Revenue and Farming Management Analysis of Arabica and Robusta Coffee in Jember Regency, East Java, Indonesia

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Abstract: This study aims to determine farm management of arabica and robusta coffee and to analyze the income of arabica and robusta coffee especially in Jember. The study was conducted in the village of the District Karangpring Sukorambi Jember. The determination of study area was based on purposive method. The sampling technique used was purposive sampling method with a single sampling. The method used are descriptive and analytical methods. The result shows that the sample of farmer do farm management of arabica and robusta coffee in cultivating field, marketing and finance planning, implementating, controling and evaluating. Arabica and robusta coffee farming provide benefits showed that the arabica and robusta coffee farm in the district of Jember has the potential to be developed and it deserves to be continued.

Index Terms: Revenues Analysis, Arabica Coffee, Robusta Coffee, Farm Management

I. Introduction

Coffee is an important plant to generate foreign exchange. It also constitutes a primary commodity of Indonesia to export (Kemendagri, 2015). There are three varieties of coffee in Indonesia. Those are Arabica, robusta and liberika coffee. Market demand to Arabica coffee is high but its production in East Java is still low. Meanwhile, the market for coffee Arabica is still opened wide, especially for export. Coffee Arabica has a good prospect. The road map data of coffee industry in Industrial Department (2009) supported it. It showed that market demand prefers coffee Arabica. Besides, coffee Arabica price is higher than coffee Robusta. Therefore, Jember starts to develop it.

However, there are some complicated problems that coffee agribusiness should face. Besides, coffee Arabica production is lower than coffee Robusta, even its quality is better than it. Farmers' productivity of Arabica and Robusta coffee in this sample is presented in Table 1. The minimum management and facility in 95 percents coffee fields in Indonesia makes its production does not optimum (Nalurita 2014).

Table 1. Data of Arabica and Robusta Coffee Productivity

Year	Arabica Coffee			Robusta Coffee		
	Production (Kg)	Area (Ha)	Productivity (Kg/Ha)	Production (Kg)	Area (Ha)	Productivity (Kg/Ha)
2011	2800	1	2800	890	2	445
2012	3500	1	3500	10600	2	5300
2013	4700	1.25	3760	9700	2	4850
2014	5000	1.25	4000	3800	2	1900
Average	4000	1.125	3515	6247.5	2	3123.75

Source: Data processed 2015

Dynamic environment makes farmers feel complicated in decision making. The questions of how to make a good plan in production to gain a better result or economic efficiency in production are some issues in farming management. Farmers should continuously make decision that focus on production, financing and marketing. Nevertheless, majority of farmers are unaware of farming business plan so that they used to make business decision based on experience. Meanwhile, good management is one of the factors of successful business. Based on this, the research aims to know the management of Arabica and Robusta coffee farming and also analyze the revenue of these, especially in Jember.

II. RESEARCH ELABORATIONS

Farmers' decision making in developing, marketing and finance, including planning, implementation, controlling and evaluation, indicates farming management. Downey and Erickson (1987) said that management concept is an effort to gain the result by cultivating the available resources effectively. As any other management, farming management also implements management functions, starts from planning, organizing, controlling and evaluating.

Hariyati research (2014) of coffee Arabica in various methods of planting said that the highest revenue is from coffee Arabica in combination with yearly plant, was that Rp 21, 550,698,00. The research was in Village Sukorejo, Sumberwringin, Bondowoso. The research was in accordance with this research, where the farmers combined coffee Arabica with coffee robusta. Another research is by Sairdama (2013). It showed that farmers' average revenue in one crops season was Rp 1,164,083,3,00. Both research indicated that coffee Arabica farming is profitable. Wahyu researched about the revenue of coffee Arabica farming (2012). It indicated that the average revenue of each farmer in Village Sumberbulus in 2007 was Rp 7,087,054.38/ha/year. It indicated that this farming is profitable for farmers and it is good to continue it.

Arabica and Robusta coffee in Jember are not free from resources that constitute production factors in farming. The resources for farming are labor, fertilizer, pesticide and any other factors. If its availability is limited, it will become a problem for farming. Therefore, it needs farming management. Besides, effective management is able to minimize the cost for farming and optimizing the revenue. Farming management includes developing, marketing, and financing. It hopes that the research will give some benefits for farmers.

The research used data of coffee Arabica farming in 2014 and coffee Robusta farming in 2012, considering that in both years, Arabica and Robusta coffee plants were in the same years. The research was only to Arabica and Robusta coffee farming that produce fruits. Coffee Arabica farming in Jember is in Village Kemiri, Panti, and Village Karangpring, Sukorambi. However, the farming in Kemiri was still new so that it did not produce yet. Therefore, the research of Arabica and Robusta coffee farming was only in Village Karangpring, Sukorambi.

The determination of research area was based on purposive method. The period was April to May 2015. The sampling method was purposive method by single sampling. It was because of homogeneity in the sample and production factor cost. The data in this research are primary and secondary data. The data collections here are interview, document research and observation. The methods here are descriptive and analytical method. Descriptive method is to explain farming management, while analytical method is to analyze the revenue of farming. The formula is as follows:

Revenue = TR-TC

Note: TR = Total Revenue
         TC = Total Cost

III.   RESULTS

Farming Management in Cultivation

Cultivation Planning
a.   Planning of Plant
     The plant that the farmers develop is the yearly plants. There are Robusta and Arabica coffee. The plants are planted in different wide of areas because of both terms to grow are different. Coffee Arabica can grow in land above of 700 masl, while coffee robusta is in land up to 700 masl. The farmers should plant both plants because of the failure risk in wet dry season. Coffee robusta needs long dry season, while coffee Arabica is better to stand in wet dry season. Besides, the different periods to crop between Arabica and robusta coffee makes the farmers only need short time to gain their money from crops.
b.   Fields Planning
     The fields for both coffees are different. The field for coffee Arabica is on 900 masl with sloping contours. Therefore the farmers use terracing. Meanwhile, the field for coffee Robusta is flat with height of 720 masl. The fields for both coffees are wood land that is in corporation with Forest Department. In 2014, the field for coffee Arabica was 1.25 ha, while coffee Robusta was 2 ha in 2012
c.   Variety Plants and How to Obtain Seeds
     Seeds variety for coffee Arabica is seed Kartika and Lini S. Seed Lini S has stronger scent than seed Kartika. The farmers usually use this seed. The farmers obtain it from Estate Department, while seed Kartika is from the field where the seed grows from the previous plant. Coffee Robusta uses seeds from Tugu Sari 6, BP 48 and BP 40 that grow from the previous plants.
d.   Planning of Fertilizer and Pesticide
     Fertilizer and pesticide in both coffees is the same. The fertilizers are inorganic fertilizers. Those are ZA and Phonska that is mixed with ratio 1:1. The pesticide is Round Up which is hybrid variant.
e.   Labor Planning
The labor who works here is from outside of family. Man labor is for farming activities. Those are field maintenance, plant and post-crops activities. Woman labor is for crops activities because it needs patience and painstaking.

Implementation of Cultivation
   The farming for Arabica and Robusta coffee is just little different. The farming activities are field maintenance, coffee plant treatment and crops. Field maintenance includes all activities to build terracing for coffee Arabica, but it is not for coffee Robusta. The place for rubbish and water flow is not prepared because the field is in mountain area where the water is from the rain. Coffee plants treatment includes weeding or weeds control four times in a year. It is that two times by using herbicide in dry season and two times manually by using sickle. After that is fertilizer preparation for rainy season. It makes some wholes surround the coffee plant for fertilizer. The data of fertilizer and pesticide for both coffees is presented in Table 2.

Table 2. Data of Fertilizer and Pesticide for Arabica and Robusta Coffee per hectare in Jember Regency

	Arabica Coffee					Robusta Coffee			
Year	Area (Ha)	Phonska (kg)	ZA (kg)	Herbicide (L)	Year	Area (Ha)	Phonska (kg)	ZA (kg)	Herbicide (L)
2014	1,25	300	300	2,4	2012	2,00	300	300	2,00

Source: Data processed 2015

    The fertilizers for both coffees are Phonska and ZA. For each hectare, it needs 300 kg Phonska and ZA fertilizer and 1 liter herbicide. The herbicide here is in a bottle with volume 1 liter. In Table 3, there is a difference in herbicide volume for both coffees because for coffee Arabica, the need of herbicide is about 2.5 liter, while the herbicide that it could buy was 3 liter. It means that coffee Arabica needs 2.4 liter per hectare. The farmers used to cut the bud on top so it will be easy for them in crops. Cutting plant after crop is in October and cutting production is in February to April. Then it is time to cut the bud that comes out from coffee stem and it is once in four months. The farmers use splice in coffee Arabica, but not in coffee Robusta. It means to know the variety of seeds, make crops become easy and rejuvenate the bud that is not productive. The data of labor in plant maintenance per hectare is presented in Table 3.

Table 3. Data of Labor in Plant Maintenance for Arabica and Robusta Coffee per hectare in Jember Regency

	Terracing Build		Manual Weeding		Herbicide Weeding	
Year	Coffee Variety		Coffee Variety		Coffee Variety	
	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta
2012	0	0	0	30	0	4
2014	112	0	48	0	6	0

Fertilizing		Cutting Production		Post-Crops Cutting		Cutting the Buds outside the Stem	
Coffee Variety		Coffee Variety		Coffee Variety		Coffee Variety	
Arabica	Robusta	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta
0	8	0	18	0	18	0	12
8	0	14	0	14	0	10	0

Source: Data processed 2015

    The labor to build terracing is 112 HOK. It is more than maintenance of any other coffee plant needs. Terracing build is only for coffee Arabica if it has been slide because of water flow. Therefore, the need of the labor is not always each year. Manual weeding also needs more labor because the farmers should clean the weeds by using sickle. The difference of labor total here is because of weed thickness that is different in each plant. Harvesting includes picking bad fruits, harvest, picking the rest fruits, and picking the fallen fruits. Picking bad fruits is once in a week before harvest. Harvest for coffee Arabica is in May to July, while coffee Robusta is in July to October. Picking the rest fruit is in the end of harvest time. Picking the fallen fruits usually is to give the fruits to the labors. The data of the labors for harvest in Jember is presented in Table 4.

Table 4. Data of Labor for Harvest in Jember Regency

	Picking Bad Fruits 1		Picking Bad Fruits 2		Picking Bad Fruits 3		Harvest		Picking the Rest Fruits	
Year	Coffee Variety		Coffee Variety		Coffee Variety		Coffee Variety		Coffee Variety	
	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta	Arabica	Robusta
2012	0	2	0	2	0	0	0	106	0	28
2014	6	0	6	0	6	0	45	0	6	0

Source: Data processed 2015

    For both coffees, the highest total of labors is in harvest time. For coffee Robusta, the labors per hectare are 106 HOK. It is higher than coffee Arabica that just needs 45 HOK. It is because of the productivity of coffee Robusta that is higher than coffee Arabica. Besides, production of coffee Robusta in 2012 was assessed good because the picking for bad fruits was only two times with 2 HOK labors.

Controlling and Evaluating

    The farmers need more time to control their fields because the fields for Arabica and Robusta coffee are in the different areas. They do it by themselves to makes sure it grows well. It includes cutting unproductive bud, picking bad fruits, splicing bud, and clean weeds. In management, it runs well. However, they need to evaluate the weeding, both manually and using herbicide, especially in coffee Arabica, because it needs more labors in its weeding.

Farming Management in Marketing

Planning of Marketing
  The farmers sell their crops in logs because they do not have any equipment to cultivate it. Besides, the time for them to gain the money is shorter and it does not it more labors to cultivate the logs coffee. They sell the coffee to farming group.

Marketing Implementation
  Based on experience, the farmers sell their crops to farming group even the farming group limits coffee Robusta. The farming group just receives 40% from total crops and the farmers should sell the rest to any other coffee sellers. It is because the equipment they have are not sufficient to cultivate all coffees. The price the farmers get if they sell to any other seller is lower than if they sell to the farming group. The spread is between 300-500 rupiahs per kilogram. They also spend transportation cost to carry their crops. The cost for transportation per hectare is presented in Table 5.

Table 5. Transportation Cost for Arabica and Robusta Coffee per hectare in Jember Regency

	Arabica Coffee				Robusta Coffee		
	Harvest				Harvest		
Year	Coffee Production	Transportation Cost	Total	Year	Coffee Production	Transportation Cost	Total
	(Kg)	(Rp/kg)	(Rp)		(Kg)	(Rp/ Kg)	(Rp)
2014	4000	100	400000	2012	5300	100	530000

Source: Data processed 2015

Marketing Controlling and Evaluation
  Marketing controlling starts when the farmers transport the corps from the fields to the merchant and measure it. It is also done by their wives. No obstacle in marketing. However, the farmers need to withstand their selling to farming group to gain the optimum profit.

Farming Management in Finance
  Finance management means to manage the farming finance in order to run it well in the present and the future. There are some farmers that also decide to take a loan from a cooperative or any other finance institution. In this research, the farmers the researcher found decide to use their own money.

Revenue Analysis
  Profit is the spread between total revenue subtracts the cost it spends. Total revenue is total coffee production multiple coffee price. Total cost is fixed cost multiple variable cost. Fixed cost is depreciation cost of all equipment they use for production. Variable cost includes fertilizer, pesticide and transportation cost. Some equipment they use in farming are sickle, pail, hack, sprayer, scissor, and knife. Knife is only for coffee Robusta. The revenue of coffee Arabica per hectare is presented in Table 6.

Table 6. Profit of Arabica Coffee per hectare in Jember Regency

Year	Fixed Cost (Rp)	Variable Cost (Rp)	Total Cost (Rp)	Total Production (Kg)	Price (Rp/Kg)	Total Revenue (Rp)	Profit (Rp)
2014	47.500	10.306.000	10.353.500	4000	5.500	22.000.000	11.646.500

Source: Data processed 2015
  The revenue of coffee Arabica per hectare in 2014 was Rp 11,646,500.00 with total cost Rp 10,353,500.00. The highest cost was cost for labors, was that Rp 8,496,000.00. It is hope that resource management, especially labor resource, effectively and efficiently is able to minimizing cost. The production of coffee Arabica was 4000 kg and the price was Rp 5,500.00. It means that the farmers gain the profit and it is good for them to continue it.

Table 7. Profit of Robusta Coffee per hectare in Jember Regency

Year	Fixed Cost (Rp)	Variable Cost (Rp)	Total Cost (Rp)	Total Production (Kg)	Price (Rp/Kg)	Total Revenue (Rp)	Profit (Rp)
2012	56.250	7.580.000	7.636.250	5300	4.100	21.730.000	14.093.750

Source: Data processed 2015
  In 2012, the revenue of coffee Robusta the farmers gained was Rp 14,093,750.00. Coffee Robusta productivity is higher than coffee Arabica even its price is lower so that its revenue is higher than coffee Arabica. Total cost of coffee Robusta was Rp 7,636,250.00. It is lower than coffee Arabica. The labor cost is the highest cost, was that Rp 5,000,000.00. The labor it used is lesser than coffee Arabica even there was salary difference between year 2012 and 2014. Therefore, it is minimizing the labor cost. Therefore, the farmers gain their profit and it is good to continue it.

IV.   CONCLUSION

The research result is that the farmers manage their developing, marketing and financing, planning and implementing, controlling and evaluating in their farming. It includes the plant, fertilizer, pesticide, fields, seeds, labor, marketing and financing planning. The farmers gain the profit from this farming that indicates that it is good to continue and develop it.

Suggestion for this are develop this farming, keep sell their crops to farming group to gain the optimum profit, and evaluate labor resource in both coffees farming. It needs subsequent research to optimizing the resource utilization to get the optimum revenue. The optimum resource takes the optimum profit.

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