

Analysis of Orange Commodity Role to Regional Development in Dairi Regency, Indonesia

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Abstract — One of the efforts made to increase the contribution in the agricultural sector is by developing superior commodities. The study is aimed to determine the effect of land area, working capital, labor, technology, formal education, and non-formal education as factors in productivity of the fresh orange commodity to the income of orange farmers in the region of Dairi Regency, Indonesia. This research was conducted in Dairi Regency, North Sumatera Province, Indonesia. The sampling technique in this research is a proportionate stratified random sampling with a total sample of 94 people. Data collection method is using primary and secondary data. Data analysis using a multiple regression model and analysis of fresh orange commodity farming to regional development by using shift share analysis. Based on the results, that the income of farmers from each planting season is 16,914,404 rupiah,- /farmer. The result of hypothesis shows that the productivity of orange farming is a 56,6% influenced by independent variable (land area, working capital, labor, technology, formal education and non-formal education). Based on shift share analysis obtained that the agricultural sector shows a positive amount of 7.890 rupiah or 25.6 percent, which means the growth of agriculture sector in Dairi relatively faster if compared with the growth of GDP of the same sector at the national level.

Keywords — *Fresh Orange Commodity; Fresh Orange Farming; Income of Orange farmer.*

I. INTRODUCTION

Agricultural development is an inseparable part of national development, which has the virtue of having a role in laying a solid foundation for the Indonesian economy. The agricultural sector is a part of national development that has an important role, because this sector is able to absorb the largest human resources or labor and is a source of income for the majority of the Indonesian population in general [1].

One of the efforts that can be done to increase the contribution of agriculture sector to GRDP and the sector of regional economic growth is by developing superior commodities. The development of superior commodities integrated in the agribusiness system, from the upstream to downstream sector is expected to contribute to regional economic growth, increase in community income and employment.

Superior commodities need to be developed optimally because they have comparative advantages that can improve the economy and income of economic actors. The wide and superior market share in market competition gives a positive effect for the state revenue. The wider market share and superior competition or the high competitive power of the product in the market allows the product to bring in high revenue of the sales process [2].

Utilization of the potential of superior areas and managed optimally and integrated is a condition that needs to be considered for the welfare and prosperity of the community can be achieved [3].

One of the leading commodities of food crop agriculture is fresh orange. Fresh oranges are one of the most popular fruits in Indonesia. Besides fresh orange is a fruit that is always available throughout the year because orange crops do not have a special season. In addition, orange plants can be planted anywhere, both in the lowlands and in the highlands.

Parbuluan district, Dairi regency of the North Sumatera province is one of the villages which has the potential of fruit plants, especially fresh orange, which make Parbuluan district has business potency in the case of fresh orange. This area is very fertile and most of the people work in orange farming, so the role of this sector becomes very important. The agricultural sector with all its advantages and disadvantages is still the foundation of the community as the main livelihood and still a leading sector.

In Arthur Mosher's classic agricultural development literature entitled "Getting Agriculture Moving" is explained simply and plainly about the terms and conditions of the transmitter in agricultural development. The main requirements of agricultural development include: (1) the market for agricultural products, (2) the technology that is constantly evolving, (3) the availability of locally produced materials and tools, (3) the production incentive for farmers, and (5) availability of smooth and continuous transportation. Meanwhile, according to Mubyarto [4] states that the production of farmers is the result of the operation of land production factors, capital, and labor.

The productivity of Indonesian oranges is much higher than that of neighboring countries, but most of the production is absorbed by the domestic market [5]. The traditional pattern of farming led to weak marketing of fruits in Indonesia. For that, it needs special handling since the preparation to be marketed [6].

Regional development planning is an effort to accelerate socio-economic development, reduce the gap between regions and maintain environmental sustainability in a region. Regional development planning is necessary because of the different socio-economic, cultural and geographical conditions between one region and another. Basically, regional development planning should be adjusted to the conditions, potentials and problems of the region concerned [7]. More clearly Zen in Alkadri [8] describes the development of the region as a harmonious relationship between natural resources, human, and technology by taking into account the environmental capacity in empowering the community.

Research question:

Do the factors in the productivity of orange farming affect the income of the community in Dairi Regency?

II. RESEARCH METHODS

This type of research is quantitative. In this research the sampling technique used is proportionate stratified random sampling. Data in the research obtained from the results of filling questionnaires distributed by researchers. Analysis of the effect of orange farming on regional development using shift share analysis.

Hypothesis

Factors in the productivity of orange farming positively affect the income of the community in Parbuluan district, Dairi regency, North Sumatra Province.

TABLE 1 VARIABLEE PENELITIAN

Variable	Indicator
Orange farming (X)	1. Land area
	2. Working capital
	3. Labor
	4. Technology
	5. Formal education
	6. Non-formal education
Orange Farmer Income (Y)	1. Income

Data collection method in this study is a questionnaire distributed directly to the community of respondents. The questionnaires containing questionnaires were given to the respondents regarding the variables of orange farming (X) including land area, working capital, labor, technology, formal education, non-formal education and income variable of orange farmers (Y) where alternative answers are provided.

In determining the number of samples to be selected, the authors use an error rate of 10%, because in each study it is impossible to achieve 100% perfect results, the greater the error rate the less the sample size. The population used is 1642 people, with the above calculation then:

$$n = \frac{1642}{1 + 1642 \cdot (0,1)^2}$$

$$n = \frac{1642}{1 + 1642 \cdot (0,01)}$$

$$n = \frac{1642}{1 + 16,42}$$

$$n = 94,25 \text{ rounded to be } 94$$

So from the total population taken as sample are 94 respondents.

To know the effect of production factors on orange commodity productivity in Dairi Regency, using formula:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + e$$

Explanation:

Y	=	Orange farmer income	
a	=	Coefficient of constants	
X1	=	Land area (Ha)	
X2	=	Working capital (Rp)	
X3	=	Labor	
X4	=	Technology	
X5	=	Formal education dummy	
X6	=	Non formal education dummy	
e	=	Pitfalls	

III. RESULT

TABLE 2 SAMPLE AREA OF ORANGE COMMODITY LAND AREA IN PARBULUAN AND SITINJO DISTRICT, DAIRI REGENCY YEAR 2015

No	Land area group (400 m2)	Amount (Person)	Percentage (%)
1	1 – 10	44	46,8
2	11 – 20	40	42,6
3	21 – 30	10	10,6
Total		94	100

From table 2 it can be explained that the largest orange farming area is in the group of land area 1-10 with the number of respondents, each 44 respondents with the percentage of each 46.8%. As for the smallest farming is in the group of land area 21-30 with the number of 10 respondents orange farmers and a percentage of 10.6%. This means that the sample farmers in orange farming have a fairly equal land area.

Production facilities that greatly affect the production of a plant is a fertilizer that works to accelerate the growth of plants and stimulate fruit growth. The fertilizer cost incurred by farmers is enough to affect the income of orange farmers. Costs incurred by farmers are quite diverse, can be seen in table 3 below.

TABLE 3 WORKING CAPITAL OF ORANGE FARMERS IN PARBULUAN AND SITINJO DISTRICT (RUPIAH/YEAR)

Working capital (Rupiah/Year)	Amount (Orange)	Percentage (%)
1.000.000 - 5.000.000	26	27,7
> 5.000.000 - 10.000.000	28	29,8
> 10.000.000 - 15.000.000	25	26,6
> 15.000.000 – 20.000.000	6	6,4
> 20.000.000	9	9,6
Total	94	100,00

From table 3 above can be seen the percentage of working capital is mostly spent by orange farmers /year in the range of 1.000.000 - 15.000.000 rupiah per year, from this table clearly visible working capital used by orange farmer is big enough because the price of seed, fertilizer and

cultivation of orange plant which is very expensive. Labor in this study is the cost paid by farmers to help the process of planting, fertilizing and harvesting the fresh orange that farmers spend. Labor costs paid by farmers vary, shown in the following table.

TABLE 4 LABOR SALARIES PAID BY ORANGE FARMERS IN PARBULUAN AND SITINJO DISTRICT (RUPIAH/ YEAR)

Labor salary (Rupiah/Year)	Amount (Person)	Percentage (%)
< 1.000.000	9	9,6
> 1.000.000 - 5.000.000	64	68,1
> 5.000.000 - 10.000.000	13	13,8
> 10.000.000 – 15.000.000	4	4,3
> 15.000.000	4	4,3
Amount	94	100,00

From table 4 above, it can be seen that the most labor wages paid by farmers/year in the range of 1.000.000 - 5.000.000 rupiah/year is 64 respondents or 68.1 percent, from this table clearly described that labor cost paid by farmers quite a lot due to the work process based on land area and the process of planting and fertilizing.

Technology is a tool used by farmers in improving the productivity of orange crops. Distribution of respondents according to the use of technology in Parbuluan and Sitinjo district can be seen in the following table:

TABLE 5 DISTRIBUTION OF FARMERS BASED ON TECHNOLOGY USAGE IN PARBULUAN AND SITINJO DISTRICT

No	Technology Usage	Amount (Person)	Percentage (%)
1	Technology's user	46	48,9
2	Non-technology user	48	51,1
Jumlah		94	100

Table 5 shows that farmers using technology to increase orange production are 46 respondents or 48.9%. While farmers who do not use technology is 51.1%.

Education is an important thing for farmers to be able to develop knowledge and human resources. Formal education

obtained by farmers from formal institutions such as schools and universities. The distribution of respondents according to the level of formal education in Parbuluan and Sitinjo district can be seen in the following table:

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TABLE 6 POPULATION DISTRIBUTION BY LEVEL OF EDUCATION IN PARBULUAN AND SITINJO DISTRICT

No	Formal Education Level	Amount (Person)	Percentage (%)
1	Primary School	11	11,7
2	Junior High School	16	17,0
3	Senior High School	52	55,3
4	Diploma	3	3,2
5	Bachelor	12	12,8
Total		94	100 %

Table 6 shows that formal education of respondents varies greatly. But the distribution of respondents at most is at the level of high school education with a population of 52 respondents (55.3%). Most of the other respondents are in junior high school as 16 respondents (17%). Respondents who continue their education to a higher level are few in number. Respondents to diploma are 3 respondents (3.2%) and to bachelor degree are 12 respondents (12,8%).

Non-formal education is an education gained by farmers from the experiences, counseling, customs and traditions of local communities in terms of planting, stacking, cultivating, harvesting and increasing fresh orange productivity. This non-formal education is non-formal that can be obtained from anyone. Distribution of respondents according to non-formal education in Parbuluan and Sitinjo district can be seen in table 7 below:

TABLE 7 POPULATION DISTRIBUTION BY LEVEL OF NON-FORMAL EDUCATION IN PARBULUAN AND SITINJO DISTRICT

No	Level of Non-formal education	Amount (person)	Percentage (%)
1	Get counseling	52	55,3
2	Non get counseling	42	44,7
Total		94	100

Table 7 shows that 52 respondents (55.3%). Of respondents in non-formal way get the most counseling while those who do not get counseling is 44,7%.

The amount of income is the farmer's gross income from the multiplication of the harvest amount and the selling price. The income of farmers is described in the table below.

TABLE 8 FARMERS INCOME RATE (RUPIAH/YEAR)

Income (Rupiah / Year)	Amount (person)	Percentage (%)
5.000.000 - 15.000.000	34	36,2
16.000.000 - 30.000.000	33	35,1
31.000.000 - 45.000.000	6	6,4
46.000.000 - 60.000.000	8	8,5
>60.000.000	13	13,8
Total	94	100,00

Based on table 8 above, it can be seen that the income of farmers in Parbuluan and Sitinjo districts is almost evenly distributed in the range of 5,000,000 - 30,000,000 rupiah / year although some reach above 60,000,000 - 100,000,000

rupiah. Low farmer income is due to low yields or low sales prices, but income is still dominated by revenues above 5,000,000 rupiah..

TABLE 9 AVERAGE PRODUCTION AND INCOME OF FARMERS EVERY PLANTING SEASON

No.	Description	Each farmer
1.	Production (ton)	8,2
2.	Sales (Rp.)	31.191.755
3.	Working capital (Rp.)	10.122.926
4.	Wages of Labor (Rp)	4.155.426
5.	Income (Rp) (Y)	16.913.404

The average orange production per farmer is 8.2 tons. This means that the productivity of orange commodities in Parbuluan and Sitinjo district is sufficient. Usually fresh oranges are sold to agents at an average price (P, P) is 4,000 rupiah / kg. The difference in selling price of oranges occurs due to the difference in the quality of fresh orange. In

accordance with the production of fresh orange obtained the average selling value of fresh oranges is 31.191.755 rupiah per farmer / planting season. After deducting the production costs incurred by farmers, income (Y) is earned.

IV. DISCUSSION

TABLE 10 RESULT OF REGRESSION ANALYSIS OF ORANGE FARMER'S INCOME IN 2015

Variable	Coefficient	Standard Error	T-statistik	Sig.
(Constant)	7,132	1,838	3,880	0,000
Land area	0,053	0,016	3,300	0,001
Working capital	0,476	0,114	4,180	0,000
Wages of labor	0,016	0,138	0,114	0,909
Technology	-0,148	0,134	-1,105	0,272
Formal education	0,144	0,070	2,079	0,041
Non-formal education	0,275	0,137	2,008	0,048
R	0,752			
R-square	0,566			
F-statistic	18,876			

Source: Primary data analysis

Table 10 shows that the calculated F value is 17.876 greater than the F table value with a 5% error rate. This means that farmers' income influenced collectively by the independent variables (land area, working capital, labor, technology, formal education and non-formal education). The value of diversity of dependent variable (farmer's income) which can be explained by independent variable is indicated by the value of the coefficient of determination (R^2). The value of R^2 is 0.566 which means that 56.6% of the diversity of dependent variables included in the model can explain the diversity of independent variables. While 43.4% are explained by other variables outside the model (climate, weather, sociology of society, and business risk).

Farmer. Shift Share analysis is a very useful technique in analyzing changes in regional economic structure compared with the national economy. This analysis aims to determine the performance or productivity of regional economic work by comparing it with larger areas. According to Arsyad [3] shift share analysis is an analysis that aims to determine the performance of the regional economy. Shift share analysis can use employment or value added variables, but the most widely used is the employment variable because the data is more easily obtained. According to Tarigan (2007) the formula of Shift Share analysis is as follows:

$$\Delta E_r = E_{r,t} - E_{r,t-n} \\ = 30.790.580 - 22.900.490$$

$$\begin{aligned} \text{Contribution of Farmers Income} &= \frac{\text{Average of farmer's income}}{\text{District's revenue}} \times 100\% \\ &= \frac{16.913.404}{58.792.000} \times 100\% \\ &= 0,287 \times 100\% \\ &= 28,7\% \end{aligned}$$

In relation to regional development, it can be seen that the income of farmers is 16,913,404 rupiah - which is lower than the per capita income of Parbuluan and Sitinjo districts of 58.792.000, - rupiah in 2015. The percentage of orange commodity contribution to the development of the region is moderate 28.7%.

V. CONCLUSION AND SUGGESTION

A. Conclusion

1. Analysis of factors that affect the productivity of farming oranges consisting of land area, working capital, labor, technology, formal education and informal

The independent variable whose positive effect on farmer's income can be known by t test. The result of analysis by using it one way test indicate that land area have real effect to farmer's income with significant value 0,001. Working capital has a significant effect to orange farmer income with 0.000 value; formal education positively affects farmers' income with a significance value of 0.041 and non-formal education has a positive effect on orange farmers income with a significance value of 0.048.

Shift Share Analysis

Based on result of research, that farmer income from orange farming per planting season is 16.913.404, - rupiah/

$$= 7.890.090$$

Based on the analysis of Shift Share, it is found that the agricultural sector shows a positive number of 7,890,090 rupiah or 25.6 percent means that the growth of agriculture sector in Dairi Regency is relatively faster when compared with the growth of GDP of the same sector at the national level. The agricultural sector still contributes 25.6 percent of Dairi District's GRDP and experiences an annual increase, supported by the community's interest in farming.

To find out how much contribution that can be given by farmer incomes to the revenue of Parbuluan and Sitinjo District then can be used by the formula below:

education have a significant effect on productivity of orange farming that is equal to 83,4%.

2. Citrus commodities have a positive impact on the development of the district of Parbuluan and Sitinjo. This can be seen from the data of regional economic growth, the agricultural sector shows a positive number of 7,890,090 rupiah or 25.6 percent, which means that the growth of agricultural sector in Dairi Regency is relatively faster when compared with the growth of GDP of the same sector at the national level and percentage the contribution of citrus commodity to the development of 28.7% which is classified as moderate.

B. Suggestion

1. In an effort to increase the production of citrus can be done by intensification, by increasing the use of labor, capital and technology on a fixed land area.
2. The Government and other stakeholders are also advised to facilitate the establishment of orange processing industries which will also encourage the development of livestock business in Parbuluan and Sitingo Subdistricts.

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