

THE COMPARISON OF INCOME AND THE RISK FARMING OF CRYSTAL GUAVA FARMING OF PARTNERED AND NON-PARTNER FARMER WITH THE GOVERNMENT IN SEMARANG

Hasri Nurain¹⁾ Wiludjeng Roessali¹⁾, Edy Prasetyo¹⁾

¹⁾Program Study of Agribusiness Faculty of Animal Husbandry and Agriculture, Diponegoro University
Email: wroessali@gmail.com, Email: edyprsty@yahoo.com, Email: hasrinurain12@gmail.com

ABSTRACT

This study analyzed the income and factors that affect the crystal guava farming income at partnered and non-partnered farmers with the Agricultural Department of Semarang City Government. The survey was done with the respondents that were chosen by purposively. A total of each 30 respondents were interviewed on partnered and non-partnered farmers. The data collected were analyzed by multiple linear regression test and coefficient variants. The result showed that there was a different revenue between partnered and non-partner farmers with the government. The income of partnered farmers was IDR 14,835,818.60/year, while the income of non-partnered farmers was IDR 75,717,383.27/year. The variables of the number of trees, the amount of production, cost farming, and the statues of farmers significantly affected the income of crystal guava farming. Meanwhile, the amount of NPK fertilizer and age were not significantly affected the income of crystal guava farming. The risk of farming of partnered farmers was higher than non-partner farmers.

Keywords: Average revenue, Crystal guava, Income, Risk of farming.

INTRODUCTION

Indonesia belongs to the twenty most significant countries in the world whose dominating world trade fruits (FAO, 2017). In 2017 Indonesia produced 21,316,280 tons of fruits. The banana was the highest fruit product, followed by orange, mango, pineapple, and guava (Directorate General of Horticulture, 2017). Guava (*Psidiumguajava* L.) is one of the superior commodities. The total production of guava in Central Java is 200,488 tons per year. Central Java is one of the largest producers of guava. The production continues to develop since the demand increasing every year (Yuniwati&Prihartini, 2018). Guava has many varieties, such as crystal guava, Bangkok guava, breadfruit guava, brittle red guava, and others (Barus et al., 2017). According to Central Java Statistics Agency data (2017), guava

production in Central Java has increased every year with a growth percentage of 19.35% from 2006 to 2016.

Crystal guava is a new crop that is cultivated in the city of Semarang, but its production is seen to be significant for farmer income since the demand increase. Therefore, some farmers have begun to cultivate guava (Semarang City Agriculture Office, 2018). The government of Semarang City in Agriculture Service willing to develop the cultivation of guava crystal to support the farmer. Since little information about the performance of Crystal Guava farming (Silveira et al., 2019; Vasanthan et al., 2014) reported, this study, therefore, would assess factors affect their income and farming risks of crystal guava. The objectives of this study were: (1) analyzed the difference in crystal farming income between farmers who were partnered and non-partnered with the government; (2)

analyzed the factors affecting farmer income; (3) analyzed the farming risk.

MATERIALS AND METHODS

The study was conducted from November to December 2018 in Gunungpati and Mijen Districts, Semarang City. The locations of the research were chosen by using the purposive sampling method in the city of Semarang. Semarang was selected due to the city program as a center of crystal guava in Central Java. A survey was done with the respondents of guava crystal farmers who partnered and non-partnered with the Department of Agriculture government in Semarang. A total of 30 farmers experiencing more than two years in cultivating crystal guava in each who partnered and non-partnered with the government were selected as respondents. Farmers associated with the government were in Gunungpati, the respondents were not affiliated to the government were in Mijen districts.

Data collection was done by interview based on a questionnaire. The primary data obtained were production costs, labor costs, productivity, and selling prices. Secondary data collected were data on the number of production of partnered farmers and the number of guava production in the city of Semarang. The data were calculated as follows:

1. Net Income

The Income of the crystal guava farming was analyzed using the formula according to Soekartawi (2006).

$$= TR - TC$$

Where :

= Farm Income

TR = Total Revenue

TC = Total Cost

2. Income Comparison of Crystal Guava Farming

The income of the farmers was compared between partnered and non-partnered farmers, with the government

used the independent sample t-test. The independent-sample t-test aims to find out the differences between two unrelated populations (Santoso, 2003). An independent sample t-test is a parametric test for normally distributed data. If the data not normally distributed, then the non-parametric Man Whitney Test is used (Harinaldi, 2005). The hypotheses were: Ho: $\mu_A = \mu_B$, and H1: $\mu_A \neq \mu_B$

where:

μ_A : Average income of partner farmers

μ_B : Average non-partner farmer income

Criteria:

1. Ho is rejected and H1 is accepted if the significance value < 0.05
2. Ho is accepted and H1 is rejected if the value of significance > 0.05
3. The multiple linear regression model was used for the analysis of factors affecting income (Sugiyono, 2007). The multiple regression equation is as follows:

$$\text{Ln}Y = a + b_1 \text{Ln} X_1 + b_2 \text{Ln} X_2 + b_3 \text{Ln} X_3 + b_4 \text{Ln} X_4 + b_5 X_5 + e$$

(Sugiyono, 2008)

where :

Ln Y = Variable dependent = Crystal Guava Farmer's Income (Rp)

a = Price Y when price X = 0

b = Regression coefficient

Ln X1 = Number of Trees (trees)

Ln X2 = Number of NPK Fertilizers (Kg)

Ln X3 = Production Amount (Kg)

Ln X4 = Farm Cost (Rp / year)

Ln X5 = Dummy status of farmers (1 for partnered farmers and 0 for non-partnered farmers).

1. Variation Coefficient (CV)

To determine the level of risk of guava crystal farming, the variance coefficient analysis was used. The CV is a measurement of the relative risk obtained by dividing the standard deviation results and the average price (Pappas and Hirschey, 1995)

$$CV = \frac{S}{x} \text{ (Pappas dan Hirschey, 1995)}$$

Where :

CV = Variation Coefficient

V = Standard Deviation

\bar{x} = Average production / price / income

RESULTS AND DISCUSSION

Characteristics of Respondents. Based on Table 1, it can be seen that all of the respondents were male. It is not a surprise, mostly female work partially in agriculture in Semarang. The age of respondents of guava crystal farmers ranged from 30-70 years; the largest number was in the age range of 41-50 years. Respondents in this range include a productive age. It is a potential farmer since those ages are productive workers (Putri et al., 2013). Damayanti (2013) and Xie, (2019) stated that the older the farmer basically has a low ability. The age can be used as an indicator

of a farmer's ability to accept innovations or new ideas in advancing his business.

Most of the education level of the respondents were junior and senior high schools. The level of education may affect farming systems. The higher the education, knowledge, and innovation are better than those with lower education. The experience of the farmer ranged from two to seven years. The guava crystals farming is still relatively new in the city of Semarang. The Agriculture Department of Semarang government has developed a collaboration with farmers so that it can be seen in partnered farmers have a long experience working on guava farming compared to farmers who do not associate with the government.

Analysis of Farm Income. Farm income was calculated by the formula introduced by Soekartawi (2006). The income of partnered and non-partnered farmers is shown in Table 2.

Table 1. Partnered and Non-Partnered Farmers Respondent Data in Semarang City.

No	Aspects	Number of Partnered Farmers (people)	Percent (%)	Number of Non-Partnered Farmers (people)	Percent (%)
1	Gender				
	a. Male	30	100	30	100
	b. Female	0	0	0	0
2	Age				
	30-40	3	10	6	20
	41-50	17	56.67	16	53.33
	51-60	7	23.33	8	26.67
	61-70	3	10	0	0
3	Education				
	None	0	0	0	0
	Elementars	9	30	5	16.67
	Junior High School	9	30	13	43.33
	Senior High School	12	40	12	40
4	Farming experience (year)				
	2-3	0	0	17	56.67
	4-5	14	46.67	12	40
	6-7	16	53.33	1	3.33

Source: Primary Research Data, 2018.

KS = partnered farmers with the government.

TKS = non-partnered farmers with the government.

Table 2. Crystal Guava Farming Income for Partnered and Non-Partnered Farmers with the Government.

Respondent	Land area	Revenue	Total Cost Production	Income
		---Rp/year---	---Rp---	---Rp/ha/tahun---
Partnered farmer	0.19	23,712,000	8,876,181.40	78,083,255.8
Non-partnered farmer	1.01	99,421,179	18,325,283.40	74,967,706.2

Source: Primary Research Data, 2018.

Production cost. Based on Table 2, it can be seen that the production costs incurred by non-partnered farmers were higher, about Rp. 17,792,243 with an area of 1.01 ha while the total cost of production of partnered farmers was Rp 8,245,015 with an area of 0.19 ha. The types of production costs can also be divided into fixed costs and variable costs. Fixed costs are types of costs that do not depend on the size of the costs of production, such as rent or interest in the form of money. Basically, an effective farm is a farm that incurs minimal production costs but high production yields and will also affect high income (Luntung, 2012).

The amount of partnered farmers' production costs was smaller than that of non-partnered farmers due to the influence of several factors. For instance, although partnered farmers had a small cultivated area, the plantation was managed by the government. Therefore, there was no cost for land tax for farmers. The government also provided other costs for fertilizers and pesticides, although the amount was minimal, and farmers claim they still have to buy additional fertilizer and pesticides.

Revenue. Based on Table 2, it can be seen that the revenue of partnered farmers was smaller compared to non-partner farmers, which was Rp 23,712,000 per year, while non-partnered farmers' revenue was Rp 99,421,179 annually. The number of trees and land area of partnered farmers was smaller so that it affects the amount of

production. In addition, the partnered farmers have to share 30% harvested revenue to the government with purchase price at Rp 10,000. In contrast, the selling price of crystal guava is Rp 15,000 on average. To that price, non-partnered farmers receive purchase price at Rp 12,000.

Income. Based on Table 2, it can be seen that the average income of partnered farmers was Rp 14,835,818.60 annually, while the income of non-partner farmers was Rp. 75,717,383.27 per year. Based on the Whitney Man difference, test the Asymp value. sig (2-tailed) of 0,000, the value is <0.05, then H0 is rejected, and H1 is accepted, so it can be concluded that there were differences in income between partnered and non-partnered farmers. According to Ghazali (2013), if the probability > 0.05, then H0 is accepted to be the same variance, but if the probability <0.05, then H0 is rejected, so the variance is different. The difference was due to the number of trees. A total of 217 and 25 trees in non-partnered farmers and partnered farmers respectively will have differences in production costs.

Partnered farmers have a production sharing system with the Agricultural Government, which was 70% for farmers and 30% for the government. The Semarang City Agriculture Government has determined the selling price. The sharing for the Semarang government was decided since the government provided land and few production costs. According to Marsudi

(2011) a type two profit-sharing system where landowners only provide land while labor and other inputs are the responsibility of farmers who cultivated the land. In addition, income is also influenced by the land area of each different farmer (Soekartawi, 2003). Non-partnered farmers have an average land area of 1.01 ha, and on partnered farmers, the average land area was 0.19 ha. Production costs incurred were also different, for non-partnered farmers, the cost was Rp. 17,792,245, while for partnered farmer cost was Rp. 8,245,015.

Analysis of Factors Affecting Crystal Guava Farming Income. The variables of the number of trees, the amount of NPK fertilizer, age, amount of production, farming costs, and status of farmers have a very significant effect on the income. This was indicated by the F-sig value of 0,000, which was smaller than the value of 0.05. Partially, the variable number of trees, the amount of production, farming costs, and

the status of farmers shows the effect on income. The regression coefficient of the variable number of trees was 1.211, which shows that if the number of trees increases by one tree assuming the other variables were fixed, then income will increase by Rp. 1,211. The variable amount of production (X4) has a positive effect on the income of 1,721, meaning that each additional amount of production was 1 kg, then income increases by Rp 1,721. Farming cost variable (X5) has a negative effect with a constant of 0.815, meaning that each additional farming cost of Rp. 1 then income will decrease by Rp. 815. The variable amount of NPK fertilizer (X2) had no significant effect on income.

Analysis of Production Risk, Price Risk, and Risk of Crystal Guava Income in Semarang City. The calculation of farm risk was based on the formula of the variance coefficient on partnered farmers and non-partnered farmers.

Table 3. Regression Factors Affects Income.

No	Variable	Coefficient	t-value	Probability (sig.)
1.	Constant	16.488	8.391	0.000
2.	Ln Number of trees (X1)	1.211	11.510	0.000
3.	Ln Number of NPK fertilizers (X2)	0.057	1.422	0.161
5.	Ln Production (X3)	1.721	22.315	0.000
6.	Ln Farming cost (X4)	-0.815	-6.781	0,000
6.	Dummy farmer status (X5)	-0.201	-2.400	0,020
R-square = 97.1%			F-sig = 0,000	

Source: Primary Research Data, 2018.

Note: *) significant; ns = not significant.

Table 4. Variance Coefficient of Production Risk, Price Risk, and Risk of Crystal Guava Farming Income in Semarang City.

No	Respondent	Production Risk	Price Risk	Income Risk
1.	Partnered farmer	0.53	0	0.80
2.	Non-partnered farmer	1.43	0.085	1.48

Source: Primary Research Data, 2018.

The risk of production in non-partnered farmers was 1.43 greater than that of partnered farmers, which was 0.53. The coefficient value of the various means that for non-partnered farmers for each one unit of production, the farmer will face a risk of 1.43 units, while for partnered farmers for each one unit of production, the farmer will face a risk of 0.53 units. The risk faced by non-partnered farmers was higher than that of partnered farmers

The price risk for partnered farmers was zero so that it was smaller than the price risk for non-partnered farmers, which was 0.085. The CV value obtained for non-partnered farmers was 0.085, while for partnered farmers was zero. The value of the CV means that non-partnered farmers for each unit price will face a risk of 0.085 units. Whereas the partnered farmers for each one-unit price of farmers will not face the risk because the resulting risk was zero. The price risk faced by non-partnered farmers was higher than the price risk faced by partnered farmers.

The risk of income to partnered farmers was 0.80. It was smaller than the risk of income to non-partnered farmers that was equal to 1.48. The value of CV to non-partnered farmers was that for each one unit of income received by farmers it would face a risk of 1.48 units, while for partnered farmers for one unit of income received it will face a risk of 0.80 units then the income risk faced by non-partnered farmers were greater than the income risk faced by partnered farmers.

CONCLUSION

Based on the analysis of revenue and risk of crystal guava farming in Semarang City that has been done, it can be concluded as follows:

1. There is a difference in the average income of crystal farming in partnered farmers and non-partnered farmers. The income of the guava farmers associated with the government was Rp. 78,083,255.8, while the farmers who do not cooperate with the government was Rp. 74,967,706.2.
2. The number of trees (X1), Number of Laborers (X2), Number of Pesticides (X3), and status of farmers (X4) simultaneously affected the income of crystal guava farmers (Y) with an adjust R Square value of 97.1%. The number of trees (X1), the number of workers (X2), the number of pesticides (X3), and the dummy status of farmers (X5) partially had a positive effect on the income of crystal guava farmers in Semarang City.
3. The risk of production of farmers who associated with the government was 0.53, while the risk of production of non-partnered farmers was 1.43. The price risk of partnered farmers was 0, and there was no risk, while non-partnered farmers were 0.085. The income risk of partnered farmers was 0.80, while the risk of income of non-partnered was 1.48.

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