Coffee agribusiness and income farmers

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Abstract. This study aims to determine the condition of coffee agribusiness in the Benteng Alla Utara Village, Baroko District, Enrekang Regency. The research locations were done intentionally or purposive sampling with the consideration that Benteng Alla Utara Village is the center of coffee development in Enrekang Regency. The number of samples taken was 24 farmers and four informants. Analysis of the data used is descriptive analysis and income analysis. The results showed the average income of coffee farmers amounting to IDR 32,027,644, the acceptance of coffee farming in Benteng Alla Utara Village within one year divided by the total cost of producing R / C Ratio of 15.12.

1. Introduction
Coffee is a major tropical commodity that is traded throughout the world with the contribution of half of the total exports of tropical commodities. Beverages products with the basic ingredients of coffee bean extract consumed around 2.25 billion glasses every day throughout the world [1]. Indonesia was famous for various types of coffee with different flavors. Even renowned in the international coffee market, such as Java coffee, Gayo Mountain coffee, Mandheiling coffee, and Toraja coffee [2]. All of these coffee types are special Arabica coffee. In 1997, Indonesia became the third-largest specialty coffee supplier after Colombia and Mexico with a 10% share of total US specialty coffee imports, amounting to 75 thousand tons [3]. South Sulawesi is one of the provinces in Eastern Indonesia that has the potential to develop coffee and indicated by a fairly extensive planting area and a very supportive agro-climatological situation.

The diversity of Arabica coffee production in 2015, Arabica coffee produced by smallholder plantations in the province reached 20.35 thousand tons of rice coffee. This production is spread almost in all regencies/cities in South Sulawesi Province with five central districts dominating. The largest was in Enrekang Regency, which contributed 38.93% or production of 7.92 thousand tons. Then Tana Toraja and North Toraja Regencies, with shares above 10%, namely 13.96% and 10.37% or the realization of production of 2.84 thousand tons and 2.11 thousand tons of rice Arabica coffee. Enrekang Regency has a district that produces high coffee production, namely Baroko District. Baroko Subdistrict, In particular, coffee cultivation in 2015 produced high output due to proper care. Baroko sub-district consisted of 5 villages, namely Baroko Village, Patongloang Village, Tongko Village, Benteng Alla Village, and Benteng Alla Utara Village. One of the five communities was selected with the criteria of Benteng Alla Village as a well-known coffee development center in Enrekang District.
2. Methods

This research was conducted in the village of Benteng Alla Utara, Baroko District, Enrekang Regency. The research locations were select done intentionally or purposive sampling. The consideration that in Enrekang District, Baroko Subdistrict, Benteng Alla Utara Village is the center of coffee development in Enrekang Regency. Data were analyzed qualitatively and using income analysis. Data obtained from farmers who cultivate coffee plants in the village of Benteng Alla Utara. Six hamlets in Benteng Alla Utara Village have farmer groups with a total number of farmer groups in Benteng Alla Utara Village there are 20 farmer groups, which selected six farmer groups representing each village. The sampling technique used is a probability sampling technique, which is to choose one farmer group per village. So the total number of members in the six groups there are 120 people and 20% of the 120 people selected for the sample are 24 farmers by taking four farmers each group randomly.

2.1. Qualitative analyze

This research was conducted in the village of Benteng Alla Utara, Baroko District, Enrekang Regency. The selection of research locations was done intentionally or purposive sampling with the consideration that in Enrekang District, Baroko Subdistrict, Benteng Alla Utara Village is the center of coffee development in Enrekang Regency. Data were analyzed qualitatively and using income analysis. Data obtained from farmers who cultivate coffee plants in the village of Benteng Alla Utara. There are six hamlets in Benteng Alla Utara Village and each hamlet found 20 farmer groups and was selected six farmer groups representing each village. The sampling technique used is a probability sampling technique, which is to choose one farmer group per village. So the total number of members in the six groups there are 120 people and 20% of the 120 people selected for the sample are 24 farmers by taking four farmers each group randomly.

2.2. Income analyze

To find out how the performance of the coffee agribusiness system in the income analysis of each business is to find out the total coffee receipts in the Baroko District, using the following formula:

\[ TR = Q \times P \]  

Information:

- TR = Total revenue (IDR)
- Q = Quantity (Kg)
- P = Price (IDR)

Meanwhile, to find out the level of income of farmers, the analysis of the formulation:

\[ I = TR - TC \]  

Information:

- I = Income
- TR = Total revenue
- TC = Total cost

Next is the Cost of Ratio (R/C) analysis, to find out a comparative analysis between business revenues and total production costs. This analysis uses the following equation model:

\[ A = TR / TC \]
TR = P \cdot Q \\
TC = FC + VC \\
R/C = \frac{(P \cdot Q)}{(FC + VC)}

Information:
\begin{align*}
A &= \text{Farming feasibility index} \\
R/C &= \text{The ratio between total revenues and total production costs} \\
TR &= \text{Total revenue} \\
TC &= \text{Total costs} \\
P &= \text{Price} \\
Q &= \text{Quantity} \\
FC &= \text{Fixed cost} \\
VC &= \text{Variable cost}
\end{align*}

With criteria, if:
\begin{align*}
R/C &= 1, \text{ the farm is not profitable and has nothing to lose} \\
R/C &< 1, \text{ the farming loss} \\
R/C &> 1, \text{ the farm is profitable}
\end{align*}

3. Results and discussions
Agribusiness is any business related to agricultural production activities, which includes the operation of farm inputs and production business itself or also the management of agricultural products. Conditions are categories of philosophy that express the relationship of objects with the surrounding phenomena in this relationship, and objects are constrained while terms represent objective diversity outside the purpose. The condition of coffee agribusiness is the condition or situation of all agribusiness business sub-systems starting from upstream, on-farm, downstream and supporting systems.

The on-farm subsystem is the activity of cultivating coffee plants in Desa Benteng Alla Utara. For the on-farm condition of coffee farmers in Desa Benteng Alla Utara, based on observations and research conducted, coffee farmers, there are already quite innovative and have high morale and social relations. Coffee plant maintenance activities such as land clearing, pruning, and harvesting are usually carried out in cooperation by farmer groups and farmer group members in rotation. For the condition of the plants themselves, many coffee plants are old enough and need to be rejuvenated so that the cultivation process takes place continuously and produces high coffee production and quality. So that coffee farmers can also prosper.

The downstream subsystem is an important part of the process of coffee farming. The downstream subsystem includes coffee traders or collectors who are ready to buy harvested coffee from coffee farmers. There are several collectors in Benteng Alla village but one example and informants to be interviewed and enough to represent the merchant collectors which is Nurhaini. She is one of the collectors in Benteng Alla Utara Village. The conditions in the downstream subsystem itself are good, but there are still many collectors from outside who often enter the Benteng Alla Utara village to buy coffee from farmers. Supporting subsystem in Benteng Alla Utara Village is Benteng Alla coffee cooperative which supports and assists coffee farmers in the coffee marketing process. The Benteng Alla Utara cooperative is located in the village of Alla, which used to have a building in the village of Benteng Alla Utara but was moved by the head of the cooperative named Mr. Ir. Patola to the village of Benteng Alla. Benteng Alla Utara Cooperative is quite well-known and is recognized as having good and quality coffee products. The Benteng Alla Cooperative has quite several members even outside the village of Benteng Alla Utara also joining this cooperative.
3.1. Description of the problem coffee farmers

In this study, data obtained from coffee farmers in the northern village of Benteng Alla, Baroko District, Enrekang Regency. Namely from several members of farmer groups in the village of Benteng Alla Utara consisting of 24 coffee farmers with an area of 30.10 hectares. According to Mr. Yusuf as the head of the Sari Farmer Group, the flowering problem is often faced by coffee farmers, which almost makes farmers lose and complain. Dating from various issues. For more details related to the difficulties faced by the farmer, it can be seen in table 1.

### Table 1. Problems faced by Coffee Farmers

| Problems                                      | Total (People) | Percentage (%) |
|-----------------------------------------------|----------------|----------------|
| Fluctuating of coffee prices                  | 20             | 30.30          |
| Difficulty in obtaining fertilizer            | 12             | 18.18          |
| Plants that are often attacked by pests and diseases | 15             | 22.72          |
| Plant conditions that are not productive      | 5              | 7.57           |
| The weather is less supportive                | 14             | 21.21          |
| **Total**                                     | **66**         | **100**        |

Table 1 shows that the problem most often faced by coffee farmers is the problem of unstable coffee prices, as many as 20 farmers with a percentage of 30.30%. The next challenge is that plants are often attacked by pests and diseases, with a rate of 15%. The unstable price of coffee is caused by the cost of coffee following international prices when world market prices also rise and vice versa. Then the cause is also when the price offered by the middleman is too low due to the long distribution chain causing the farmers' income to decrease.

Coffee that is exposed to pests and diseases results in weak quality coffee, the production of coffee is not very good and coffee production can also decrease. For the problem of difficulties in obtaining fertilizer, some farmers complained, which resulted in many farmers who were often late in fertilizing, but this problem always tried to be minimized by the government. Evidenced by the help of subsidized fertilizer, which is usually given to people who are members of farmer groups. This is consistent with the opinion of Suryana et.al.[4], which states that government policies that tend to continue to increase fertilizer subsidies aim to improve the performance of the agricultural sector. This policy is based on the idea that fertilizer is a critical factor in increasing productivity, and endowments with lower fertilizer prices will encourage increased input. According to Lukiawan [3], fertilizer subsidies are also intended to respond to the tendency of rising fertilizer prices on the international market and to reduce the rate of profitability of farming. Furthermore, the fertilizer subsidy policy also aims to fulfill the principle of six in the distribution of fertilizers, namely the right type, quantity, price, place, time, and quality.

The problem is because plants do not produce because old trees that do not provide much fruit do not bear fruit. This problem needs to be followed up with rejuvenation and replanting of coffee trees. The next challenge is bad weather, which is quite high rainfall intensity in this area and lack of sunlight due to too much fog, overcoming delays in the coffee drying process. So many farmers sell coffee in the wet form or sell directly after being taken, farmers already need money. Farmers prefer to sell high-quality coffee beans because of the financial needs demanded. One factor is that many coffees in Benteng Alla Utara Village cannot wait long to process their coffee for quite high types of coffee.
3.2. Analysis of coffee farmer income
People are always looking for high-income levels to meet their household needs, but are limited by a number of these factors [5]. One factor that is quite important to see the economic development of a particular unit or group of people is to know how the level of community income. The level of income in question is the level of income of coffee farmers during the coffee business is as follows.

3.2.1. Coffee farming costs. Farming costs are all expenses incurred on a farm that aims to get a benefit or to obtain more profits.

a. Fixed costs
Fixed costs are costs that will still be incurred without following the increase in the number of products produced. Fixed costs consist of land taxes and depreciation of equipment. For coffee farming, a fixed cost for depreciation can be seen in Appendix 35. Meanwhile, concerning land tax, in the village of Benteng Alla Utara itself, a detailed land measurement is carried out by the government. So for dry land such as coffee patented tax payment of IDR 10,000. Appendix 34 shows that the equipment used by farmers consists of sprayers, forks, machetes, pruning shears, coffee grinders, hoes, and sickles. With an average cost of IDR 279,803,30 / Ha. As for the use of tools used by farmers, see table 2.

Table 2. Coffee farming equipment.

| Equipment                  | Total (Person) | Percentage (%) |
|----------------------------|----------------|----------------|
| Sprayer                    | 24             | 100            |
| Fork                       | 10             | 41.66          |
| Machete                    | 24             | 100            |
| Prune the coffee           | 24             | 100            |
| Coffee Milling Machine     | 1              | 4.16           |
| Hoe                        | 24             | 100            |
| Sickle                     | 13             | 54.16          |

Table 2 shows that all farmers own the tools in the form of machetes, pruning shears, sprayers, and hoes. This proves that tools are essential in coffee farming. Unlike the case with Fork, which is only owned by ten farmers, and Sickle, which is only held by 13 farmers because this tool may only be used for certain things in the coffee maintenance process. Then the coffee grinder machine is only owned by one person because the price is quite high and there are still many farmers who can not afford to buy this tool and prefer to sell coffee in the form of beans only.

b. Variable costs
Variable costs are costs incurred following the results of the products produced. So, if there is a lot of production, then this variable cost will also increase. The variable costs of coffee farming consist of fertilizers, pesticides, and labor. In appendices 8, 14 and 19, the sequential average use of fertilizers, pesticides / herbicides / insecticides, and labor costs are IDR 191,424.09 / Ha, IDR 18,487.39 / Ha, and IDR 563,400.00 /Ha. As for the use of fertilizers and pesticides used by farmers, see table 3.

Table 3. Use of coffee farming equipment.

| Production input | Total (People) | Percentage (%) |
|------------------|----------------|----------------|
| Urea             | 23             | 28.75          |
| ZA               | 24             | 100            |
| Ponska           | 24             | 100            |
| Sp36             | 24             | 100            |
Table 3 shows variations in the use of fertilizers and pesticides used in coffee plants. For example, the use of phonska fertilizer, ZA, SP36 is used by all farmers. This is due to the use of phonska fertilizer which aims at the differences in the variation of fertilizers chosen by farmers that can be caused by consideration of their nutrient requirements are indeed different or even due to price considerations from farmers. Common fertilizer that is also used among farmers is phonska fertilizer. Phonska fertilizer is also called NPK compound fertilizer consisting of several macronutrients, namely nitrogen (N), phosphorus (P), potassium (K) and sulfur (S). Until now, phonska fertilizer is widely known and widely used by farmers. Farmers extensively use this fertilizer because it can improve yields and fruit quality. In addition to chemical fertilizer, coffee farmers also use organic fertilizer, organic fertilizer used, namely goat dung taken directly from the goat pen that is maintained by coffee farmers in their coffee plantations.

3.2.2. Coffee farm reception. Coffee farms have large and small revenues, depending on the amount of harvest and price. Coffee farm receipts can be seen in Appendix 36. In Appendix 36, there shows the number of farmers receiving coffee with production per hectare from the unit price per/kg for a year. Because it has been known that the harvest of coffee is only done once every year. The average production in sequential harvests is IDR 1,242.53 kg/ha with the price of IDR 28,125.00 IDR/Kg. As for the overall revenue in a year is IDR 34,295,138.89/ha.

### Table 4. Analysis of the average income of coffee farmers.

| Coffee farm description | Volume/Ha | Price (IDR/Unit) | Total price (IDR/ha) |
|-------------------------|-----------|-----------------|---------------------|
| 1. Production (kg)      | 1,242.53  | 28,125.00       | 34,295,138.89       |
| Variable cost           |           |                 |                     |
| Urea fertilizer (kg)    | 196.39    | 1,900.00        | 373,131.81          |
| Phonska Fertilizer (Kg)| 101.00    | 1,900.00        | 191,893.69          |
| ZA Fertilizer (kg)      | 81.73     | 1,700.00        | 138,936.88          |
| SP 36 (Fertilizer) Fertilizer | 51.18     | 1,200.00        | 61,395.35           |
| Rambo (l)               | 0.32      | 70,000.00       | 22,093.02           |
| Gramoxone (l)           | 0.76      | 70,000.00       | 53,488.37           |
| Supremo (l)             | 1.16      | 75,000.00       | 87,209.30           |
| Aneto (l)               | 0.06      | 33,250.00       | 26,511.63           |
| Labor                   |           |                 |                     |
| Weeding                 | 1.20      | 119,270.83      | 120,468.75          |
| Fertilization (HOK)     | 1.42      | 149,479.17      | 141,970.49          |
| Pruning (HOK)           | 1.62      | 174,479.17      | 162,213.54          |
| Harvesting (HOK)        | 3.98      | 298,437.50      | 398,046.88          |
| Drying (HOK)            | 1.01      | 94,791.67       | 101,093.75          |
| 2. Total Variable Cost  |           |                 | **1,974,690.74**    |
| Fixed cost              |           |                 |                     |
| Land Tax (IDR)          | -         | -               | 10,000.00           |
| Shrinkage Tool          | -         | -               |                     |
Pruning shears (IDR) - - 8,820.91
Sprayer (IDR) - - 38,283.69
Crescent (IDR) - - 15,581.59
Hoe (IDR) - - 15,794.51
Machete (IDR) - - 12,779.44
Fork (IDR) - - 40,685.64
Coffee grinder - - 86,667.63

3. Total Fixed Costs 289,803.30
Total Cost (2 + 3) 2,267,494.04
Farm Income (1-4) 32,027,644.85

Table 4 shows that coffee farm receipts are quite high at 1,242.53 per hectare per year at a price of IDR 28,125.00 / Kg. If seen in the table, this coffee farming is profitable. This can be seen from the higher acceptance of the total costs incurred, namely the receipt of IDR 34,295,138.89 with a variable cost of IDR 1,957,537.54 and a fixed cost of IDR 289,803.30. After the revenue and all costs are known, then the farm income can be identified in the amount of IDR 32,027. 644.85. This income is consistent with what was stated by Zainura [6] that income is the result of money or other material obtained from the use of capital or wealth. If Looking at the income stated above, it can be concluded that the income of the farmer is the amount of use of the wealth of the services, it has either in the form of money or the type of material in its farming.

3.3. Business feasibility analysis
Analysis of coffee farm income is to use R/C Ratio analysis. Where the review is fundamental to know to provide an overview of the benefits of farming activities. Analysis of farm income is the net income received by farmers. Net income in question is income received by farmers after all costs of farming needs are incurred. The farming costs consist of production input costs, labor costs, equipment depreciation costs, and tax costs that can be seen in annexes 19, 25, and 34.

Table 5. Feasibility analysis of coffee farmers' one-year business period.

| Description      | Coffee farming |
|------------------|----------------|
| Revenue (IDR)    | 34,295,138.89  |
| Total cost (IDR) | 2,267,494.04   |
| R/C Ratio        | 15.12          |

Table 5 shows that the acceptance of a coffee farm in Desa Benteng Alla Utara for one year divided by the total cost of producing an R/C Ratio of 15.12. This ratio test will compare the revenue with the expenses incurred by farmers on a farm. This is following Dillon et.al. [7] which states that if the R/C ratio is > 1, then the business that is run is profitable or feasible to be developed. When seen from the R/C ratio coffee has a value > 1.

3.4. Downstream subsystem
Downstream subsystem actors influence coffee farming because this subsystem is a connector or market for coffee farmers to sell their coffee, or as coffee buyers. One of the downstream agribusiness actors is collectors or traders who buy crops from coffee farmers. The trader in the village of Benteng Alla Utara that I interviewed was named Ibu Nurhaeni. Ms. Nurhaeni is a big collector in the village of Benteng Alla Utara. According to Nurhaeni, the collection process is not so complicated because when she goes to the farmer to buy her coffee, she is directly transported to her house using a pickup car and usually also the next buyer who immediately takes it to Mrs. Nurhaeni's house. Sometimes Ibu Nurhaeni only comes to liter coffee beans that she wants to buy because coffee is purchased in the form of a
liter. Nuraeni started her business only with family and has no outside employees. Nurhaini often buys coffee from farmers is cherry coffee beans and horns coffee. With prices that are different. Cherry coffee beans are bought at IDR 8,000 / liter and horn coffee bought at IDR 20,000 / liter. Mrs. Nurhaini can buy coffee to farmers 100 liters to 1 ton. Then to the next trader, Nurhaini used to sell 2-3 tons depending on the number of coffee beans available and sold at a price difference of IDR 1,000 more expensive than the purchase price to farmers. The swordman who buys coffee at Ibu Nuraini is also a big collector who brings it directly to the company or factory in Toraja. Nurhaini's net income within one year reached IDR 22,420,000. besides selling to big traders, Ibu Nurhaeni also often sells coffee that she buys to farmers at the Benteng Alla Utara Cooperative.

3.5. Supporting subsystem
Supporting subsystems are agribusiness support institutions. In the village of Benteng Alla Utara the supporting subsystem is a cooperative, the cooperative named the Benteng Alla cooperative which was established in 2014 by the initiative of Mr. Ir. Patola as chairman of the cooperative. The cooperative in the Benteng village of Alla Utara is sufficient to support the marketing of coffee farmers and help farmers in the process of selling coffee and the price is quite high compared to collectors. But the coffee payment system is given if the coffee has been sold and the farmer gets a new payment and is also given the coffee money he sells to the cooperative. The Benteng Alla cooperative is quite well known to foreign countries. Many foreign investors come to visit and see the coffee plantations until the coffee making process is ready to be marketed. One of them is a coffee company from the Netherlands that provides financial assistance and machine tools to the Benteng Alla cooperative to facilitate the process of making quality coffee and produce a distinctive aroma. Also, Starbuck coffee company also provides funding assistance and coffee dryers, because the Benteng of Alla cooperative is one of the suppliers of coffee to Starbuck.

4. Conclusion
Benteng Alla Utara Village Baroko Subdistrict Enrekang Regency already has a link between coffee agribusiness subsystems ranging from upstream, on a farm, downstream and supporting subsystems. So that each agribusiness actor has been able to run each subsystem, this is a support for the progress and development of coffee agribusiness.

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