IMPROVEMENT OF CULTIVATION AND PROCESSING PRODUCTION PATCHOULI OIL AT THE VILLAGE AND VILLAGE FARMERS LEVEL SMALL AND MEDIUM SCALE AGROINDUSTRY IN VILLAGES PASE SENTAUSA KECAMATAN SIMPANG KEURAMAT NORTH ACEH DISTRICT

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Abstract

Patchouli oil is one of the country's foreign exchange earning commodities. This oil has strategic potential in the world market to be used as a fragrance binder in perfumes, cosmetics, the pharmaceutical industry, and other industries. Patchouli oil is produced through the distillation process of the patchouli plant (Pogostemon cablin Benth). However, the quality of patchouli oil produced in Indonesia is still relatively low because it is generally cultivated by traditional farmers or refiners whose quality control is very neglected. The purpose of this study was to determine the income and feasibility of Patchouli Oil production produced in the Patchouli Oil Processing Agro-industry at the Level of Village Farmers and Small and Medium Scale Agro-industry. This research was conducted in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency. Determining the location of this research was done purposively because in that area there are farmers who run patchouli farming and have a patchouli oil processing agro-industry. This research will describe the development of patchouli production. The results of the study, the net income of patchouli farmers in the patchouli oil industry business is Rp. 134,728,000. Patchouli oil industry business in producing patchouli oil with a value (R/C) > 1 of 3.55, patchouli oil refining agro-industry in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency is feasible to be cultivated.

Keywords**: *Patchouli, Agroindustry, Profit and Feasibility***

1. INTRODUCTION

The cultivation and production of patchouli oil processing in Indonesia is generally carried out by farmers and the patchouli distillation agro-industry which uses technology that is still traditional and has limitations in the field of patchouli oil extraction knowledge so that quality control is very little paid attention to. In addition, another problem they face is the problem of capital, both in patchouli cultivation and processing. It is this limitation that encourages efforts to optimize the added value of each agricultural commodity, especially the production of patchouli oil processing at the village farmer level. In this optimization perspective, the role of agro-industry as a vehicle for added value extraction and innovation becomes very important. The empowerment of small and medium scale patchouli processing agro-industry at the village level is expected to increase the income of patchouli farmers and the surrounding community.

As an export commodity, patchouli oil has good prospects because it is needed continuously in the perfume, cosmetic, soap, pharmaceutical and other industries. The use of patchouli oil in the industry is due to its high fixation power on other fragrance ingredients, so it can bind the fragrance and prevent the evaporation of the fragrance substances so that the fragrance does not disappear quickly or lasts longer, and cannot be replaced with other synthetic substances, apart from that patchouli oil It can also be used as a vegetable pesticide. The waste from the distillation of patchouli oil which consists of leaf and stem waste has the potential to be used as an ingredient for

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making incense, mosquito coils, and compost and the remaining water from the distillation after being concentrated can be used as a raw material for aromatherapy.

The quality of patchouli oil is generally determined by several factors, both regarding pre-harvest and post-harvest. Pre-harvest factors involving plant materials, cultivation techniques, methods and timing of harvest as well as environmental factors greatly affect the productivity and quality of processed materials, which will ultimately affect the quality of processed products, while post-harvest factors which include handling of processed materials, processing methods including tools , packaging, and storage greatly affect the quality of the final product, to improve the quality of Indonesian patchouli oil, these factors must be carefully considered.

Currently patchouli farming has not been optimally developed by patchouli farmers in Simpang Keuramat District, Pase Sentausa village, the production of patchouli plantations in North Aceh is lower than the production of patchouli plantations in other districts in Aceh Province, the land in the District Simpang Keuramat and also the condition of the area in Simpang Keuramat Subdistrict is very strategic for the development of patchouli plants and patchouli oil agro-industry and the quality of the patchouli oil produced is also not inferior to the quality of patchouli oil from other regions, when seen from the large demand for patchouli oil which is used as raw material industry so that it has the potential to be developed in order to increase the income of farmers and agro-industry actors in the research area. Based on the background above, the researcher is interested in conducting research on "Increasing Patchouli Oil Cultivation and Production at the Village Farmer Level and Small and Medium Scale Agro-Industry in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency".

2. LITERATURE REVIEW
2.1 Farming Concept

The farming concept discussed by Ken Suratiyah (2015) is that farming activities at first only managed food crops and then developed to include various commodities so that they were not pure farming but became mixed farming. Mixed farming includes various types of commodities including food crops, horticulture (vegetables, fruits, ornamental plants), estate crops, fisheries, and livestock. Broadly speaking, there are two known forms of farming, namely family farming and agricultural enterprises. Generally what is meant by farming is family farming, while others are agricultural companies. The ultimate goal of family farming is the family farm income which consists of profits and wages for family labour. The income in question is the difference between the value of production minus the costs incurred by farmers. While the ultimate goal of agricultural companies is profit or profit as much as possible, namely the difference between the value of production minus costs.

Farming is an activity of organizing or managing an asset and way of farming. Farming is also an activity that organizes agricultural production facilities and technology for a business related to agricultural activities (Moehar, 2001). According to Soekartawi (1994) farming is a science that studies how a farmer allocates existing resources effectively and efficiently to obtain high profits at a certain time. Farming is an activity of cultivating the factors of production in the form of land, labor and capital so as to provide benefits. Enterprises are farmers' ways of determining the use of production factors as effectively as possible so that businesses in agriculture provide the maximum possible income (Suratiyah, 2006).

2.2 Definition of Agroindustry

Agro-industry can be interpreted in two ways, namely first, agro-industry is an industry that has the main raw materials from agricultural products. Agro-industry studies in the context emphasize food processing management in a processed product company whose main raw materials are agricultural products. Meanwhile, according to FAO in Soekartawi (2000), an industry that uses raw materials from agriculture with a minimum amount of 20% of the total raw materials used called agroindustry. Agro-industry development is part of a long-term effort to change the structure of the economy to be balanced between agriculture and industry. To achieve this, the development of various types of agro-industry is a more appropriate alternative. Development of agro-industry that has a comparative advantage, so that it can increase added value, expand employment and business opportunities as well as equal distribution of income. Agro-industry can also be seen as a use that requires input, then changes it to achieve certain goals. Inputs in the use of agro-industry consist of agricultural raw materials and additional materials, labor, capital and other supporting factors including technology, information, management, availability of infrastructure and supporting facilities as well as research and development and policies, while agro-industrial activities include efforts to increase value adding agricultural products through further processing of raw agricultural materials or providing services to craftsmen.

2.3 Income Concept

Revenue is the difference between receipts and total costs. Total farm income (net income) is the difference between total revenue and total costs incurred in the production process, where all inputs owned by the family are calculated as production costs (Sukirno, 2002). According to Prasetyo, (2006) income is the difference between receipts and expenses incurred. Income has a function to be used to meet daily needs and continue farming activities. The amount of farming income can be used to assess the success of farmers in managing their farming. Income is a measure of the income received by farmers from their farming activities. In the analysis of farming, farmers' income is used as an important indicator because it is the main source in meeting their daily needs. Farming income includes the difference between receipt of production costs (Kindagen, 2009).

2.4 Factors Affecting Income

The concept of Ken Suratiyah (2015) explains that the factors that affect income are divided into two groups, namely (1) internal factors and external factors, (2) management. The internal factors that affect income in farming activities are (1) the age of the farmer, (2) education, knowledge, experience and skills, (3) the number of family workers, (4) land area, (5) capital.

3. IMPLEMENTATION METHOD

This research was conducted in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency. Determining the location of this research was done purposively because in that area there are farmers who run patchouli farming and patchouli oil processing agro-industry. The scope of this research is limited toCultivation and Production of Patchouli Oil Processing at the Village Farmer Level and Small and Medium Scale Agro-Industry in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency. The object of research is farmers and managers of patchouli oil agro-industry. In this study using two types of data, namely, primary data and

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secondary data. Primary data is data obtained through direct observation (observation), interviews and distribution of questionnaires to farmers and managers of the patchouli oil agro-industry. While secondary data is data obtained from relevant literature such as the Central Bureau of Statistics (BPS), research journals, libraries, the Department of Agriculture and the internet related to research titles.

The population in this study were all farmers who cultivate patchouli with a minimum land area of 1 ha and have a patchouli oil agro-industry located in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency. The method of data analysis used in this study using quantitative methods, analyzed using multiple linear regression, namely to see the effect of the independent variables on the dependent variable. The following is an explanation for the method.

A. Quantitative Analysis

Quantitative analysis is a form of analysis used for data in the form of numbers to analyze patchouli farming income. To calculate gross income (revenue) the formula is used:

Reception

Formula: $TR = P \times Q$

Description: TR = Total revenue (Total Revenue)

P = Selling price of patchouli oil

Q = Amount of patchouli oil production

Basically a business will be said to be feasible to run if the R/C value obtained is greater than 1. This can happen because the higher the R/C of a business, the higher the level of profit that will be obtained by a business. R/C stands for Revenue Cost Ratio or known by the comparison between total revenue (R) and total costs (C). Soekartawi (1995) further suggests that the Revenue Cost Ratio analysis is an analysis that looks at the comparison between income and expenses. The aim is to find out if farming is feasible or not, with the formula:

R/C Ratio = TR/TC

Information:

R/C Ratio = Comparison between Total Revenue and Total Cost

TR = Total Revenue (total revenue)

TC = Total Cost (total cost)

If R/C = 1, it means that there is neither profit nor loss or break-even, then if R/C < 1, it indicates that the business is not feasible and if R/C > 1, then the farming is feasible (Soekartawi, 2002).

In carrying out patchouli farming activities in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency, there are several factors that affect income in farming. The factors that affect income are land area, capital, number of trees, labor, and plant age.
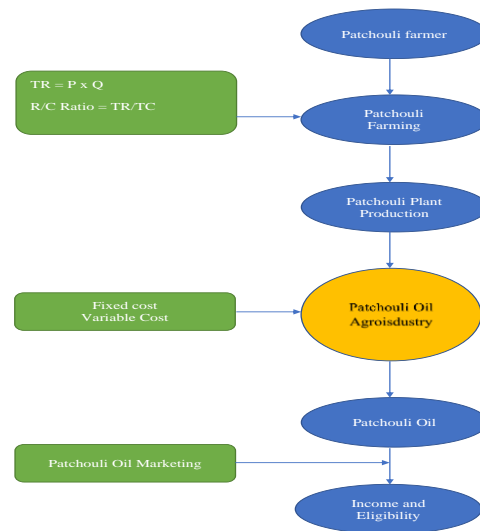
Figure 1. Research Thinking Framework

4. RESULTS AND DISCUSSION

4.1 Gampong Overview

Gampong Pase Sentosa is one of the villages located in the Buloh Raya Mancang sub-district, Simpang Keramat sub-district, North Aceh Regency, which is 6 KM from the sub-district center. With an area of approximately 3000 Ha, Gampong Pase Sentosa has a population of 580 people consisting of 235 people (men) and 345 people (women). The livelihoods of the Pase Sentosa people are mostly garden farmers, such as soybeans, saplings, bananas and almost 25% of the people in Gampong Pase Sentosa are currently patchouli farmers.

Pase Sentausa Village is located in the Buloh Raya Mancang settlement, bordering:

      a. To the north it is bordered by the Simpang Keuramat Settlement.
      b. To the south it is bordered by Bener Meriah Regency.
      c. To the west it is bordered by the District of Kuta Makmur.
      d. To the east it is bordered by Geureudong Pase District.

4.2 Farmers' income

Farm income (net farm income) is defined as the difference between farm revenue and the total cost of farming including variable costs and fixed costs.

4.3 Reception

Acceptance can be interpreted as the total product value within a certain period of time whether marketed or not (Soekartawi, 2002). Receipt can also be defined as the monetary value received from sales. Farming revenue, namely revenue from all sources of farming including the selling value of the results, the addition of inventory, the value of products consumed by farmers and their families. Acceptance is the result of multiplying the production obtained by the selling price of the product.

The results of the analysis of patchouli farmer acceptance in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency can be seen in the following table:

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Table 1. Average Revenue of Patchouli Oil Agroindustry in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency.

No.	Description	Value (IDR)
1	Acceptance (TR) = Y. Py	
	- Production	119.5
	- Price	500,000
2.	Total Revenue (TR)	59,636,250

Primary Data Processed in 2022.

Table 1 explains that the total average production of Patchouli is 119.5 Kg/Agro-industry at a price of IDR 500,000/Kg. So the total income of Patchouli farmers is Rp. 59,636,250/Agro-industry can be seen in Appendix 6.

4.4 Production cost

Production costs are all costs incurred by farmers for production in the business. The costs calculated in this study are costs incurred during one growing season which are classified into fixed costs and variable costs.

4.5 Variable costs

Variable costs, namely costs incurred depending on the size of the business volume. The larger the scale of the business, the greater the costs that must be spent, which are included in the variables are fertilizers, pesticides, and labor.

1. Fertilizer Cost

The cost of fertilizer is the cost that must be paid by farmers for patchouli farming business needs in kilograms. The fertilizers used by patchouli farmers are:

a. Urea Fertilizer

The average amount of patchouli farmer's use of urea fertilizer is 155 kg/farmer with an average total cost of IDR 899,000/farmer. This is influenced by the area of land, the wider the land used, the more fertilizer the patchouli farmers use. The price of fertilizer is IDR 5,800 / kg.

b. NPK fertilizer

The average amount of NPK fertilizer used by patchouli farmers is 125 kg/farmer with an average total cost of IDR 625,000/farmer. This is influenced by the area of land, the wider the land used, the more fertilizer the patchouli farmers use. The price of fertilizer is IDR 5,000/Kg.

c. Manure

The average amount of manure used by patchouli farmers is 8 trips/farmer (where 1 trip = 1 time of transportation) with an average total cost of IDR 1,650,000/farmer. This is influenced by the area of land, the wider the land used, the more fertilizer the patchouli farmers use. The price of fertilizer is IDR 220,000/rit.

Pesticide Costs Pesticide costs are costs that must be borne by farmers for the needs of patchouli farming in the form of units of liters. The pesticides used by patchouli farmers are:

a. roundup

The average amount of Roundap used by patchouli farmers is 500 / ml of farmers with an average total cost of IDR 60,000 / farmer. This is influenced by the area of land, the wider

the land used, the more pesticides used by farmers. The price of Roundap Rp. 120 / ml.

b. Gramakson

The average amount of use of Gramakson, patchouli farmers is 500 / ml of farmers with an average total cost of IDR 175,000 / farmer. This is influenced by the area of land, the wider the land used, the more pesticides used by farmers. The price of Roundap Rp. 350 / ml.

1. Labor costs

Labor costs are costs incurred by Patchouli farmers to pay the wages of their workers. The workforce employed starting from the process of cultivating land, planting, fertilizing, weeding, harvesting and refining as a whole is male. The total wage for the total workforce is Rp. 128,000,000.

Table 2. Results of the Recapitulation of the Use of Patchouli Farmers in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency

No	Description	Labor Wages (Rp)
1.	Soil	Rp. 20,000,000
2.	Processing	Rp. 15,000,000
3.	Planting	Rp. 29,000,000
4.	Fertilization	Rp. 25,000,000
5.	Weeding	Rp. 11,000,000
6.	Harvesting	Rp. 28,000,000
	Refinery	
Amount		Rp. 128,000,000

Source ; Primary Data Processed in 2022.

Table 2 explains that the largest amount of labor wages spent on weeding is Rp. 29,000,000 and the minimum wage for labor is spent on harvesting, which is Rp. 11,000,000.

Table 3. Results of the Recapitulation of Average Labor Wages Per Stage of Patchouli Activities in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency.

No	Description	Labor Wages (Rp)
1.	Soil Processing	Rp. 2,500,000
2.	Planting	Rp. 1,875,000
3.	Fertilization	Rp. 3,625,000
4.	Weeding	Rp. 3,125,000
5.	Harvesting	Rp. 1,375,000
6.	Refinery	Rp. 3,500,000
Amount		Rp. 16,000,000

Source ; Primary Data Processed in 2022.

Table 3 explains that the average labor wage that must be paid by patchouli farmers in Pase Sentausa Village at the land cultivation stage is Rp. 2,500,000, planting Rp. 1,875,000, fertilization of Rp. 3,625,000, weeding Rp. 3,125,000, the harvest is Rp. 1,375,000 and a refinery of Rp. 3,500,000. The amount of variable costs incurred by patchouli farmers in Pase Sentausa Village, Simpang Keuramat District, North Aceh Regency can be seen in the following table

Table 4. Result of Recapitulation of Total Variable Costs incurred by Patchouli Farmers in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency

No	Description	Total Cost (Rp)
1.	Fertilizer costs	25,392,000
2.	Cost of drugs	1,880,000
3.	Labor costs	128,000,000
4.	Cost of Fuel Wood	25,000,000
Amount		180,272,000

Source ; Primary Data Processed in 2022.

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Table 4 explains that the total cost of using fertilizer is Rp. 25,392,000, the cost of using drugs is Rp. 1,880,000, the cost of using labor is Rp. 128,000,000 and the cost of fuel wood is 25,000,000, the total variable costs are Rp. 180,272,000.

4.6 Fixed cost

Fixed costs are costs incurred to finance farming, the amount of which is always the same even though the amount of production changes. Fixed costs are expenses incurred to finance patchouli farming on a regular basis that do not depend on the size of the business scale, such as equipment depreciation. Fixed costs incurred in this study include NPA (Depreciation Value of Equipment).

Table 5. Average Tool Depreciation Value (NPA) of Patchouli Farmers in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency.

No	Tool Type	NPA(Rp)
1.	Hoe	79,063
2.	Sickle	26,333
3.	Scissors	23.125
4.	Spray Machine	192,321
5.	Bucket	25,088
6.	Production House and Patchouli Oil Refining Boiler	4,625,000
Amount		4,970,930

Source ; Primary Data Processed in 2022.

Table 5 explains that Hoes have a depreciation cost of IDR 79,063 / farmer, sickles have a depreciation fee of IDR 26,333 / farmer, scissors have a depreciation cost of IDR 23,125 / farmer, spray machines have a depreciation cost of IDR 192,321 / farmer, buckets have a depreciation fee of Rp. 25,088 / farmer and the patchouli oil production house and boiler have a depreciation cost of Rp. 4,625,000 / farmer. Can be seen in attachments 7, 8, 9, 10, 11 and 12.

Table 6. Results of Recapitulation of Total Fixed Costs for Patchouli Farmer Equipment Depreciation in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency

No	Description	Cost Rp
1.	Hoe	632,500
2.	Sickle	210,667
3.	Scissors	185,000
4.	Spray Machine	1,538,571
5.	Bucket	200,700
6.	Production House and Patchouli Oil Refining Boiler	37,000,000
Amount		39,767,438

Source ; Primary Data Processed in 2022

Table 6 explains that the total Equipment Depreciation Value (NPA) is IDR 39,767,438.

4.7 Analysis of Patchouli Oil Agroindustry Income

Table 7. Income Analysis of Patchouli Oil Agroindustry in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency

No.	Description	Mark
1	Acceptance (TR) = Y. Py - Production - Price Total Revenue (TR)	956 500,000 478,000,000

2	Production cost
	   a. Variable Cost (VC)
	      - Fertilizer Cost
	      - Drug Expenses
	      - Labor costs
	      - Cost of Fuel Wood
		25,392,000
		1,880,000
		128,000,000
		25,000,000

3.	**Total Variable Cost** b. Fixed Cost (FC) - Production House and Patchouli Oil Refining Boiler	163,000,000
4.	**Total Fixed Costs** Total Production Cost (TC) = VC+FC	343,272,000
5.	Pb Net Income = (TR-TC)	134,728,000

Source: Primary Data Processed in 2022.

4.8 Wealth Analysis

Calculation of the feasibility of patchouli farming is done financially using investment criteria. Feasibility is seen from the calculation of the net value. The income of patchouli farmers in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency is Rp. 134,728,000. Based on the feasibility calculation results TR/TCRatio = 478,000,000(TR)/ 343,272,000 (TC) = 3.55. So the TR/TCRatio index shows the number 3.55 which is greater than 1, meaning that the Patchouli oil agro-industry provides economic benefits to the Patchouli oil agro-industry in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency. This can be interpreted that if the farmer spends Rp. 1, the respondent farmer will get a profit of Rp. 3.55 in one growing season. Based on the profit analysis, it can be said that patchouli oil agro-industry players get greater profits.

5. CONCLUSION

Based on the results of observations, analysis of the results and discussion of the research, it can be concluded. The net income of patchouli farmers in the patchouli oil industry is Rp. 134,728,000. Patchouli oil industry business in producing patchouli oil with a value (R/C) > 1 of 3.55, patchouli oil refining agro-industry in Pase Sentausa Village, Simpang Keramat District, North Aceh Regency is feasible to be cultivated.

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