

Identification and Study of Fertilizer Enterprise Business Coffee Based on Sustainable Agroindustry in Combined Farmer Group “Maju Mapan” in Jember Regency

Sumadi¹, Rediyanto Putra², Oryza Ardhiarisca³

1,2,3 Public Sector Accounting Program Study, Politeknik Negeri Jember, Indonesia

Abstract. The purpose of this study is to determine the level of feasibility and provide recommendations related to improvements made by Combined Farmer Group Coffee Maju Mapan of the principle of sustainable agroindustry. This research is conducted because of the high growth in coffee production in Jember Regency since 2016 and the high potential of Combined Farmer Group Maju Mapan to develop sustainably due to the assistance of credit funds from Bank BPR Jatim. The research data required in this study is obtained directly from the Combined Farmer Group Maju Mapan coffee and documents owned by the Combined Farmer Group Coffee Maju Mapan. Data collection techniques in this research are field survey, interview, and documentation. The data analysis technique used in this research is using the basic principle of sustainability agroindustry. The results of this study indicate that Combined Farmer Group Maju Mapan consists of 6 groups of farmers with decent business if based on the principle of sustainable agroindustry. The results showed that the level of production of farming Combined Farmer Group Maju Mapan greater than the area of land managed. The results also indicate that farming Combined Farmer Group Maju Mapan has BC value ratio more than 1. The business of Combined Farmer Group Kopi Maju Mapan has a good method related to the maintenance of coffee plant resources through the mixing of natural and artificial fertilizers, so this does not cause the soil to be damaged and produce more quality coffee plants tub. Combined Farmer Group Kopi Maju Mapan is also able to manage the waste generated from coffee processing to be used as raw material to produce liquid fertilizer, so it can be recovered and reduce the negative impact to the environment.

1. Introduction

Indonesia is a country that has a great potential in the production of coffee. Indonesia is a country that has a number of coffee exports, which is very instrumental in the formation of the country's foreign exchange. Data from the Directorate General of Plantations during the year 2007 to 2015 indicate that the total value of exports of coffee in Indonesia is at a high amount. The following figure presents the data regarding the export value has been noted by the Directorate General of Plantations during the year 2007 to 2015.

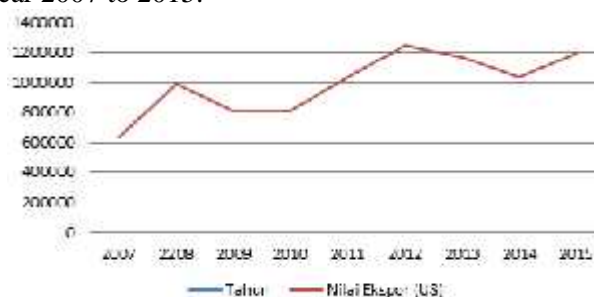


Figure 1. The Export Value Of Coffee from 2007 until 2017. Source: Statistik Perkebunan Indonesia Kopi 2015-2017

Five provinces with the largest number of coffee producers in Indonesia until the year 2017 based on data from the Directorate General of Plantations owned by the province of South Sumatra, Lampung, East Java, North Sumatra, and Aceh. As for the related data the amount of coffee produced results from these provinces are as follows:

Table 1. The Largest Coffee-Producing Province in 2017

Name	Area (Ha)	Production (ton)	Prosentase
Province South Sumetra	206.018	110.481	53,63%
Province Lampung	137.928	110.368	80,02%
Province East Java	80.721	67.614	83,76%
Province North Sumatera	58.773	61.092	103,95%
Provinsi Aceh	69.128	46.828	67,74%

Source: Statistik Perkebunan Indonesia Kopi 2015-2017

Table 1 above shows that East Java province is the province that has the level of productivity for the second after the province of North Sumatra. Thus, the potential of which is owned by East Java to do the export of coffee is very high. Thus, the East Java province is the province that needs to get special attention in the development of coffee production in Indonesia. An increase in growth of the most significant coffee production in East Java province occurred in Jember Regency. Central Bureau of statistics noted a sharp increase in the occurrence of coffee production in Jember Regency in 2016 is of 18,320 tons. This number increased dramatically compared to the previous year which was only 3,149 tons. The following graph presents regarding the number of coffee production that occurs in Jember from 2006 to 2016.

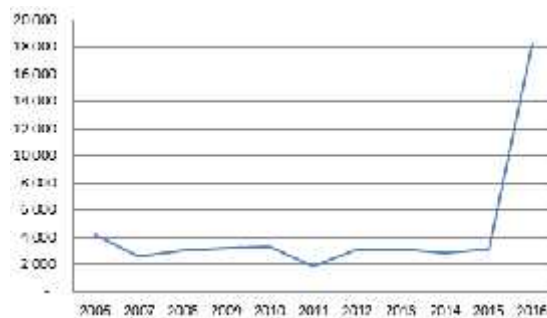


Figure 2. Graph The Number of Coffee Production in Jember Regency. Source: data www.bps.go.id

Figure 2 above shows the occurrence of a significant growth of coffee production in Jember District in the year 2016. The amount of this production is also the number of the highest production in East Java in the year 2016. Therefore, the related feasibility study research efforts on farming of coffee into an interesting thing for the researched. This research will be conducted at the combined group of farmers "Maju Mapan" Jember Regency. The combined group of farmers Established Forward is a combination of the existing coffee grower groups in District Nursing and Sukorambi.

This research using a combination of farmer groups Maju Mapan because the combined group of farmers has a great potential to become a farmer with ongoing prospects are good. This is due to the combined group of farmers Maju Mapan has managed to do the process of export product coffee produced through cooperation with PT. Indocom. In addition, the combined farmers group Maju Mapan in 2018 received credit funds of the Bank Jatim BPR with considerable amount i.e. 4.8 Billion Rupiah. This Fund is a fund that is used for the purposes of investment and operational costs of cultivation and processing as well as bailouts to provide raw materials. This Fund is part of the upstream to the downstream agromairtim Governor of East Java to Jember Regency plantation sector. The existence of this funds indicate that the chance of developing from the combined group of farmers

Maju Mapan to be higher agricultural industry of coffee because of the great opportunities for investing in process coffee plant production.

Related research the feasibility of farming of coffee has been previously done by some researchers[1,2,3,4]. However, these studies only test the feasibility of farming only from the financial standpoint only. Previous studies linked throw over the quality of preservation of natural resources and environmental impact caused. Therefore, this research will conduct tests the farmer uses the principle of sustainable agro-industries so that research results produced are more comprehensive. The sustainable agro-industries has three characteristics, namely (1) productivity and profits can survive or upgraded in a long time, (2) natural resources capable of producing raw materials in agro-industries continuously, and (3) are able to minimize the negative impact of natural resource users [5]. This research will do prove empirically advisability of farming in the combined group of farmers Established Forward based on the principle of sustainable agroindustry.

The results of this study contribute in giving a description of the level of appropriateness of farmer that is in the combined group of farmers Maju Mapan Coffee Jember Regency. In addition, the results of this research also have contributions in determining the feasibility of farming has been done by a combination of advanced coffee farmer groups Established District Jember is based on the principle of sustainable agroindustry. The contribution of this research is expected to be a form of evaluation resources for farming to be led to an increase in human resources, independence, and development that leads to the agriculture industry. Therefore, the formulation of the problem be answered on research is as follows:

1. How is the level of feasibility of farming in the Maju Mapan coffee farmer group in Jember Regency?
2. Is the farming carried out by a combination of the Maju Mapan coffee farmer group in Jember Regency feasible when viewed from the principle of sustainable agroindustry?

2. Literature Review

2.1. Sustainable Agorindustry Principle

Sustainable agroindustry development is the development of an agro-industry that reviews aspects of management and conservation of natural resources with the use of technology and institutions in accordance with the carrying capacity of the environment. In addition, the development of sustainable agro-industries does not cause degradation and benefit the people economically and socially [5]. The principle of sustainable agro-industry has characteristics that become a measure. The main characteristics of sustainable agro-industry[6]:

1. Profits and productivity can be maintained for a long time
2. Natural resources are well maintained
3. Low environmental impact

The principle of sustainable agroindustry basically requires that a good farm can meet the requirements of financial elements, maintain resources, and have the minimal environmental impact. Farming businesses included in the sustainability agroindustry have good productivity and profit, namely the level of products produced is much higher compared to the area of land managed. Farming must also be good for maintaining natural resources in order to be able to continuously produce products. In addition, farming must also have a slight negative impact from the production waste produced on the environment.

2.2. Business Feasibility Study

The business feasibility study is something that is needed for a business both for the perpetrators, potential investors, banks, government, and others. The business feasibility study is a research that involves several aspects, namely legal, socio-economic and cultural aspects, market and marketing aspects, technical and technological aspects to the management and financial aspects of which the results are used to make a decision whether a project or business can be done or delayed and not even executed [7]. Business feasibility studies can also be used for a number of purposes. There are five objectives in conducting a feasibility study, including [8]:

1. Making planning easy
2. Avoid the risk of loss
3. Implementation becomes easy
4. Supervision made easy
5. Control made easy

The business feasibility study must be carried out in depth to get maximum results. The business feasibility study is an activity that learns about the business carried out in depth to determine the feasibility of an effort [8]. The results of the business feasibility study can be used as a basis for evaluating the efficiency and effectiveness of a business. The feasibility study allows the level of profit to be achieved can be known, avoided waste of resources, and the selection of the most profitable projects [9].

2.3. Previous Study

Research on the feasibility of farming has been carried out in previous studies. The research objects are different, ranging from sugar palm cultivation, rice, pondoh salak, floating rice fields, and water guava. Several previous studies that are references in this study are presented in Table 2

Table 2. Previous Study

Name	Method	Result
Sulistiyanto et al (2013)	Descriptive with survey method	Rice farming is declared feasible based on the value of R / C Ratio and B / C Ratio
Yesi & Hidayah (2014)	Interview, Quesstioner, documentation study, and field study	Palm farming can be said to be feasible based on financial analysis: Net Present Value, Benefit Cost Ratio, Internal Rate of Return, Gross Benefit Cost Ratio, and Payback Period
Saputra (2015)	Descriptive Method	Floating rice farming is said to be feasible based on the Net Present Value, Net Benefit Cost Ratio, Internal Rate of Return, Pay Back period
Azmi (2016)	Survey Method	Pondoh barking farming is said to be feasible based on Gross Benefit Cost Ratio, Net Benefit Cost Ratio, Net Present Value, Internal Rate of Return, the payback period

3. Method

3.1. Location and Research Data

This research will be conducted at the Maju Mapan coffee farmer group in Jember Regency. The combination of the Maju Mapan coffee farmer group is in the Panti and Sukorambi Districts, Jember Regency Indonesia which is located around the slopes of Argopuro Mountain. This study requires data such as data related to the description of the organization, natural resources, data on human resources, production, and finance. The research data needed in this study came from two sources, namely obtained directly from a combination of the Maju Mapan coffee farmer group and the documents owned by a joint Maju Mapan coffee farmer group. The collection of data needed for this study was carried out with several techniques. The data collection techniques carried out in this study are filed survey, interview, and documentation.

3.2. Data Analysis

The data analysis technique used in this study is to use the basic principles of sustainability agro-industry. Determination of farming feasibility will be based on the results of the following analysis:

1. Productivity and Profitability Level

The first analysis is an analysis related to determining the feasibility of farming from the aspects of productivity and profitability. This analysis is determined from the results of calculations using the following three formulas:

- a. Productivity Calculation [10]:

$$\frac{\text{Production (Ton)}}{\text{Area (Ha)}}$$

Information:

Production = Total yield of plants

Area = The land area used by farmers in producing crops

- b. Profitability Calculation [10]:

$$P = TR - TC$$

Information:

P = Income

TR = Total Revenue

TC = Total Cost

- c. BC Rasio Calculation [8]:

$$\text{Net B/C} = \frac{B}{C}$$

Information:

B = Income

C = Cost Production

2. Verification on the Quality of Natural Resources and Total Waste

The next data analysis is to verify the quality of the existing natural resources and the level of negative impacts of the combined farming of the Maju Mapan farmer group. The aim is to ensure that the farming of the Maju Mapan farmer group is in accordance with the principles of sustainable agor industry from the aspect of natural resources and environmental impacts. The method used is through testing of laboratory tests related to the quality of natural resources, interviews related to the process of preserving natural resources and waste management, as well as calculating the costs incurred for the purposes of preserving natural resources and processing waste.

4. Result

4.1. Description of Research Subject

The Association of Maju Mapan Coffee Farmers Group is a combination of several groups of coffee farmers in East Java Regency. The combination of this farmer group has been around for about 6 years, from 2012 to 2018. The Maju Mapan farmer group is composed of coffee farmers around the slopes of Mount Argopuro in Panti and Sukorambi Districts, Jember Regency. Land managed by a joint Maju Mapan farmer group is owned by Perhutani with an area of 389.09 hectares for land in Panti District and 107.82 for land in Sukorambi District (Dishutbun Jember Regency, 2015). The association of the Maju Mapan farmer group produces coffee plants in several forms of products. These products are produced from several existing Service Units in the Maju Mapan.

4.2. The Result of Data Analysis

The analysis process carried out in this study is divided into three parts, namely analysis on aspects of productivity and profitability, aspects of natural resources, and environmental aspects. The aim is to provide empirical evidence related to the feasibility of farming from a combination of Maju Mapan farmer groups based on the principles of sustainability agro-industry. The explanation of each of the results of the analysis that has been carried out in this study is as follows.

4.2.1. Productivity and Profitability Analysis

The Maju Mapan farmer group combined has a high level of productivity. This is evident from the results of products produced in one harvest period, which amounted to 2,981.46 tons of the area of land managed by an area of 496.91 hectares. The production results are divided into two types of coffee, namely arabica coffee and robusta coffee with a ratio of 1 to 2. Thus, the total amount of arabica coffee produced is 993, 82 tons and robusta coffee are 1987.46 tons. The production of the Maju Mapan farmer group combined, 2.5% or 74.54 tons is used to pay rent for land managed by

Perhutani. Therefore the level of productivity of the combined Maju Mapan farmer groups is as follows:

$$\text{Productivity} = \frac{2.981,46}{496,91} = 6 \text{ ton/ hektar}$$

The calculation results show that the productivity level produced by the combined farming of the Maju Mapan farmer group is as much as 6 tons for each hectare of land managed. Therefore, the combined farming of the Maju Mapan farmer group can be said to be feasible in terms of the level of productivity owned.

The calculation of the profitability level of the Maju Mapan farmer group combined is based on the difference between the income earned and the number of costs incurred during one harvest season. In addition, the calculation of the level of profitability is also based on the calculation of BC ratios to see the percentage of income obtained by the number of costs incurred. The amount of income and costs from the Maju Mapan farmer group combined obtained during one harvest season based on the results of interviews that have been conducted as presented in tables 3 and 4 below.

Table 3. Total Revenue

Coffee Type	Price	Total Production	Total Revenue
HS Basah Arabika	Rp 27.000,-/kg	96.276,3125 kg	Rp 2.599.460.437,5
Green Bean Arabika	Rp 80.000,-/kg	77.021,05 kg	Rp 6.161.684.000
Premium Arabika Honey	Rp 18.000,-/ons	6.4188,35 ons	Rp 1.155.315.750
Premium Arabika Full Wash	Rp 18.000,-/ons	6.4188,35 ons	Rp 1.155.315.750
Premium Arabika Lanang	Rp 22.000,-/ons	6.4188,35 ons	Rp 1.412.143.683,5
Afkiran Arabika	Rp 5.000,-/kg	49.691 kg	Rp 284.455.000,-
Green Bean Robusta	Rp 35.000,-/kg	385.105,25kg	Rp 13.478.683.750,-
Afkiran Robusta	Rp 5.000,-/kg	99.382kg	Rp 496.910.000,-
Total			Rp 26.707.968.371,-

Table 4. Total Cost

Cost Type	Number of Cost
Weeding Process	Rp 1.391.348.000,-
Fertilizer Hole Making Process	Rp 69.567.400,-
Fertilization Process	Rp 802.509.650,-
Pruning Process	Rp 1.043.511.000,-
Picking Process arabica coffee	Rp 1.647.654.178,-
Picking Process for robusta coffee	Rp 1.694.736.400,-
Sorting Process for coffee seed	Rp 569.292.000,-
Fuel for the engine (pulper & Huller)	Rp 82.362.832,-
Labor for pulper, fermentation, washing, floating, and hullers process	Rp 335.414.250,-
Dry coffee sorting process	Rp 260.877.750,-
Roasting Process	Rp 3.366.565.250,-
Proses Selep Kopi	Rp 50.498.478,75
Packaging for Premium Coffee	Rp 462.126.300,-
Packaging for Normal Product	Rp 145.184.679,25
Total Cost	Rp 11.948.666.803,13

The income and cost data are shown in Tables 3 and 4 show that the amount of profits obtained by the combined Maju Mapan farmer groups is as follows:

$$\begin{aligned} \text{Profitability} &= \text{Rp } 26.707.968.371 - \text{Rp } 11.948.666.803,13 \\ &= \text{Rp } \mathbf{14.759.301.567,88} \\ \text{BC Ratio} &= \text{Rp } 26.707.968.371 : \text{Rp } 11.948.666.803,13 \\ &= 2,24 \end{aligned}$$

The amount of profits obtained by the Maju Mapan farmer group for one harvest season is around Rp. 14,759,301,567.88 with a BC level of 2.24. This shows that the Maju Mapan farmer group joint

venture from the aspect of profitability has also fulfilled because of the high value of profit and a BC ratio is higher than 1.

4.2.2. *Quality Analysis of Natural Resources*

The second analysis is an analysis related to natural resources. The results of the analysis of the quality of natural resources from the combined Maju Mapan farmer group are as follows.

Table 5. Soil Quality Laboratory Test Results

No.	Sample Code	Texture			pH	BO
		Sand	Clay	Dust		
1.	Top Soil	49,77%	18,96%	31,27%	6,6	1,49%
2.	Bottom Soil	61,7%	10,87%	27,43%	6,53	0,84%

Tabel 6. Natural Resource Supporting Data Factors from Jember Climate (id.climate-data.org)

No.	Jenis Faktor Pendukung	Keterangan
1.	Daily Temperature	17,1-33,7° celcius
2.	Rainfall Averages	2.396 mm/years
3.	Altitude	850-1.200 mdpl
4.	Number of Dry Months	1 month

Table 7. Natural Resource Maintenance Costs

No.	The Type of Maintenance	Besaran Biaya
1.	Purchasing Urea Fertilizer	Rp 205.702.200
2.	Purchasing Ponska Fertilizer	Rp 263.679.174,25
3.	Purchasing ZA Fertilizer	Rp 159.207.776
Total Cost		Rp 628.591.150,-

Tables 5 through 7 are the results of the analysis conducted to determine the quality of natural resources and their supporting factors. The results of the analysis will then be compared with the growing coffee requirements (standards/benchmarks) used. The benchmark data has been presented in table 8 below [11].

Table 8. Growing Coffee Terms from Hulupi (1998)

Growing Terms	Robusta Coffee	Arabica Coffee
Climate		
Altitude (m dpl)	300-600	700-1400
Daily Air Temperature (°C)	24-30	15-24
Rainfall Averages (mm/tahun)	1.500-3000	2.000-4000
Number of Dry Months (per tahun)	1-3	1-3
Land		
Degree of acidity (pH)	5,5-6,5	5,3-6,0
Organic ingredients (%)	>3%	>3%
Soil Texture	Enough sand	Enough sand

The results of the comparisons that have been made show that in terms of the plantation location climate managed by a joint Maju Mapan farmer group has fulfilled the body climate requirements of coffee plants. However, the quality of the soil in the Maju Mapan farmer group combined land because the land from the land only meets the requirements of the acidity and texture but not enough to meet the organic matter content (BO). Therefore, the act of applying fertilizer carried out by a combination of the Maju Mapan farmer group is appropriate. The combined Maju Mapan farmer group provides artificial fertilizers and natural fertilizers to improve soil fertility. Nevertheless, the cost of natural fertilizer released by the Maju Mapan farmer group is insignificant in number. This is because the combined Maju Mapan farmer group uses fallen leaf media and unused coffee skin as the natural fertilizer.

4.2.3. Negative Impact Level Analysis on the Environment

The last analysis is an analysis related to environmental impacts. This analysis is carried out by assessing the amount of waste generated from the continuous coffee production process. In addition, this analysis is also carried out by conducting interviews related to the processing of waste produced. The results of the analysis have shown that the coffee production process carried out by the combined Maju Mapan farmer group has a small amount of waste. This is because the waste produced from this coffee production process is only coffee skin which is then processed again into liquid fertilizer. In addition, coffee beans that are not good also do not dispose but are reprocessed to become defective coffee products sold at a low price of Rp 5,000 per 1 kilogram.



Figure 3. Coffee Skin Waste & Liquid Fertilizer Products. Source: researcher documentation

5. Conclusion & Limitation

This study aims to examine the feasibility level of farming from a combination of Maju Mapan farmer groups based on the principles of sustainable agro-industry. The results of the study based on analysis from three aspects showed that the farming of the combined Maju Mapan farmer group was feasible. This is indicated by the high level of productivity and profitability, the maintenance of good resources, and the low level of negative environmental impacts. Therefore, this farming business deserves further development.

The results of this study can be accepted while taking into account some limitations. First, research related to the feasibility of farming based on the principles of sustainable agro-industry in Indonesia is still difficult to find. Therefore, further research needs to carry out deeper exploration regarding the reference to be used. Second, the limited research related to the business feasibility study of the principles of sustainable agro-industry which is still difficult to cause the research method up to data analysis is still based on the combination of several methods, thus causing maximum inaccuracy of results. Therefore, further research needs to determine which research methods are more appropriate to use. Third, the data needed for this study cannot be maximized. This is because the joint members of the Maju Mapan farmer group have not carried out the documentary process well, thus causing this study to use direct interview methods to obtain data. Therefore, further research must maximize the acquisition of data sources that will be obtained through the identification of the data needed at the beginning before the implementation of the research.

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