

ANALYSIS OF THE FACTORS AFFECTING THE INCOME OF ROBUSTA COFFEE FARMERS IN TEMANGGUNG

by Edy Prasetyo

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1 ANALYSIS OF THE FACTORS AFFECTING THE INCOME OF ROBUSTA COFFEE FARMERS IN TEMANGGUNG

Listiyaningsih, Dini¹⁾, Edy Prasetyo²⁾ and Mukson²⁾

¹⁾ Agribusiness Masters Program Students, Diponegoro University,

Directorate General of Plantations, Ministry of Agriculture Republic of Indonesia

²⁾ Lecturer at the Faculty of Animal Husbandry and Agriculture, University of Diponegoro

Email correspondence: dinilistiya@gmail.com

Abstract: Coffee is one of the plantation commodities that has an important role in the national economy, especially as an employment provider, a source of farmer's income, and a source of foreign exchange. Temanggung is the Robusta coffee production center which has an important role in fulfilling Robusta coffee supply in Central Java. This research aims at analyzing the income and the factors affecting the income of Robusta coffee farmers in Temanggung. Penelitian ini dilakukan pada bulan November- Desember di Kabupaten Temanggung dengan metode survei. This research was conducted in November – December in Temanggung using survey method. The research location which is Temanggung was chosen deliberately since this district is the biggest Robusta coffee production center in Central Java. The farmer sampling was conducted by cluster random sampling. The Slovin formula was utilized to determine the number of samples which is ninety eight sample farmers. The result of this research shows that the income of Robusta coffee farmers who sell the product in the form of coffee cherries is significantly different from the regional minimum wage of Temanggung. Meanwhile, the income of the Robusta coffee farmers who sell the product in the form of coffee bean is not significantly different from the regional minimum wage of Temanggung. The factors affecting the income of Robusta coffee farmers are land area, fertilizer cost, the age of the farmers, farmers' education, and the coffee shape.

Keywords: coffee farming, production cost, income

6 I. INTRODUCTION

Coffee is one of the plantation commodities that has important role for the national economy, especially as an employment provider, a source of farmer's income, and a source of foreign exchange. There is around 96,16% or covering an area of 1.2 hectares are of coffee plantation in Indonesia has been managed by people's plantation (Directorate General of Estates,

2016). The width area of coffee plantation management indicates that the role of coffee commodity as the source of income and employment for the people is important. The biggest coffee producing in Indonesia is Sumatera, Java, and Sulawesi. The most contributing province in producing coffee in Java is East Java and Central Java. Temanggung is the coffee producing center, especially Robusta in Central Java. Temanggung is in the first rank among the coffee producing areas in Central Java that contributes thirty percents of the total Robusta coffee production in Central Java.

The volume export of coffee in 2016 is 414.651 tons (Pusdatin-Kementan 2016). The export of Indonesian Robusta coffee is predicted continuously increasing until year of 2021 with growth rate 1.6% each year (Chandra *et al.*, 2013). Furthermore, domestic consumption is also projected to increase. Based on the data from agriculture ministry and information center in 2016, the coffee consumption in Indonesia is 249.824 tons and in 2021, it is projected to increase 369.886 tons, its average is 8,22%. The increase is caused by drinking coffee, now, becomes people's lifestyle. According to Aklimawati and Shaf, drinking coffee is more entrenched and becomes part of the social life of the community.

The momentum of the increase of coffee need pushes the government to promote the development of coffee plants. The coffee development will be successful only if the coffee farmers get proper income. The effort to increase the income and welfare of farmers, however, has several problems. The problems include the relatively low knowledge of farmers, the lack of modal, the narrow land ownership, lack of farmers' skills, and the natural conditions that affects the production as well as coffee productivity that affects the income of the coffee farmers. Knowing the several problems faced, the researcher needs to know how the income of coffee farmers is and the factors affecting the income of coffee farmers. The cosio-economic factors that are expected to affect the income of Robusta coffee famers are the land area, fertilizer cost, the age of the farmers, farmers' education, and the coffee shape.

The research is aimed at knowing the income of the Robusta coffee farmers and the factors affecting the income. This information is considered important to describe the income and the factors affecting the income of the Robusta coffee farmers as reference for developing Robusta coffee.

II. RESEARCH METHOD

2.1 Time and Location of the Research

The research was conducted in November-Desember 2018 in Kandangan, Gemawang, and Candirototo of Temanggung, Central Java. The research location was chosen deliberately since Temanggung is the biggest Robusta coffee production center in Central Java. The research method

utilized is survey method by directly giving questionnaire to the Robusta coffee farmers in Temanggung for the interview section.

2.2 The Sampling Method

Metode yang digunakan untuk menentukan sampel yaitu *cluster random sampling* dan diperoleh responden petani kopi robusta sebanyak 98 petani. The sampling method utilized a cluster random sampling that was obtained 98 respondents of Robusta coffee farmers.

2.3 Data Analysis Method

Calculating the farmers' income by subtracting the total revenue from the total production costs of farming, the formula (Soekarwati, 2002) is below:

$$TC = TFC + TVC$$

$$TR = P \times Q$$

$$Pd = TR - TC$$

in which:

$$TC = \text{Total Cost (Rp)}$$

$$TFC = \text{Total Fixed Cost (Rp)}$$

$$TVC = \text{Total Variabel Cost (Rp)}$$

$$TR = \text{Total Revenue (Rp)}$$

$$P = \text{Price (Rp)}$$

$$Q = \text{Quantity (kg)}$$

$$Pd = \text{Income (Rp)}$$

$$TR = \text{Total Revenue (Rp)}$$

$$TC = \text{Total Cost (Rp)}$$

The average of the farmers' income, then, is tested by one sample t-test in order to analyse the comparison between the average income of the Robusta coffee farmers in Temanggung and the regional minimum wage of Temanggung.

The analysis used to determine the relationship between variables is linear regression analysis. The data analysed by the regression analysis needs to be tested previously using normality test, autocorrelation test, multicollinearity test, and heteroscedasticity test.

RESULT AND DISCUSSION

3.1 Production Costs

The production cost is the cost incurred during the production process. The costs incurred by the farmers include fixed costs and variable costs. The average of production costs can be seen in Table 1.

Table 1. Each Farmer's Production Costs Average Per Year

Cost Component	Farmers selling the product in the form of coffee cherries (cherry)	Farmers selling the product in the form of coffee bean (green bean)
	---Rp---	---Rp---
Fixed Costs	838.972,56	888.113,74
1. Cost of Depreciation	792.929,88	839.131,29
2. Land Tax	46.042,68	48.982,46
Variable Costs	5.254.134,15	6.702.620,18
1. Fertilizer Costs	1.159.012,2	1.151.254,39
2. Labor Costs	4.095.121,95	4.490.438,6
3. Post-Harvest Costs	0	1.060.927,19
Total Costs	6093106,71	7590733,92

The fixed costs are the costs that are fixed and not influenced by the amount of production. The kinds of fixed costs in Robusta coffee farming is the depreciation fees and land taxes. The farmers have seven types of depreciated items that are coffee tree, hoe, sickle, pruning shears, saw, and knife. The variable costs are the costs depending on the amount of the production produced. The variable costs in the analysis of Robusta coffee farmers' income includes fertilizer costs and labor costs. The fertilizer utilized are chemical and organic fertilizer. The type of chemical fertilizer includes urea, NPK, SP36. The organic fertilizer utilized is manure. The labor costs in the Robusta coffee farming includes fertilizing, weeding, pruning and harvesting labor. The different forms of coffee sold gives the consequences of different processing costs. The farmers selling the production in the form of coffee bean (green bean) have the post-harvest costs. The post-harvest costs include the costs for drying and grinding coffee.

3.2 Revenue

The revenue is the results receives by coffee farmers for the sale of agricultural products. Revenue is obtained from the multiplication of all results of coffee production with the selling

price of coffee per kilogram. The selling price of coffee in Temanggung often changes. However, the change is not determined by the farmers. In this case, the farmers are the price taker.

Table 2. Each Farmer's Average Revenue Per Year

Revenue	Total Production	Selling Price	Total Revenue
	----- Kg -----	----- Rp -----	----Rp----
Coffee Cherries (<i>cherry</i>)	4073.17	5.443,90	22.174.146,34
Coffee Bean (<i>green bean</i>)	1141.49	25.688,60	29.462.276,32

3.3 Income

The income of the farming is obtained from the deviation between the total revenue and total costs in one year.

Table 3. Each Farmer's Average Income Per Year

Farmers' Income		Total
		---Rp/Tahun---
1	Coffee Cherries (<i>cherry</i>)	16.081.039,63
2	Coffee Bean (<i>green bean</i>)	21.871.542,40

The income of the farmers selling the production in the form of coffee cherries is Rp. 16.081.039,63/year while the income of farmers who sell the production in the form of coffee bean (gree bean) is Rp. 21.871.542,40/year.

This research utilizes one t-test sample to compare the farmers' monthly income and the regional minimum wage of Temanggung in 2018 that is 1.557.000

Table 4. The Comparison of Farmers' Income and the Regional Minimum Wage.

No	Information	Income	Regional Minimum Wage	Sig	Conclusion
1	Farmers selling the product in the form of coffee cherries (<i>cherry</i>)	1.340.086,64	1.557.000	0,000	There is a difference
2	Farmers selling the product in the form of coffee bean (<i>ose</i>)	1.822.628,53		0,594	There is no difference

2
The different monthly income of Robusta coffee farmers who sell the product in the form of coffee cherries with the regional minimum wage of Temanggung has significance 0,00 < 0,05 which means H_0 is rejected and H_1 is accepted. The monthly income average of Robusta coffee farmers who sell the product in the form of coffee cherries is 1.340.086,64 while the regional minimum wage of Temanggung is Rp. 1.557.000. Therefore, there is a difference between the income of Robusta coffee farmers who sell the product in the form of coffee cherries and regional minimum wage of Temanggung. Based on the t value, it has negative value. It means that the income of the Robusta coffee farmers who sell the product in the form of coffee cherries is lower than the regional minimum wage of Temanggung. The result is suitable with Haryani (2018) in West Lampung who states that the monthly income of the coffee farmers is low.

The different between the monthly income of Robusta coffee farmers who sell the product in the form of coffee bean (green coffee) and the regional minimum wage of Temanggung has significance $0,594 \leq 0,05$ which means H_0 is accepted and H_1 is rejected. The average monthly income of Robusta coffee farmers who sell the product in the form of coffee bean is 1.822.628,53 while the regional minimum wage of Temanggung is Rp. 1.557.000. Therefore, there is no difference between the Robusta coffee farmers who sell the product in the form of coffee bean (ose) and the regional minimum wage of Temanggung.

3.4 Normality Result

The result of Kolmogorov-Smirnov (KS) test shows significance value 0,200 which means the data distributed is normal. The data that is normally distributed is the data of which significance value $\geq 0,05$ while the data that is not normally distributed is the data of which significance value $< 0,05$ (Santosa, 2002).

Table 5. The Result of Multiple Linear Regression

No	Factor	Coefficient	Significance
1	A Constant	0,643	0,000
2	Land Area	0,588	0,000
3	Fertilizer Costs	0,505	0,000
4	The Age of the Farmers	0,295	0,005
5	Education	0,177	0,016
6	Coffee Shape	0,095	0,000
7	R^2	0,963	-
8	F	-	0,000

The Result of Multiple Linear Regression Test

The result of the multiple linear regression analysis using SPSS 22 software is provided in table 5. The multiple linear regression analysis is utilized to know the effect of independent variable to the dependent variable like land area, fertilizer costs, the age of the farmers, education, and coffee shape over the Robusta farmer's income level. The result based on the multiple linear regression analysis is

$$Y = 0,643 + 0,588 X_1 + 0,505 X_2 + 0,295 X_3 + 0,177 X_4 + 0,095 D$$

The coefficient of R^2 determination obtained is 0,963 which means the ups and downs of income is caused by the ups and downs of variables that are land area (X_1), fertilizer costs (X_2), the farmers' age (X_3), education (X_4), and coffee shape (D). The rest 3,70% is caused by other factors that is not discussed in this research model. The result of F test shows a significance value 0,000 or lower than 0,05 so that H_0 is rejected and H_1 is accepted which means the variables of land area, fertilizer costs, the age of the farmers, education, and coffee shape have simultaneously significant effect on the income. The result of the effect of variable partially using t test shows that the land area costs, fertilizer costs, farmer's age, education, and coffee shape have a significant effect on the income. The significance value is less than 0,05 which means the factors have significant effect on the income of Robusta farmers.

3.5 Land Area

The land area variable has a significant effect on the income of Robusta farmers. The regression coefficient for the land area variable is 0,588 and it has positive value which means that the land area has a direct relationship with the income. For every increase in land area of 1.00 meters, the Robusta coffee farmers' income value will add up to Rp. 0,588. According to the data of the research conducted in Temanggung, the average land area of the farmers is 5262 m². The more arable land will increase the yield of coffee production. The increased production will increase revenue. The revenue minus the total costs will earn income. It means that if the land area of Robusta coffee farmer is expanded, the income will also increase. It is suitable with the opinion of Galish and Setiawin (2014) that the production result of the farmers is determined by the land areas—the greater the land area, the greater the yield—.

3.6 Fertilizer Costs

Fertilizer cost variable has a significant effect on the income of Robusta coffee farmers. Regression coefficient for the fertilizer cost variable is 0,505 and it has positive value which means that the fertilizer cost has a direct relationship with the income. For every increase of feed cost Rp 1,00, the income value of Robusta coffee farmers will increase Rp 0,505. Farmers tend to utilize

fertilizer out of the dosage or recommendation. The average use of fertilizer in the research area (land area of 5262 m²) is the manure use 587,95 kg, NPK 175,77 Kg, SP36 103,57 Kg, Urea 200,41 Kg. The use of fertilizer is less than the recommended dosage. The use of fertilizer must be in accordance with the dosage recommended since the right way in using fertilizer will affect the plant productivity. According to Linggah and Marsono (2008) the right way in using fertilizer have to pay attention to several things like the dosage, how to use, fertilizer use, and the usefulness for plants. The right use of fertilizer and as recommended will increase the amount of yield that is followed by the increase if income.

3.7 Age

The farmers' age variable has significant effect on the income of Robusta coffee farmers. The regression coefficient for the age variable is 0,295 and it has positive value which means that the age has a direct relationship with the income. It means that the one-year increase of the farmers' age will increase the Robusta coffee farmers' income of 0,295. The average of respondent farmers' age is in the productive age which is around 41-50 years of age. The observation result shows that in Temanggung, generally, the young men who has a strong physique tend to choose another work such as become an employee, a trader, and go outside because they will earn more money in a fast way than waiting the long harvest moon. The young men think that farming is less prestigious and needs modal with many risks. In contrast to the young men's statement, farming is an activity to increase income in the old days and retired days so that the older farmers are motivated to do the Robusta coffee farming to fulfill their family needs since farming is their main job. It is supported by the research of Mugraha (2019) that the older farmers will more professional in increasing their income compared to the young farmers.

3.8 Education

The education variable has significant effect on the income of Robusta coffee farmers. The regression coefficient is 0,177 and has positive value which means that the education has a direct relationship with the income. Every increase of one level of education will increase the income value of Robusta coffee farmers which is Rp 0,177. The farmers with the higher education have more knowledge about the understanding of the importance of increasing productivity where the increasing will have a direct impact on the income increase. It is suitable with the research of Istianah (2015) that the lows and highs of farmers' formal education will affect their mindset while the farmers' intellectual level affects their attitude and behavior. The farmers whose higher education will be easier to accept new information and to access new technology for expanding relation, processing result, and marketing.

3.9 Coffee Shape

The ³summary of farmers who sell the product in the form of coffee bean (green bean) has significant effect on the income of Robusta coffee farmers. The regression coefficient value is 0.095. According to the observation, the process of processing coffee cherries into coffee beans is the first stage process that was conducted by farmers in household. The average selling price of cherries Robusta in Temanggung is Rp 5443,9, per Kg while the average selling price of coffee bean Robusta is Rp25.688,60 per Kg. There is value added for the farmers who sell the coffee in the form of bean so that they get more income than those who sell coffee cherries. It is suitable with the research of Sari (2015) that the income of the farming that sells coffee bean is higher than the income of the farming that sells cherries.

III. CONCLUSION

1. The average income of the Robusta coffee farmers who sell the cherries is Rp. 16.081.039,63/year. The average monthly income is Rp 1.340.086,64. The average income of the Robusta coffee farmers who sell the cherries is significantly different from the regional minimum wage of Temanggung that is Rp 1.557.000,00.
2. The average income of the Robusta farmers who sell the green bean is Rp. 21.871.542,40/year. The average monthly income is Rp 1.822.628,53. The average income of the Robusta farmers is not significantly different from the regional minimum wage of Temanggung which is 1.557.000,00.
3. The factors affecting the income of the Robusta farmers in Temanggung are land area, fertilizer costs, farmers' age, education, and coffee shape.

IV. RECOMMENDATION

1. The coffee farmers in Temanggung is suggested to keep the increase and productivity in processing coffee by utilizing the potential and factors having significant effect on the farmers' income such as land area, fertilizer cost, farmers' age, education, and the coffee shape sold by the farmers.
2. Petani diberikan informasi melalui penyuluhan-penyuluhan tentang pengolahan kopi agar mendapatkan nilai tambah dan pendapatan yang lebih tinggi. It is needed for the farmers to have information through counseling about the coffee processing in order to have added value and higher income.

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