Income Analysis of Robusta Coffee Farming in Sumbermanjing Wetan Subdistric

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ABSTRACT
This study aims to determine the income of robusta coffee farming and determine the feasibility of robusta coffee farming based on the harvest month in Sumbermanjing Wetan Subdistrict. This research was conducted for four months, from August to November 2022, which is located in Sumbermanjing Wetan Subdistrict, Malang Regency, East Java Province, Indonesia. Determining the sample of farmers used a stratified sampling method with a proportional approach. Data analysis in this study uses descriptive analysis with the help of tables, and to find out the amount of income using the formula: I = TR - TC. The feasibility of farming uses return ratio analysis with the formula: a = R : C. Based on the results of data analysis, the average income of coffee farming managed by respondent farmers in Sumbermanjing Wetan Subdistrict based on the month of harvest, for the first harvest month is IDR 3.307.910,6 per hectare and the second harvest month is IDR 5.000.604 per hectare. The R/C value for the first harvest month was 1,46 and the second harvest month was 1,73. Based on the decision rule, if the R/C value is more than one, it means that Robusta coffee farming in Sumbermanjing Wetan Subdistrict is able to provide benefits and the farming is feasible.

Keywords: *Farm Income, Robusta Coffee, Coffee Farmers, Sumbermanjing Wetan Subdistrict*

1. INTRODUCTION

Indonesia is ranked 4th as a coffee producing country in the world after Brazil, Vietnam and Colombia. The area of coffee plantations in Indonesia shows an increasing trend from 2013 to 2019 with an average area of 1.240.806,57 hectares. The classification of coffee plants produces as much as 75% which is planted in 936.646 hectares, 15% of immature coffee plants are planted in an area of 183.868 hectares, and around 10% is classified as non-productive/damaged plants in an area of 124.848 hectares. The average national coffee production is also experiencing an upward trend, from 2013 to 1019 the average Indonesian coffee production is around 692.784 tons (Secretariate of Directorate General of Estate Crops, 2022).

Increased coffee production in Indonesia has also had an impact on the country's economy (Zuhdi & Yusuf, 2001). The coffee industry provides employment to millions of farmers (Karuri, 2020; Sarirahayu & Aprianingsih, 2018), coffee entrepreneur (Nguyen, Hoang, Nguyen & Ngo, 2021), processing plant workers (Virji, Cummings, & Cox-Ganser, 2022), as well as other related sectors (Talbot, 2002). In addition, according to Ibrahim & Zailani (2010) Indonesia's coffee exports also make an important contribution to the country's foreign exchange earnings. The important role of coffee in the Indonesian economy makes coffee farming an attractive activity for many farmers in various regions. Coffee farming does not only provide opportunities to increase farmers' income (Murekezi & Loveridge, 2009), but can also contribute to

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improving the welfare of the community around the plantation area (Hall, Scoones & Tsikata, 2017).

One area that has great potential in coffee farming is Sumbermanjing Wetan Subdistrict. Various factors such as natural conditions, types of coffee varieties, and the level of access of farmers to technology and markets, can affect the productivity and income of coffee farming in this region (Winarno, Wijijayanti & Agustina, 2018).

Table 1. Production of Coffee Estate (ton) in Sumbermanjing Wetan Sub-District, 2019-2022

Year	Harvest Area (ha)	Green Beans of Coffee Production (tons)
2019	1.349	1.034,4
2020	1.348	2.397,4
2021	1.370	1.052
2022	1.066	1.066

Source: Statistics of Malang Regency, 2023

According to data from the Department of Food Crops, Horticulture and Plantations in Malang, in 2019, the harvested area was 1.349 hectares with a production of 1.034,4 tons. Then, in 2020, even though the harvested area is almost the same (1.348 ha), production increased significantly to 2397,4 tonnes. This indicates an increase in productivity or efficiency in land use. However, in 2021, although the harvested area has increased to 1.370 hectares, production has decreased to 1.052 tonnes. This suggests that productivity per hectare may have declined in that year. In 2022, the harvested area will decrease to 1.066 hectares, and production will also decrease to 1.066 tons. In this case, even though the harvested area is reduced, the production remains the same. This may indicate an increase in productivity or efficiency in land use.

From the description of the data on harvested area and production above, trends and changes can be observed. 2019-2020 saw a significant increase in production (131,82%). However, after that, production experienced a significant decline in 2020-2021 (-56,12%). Then, in 2021-2022, production will experience a small increase (1,33%). Overall, production trends show significant fluctuations from year to year. While the trend of harvested area does not show consistent changes from year to year. In 2019-2020, the harvested area was almost the same (-0,07%), then it increased in 2020-2021 (1,63%), and then experienced a significant decrease in 2021-2022 (-22,63%).

This study aims to examine and analyze the income of coffee farmers based on the harvest season in the Sumbermanjing Wetan Subdistrict. Through this research, it is hoped that a more in-depth understanding of the income of coffee farmers and the factors that influence it will be obtained. In addition, this research will also provide information regarding the feasibility of coffee farming in the Sumbermanjing Wetan Subdistrict area, so that it can become a reference for farmers and related parties in making decisions related to the development of the coffee sector in the region. The results of this research are expected to be input for policy makers in formulating programs aimed at increasing the productivity and income of coffee farmers. In addition, this research can also be a reference for other researchers who are interested in conducting further studies in agriculture, especially coffee.

By revealing the differences and similarities with previous research, this research will make an additional contribution in enriching the scientific literature on coffee farming in Indonesia, as well as providing a more comprehensive picture of the condition of coffee farming in the Sumbermanjing Wetan Subdistrict. Such is the background of this research. In the next section, a review of the literature and research methods used in assessing the income of coffee farmers in the Sumbermanjing Wetan Subdistrict will be described.

1.1. Formulation of the problem

Based on the background, the problem can be formulated as follows:

1. How much is the income of coffee farming based on the harvest month in Sumbermanjing Wetan Subdistrict?.
2. What is the feasibility of coffee farming based on the harvest month in Sumbermanjing Wetan Subdistrict?

1.2. Research Purposes

Based on the background and formulation of the problem, this study aims to:

1. To find out the amount of coffee farming income based on the harvest month in Sumbermanjing Wetan Subdistrict.
2. To find out how the feasibility of coffee farming is based on the harvest month in Sumbermanjing Wetan Subdistrict.

2. LITERATURE REVIEW

Kiyingi & Gwali (2012) revealed that the productivity of coffee farming can be defined as the result or production produced from coffee farming in a certain period, expressed in certain units of measurement, such as tons of coffee beans per hectare or kilograms of coffee beans per coffee tree. The productivity of coffee farming reflects production efficiency and the ability of farmers to produce optimal amounts of coffee with available resources.

Various studies related to the productivity and income of coffee farmers reveal various influencing factors. The productivity of coffee farmers in West Lampung, Indonesia is influenced by various factors such as soil conditions, climate, and use of technology. By optimizing these factors, farmers' income can be significantly increased (Agus & Fathurrahman, 2021). A case study of the Chittagong Hill Tracts region of Bangladesh revealed that the environmental conditions, such as soil type, rainfall and topography, also have a significant impacted on coffee production and productivity (Sarker, Islam & Haque, 2020).

A case study of the Jimma Zone region of Ethiopia revealed that factors such as selecting the right coffee varieties, efficient use of fertilizers, and good farm management play an important role in increasing the productivity and income of coffee farmers (Moges, Beshir & Alene, 2020). Research by Ngatia & Kamau (2021) also examined the effects of agricultural inputs on coffee production, productivity, and income of small farmers in Nyeri County, Kenya. This study concluded that the proper use of organic fertilizers and pesticides as well as adequate access to agricultural inputs contributed to increased production, productivity and income of coffee farmers in the area. The success of coffee farmers in Kirinyaga County, Kenya is supported by good use of technology, such as proper fertilization and effective pest and disease management. This contributes to increased farmer productivity and income (Muriuki, Gitonga & Ndungu, 2021).

Whereas in the case of coffee farming in Central Lampung, Indonesia, the use of modern technology and proper care of coffee plants has a positive impact on farmer productivity and income. Developing farmer skills in managing coffee plantations is also an important factor in increasing yields and income (Amri, Sunarti & Andarwati, 2020). Another case of coffee farmer in Bangladesh, the use of modern technology, such as efficient irrigation systems and superior coffee varieties, increases the production and productivity of coffee farmers. This has had a positive impact on the income of coffee farmers, thereby providing opportunities to reduce poverty levels in the region (Khan, Rahman, & Amin, 2020). The success of coffee farmers in Kirinyaga Regency is supported by the use of good technology, such as proper fertilization and effective management of pests and diseases. This contributes to increased farmer productivity and income (Muriuki, Gitonga, & Ndungu, 2021).

3. RESEARCH METHODS

3.1. Time and Place of Research

This research lasted for 4 months starting from August to November 2022 from the preparation stage, data collection and up to the preparation of the research report. The research location is in Sumbermanjing Wetan Subdistrict, Malang Regency, East Java Province, Indonesia. Sumbermanjing Wetan Subdistrict is one of the coffee production centers in East Java Province, Indonesia.

3.2. Method of collecting data

The data collected is in the form of primary data and secondary data. Primary data were obtained by direct observation at the research location and direct interviews with respondents using a list of questions. While secondary data were obtained from agencies related to this research, namely the Central Bureau of Statistics (BPS) of Malang Regency, Agricultural Extension Center of Sumbermanjing Wetan Subdistrict, and other related data sources.

3.3. Sampling Method

The method used in determining the sample in this study is a stratified sampling method with a proportional approach. In this method, the coffee farmer population in Sumbermanjing Wetan Subdistrict is represented by several villages that are selected proportionally based on the number of farmers in each village. First, the required total sample size is determined using the Slovin formula to obtain a significant enough representation of the population. Then, villages that have a larger number of farmers are selected as representative villages.
Using the Slovin formula, the number of respondents required can be calculated using the following formula:

$$n = N / (1 + N(e^2))$$

Where:
n = number of respondents required
N = population (number of farmers in the district)
e = error tolerance or confidence level (5% or 0.05)

Using the Slovin formula with a coffee farmer population of 2134 and a 95% confidence level, the number of respondents required is 337 respondents. In this study, villages with a larger number of farmers were selected. In that case, the villages with the largest number of farmers are selected, and the proportion of these villages to the number of farmers selected is calculated. This proportion is then used to determine the number of samples to be taken from each village so that the same proportion is maintained in a smaller sample. By using a stratified sampling method with a proportional approach, researchers can reduce the sample from the total population and select villages that represent the variety of farmers in the sub-district. So, in this study around 57 samples were selected from Village 1 and around 53 samples from Village 2 to obtain a total sample of 110 representing 2.134 total coffee farmers in Sumbermanjing Wetan Subdistrict with a 95% confidence level.

3.4. Variable Measurement Concept

The variables that will be measured in this study are:

1. Characteristics of Respondents:
a. Age: Respondent's age who manages coffee farming
b. Education Level: Judging from the education level of the respondents who manage coffee farming are divided into:
    1. No school
    2. Graduated from elementary school
    3. Graduated from junior high school
    4. Graduated from high school/vocational school
    5. Graduated Diploma (D3)
    6. College Graduate (S1)
c. Length of Farming
d. Land Ownership Status
2. Farming production is the amount of production produced by farmers in each harvest month and expressed in units (Kg) both sold by farmers as a green beans and consumed by farmers.
3. The selling price is the selling price of farming production (Kg) that applies in the research area at each harvest month on farm gate price (IDR).
4. Fixed costs are costs incurred by the respondent farmers for land tax payments and equipment depreciation at each harvest month (IDR).
5. Variable costs are all costs incurred by the respondent farmers for labor costs, costs for production facilities, and milling machine rental costs in each harvest month (IDR).
6. Production costs are all expenses in each month of harvest which include fixed costs and variable costs (IDR).

3.5. Data Analysis

The data obtained in this study were analyzed using descriptive analysis methods with the help of tables, and to find out the amount of income earned using the formula:

$$I = TR - TC$$

Information:
I = Income
TR = Total Revenue TC=Total Cost

To determine the feasibility of farming, the Return Cost Ratio Analysis formula is used:

$$a = R : C$$

Information:
a = Return Cost
Ratio R= Return
C= Cost
With the decision rule:
If:
R/C = 1 then Farming is not profitable and no loss R/C < 1 then Farming Loss
R/C > 1 then Farming is Profitable

4. RESULTS AND DISCUSSION

4.1 General Condition of Sumbermanjing Wetan Subdistrict

4.1.1. Geographical location

Sumbermanjing Wetan Subdistrict is located in Malang Regency, East Java Province, Indonesia. The territory of this sub-district has the following boundaries: To the north it is bordered by Turen District and Dampit District, To the south it is bordered by the Indian Ocean, To the east it is bordered by Dampit District and Tirtoyudo District, to the west it is bordered by Gedangan District. Sumbermanjing Wetan Subdistrict is divided into 5 land use classifications, with an area of 239,49 km² or 8,04% of the area of Malang Regency (Malang Regency in Figures, 2022) which includes Residential area: 8.857 ha/m², Rice field area : 849 ha/m², Area of land/garden : 5.214 ha/ m², Area of fields/Huma : 2.588 ha/m², Area of plantation : 3.255 ha/m².

Sumbermanjing Wetan Subdistrict has a topography which is located in a highland area with an altitude reaching 650 meters above sea level and a slope of less than 40%. The central, northern and eastern parts of this sub-district are valleys, while in the southern most part there are sea, beaches and coral islands. Overall, the average altitude of Sumbermanjing Wetan Subdistrict is 563 meters above sea level. In the coastal area of Sumbermanjing Wetan Subdistrict, the topography is in the elevation range of 1-50 meters above sea level.

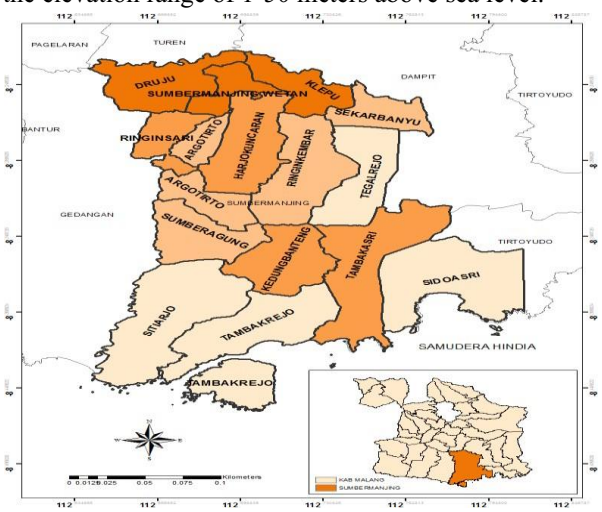

Figure 1. Map of Study area

4.1.2. Total Area of Plantation Land

The plantation area in Sumbermanjing Wetan Subdistrict is divided into coffee plantation covering an area of 1.371 hectares in 2021 and an area of 1.066 hectares in 2022, cocoa plantation covering an area of 455 hectares in 2021 and an area of 405 hectares in 2022, Sugarcane plantations covering an area of 2.462 hectares in 2021 and an area of 2.780 hectares in 2022, coconut plantations covering an area of 991 hectares in 2021 and 1.437 hectares in 2022 (Statistics of Malang Regency, 2023).

The types of land use in the Sumbermanjing Wetan Subdistrict. The largest use is for residential area of 8.857 hectares. The second largest use is for moor/gardens. The third largest use is for a plantation area of 3.255 hectares, and the fourth largest use is for fields/huma. Total area of forestry land in Sumbermanjing Wetan Subdistrict is
1.414 hectares, which is divided into 1.348 hectares of state forest and 30 hectares of community forest (Malang District Government, 2022).

4.2 Population Condition

The population in Sumbermanjing Wetan Subdistrict until 2020 is 98.647 people with 49.762 men and 48.885 women. most of the people in the Sumbermanjing Wetan Subdistrict are 83.737 Muslims. Furthermore, there are
18.578 Protestant Christians, 1.227 Catholic, 11 Hindus, and 217 Confucians. that most of the population in the Sumbermanjing Wetan Subdistrict, 1.757 people are highly educated. The number of people who have higher education in 2021 includes 225 graduates of Diploma I/II, 316 graduates of the Academy/Diploma III/Bachelor Degree, 1.147 graduates of Diploma IV/Strata I, 62 graduates of Strata II, and 62 graduates of Strata III as many as 7 peoples (BPS-Statistics of Malang Regency, 2021).

4.3 Characteristics of Coffee Farming Respondents

4.3.1 Age of Respondents

Age has an influence on a person's mindset and physical ability at work. For those who work in the agricultural sector, physical ability is the main key. Optimal physical condition is very important because it can affect the work productivity of farmers. In addition, age can also affect the thinking ability of farmers in making the right decisions in allocating the necessary resources, as well as their managerial abilities. However, it cannot be ascertained that a relatively young age will guarantee success in farming.
The age range of most coffee farmer respondents is in Sumbermanjing Wetan Subdistrict, namely 46-55 years. Most of the coffee farmer respondents were in the age group of 46-55 years, with a total of 37 farmers or 33.64% of the total respondents. The rest were in the age group of 36-45 years, as many as 24 people or 21.82%, those aged over 55 years were 20 people or 18.18%, those aged 26-
35 years were 13 people or 11.82%, and those aged 16 - 25 years as much as 5.45% of the number of farmer respondents.

4.3.2 Respondent's Education Level

The higher a person's education level, the easier it is for them to receive information and acquire broader knowledge. Conversely, a lack of education can hinder a person's development in accepting the new values that are introduced. Thus, it can be said that farmers who have education will more easily receive information about the latest technological advances and innovations, and are better able to filter this information to be applied in their businesses.

The level of junior high school education (SMP) which has a percentage value of 43,64% or as many as 48 people, farmers with elementary school education (SD) have a percentage of 43,64% or as many as 48 people, farmer with high school education (SMA/SMK) has percentage of 37,27% or as many as 41 people, farmer with Bachelor (S1) education have a percentage of 3,64% or as many as 4 people, farmers with Diploma Education (D3) have a percentage of 0,91 % or as many as 1 person, and farmers who are not in school have a percentage of 8,18% or as many as 9 people.

4.3.3 Type of Experience of Coffee Farming Has Been Carried Out By Farmers

The process of developing farmers to become more experienced and knowledgeable about the farming they manage takes a long time. There were 40 coffee farmer respondents in Sumbermanjing Wetan Subdistrict who had farming experience in the low category (1-11 years) or 36,36%. Meanwhile, there are 63 farmers with the Farming experience category who are in the regular category, namely having experience between 11-30 years or 57,27%. The last group is farmers with long farming experience who are categorized as the rich type with experience of more than 30 years, namely 35 people or 31,81%.

4.3.4 Land Ownership Status

Land ownership status influences the income of coffee farming in Sumbermanjing Wetan Subdistrict. In the management of coffee farming in Sumbermanjing Wetan Subdistrict, there are farmers who manage their own farms or have the status as owners, and there are also those who manage their farms that are not their own or have the status of a lease or with a profit sharing scheme. That most of the respondent farmers in Sumbermanjing Wetan Subdistrict, or as many as 100 farmers from the number of respondents have the status of private owner farmers, with a percentage of 90,91% and the remaining or as many as 8 farmers from the number of respondents have the status of owners of share rights. yield with a percentage of 7,27%, and as many as 2 farmers from the number of respondents with the status of landlords with a percentage of 1,82%.

4.4 Planted Area, Production and Selling Price of Coffee Farming by Harvest Month

4.4.1 Planted area

Land plays a crucial role in coffee farming activities, because it is the medium in which coffee cultivation is carried out. Planted area refers to the size of the land area required and used in the farming process to achieve coffee production. the planting area of farmers 12.000 m^2 with a percentage of 32,73% of all respondents, then 33 respondent farmers have a planting area of 12.000 m^2 – 18.000 m^2 with a percentage of 32,73% of all respondents, 31 respondent farmers have a planting area

of less than 6.000 m^2 with a percentage of 28,18% of all respondents, 9 respondent farmers have a planting area of 18.000 m^2 – 24.000 m^2 with a percentage of 8,18% of all respondents, and 1 respondent farmer has a planting area of 24.000 m^2 – 30.000 m^2 with a percentage of 0,91% of all respondents.

4.4.2 Coffee Farming Production

Production refers to the results obtained through the combination of factors of production such as capital, labor, technology and managerial skills to increase profits. Farmers' income is highly dependent on the amount of production produced. The higher the production volume achieved, the greater the income that will be received. Coffee production in Sumbermanjing Wetan Subdistrict is in the form of dry coffee beans.

Average coffee production of coffee respondent farmers in Sumbermanjing Wetan Subdistrict in each harvest month, namely, the first harvest month is 416,29 kilograms of coffee per hectare, and the second harvest month is 462,97 kilograms of coffee per hectare. The results showed that the difference in the amount of production for the first harvest month and second harvest month was due to climatic conditions during the farming process.

4.4.3 Selling price

The selling price that was in effect at the time the research was conducted, for the first harvest month and second harvest month were the same. For the selling price of the first harvest month and second harvest month at the time of the study, it was IDR 24.000 per kilogram of coffee beans.

4.4.4 Coffee Farming Costs by Harvest Month

4.4.4.1 Cost of Production Facilities

The cost of production inputs refers to the total cost incurred to obtain production facilities in agricultural activities. The means of production in question are seeds, fertilizers and pesticides used by the farmers we interviewed in coffee farming in the Sumbermanjing Wetan Subdistrict area. To calculate the cost of production inputs, we multiply the number of production inputs used by the current market price.

The average cost of production facilities for coffee farmers in Sumbermanjing Wetan Subdistrict for the first harvest month is IDR 2.203.544,3 per hectare, and for the second harvest month season of IDR 2.104.077 per hectare. The results of the study found that the cost of fertilizer is the largest contribution to the cost of production inputs both in the first and second harvest months. The cost of fertilizer for harvest season 1 (one) is IDR 1.305.063,3 per hectare with a percentage of 59,23%. For harvest season 2 (two) IDR 1.382.656 per hectare with a percentage of 65,71%. Then followed by seeds, for the first harvest month of IDR 662.974,68 per hectare with a percentage of 30,09%, the second harvest month of IDR. 506.875 per hectare with a percentage of 24,09%. And the cost of pesticides, for the first harvest month is IDR 235.506,33 per hectare with a percentage of 10,69%, second harvest months of IDR 214.545,5 per hectare with a percentage of 10,20%.

4.4.4.2. Equipment Depreciation Cost

Equipment is a means of supporting farming activities that need to be owned by farmers. The tools used by the respondent coffee farmers in Sumbermanjing Wetan Subdistrict include: hoes, sickles, sprayers, and coffee milling machines. Not all of these tools are owned by farmers in Sumbermanjing Wetan Subdistrict. This is because the price of equipment that is not affordable by farmers. Fixed costs that must be borne by farmers are strongly influenced by the cost of equipment depreciation. This depreciation process is used to determine the value of the decline in investment in agricultural equipment each year. The method used to calculate the depreciation value is using the straight-line approach, taking into account the difference between the initial purchase value of the equipment and its economic life. The average cost of depreciation of equipment in coffee farming based on harvest month in Sumbermanjing Wetan Subdistrict for the first harvest month amounting to IDR 843.201,95 per hectare and second harvest months totaling IDR 762.019,1 per hectare.

The results showed that the difference in equipment depreciation costs for first harvest season and second harvest season was influenced by price conditions and the economic life of the equipment. The biggest contribution to the formation of depreciation costs for farming equipment for first harvest season and second harvest season is the sprayer. The cost of depreciation of the sprayer in the first harvest season is IDR 429.476,15 per hectare or 50,93%, and in the second harvest season IDR 314.531,3 per hectare or 41,28%. Farming equipment that contributes the lowest depreciation costs based on the first harvest month and second harvest month is sickle. For first harvest month amounting to IDR 49.003,18 per hectare or 5,81%, and for second harvest month totaling IDR 48.791,59 per hectare or 6,40%.

4.4.4.3. Labor Costs

Labor costs are the result of multiplying working days by labor wages. The calculation of labor costs is based on the labor wage payment system that applies in Sumbermanjing Wetan Subdistrict. Payment of labor wages for first harvest month and second harvest month ranges from IDR 50.000 to IDR 100.000. The results of the study show that the difference in payment of labor wages is because wages change or increase every year, and payment of labor wages does not include other costs such as cigarettes, candy, tea or coffee, and food. There was no difference in the payment of wages between male and female workers. The process of activities carried out in coffee farming in Sumbermanjing Wetan Subdistrict which uses human labor, namely: planting, maintenance, harvesting and post-harvesting.

The largest average labor cost is in harvest/post-harvest activities. Based on the existing two harvest months, the average labor expenditure for the harvest/post-harvest process in first harvest month is IDR 2.827.341,8 and in the second harvest month IDR 2.907.813. The second largest expenditure on labor costs is in the planting

process, for labor costs in the first harvest month of IDR 644.810,13 per hectare and in the second harvest month for planting activities amounting to IDR 488.281,3 per hectare. The lowest average labor cost is in the maintenance process in the first harvest month of IDR 426.455,7 and the cost in the second harvest month is IDR
366.250. The results of the study also show that in the first harvest month and second harvest month in the maintenance process, farmers do not really need labor from outside the family.

The average total labor costs incurred by coffee farmers in Sumbermanjing Wetan Subdistrict for first harvest month amounts to IDR 3.898.607,6 per hectare. In the second harvest month the amount is IDR 3.762.344 per hectare.

4.4.4.4 Fixed Cost of Coffee Farming

The fixed costs of coffee farming in Sumbermanjing Wetan Subdistrict, which are included in this study include land taxes and depreciation of equipment used by coffee respondent farmers in the entire process of coffee farming up to sales.

The average cost of land tax for respondent farmers in Sumbermanjing Wetan Subdistrict for the first harvest month is IDR 185.026 and for the second harvest month average land tax fee is IDR 148.644 per hectare. For the average cost of depreciation of coffee farmer respondent equipment in Sumbermanjing Wetan Subdistrict for the first harvest month of IDR 843.202 per hectare and for the second harvest season is IDR 762.019,1 per hectare. The results showed that the difference in the average cost of depreciation of coffee farmer respondents in Sumbermanjing Wetan Subdistrict was influenced by price conditions and the economic life of the equipment.

4.4.4.5. Variable Cost of Coffee Farming

Variable costs for coffee farming in Sumbermanjing Wetan Subdistrict based on first harvest month and second harvest month include the cost of buying production inputs, using labor, and renting coffee milling machines. The results showed that the difference in variable costs for first harvest month and second harvest month was due to the use of different costs. The average variable cost of coffee farming in Sumbermanjing Wetan Subdistrict based on first harvest month and second harvest month.

The average variable cost of coffee farming in Sumbermanjing Wetan Subdistrict based on first harvest month and second harvest month, for first harvest month is IDR 6.176.709,3 per hectare and for second harvest months is IDR 5.952.983 per hectare. The composition of these costs is used to purchase production inputs: first month of harvest in the amount of IDR 2.203.544,3 per hectare and second harvest months of IDR 2.104.077 per hectare. Use of labor: first harvest month IDR 3.898.608 per hectare and second harvest months of IDR 3.762.344 per hectare. Rent a coffee mill machine: first harvest month IDR 74.556,96 per hectare and for second harvest months of IDR 86.562,5 per hectare.

4.4.4.6. Production Cost of Coffee Farming

The total cost of farming consists of fixed costs and variable costs. Fixed costs are those that are relatively in number and continue to be incurred even if the production is a lot or a little, such as taxes and depreciation of equipment. While variable costs are costs whose size is influenced by the amount of production obtained which includes the purchase of production inputs, use of labor, the cost of renting a coffee milling machine.

The average use of coffee production costs in Sumbermanjing Wetan Subdistrict, based on the month of harvest, for the first month of harvest is IDR 7.204.937,5 per hectare and for second harvest months of IDR 6.863.646 per hectare. The composition of fixed costs for harvest season 1 (one) is IDR 1.028.228,2 per hectare and for harvest season 2 (two) is IDR 910.663,3 per hectare, and the composition of variable costs for first harvest season is IDR 6.176.709,3 per hectare and for second harvest seasons of IDR 5.952.983 per hectare.

4.5 Coffee Farming Income based on Month of Harvest

The value of farm income received by respondent farmers in Sumbermanjing Wetan Subdistrict based on the month of harvest, is the difference between total revenue and total expenses or costs, both fixed costs and variable costs. The amount of income of respondent farmers based on the month of harvest, is calculated using the formula:

$$I = TR - TC$$

The average income of coffee farming in Sumbermanjing Wetan Subdistrict by harvest month is presented in Table 21.

Table 2. Average Income of Coffee Farming by Month of Harvest

Description	Average (IDR/ha)	
	Harvest 1	**Harvest 2**
Revenue	10.512.848	11.864.250
Cost	7.204.937,5	6.863.646
Income	3.307.910,6	5.000.604

Source: Primary data, 2022

Table 2 shows that the average income of coffee farming based on the harvest month in Sumbermanjing Wetan Subdistrict for the firstharvest month is IDR 3.307.910,6 per hectare and second harvest months of IDR 5.000.604 per hectare.

4.6 R/C Value of Coffee Farming Ratio by Month of Harvest

R/C ratio analysis is a comparison between revenue and costs. To calculate the R/C ratio analysis using the formula:

$$a = R : C$$

The results of the calculation of the R/C ratio analysis of coffee farming in Sumbermanjing Wetan Subdistrict

based on the harvest month for first harvest month and for second harvest month are as follows:

Harvest
Month 1 a =
R : C

a = 10.512.848 : 7.204.937,5

a = 1,46

The value of the R/C ratio for first harvest month is 1.46, which means that every expenditure of IDR 1 will generate revenue of IDR 1,46
Harvest Month 2

a = R : C
a = 11.864.250 : 6.863.646
a = 1,73

The value of the R/C ratio for second harvest month is 1,73, which means that every expenditure of IDR 1 will

generate revenue of IDR 1,73.

The R/C ratio value of more than one indicates that the farming for the first harvest month is 1,46 and the second harvest month is 1,73 capable of providing a profit of 1,46 times for the first harvest month and 1,73 times for the second harvest month of the costs incurred. Thus it can be concluded that coffee farming in Sumbermanjing Wetan Subdistrict managed by respondent farmers for the first and the second harvest months is relatively profitable so that coffee farming in Sumbermanjing Wetan Subdistrict for the first and second harvest months are feasible to be managed by farmers because they provide benefits, and coffee farming is able to improve the standard of living of coffee farmers.

4.7. Summary of Differences in First Harvest Month and Second Harvest Month

Coffee farming in Sumbermanjing Wetan Subdistrict for first harvest month and second harvest months is different. For the average amount of production in first harvest month of 416,29 kg per hectare and second harvest month of 462,97 kg per hectare. The difference in the amount of production is due to changing climatic conditions which causes the amount of production to be not constant. The selling price for the first harvest month and the second harvest month is IDR 24.000/kg. Cost of production facilities for the first month of harvest is IDR 2.203.544,30 per hectare and second harvest months of IDR 2.104.076,70 per hectare.

The difference in the cost of production facilities is due to the increase in the price of each component.

Equipment depreciation cost for first harvest month is IDR 843.201,95 per hectare and second harvest months of IDR 762.019,09 per hectare. The difference in equipment depreciation costs for first harvest month and second harvest month is caused by the condition of the price and the economic age of the equipment.

The labor cost for the first harvest month is IDR 3.898.607,59 per hectare and second harvest months of IDR 3.762.344 per hectare. The difference in labor costs in first harvest month and second harvest month is due to the price of labor wages increasing each year. Fixed costs for the first harvest month of IDR 1.028.228 per hectare and second harvest months of IDR 910.663 per hectare. The difference in fixed costs for first harvest month and second harvest month is due to equipment depreciation costs.

Variable costs for the first harvest month is IDR 6.176.709,27 per hectare and second harvest months of IDR 5.952.983,20 per hectare. The difference in variable costs for first harvest month and second harvest monthis due to the use of different costs. Revenue for first harvest month is IDR 10.512.848,1 per hectare and second harvest months of IDR 11.864.250 per hectare. The difference in revenue for first harvest month and second harvest month is due to the different production quantities and selling prices. The total cost for first harvest month is IDR 7.204.937,5 per hectare and second harvest month is IDR 6.863.646 per hectare. The difference in total costs for first harvest month and second harvest month is due to high variable costs, labor costs, and production facility costs which show a comparative concentration in harvest season 2 and also due to the condition of the economic age of goods and fees vary each year.

Income for first harvest month is IDR 3.307.910,60 per hectare and second harvest months of IDR 5.000.604 per hectare. The difference in income for first harvest month and second harvest month is because the amount of production in second harvest month is more than the total production in first harvest month and the total cost for second harvest month is more less than in the first month of harvest.

R/C ratio value for first harvest month is 1,46 and second harvest month is 1,73. The difference in the value of the R/C ratio for first harvest month and second harvest month is because the revenue for second harvest season is greater than first harvest month and the total costs for second harvest month less than in the first harvest month. The differences for first harvest month and second harvest month are presented in Table 23.

Table 23 shows that the differences in the amount of production, selling prices, costs, receipts, revenues and the value of the R/C ratio for harvest month 1 and harvest month 2 can be seen that the comparative concentration is in harvest month 1.

Compiler of comparative concentrations in first harvest month consists of: total production of 416.29 kg/ha, selling price of IDR 24.000/ kilogram of coffee, equipment depreciation costs IDR 48.832,58 per hectare, the cost of renting a coffee milling machine is IDR 74.556,96 per hectare, a fixed cost of IDR 1.028.228,2 per hectare, revenue of IDR 10.512.848 per hectare, income IDR 3.307.910,6 per hectare and the R/C ratio is 1,46.

Compiler of comparative concentrations for second harvest month consists of: total production of 462.97 kg, selling price of IDR 24.000/kilogram of coffee, equipment depreciation costs IDR 48.925,94 perhectare, the cost of renting a coffee milling machine is IDR 86.562,5 per hectare, a fixed cost of IDR 910.663,3 per hectare, a variable cost of IDR 5.952.983 per hectare,

revenue of IDR 11.864,25 per hectare, income IDR 5.000.604 per hectare, and the R/C ratio is 1,73.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

1. Based on the results of research on the income of coffee farming managed by respondent farmers in Sumbermanjing Wetan Subdistrict, based on the harvest month, the first harvest month and the second harvest month are different. It is influenced by climate and cost.
2. The value of the R/C ratio is more than one, meaning that coffee farming in Sumbermanjing Wetan Subdistrict is able to provide benefits and the farming is feasible to be cultivated.

5.2 Recommendations

1. Coffee farming in Sumbermanjing Wetan Subdistrict, is feasible to be cultivated, therefore the government and farmers must work together in increasing the production of coffee farming, so that coffee farming is not only cultivated but also more developed.
2. Farmers must maintain the use of certified seeds/seedlings so that farming production increases.
3. Further research is needed, especially regarding the efficiency of the use of coffee production factors, in order to find out whether the income earned is based on the use of the right production factors or not.

AUTHORS' CONTRIBUTIONS

Yogi Pasca Pratama have made substantial contributions to conception and design, acquisition of data, analysis and interpretation of data. Hurng-Jyuhn Wang have been involved in drafting the manuscript. Doo-Chul Kim have been involved in revising it critically for important intellectual content.

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