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ASSESSMENT OF INCOME INEQUALITY OF SHALLOT AND PADDY FARMING IN THE COASTAL AREA OF BANTUL REGENCY

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ABSTRACT

This study attempts: (1) to estimate the income of shallot and paddy farming, (2) to calculate the contribution of shallot and paddy farming to the household income of the farmer, (3) to know the structure pattern of farm household income, and (4) to analyze the inequality of farm household income in the coastal area of Bantul Regency. This research was located in Sanden and Kretek Sub-District of Bantul Regency. The samples were 45 farmer households that did shallot and paddy farming. Farming income contribution was gained by calculating the percentage of farming income to the total household income. The data were analyzed by a one-sample t-test. The contribution pattern was obtained by descriptive analysis. The income gap was identified by the Gini index analysis, Gini index decomposition, World Bank criteria, and Lorenz curve. The results showed that (1) the average income of shallot farming was greater than paddy farming, (2) the contribution of shallot farming income was higher than paddy farming income to farm household's income, (3) the structure of farm household's income has a different pattern – households with above-average income have a structural pattern that is dominated by non-shallot and paddy farming, and (4) based on Gini Index and World Bank category, farm household's income inequality is in the medium category.

Keywords: *Coastal Area, Contribution, Income Structure Pattern, Inequality*

INTRODUCTION

Agriculture is a mainstay sector in Indonesia, which several areas are still working on. The agricultural sector is one of the leading sectors of the Bantul Regency, which increased the Gross Regional Domestic Income (PDRB) of the Bantul Regency in 2016 by 14.39 percent (BPS, 2017).

Shallots are the horticultural commodity with the highest production in Bantul Regency. According to BPS data (2017), shallot production in 2016 reached 79,047 quintals. The food commodity with the highest production is paddy. The average paddy production during 2012 - 2016 reached 197,983 tonnes annually.

The coastal area of Bantul Regency is one of the agricultural areas. The people of the coastal areas use much land on the coast for farming activities. The land used is in the form of paddy fields and also sand land.

Households receive income from farming and outside of farming. The income received by farm households varies based on the contribution of each source of income. Differences in income received by farm households cause income disparities in farm households. According to Arsyad (2010), the income gap is an indicator that can be used to determine economic growth in community groups.

The income gap is closely related to income contribution. Ngadi (2016) reveals a difference in income contribution between the fisheries and agriculture sectors in the Coastal Zone of Wakatobi Regency. The agricultural sector is only able to contribute 7.7 percent of total household income. The fishery is the sector with the highest contribution, namely, 30.4 percent. Agriculture is only considered a side job that is useful to meet the household's daily needs.

The income gap in the coastal area of the large Pelagic fisherman household in Sendang Biru, Malang, East Java, is in the medium category. The income gap itself is shown by the Gini index of 0.42. Income disparities occur due to differences in the assets owned by each farm household. The difference in assets causes the income received by each household also to experience differences (Firdaus et al., 2014).

The income gap is indicated by several values, one of which is the Gini index. The Gini index, according to Kuncoro (2010), is a measure of the income gap whose value is between 0 (zero) to 1 (one). If the Gini index value gets closer to 1 (one), the income gap of a group is getting higher, whereas if the Gini index value is getting closer to 0 (zero), then the income gap of a group will get lower.

This study aimed to determine the amount of shallot and paddy farming income, analyze the contribution of shallot and paddy farming income, know the structure of farm household income, and know the inequality of farmers' household income in coastal areas.

METHOD

The primary method used is descriptive analysis. Sampling was carried out by purposive sampling, which involved 45 samples of farm households that did shallot and paddy farming. The research location was selected by purposive sampling, namely the coastal area of Bantul Regency, which includes Sanden District and Kretek District. The data used are primary, namely farm data for one year, namely 2017, and secondary data in 2016.

1. Farm Income

Farm household income is known through the formula (Suratiyah, 2008):

$I = TR - TC$ explicit…..……..…….. (1)

in which:

I	= Net Income (Rp)
TR	= Total Revenue (Rp)
TC explicit	= Total Explicit Cost (Rp)

2. Contribution of Farm Income

The contribution of farm income is the ratio of farm income to farm household income. The formula for finding the contribution of farm income is (Leslie et al., 2011):

$$Y = \frac{Pn}{Pt}.100\% \text{.....(2)}$$

in which:

Y = Percentage of the contribution of household income of shallots and paddy farming to total household income (%)
Pn = Household income from each economic activity (Rp)
Pt = Total household income (Rp)

After knowing the contribution of income, an analysis of the income contribution criteria is carried out based on the following criteria (Leslie et al., 2011):

a. The contribution of income is said to make a small contribution if the contribution of income is <25%;
b. Income contribution is said to be a moderate contribution if the income contribution is (25 - 49)%;
c. Income contribution is said to make a large contribution if the contribution of income is (50 - 75)%;
d. Income contribution is said to give a very large contribution if the income contribution is > 75%.

3. Income Structure Patterns

The income structure pattern is identified by conducting a descriptive analysis. Descriptive analysis is carried out by comparing the above-average income with the farmer household group with below-average income.

4. Income Gap

The income gap can be identified by several methods, namely the Gini index, Gini index decomposition, World Bank criteria, and the Lorenz curve.

a. Gini Index

The Gini index has a value between 0 (zero) to 1 (one). The income gap category, according to Oshima in Wiratmo (1992), is in a low category if the Gini index is 0.2 - 0.35, the Gini index value is 0.35 - 0.5, the income gap is in the medium category, and when the Gini index is> 0.5, high-income gap category. The Gini index is known from the formula (Arsyad, 2010):

$$KG = 1 - \sum_{i=1}^{n} f_i(Y_{i+1} + Y_i) \text{.....(3)}$$

in which:

KG = Gini index number
f_i = Proportion of the number of households in class i
Y_i = The proportion of cumulative total household income in class i
i = Farm household class

b. Gini Index Decomposition

Gini index decomposition is a method used to determine the largest contribution from income sources, which causes an increase in the income gap. The decomposition is obtained based on the coefficient of variation (CV) and the Gini index. Decomposition, according to Adam and Jane (1995), can be obtained by the formula:

$$\sum w_i c_i = 1 \text{.....(4)}$$

$$w_i = \frac{\mu_i}{\mu}$$

$$c_i = R \frac{\sigma_i / \mu_i}{\sigma / \mu}$$

and

$$\sum w_i g_i = 1 \text{.....(5)}$$

$$w_i = \frac{\mu_i}{\mu}$$

$$g_i = R_i \frac{G_i}{G}$$

in which:

$w_i c_i$ = Weighting factor for the gap from each income source itth to the household income gap based on the coefficient of variance (CV)

$w_i g_i$ = The weighting factor for the gap of each ith income source against the gap in household income is based on the Gini index

w_i = Proportion of income sources i-th

μ_i = Average income from the i-th source of income

μ = Average of total household income

c_i = The relative concentration coefficient of the i-th coefficient of variance of the source of income from the overall gap (CV of the i-th source of income)

R = The correlation coefficient of the i-th source of income to household income

σ_i = Standard deviation of the i-th source of income

σ = Standard deviation of household income

g_i = The relative concentration coefficient of the i-th Gini index of the overall gap source of income.

R = The correlation coefficient of the i-th source of income to household income.

G_i = The correlation coefficient of the i-th source of income to household income.

G = Gini index of farm household income

The income source will increase inequality if the Gini index concentration coefficient and the coefficient of variance on the i-th income source are more than one (Adam and Jane, 1995).

a. World Bank Criteria

According to Kuncoro (2010), the distribution gap based on World Bank criteria is:

a) High-income gap if 40% of the population with low income receives income <12% of total income.
b) Medium income gap if 40% of the population with low income receives income (12 - 17)% of total income.
c) The income gap is low if 40% of the population with low income receives income> 17% of total income.

b. Lorenz Curve

The Lorenz curve shows the quantitative relationship between the population's percentage and the percentage of income received by the population over a certain period.

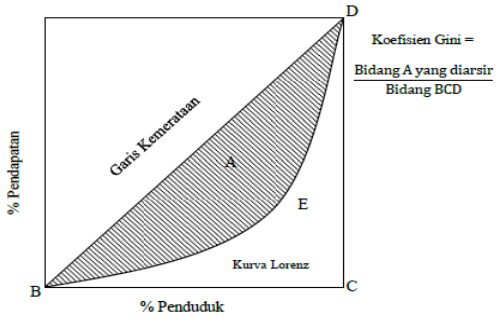

Figure 1. Lorenz Curve

The income gap is higher if the Lorenz BED curve is further away from the BD balance line, while the income gap is lower if the Lorenz curve gets closer to the equilibrium line (Arsyad, 2010).

RESULTS AND DISCUSSION

A. Shallot And Paddy Farming Income

Farm households mostly carry out shallot and paddy farming in the coastal area of Bantul Regency because the area is in accordance with the needs of planting shallots. Paddy farming is cultivated because of the easy cultivation of paddy commodities. Table 1 shows the average income and costs of shallot and paddy farming for each farming household for one year.

Table 1. Average Income of Shallot and Paddy Farming Per Year

Components	Commodities	
	Shallot	Paddy
Harvested Area (m^2)	2,417.800	2,998.44
Revenue (1) (Rp/year)	27,646,549	4,874,434
Explicit Costs (Rp/year)		
Labor (Rp/year)	1,964,277	1,234,822
Inputs (Rp/year)	10,836,002	792,254
Other (Rp/year)	515,153	483,169
Total cost (2) (Rp/year)	13,315,432	2,510,246
Income (1-2) (Rp/year)	14,331,117	2,364,188

Source: Primary Data Analyzed in 2018

Table 1 shows the average income of shallot farming, which reaches Rp. 14,331,117.00 for one year, while paddy farming income reaches IDR 2,364,188.00 for one year. Farming income is

higher than paddy farming due to differences in selling paddy for the two types of commodities. The average selling paddy of shallots is IDR 18,300 per kilogram. Paddy itself has an average selling paddy of IDR 8,500 per kilogram in the form of paddy. The average production of the two commodities is also different. The average production of shallots was 1,508.69 kilograms, while paddy production only reached 577.09 kilograms in the form of paddy.

The frequency of the shallot growing season, which is longer than the frequency of planting paddy, is the cause of the difference in the production between the two commodities. The total explicit cost required for the two commodities equals almost 50 percent of the revenue received. Shallot farming costs the most to buy production facilities, namely seeds. It is because the paddy of shallot seeds is quite expensive. The cost most spent on paddy farming is for labor. Paddy farming requires much labor, especially inland cultivation, planting, and harvesting.

B. Income Contribution

Income contribution states the percentage of income received by farming households based on income sources compared to farm households' total income. Table 2 shows the average farm household income and income contribution by the source of income per year.

Table 2. Average Total Farm Household Income and Income Contribution based on Annual Income Sources

Source of Income	Income Value (IDR/year)	Income Contribution (%)
Shallot Farming	14,331,117	27.65
Paddy Farming	2,364,188	4.56
Non-Shallot and Paddy Farming	19,803,212	38.21
Non-Farming	15,327,798	29.58
Farmers Household Income	51,826,315	100.00

Source: Primary Data Analyzed in 2018

Table 2 shows that the shallot farming income contribution is more significant than paddy farming income to the total farm household income. It is closely related to the difference in the average income of shallot and paddy farming. Increasing income from farming needs to be done by increasing paddy productivity to obtain maximum production.

The contribution of farm income as a whole to farm households reached 70.42 percent. This contribution indicates that the coastal area of the Bantul Regency is agricultural and supports the agricultural sector in Bantul Regency.

One sample t-test analysis was performed to analyze further the difference in shallot and paddy farming income contribution. The result of this test is that the t-value is greater than the t-table. Also, the significance value (one-tailed) reached 0.00, which means it is smaller than α 0.05.

Therefore, it can be said that the contribution of shallots is indeed greater than the contribution of paddy farming.

C. Income Structure Pattern

The pattern of the farm household's income structure has differences in meeting the farm household's needs. Figure 2 shows the pattern of the farm household income structure.

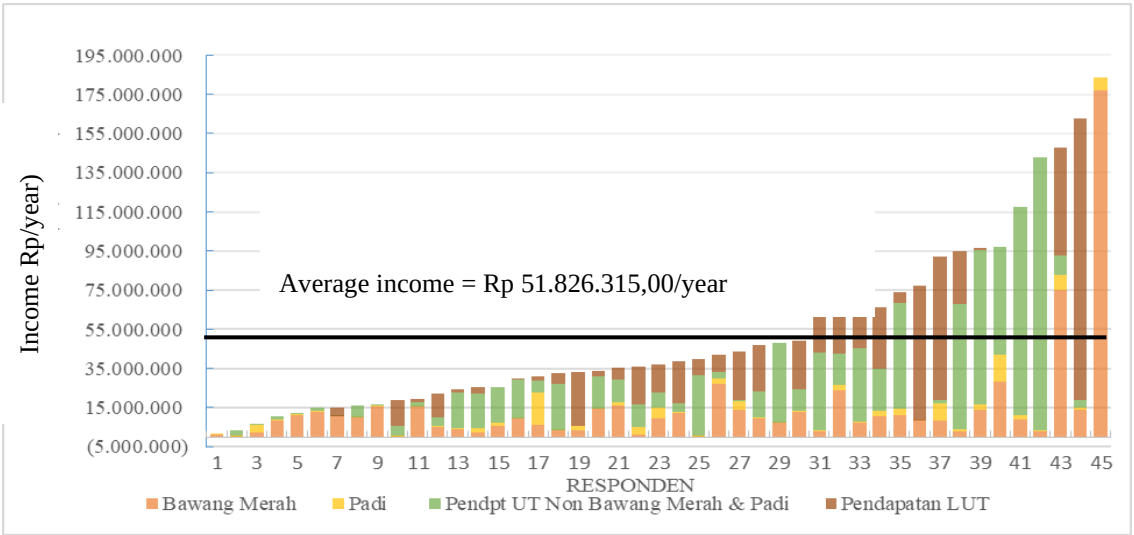

Figure 2. The pattern of Coastal Area Farmers' Household Income Structure in 2017
Source: Primary Data Analyzed in 2018

Farmers' household groups with low income have the highest income source, dominated by shallot farming. Shallot farming is widely cultivated because the coastal area is one of the areas with the highest shallot production in the Bantul Regency.

The difference in the income structure of the highest and lowest income groups can be seen in income sources' contribution. The high-income household group has a source of income from outside the farm, while the source of income from farming only dominates the low-income household group. It is related to the openness of access to outside farming activities, which can only be accessed by some farming households.

D. Income Gap

The income gap is measured using the Gini index, Gini index decomposition, World Bank criteria, and the Lorenz curve. The results of measuring the income gap using the Gini index can be seen in Table 3.

Table 3. The gap in Farm Household Income Based on the Gini Index

Components	Gini Index
Shallot Farming Income	0.58
Paddy Farming Income	0.65
Non-Shallot and Paddy Income	0.66
Non-Farming Income	0.70
Farmers Household Income	0.43

Source: Primary Data Analyzed in 2018

Table 3 shows the gap in farm household income and the sources of income. The Gini index for shallot farming income is 0.58, and then for the Gini index on paddy farming, income is 0.65. According to Oshima in Wiratmo (1992), shallot farming income and paddy farming income are in the high-income gap category. It can be seen based on the Gini index value, which is greater than 0.5. The income gap that occurs in shallot and paddy farming income is due to differences in the income received by each farm household.

Differences in income received are closely related to differences in resources owned by farm households. The resources in question include, among others, different cultivated land ownership. The frequency of different cropping patterns is also one of the causes of differences in income disparities.

The highest income gap occurs in non-farm income sources. The gap in off-farm income is indicated by the Gini index value, which reaches 0.70. It happens because not all farm households carry out activities outside of farming; besides that, access to outside farming activities, which can only be accessed by a part of farming households, is also the cause of the income gap outside of farming.

However, the income gap of farm households has a low Gini index value of 0.43. The farmer household income gap is in the medium category due to each farming household has its views on maximizing farm household income. When they feel that they do not have adequate income sources from farming activities, the farm household will look for other income sources. Even so, farming households still do not abandon shallot and paddy farming activities. Paddy farming is carried out to meet the food needs of farm households to reduce household expenses.

After knowing the Gini index of farm household income, a decomposition of the Gini index is carried out to determine the income source that increases farm households' income gap.

Table 4 shows that the income source that causes an increase in farm households' income gap is farm income, which is indicated by the value of the relative concentration coefficient CV (ci) of more than 1, namely 1.30. The contribution of farm income to the increase in income gap is 21 to 36 percent. The percentage value is obtained from calculating the Gini index decomposition ($w_i g_i$) and decomposition of CV ($w_i c_i$).

Table 4. Decomposition of Farmer Household Income Gap Measurement

Componets	Shallot Farming Income	Paddy Farming Income	Non-Shallot and Paddy Income	Non-Farming Income	Total Income
Average income (μ) (Rp)	14,331,117	2,364,188	19,803,212	15,327,798	51,826,315
Standard deviation (σ)	27,451,913	3,542,032	29,468,680	26,237,260	43,940,314
The correlation coefficient (R)	0.58	0.32	0.48	0.49	
Share sources of income (wi)	0.28	0.05	0.38	0.30	1.00
Relative concentration coefficient CV (ci)	1.30	0.56	0.85	0.99	
Dekomposisi CV (wici)	0.36	0.03	0.32	0.29	1.00
Gini index relative concentration (gi)	0.77	0.48	0.73	0.79	
Gini index decomposition (wigi)	0.21	0.02	0.28	0.23	1.00
Gini index of the i-th source of income (Gi)	0.58	0.65	0.66	0.70	
Gini Index Coefficient (G)					0.43

Source: Primary Data Analyzed in 2018

When viewed from the Gini index, the biggest gap is in the source of income from outside farming activities, but it is shown from the decomposition of the Gini index that the income of shallot farming has the most considerable contribution in increasing the income gap. It is related to the correlation coefficient of each source of income to farm household income, which is also a determinant of decomposition's relative coefficient value.

The income of shallot farming is the cause of the increase in income inequality because all farm households do shallot farming, so the effect of shallot farming income on farm household income is greater than that of outside farming income. It is related to the fact that not all households carry out activities outside of farming. An income gap analysis was carried out based on the World Bank criteria to convince the result further. The World Bank classifies farm households based on the cumulative amount of income received by farm households. Farm household groups consist of high, medium, and low-income groups. The income gap based on World Bank criteria is based on the lowest 40 percent of the population. The results of the World Bank criteria analysis are shown in Table 5.

Table 5. The gap in Farm Household Income Based on World Bank Criteria

Source of Income		Cumulative Percentage of Recipients of Income		
		40	80	100
Shallot Farming Income	(Rp)	58,359,331	252,895,283	644,900,259
	(%)	9.05	39.21	100
Paddy Farming Income	(Rp)	4,211,634	252,895,283	644,900,259
	(%)	0.65	39.21	100
Other Farm Income	(Rp)	24,994,416	274,776,260	891,144,553
	(%)	2.80	30.83	100
Non-Farming Income	(Rp)	4,720,000	213,110,889	689,750,898
	(%)	0.68	30.90	100
Farmers Household Income	(Rp)	317,311,070	1,196,460,969	2,332,184,159
	(%)	13.61	51.30	100

Source: Primary Data Analyzed in 2018

Table 5 shows the gap in farm income based on World Bank criteria is in the high category. It is related to the percentage of cumulative income from farm income sources whose value is less than 112 percent, while overall total income has a percentage value of 13.81 percent. According to the World Bank criteria, the farmer household income gap is in the medium category.

Table 5 shows that 50 to 60 percent of the cumulative income from each income source is controlled by 20 percent of farming households with the highest income. The pattern of income structure in farm households that has been described in Figure 6.1 can explain the causes of this cumulative income control. Most farming households have their views on how to obtain household income through existing sources of income. Most farm households are aware of limited resources for specific income sources but have sufficient resources to carry out other business activities. So, farming households will maximize their resources without leaving shallot and paddy farming.

The existence of different income structure patterns and gaps in each category of farm households means that the government must have the right policies regarding policy content and policy targets. For example, there is a policy from the local government relating to training on making unique arts or crafts to become a source of increasing the expertise of coastal communities around tourist sites. Meanwhile, the community also needs to cooperate with policies or budgets issued by the government. To increase income, one can receive training independently to continue practicing until it is successful and can be used as a job. Cooperation between government and society is the key to the successful implementation of government policies towards society.

The Lorenz curve is an additional method to determine the quantitative relationship between income earners and the percentage of income received. The Lorenz curve is obtained based on the Gini index value of the source of income. The results of the Lorenz Curve analysis are shown in Figure 3 below.

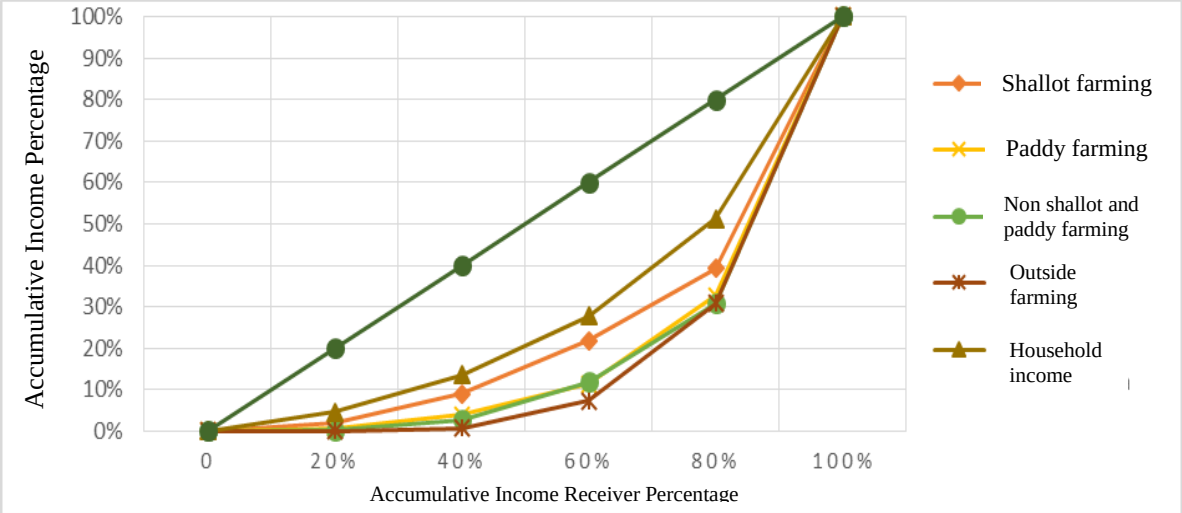

Figure 3. Lorenz Curve Gap of Farmer Household Income in the Coastal Areas of Bantul Regency
Source: Primary Data Analyzed in 2018

Based on Figure 3, it can be seen that the more convex the curve that is formed towards the balance line, the higher the income gap that occurs in farming households. On the other hand, if the curve formed is closer to the equilibrium line, this indicates an increasingly even gap in the farm household's income. The area formed between the equilibrium line and the Lorenz Curve shows the Gini index value.

Figure 3. shows that the income source outside the farm is the income source with the highest gap. It can be seen from the area between the balance line and the farm's outer curve that is the widest among the others. Meanwhile, farm household income has the narrowest area. In other words, household income has the lowest gap compared to sources of income. Figure 3. also shows that 80 percent of the population receives a cumulative income above 40 percent. These sources of income simultaneously reduce the inequality of farm household income.

The income gap in income sources, especially in shallot and paddy farming, needs further analysis. Further analysis is needed to determine the leading cause of the income gap that occurs. Inequality in income is not only caused by differences in income received by each farming household but can also be caused by differences in

the capital owned by each farming household. This capital can be in the form of land, financial capital, and experience capital.

The income gap for farm households experienced an income gap in the medium category based on the Gini index and World Bank criteria. Meanwhile, the sources of income experienced a gap in the high category. This phenomenon indicates that each farming household has its view of the source of income. Some farm households have high income from farming but only get a small amount of income from outside of farming or vice versa.

CONCLUSIONS

The average income of shallot farming is greater than that of paddy farming, and it also contributes more to household income. However, for farming households whose income levels are above the average, the main contribution of income comes from non-shallot and paddy farming. Furthermore, it is related to the income gap of farm households in the coastal area of Bantul Regency, which is at a moderate level.

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