contribution data used in this study are GRDP at constant prices. Current prices can be used to see shifts and economic structure, while constant prices are used to determine economic growth from year to year (Central Statistics Agency, 2018).

Table 4.4 Per capita DRGP Value Based on 2010 North Sumatra Province Constant Price in 2012-2016 (Thousand Rupiahs)

DRGP Categories	2012	2013	2014	2015	2016
Agriculture, Forestry, and Marine/Fishery	721,93	749,60	757,35	788,96	817,62
Agriculture, Husbandry, Hunt and agriculture services	633,08	657,05	663,65	691,67	718,08
a. crops	112,82	112,61	107,27	116,33	126,30
b. Annual horticultural plants	6,49	6,43	5,66	4,97	4,97
c. Annual plantation	1,81	1,88	1,79	1,87	1,96
d. Annual horticultural plants and others	74,41	75,69	75,74	75,28	76,03
e. Regular plantation	377,88	398,38	409,50	426,09	438,55
f. Husbandry	53,87	56,08	57,72	60,79	64,15
g. Agriculture service and hunt	5,80	5,98	5,98	6,05	6,13
h. Forestry and logging	27,72	28,70	28,52	29,26	28,46
i. Marine/Fishery	61,13	63,86	65,18	68,02	71,09
GROSS REGIONAL DOMESTIC PRODUCT	2.844,59	2.992,03	3.047,71	3.163,74	3.288,51

Source: author (2018)

From Table 4.4 it can be seen that the annual estate crops sub-sector is the sector that has the highest PDRB value with an average value during 2012-2016 of Rp. 410.08 and the estate crops sub-sector is the lowest with an average value of Rp. 1.86. Overall the agricultural sector in the past five years continues to experience a significant increase each year. This is a sign of improving the structure of the global income community in North Sumatra.

Position of Plantation Sector and Plantation Sub Sector in North Sumatra

The theory of economic bases is divided into two parts, namely the base sector which is an economic sector that can meet the needs of its own region and can export its industrial products outside the region. Meanwhile, the non-base sector is an economic sector that can only meet the needs of its own region and tends to import from other regions.

Changes in Position of the Agriculture Sector and Other Sectors

Changes in the position of various sectors are obtained by combining the two previous methods namely the Location Quotient (LQ) and Dynamic Location Quotient (DLQ) methods. The following are the combined results of the two methods presented in Table 4.5

Table 4.5 Agriculture sector Position and other Sectors Changes based on LQ and DLQ method

DRGP Categories	LQ	DLQ	Information
	1,94	2,19	Base – Base
Agriculture, Forestry and Marine/Fishery	0,16	36.372,59	Non Base – Base
Mining and drainaise	0,91	0,45	Non Base - Non Base
Processing industry	0,13	0,00	Non Base - Non Base
Electricity and gas	1,20	3,55	Base – Base
water, recycling rubbish	1,26	0,70	Base - Base Non
Construction	1,32	1,77	Base – Base
Micro and macro trade car and motorcycle workshop	1,16	0,51	Base - Base Non
Transportations and warehousing	0,76	1,86	Non Base – Base
Accommodation and consumption	0,53	0,21	Non Basis - Non Base
Information and communication	0,78	0,38	Non Base - Non Base
Financial service and insurance	1,40	1,30	Base – Base
<i>Real Estate</i>	0,52	0,22	Non Base - Non Base
Company service	0,95	1,86	Non Base – Base
Government administration, defense mandatory social security	0,65	0,54	Non Base - Non Base
Education service	0,87	1,62	Non Base – Base
Health service and social humanity	0,30	0,63	Non Base - Non Base
Other services			
Gross regional domestic product			

Source: author (2018)

From Table 4.5 above, it can be seen that there are four sectors that have changed positions from non-base to basic sectors including the mining sector, accommodation supply sector, government administration sector, and health service sector, however, there are also two sectors that have changed position from the sector basis into the non-base sector, namely the construction sector and the transportation sector. From the combined results of the two analytical methods it is estimated that the growth rate of all economic sectors in North Sumatra is still said to be good for the economy in the future. The multiplier or multiplier provides an overview of the intensity of the relationship between an agricultural sector variable and the national income presented to see the role of the plantation sector in regional development in North Sumatra, which can be seen in Table 4.6

Table 4.6 Income multiplier score

YEAR	TOTAL INCOME (Y)	PLANTATION SECTOR INCOME (YP)	MS (MS = Y/YP)
2012	7.727.083.400	95.405.417	80,99
2013	8.156.497.800	99.894.566	81,65
2014	8.564.866.600	104.262.830	82,15
2015	8.982.517.100	109.962.980	81,69
2016	9.434.632.300	115.308.877	81,82
Average			81,66

Source: author (2018)

In Table 4.8 above shows that the value of the lowest income multiplier occurred in 2012 with a value of 80.99 and continued to increase in 2013 amounted to 81.65 and in 2014 was the year with the highest value of 82.15 but, in 2015 there was a decrease to 81.69 and in 2016 again increased by 0.13 to 81.82. It can be interpreted that each rupiah income in the plantation sector will affect changes in regional income of North Sumatra Province by an average of 81.66. During 2012-2016 the total national income as well as the income of the agricultural sector continued to experience a significant increase each year, this could prove that the position of the agricultural sector had a significant role in regional development in North Sumatra Province as evidenced by the acquisition of income multipliers.

CONCLUSIONS AND SUGGESTION

Conclusion

Based on the research and results of the discussion in the previous chapter, during 2012-2016 it can be concluded that:

1. In 2016 the agriculture sector contributed 24.86% to the total North Sumatra Province DRGP, with two agricultural subsectors also having the largest contribution, namely the annual plantation subsector with a contribution value of 13.34% and followed by the food crops subsector of 3.84% of total DRGP. With one of the leading commodities in the annual plantation subsector in North Sumatra, namely oil palm. In 2016 North Sumatra palm oil production reached 5,775,631.82 tons of FFB with a plantation area of more than 350 thousand hectares.

The plantation sector plays an important role in regional development. It can be seen from the annual plantation subsector that has a high GRDP per capita value of all DRGP categories with an average value during 2012-2016 of Rp. DRGP per capita. This is an improvement in income for the welfare of the people in North Sumatra.

2. The position of the plantation sector in 2016 remains in the base sector and in the future it can still be expected to become a base sector. When viewed from the value of the plantation sector income multiplier in 2016, a value of 81.82 was obtained, which means that everyone rupiah income in the agricultural sector would be quite influential in changing revenue in the North Sumatra Province. The difference in contribution is because the data used is different, the data from BPS uses current prices that are used to see shifts and economic structure, while constant prices are used to determine economic growth from year to year. This can be interpreted that the Gross Regional Domestic Product on the basis of constant prices is better used in certain economic growth, because the measurement uses the price basis in previous years so that the inflation factor can be eliminated.

Suggestion

The suggestions for this research are:

1. As a superior commodity in North Sumatra, palm oil is quite a large contribution to the economic growth in North Sumatra, therefore it is necessary to expand the place and nursery to produce good quality. In addition, the palm oil processing industry can also be developed so that it can open up greater employment opportunities so that people's lives can be better, especially those in rural areas.

2. if it is seen from the position of the economic sector, the plantation sector is therefore needed special attention from the Government and related institutions to keep developing the best commodities result in plantation especially in palm oil since North Sumatera is one of the five largest palm oil production in Indonesia.

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