

Feasibility Analysis of Patchouli Farming Business In Burana Village, Tabulahan District, Mamasa Regency

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Abstract. Patchouli has begun to be widely cultivated by farmers in Burana Village with its easy cultivation and offer a promising profit. This study aims to determine whether or not it is feasible to develop a patchouli farming business in this area. Quantitative research is used to analyze farm costs, farming profits, farm income, return cost ratio (R/C), capital productivity (n/C) and break-even point analysis (BEP). The results showed that the average area of farmers' land is 47.22 acres, so the average cost of production on patchouli farming is Rp23,521,073, and the average revenue obtained is Rp30,486,379, then the average profit for each respondent is Rp6,965,306, so the R/C ratio obtained is 1.3 because the value of the R/C ratio is greater than 1, so patchouli farming is feasible. The value of π/C 0.29 indicates a profitable business where each additional cost of Rp100 then a profit of Rp. 29 (29%). The analysis of break-even point for the production volume in patchouli farming is 53,458 kg, meaning that at 53,458 kg the patchouli business is profitable because the patchouli product number of 53,456 kg is below the average product figure of 69.998 kg. Analysis of the point of return for the cost of production in patchouli farming is Rp336,025 shows that it is still below the market price of Rp439,995, means that the patchouli business is profitable.

Keywords: farming business costs, business feasibility, profit, revenue

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1. Introduction

Indonesia is an agricultural country with abundant natural resources that can support the country's economy. Therefore, our country cannot be separated from the agricultural sector which is the income resources for most of Indonesia's population. The agricultural sector plays a strategic role in national and regional economic development. Even in the era of globalization, the agricultural sector has proven its strong capacity to support the national economy, so it is hoped that it can play a role at the forefront of overcoming the economic crisis [1] The income of farmers in developing an agricultural commodity cannot be separated from the input costs incurred and the selling price of the commodity. Indonesia, which has abundant natural resources, gives farmers many choices in developing types of commodities. One of the export

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commodities that has a high market value and is classified as a short-term crop suitable for cultivation in Indonesia is patchouli.

Patchouli plant (**Pogostemon cablin** Benth.) is one of the important essential oil-producing plants and is known as patchouly oil. Patchouli oil along with 14 other essential oils is an export commodity that generates foreign exchange. From 2001-2018, the average value of patchouli essential oil exports by Indonesia every year was US\$ 115,182,000 while the average import value was only US\$ 65,225,000 [2].

Patchouli as a type of plantation crop has quite large export prospects in the future, given the high world demand for patchouli oil. The uses of patchouli oil is as a binder (fixator) in the perfume/fragrance, cosmetic, pharmaceutical, and aromatherapy industries, so far it cannot be substituted by other ingredients. Patchouli farming development is an opportunity to invest capital to gain profits in the future. Patchouli as one of the plantation crops has a high selling price. The price of patchouli oil has jumped from the price of Rp325,000/kg since the end of October 2019, now it has almost doubled to Rp. 645,000/kg, with this price of course providing guarantees for investors in investing their capital in patchouli farming and also motivating patchouli farmers to expand the cultivation area [3].

Sulawesi as one of the patchouli production centers including South Sulawesi, Southeast Sulawesi, Gorontalo. Currently West Sulawesi has begun to develop patchouli, especially in Tabulahan District, Mamasa Regency which is supported by extensive topography, loose soil, altitude reaching 187m above the surface. sea and other potentials [3]. Since the last few years, when patchouli oil prices soared, many farmers in the Tabulungan sub-district have switched functions from cocoa, corn and farmers to patchouli farmers. Farmers cultivate patchouli either monoculture or intercropping.

Burana Village is one of the centers for patchouli development in Tabuhanan District. Burana Village with an area of 56.75 km² (11.04%) is the largest village with a population in 2018 of 872 people [3] and in 2021 the population of Burana Village is 1,053 people. The potential of natural resources and human resources owned by Burana Village is very good for farmers and entrepreneurs in investing in patchouli farming.

A total of 228 farmers in Burana Village, who were previously corn farmers, have now become patchouli farmers. Not only easier maintenance, a promising price, resistant to pest but also once planting for harvesting 2 to 4 times in one growing season. In patchouli development, farmers also sometimes intercrop with cocoa as the main crop to optimize land, but farmers are dominant in developing monocultures through opening new land. The main problem faced by farmers and patchouli refining in Burana Village is the fluctuating price of patchouli oil and the lack of government attention to farmers, starting from the planting period, farmers' infrastructure and controlling price of agricultural products, farmers do not get guidance about

farming techniques that can improve quality and quantity. yields, thus greatly affecting the production volume of patchouli plant management.

Given the problems above, it is necessary to carry out a calculation based on the feasibility analysis of business/business development, in order to provide views to patchouli farmers in Burana Village regarding whether or not the patchouli business is feasible to develop. A business feasibility study is an activity to analyze in depth about a business or business that is being run to determine whether or not the business is feasible to run. A business feasibility study is carried out so that the projects carried out are not in vain. In other words, the projects that are run do not waste time, energy, and thoughts in vain and cause problems in the future [4].

2. Methods

This research was conducted in Burana Village, Tabuhanan District, Mamasa Regency. The research location was chosen purposively, with the consideration that the area is one of the centers for patchouli development in Tabuhanan District. The population in this study were all patchouli farmers in the hamlets of Pombalaan, Pondan, Burana, Kyumea, Rattana, Salu Marante and Tatekko, Burana Village, Tabuhanan District, Mamasa Regency, totaling 228 people. Sampling in this study was carried out using stratified random sampling, namely 45 people from 228 populations with a percentage of 20% so that a sample of 45 people was obtained.

Table1. Calculation of the Number of Samples in Each Hamlet in Burana Village

No	Village Name	Population	Percentage (%)	Number of Samples
1.	Pombalaan	37	20	7
2.	Pondan	34	20	7
3.	Burana	32	20	6
4.	Kyumea	45	20	9
5.	Rattana	24	20	5
6.	Salu Marante	27	20	5
7.	Tatekko	29	20	6
Total		228		45

Source: Processed data, 2022

The sample selection in this study was carried out randomly without looking at certain criteria in the sample. For the distribution of the number of samples in each village there were 5 people in 2 hamlets, 6 people in 2 hamlets, 7 people in 2 hamlets and 9 people in 1 village where the number of samples in each hamlet was adjusted to the number of populations in each village. The data used for this study is quantitative data in the form of statements and calculations in the questionnaire which is measured using feasibility analysis.

Analysis of the data used in this study is calculation of patchouli farming that harvested twice in each growing season. This study analyzed farm revenues, farm income or profits, business feasibility analysis (R/C-Ratio), capital productivity analysis (π /R Ratio) and break-even point analysis (BEP).

Production costs are divided into two types, namely: fixed costs and variable costs. The formula for calculating the total cost of farming is:

$$TC = TFC + TVC \quad (1)$$

Where: TC = Total Cost (Rp/Period); TFC = Total Fixed Cost (Rp/Period); TVC = Total Variable Cost (Rp/Period)

Income is the amount of money received by entrepreneurs in running their business. The formula used to calculate income is as follows [5].

$$TR = P \times Q \quad (2)$$

Description: TR = Total Revenue (Rp/Year); P = Price (Per/Kg); Q = Quantity(Kg/Year)

Farming income (net farm income) is defined as the difference between gross farm income and total farming expenses. The income difference from farming can be used to measure the rewards obtained at the farm family level in terms of the use of production factors of work, management and capital (Soekartawi, 1986).

So farming income can be formulated as follows:

$$\pi = TR - TC \quad (3)$$

Where: π = Farmer's Income; TR = Total Revenue/Revenue; TC = Total Cost/Cost

Revenue/Cost Ratio is a comparison between total revenue and total cost with the following formula (Soekartawi, 2006 in [5].

$$R/C \text{ Ratio} = TR/TC \quad (4)$$

Where: TR = Total Revenue/Total Revenue; TC = Total Cost/Total Cost; the criteria based on the R/C Ratio are R/C ratio > 1, patchouli cultivation is feasible; R/C ratio = 1, then the patchouli cultivation business is neither profitable nor loss; R/C ratio < 1, patchouli cultivation is not feasible to cultivate.

π /C Ratio is the ratio or ratio between absolute income or profit with total production costs. Mathematically expressed by the formula:

$$\pi /C \text{ Ratio} = \pi /TC \quad (5)$$

A business or business is said to be feasible if the value of π /C Ratio > the prevailing bank interest rate, then the farming business has economic feasibility [6]. The value of π /C Ratio is one of the investment decision tools, because the value of π /C Ratio which is greater than the

prevailing bank interest rate indicates that it is more profitable for entrepreneurs to invest their funds in business activities rather than saving in a bank (saving).

The calculation of BEP on the basis of production units describes the minimum production that must be produced in an effort to avoid losses, can be done using the following formula:

$$\text{BEP (Q)} = \text{TC}/(\text{Sales Price}) \quad (6)$$

Where: BEP (Q) = Break-even point in units of production; TC = Farmer's business cost; P = Price

This BEP price is the basic or basic price to return the capital so that the business is profitable, then the farmer must sell production above this base price and can be seen in the following formula:

$$\text{BEP (P)} = \text{TC}/(\text{Total Production}) \quad (7)$$

Where: BEP (P) = Break-even point in unit price of production; TC = Farmer's business cost; Q = Quantity

3. Results and Discussion

3.1. Patchouli Farming Production Costs

The patchouli production process in Burana Village, Tabuhanan District, still uses a simple method starting from land selection, planting stage to distillation stage. The land selection process is adjusted to the respondent's land conditions and mostly uses sloping land. The process of planting patchouli plants is carried out directly in the form of shoot cuttings that have shoots with a length of 15-30 cm without conducting a nursery first by providing shade in the form of reeds and or packaged bottles with a spacing that varies from 30 x 30 cm to 1 x 1 meter. Planting is not done simultaneously, depending on time, effort, and land readiness.

Table 2. Breakdown of Average Production Costs for Patchouli Farming in Burana Village, Tabuhanan District, Mamasa Regency

No.	Description	Total Cost
1.	Average Fixed Cost	
	- Land Tax	5,200
	- Depreciation	786,289
2.	Variabel Cost Average	
	- Seeds	176,333
	- Fertilizer	218,140
	- Pesticide	481,444
	- Labor	19,607,778
	- Distillate Rental	2,422,222
	Total	23,478,962

Source: Processed data, 2022

Land tax is a tax levied because of a profit or socio-economic position, while the average tax fee that must be paid for each respondent farmer is Rp5,200 with an average land area of 47.22 acres. Farming also requires tools to fulfill its production activities, as well as patchouli farmers, the cost of depreciation of tools that must be incurred by patchouli farmers are machetes, shovels, scissors, packaging bottles, sprayers, tents, sacks and rapia ropes at an average cost Rp. 786,289 in one patchouli cultivation cycle (1 year). The amount of depreciation expense on fixed assets affects the size of the operating profit obtained by the company.

Seeds play an important role in the means of production. The type of patchouli developed in Burana Village is **Pogostemon cablin** Benth. Table 2 shows the average cost of patchouli seeds in the research area of Rp176,333 with an average land area of 47.22 acre. Seedlings were obtained from areas that developed patchouli earlier and in family gardens in several ways, some were exchanged for labor, food and paid for directly before taking the seeds or picking them up by the owner. Fertilizer is one of the most important plant care actions, because the purpose of fertilization is to increase the availability of nutrients in the soil so that plants can absorb them according to their needs so that plants can grow fertile and can produce higher. The average cost of urea, ponska and leaf perfect liquid fertilizers in the study area is Rp218,140 with an average land area of 47.22 are. Patchouli farmers in Burana Village are still lacking in the use of fertilizers which are influenced by soil fertility factors and farmers minimize expenses or variable costs. The use of pesticides and insecticides is used to reduce the risk of crop failure caused by weeds, pests and diseases. The average cost of pesticides and insecticides in patchouli farming in the study area is Rp481,444 with an average land area of 47.22 acre. One type of pest that attacks farmers' patchouli is Leaf Roller Caterpillar (*Pachyzanaba stutalis*) where this pest lives in young leaf rolls, while eating growing leaves. One of the diseases that endanger patchouli farmers is Budok disease which is characterized by swelling (scbies) on the leaves.

Labor is an important factor in determining the success of farmers in the implementation of their farming business. There are two sources of labor that manage the respondent's land, namely 70% family workers and 30% external workers. The labor costs that must be incurred by respondent farmers in their patchouli farming business with an average of 305 workers are Rp19,607,778 with an average land area of 47 are. Sewah distillation is the cost that must be incurred by farmers or respondents in refining dry patchouli to be processed into oil, at the research location there are 7 refining furnaces that patchouli farmers can choose to distill with a budget of Rp200,000 distillates. The average refining cost that must be paid to each respondent farmer is Rp2,422,222 with an average land area of 47 acres. Then the average overall production costs incurred both fixed costs and variable costs in the research area in one year is Rp23,478,962 with an average land area of 47 are. In Herianti's research (2020), the average overall production costs incurred, both fixed costs and variable costs in the research area, were Rp. 11,820,366, with an average land area of 101 are [6].

3.2. Production and Revenue Value

The results showed that the average production of patchouli farming in the research area was 69,998 kg in the form of oil. The production value is the gross income obtained from the product of the total production with the prevailing selling price. The average price of patchouli oil in the study area is Rp439,995/kg, the Table 3 show the average production value produced by the sample farmers.

Table 3. Average Production and Revenue Value of Patchouli in Burana Village, Tabuhanan District, Mamasa Regency

Land Area (Are)	Production (Kg)	Selling Price (Rp)	Revenue (Rp)
47.22	69,998	439,995	30,798,770

Source: Processed data, 2022

Table 3 shows that the average of patchouli oil production in a year is 69.998 kg with revenue Rp30,798,770. According to previous study, the marketing system for patchouli oil starts from the farmer level where farmers carry out the patchouli oil refining process several times with an average production yield of 168.64 kg/year per farmer with an average land area of 74 acres. the average production yield is 69,998 kg/year with an average respondent's land area of 47,998 are. In the management of patchouli oil production, it can be influenced by the patchouli plant care system, patchouli plant drying and the refining process. The quality of patchouli oil includes soil and climate, cropping pattern systems, methods of handling raw materials, and the refining process [7].

From the results of the average patchouli oil production of 69,998 kg/year with a land area of 47.22 acres, it shows that the yield Production in Burana Village in patchouli farming activities is still lacking which is influenced by many factors, ranging from cultivation, harvesting, post-harvest, processing and especially the area of land planted with patchouli where the area of 47.22 acres is still very small [8].

3.3. Income

Patchouli farming in Burana Village, Tabuhanan District, Mamasa Regency, has various profits after decreasing fixed costs and variable costs incurred by respondent farmers, income or profit is the difference between revenues and expenses.

Table 4. Average Revenue, Production Costs, and Net Income of Each Respondent in Burana Village, Tabuhanan District, Mamasa Regency

Land Area (Are)	Revenue (Rp)	Total Cost (Rp)	Net Income (Rp)
47.22	30,486,379	23,521,073	6,965,306

Source: Processed data, 2022

Based on Table 4 shows that the average land area of the respondents is 47.22 acres, the average income value is Rp30,486,379, the average production cost is Rp23,521,073, so the average

income/profit obtained by patchouli farmers in the research area is Rp6,965,306/year. The profit obtained by patchouli farmers varies according to the respondent's land area. Based on the results of interviews with respondents, the condition of the land in the area is very good for patchouli farming because the condition of the land is so fertile that it is rich in nutrients. The average profit obtained by patchouli farmers is Rp6,965,306 /year.

3.4. Analysis R/C Ratio

R/C Ratio is a ratio between total revenue and total cost which shows the value of revenue obtained from each rupiah spent. Calculation in this research used the value of the average income of farmers Rp. Rp30,798,770, and the production costs incurred during the development process are Rp23,521,073. The R/C Ratio states the feasibility of a farming business whether it is profitable, return on investment, or not profitable (loss). A patchouli farming business is feasible and beneficial if the R/C ratio > 1 , the greater the value of profit on costs, the greater the benefits that will be obtained from the business. Based on the results of systematic calculations (R/C Ratio), the following feasibility values are obtained :

Table 5. Analysis of R/C Ratio in Patchouli Farming in Burana Village, Tabuhanan District, Mamasa Regency

Description	Amount (Rp)	R/C
Income	30.798.770	1,31
Total Cost	23.478.962	1,31

Source: Processed data, 2022

Based on the calculation results, it can be seen that if the average income obtained by respondent farmers in the study area is Rp30,798,770 and if the average production cost to be incurred by the respondent farmers is Rp23,521,073, then an R/C ratio of 1.31 is obtained. That is, every 1 spent by farmers for patchouli farming costs will generate a profit of Rp1.31. Because the R/C ratio is greater than 1 ($R/C > 1$), patchouli farming is feasible. Thus, if farmers plant patchouli with a larger area of land, the profits will be even greater.

A similar study was also revealed that the R/C Ratio was Rp1.1. It means every 1 spent by farmers for patchouli farming costs will generate a profit of Rp1.1. Because the value of the R/C ratio is greater than 1 ($R/C > 1$), patchouli farming is feasible. Thus, if farmers plant patchouli with a larger area, the profits will be even greater [9].

3.5. Capital Productivity Analysis (π/C Ratio)

Capital productivity (π/C) is the ratio between income or profit with the total cost of farming production. Mathematically expressed by the formula: $\pi/C \text{ Ratio} = \pi/TC$. Analysis of capital productivity (π/C) on lowland rice farming activities in the research area can be seen in Table 6.

Table 6. Analysis of Capital Productivity (π/C) in Patchouli Farming in Burana Village, Tabuhanan District, Mamasa Regency

Description	Amount (Rp)	π/C
Profit	6,965,306	0.29 (29%)
Total Cost	23,478,962	

Source: Processed data, 2022

Based on Table 6. shows that the value of π/C in patchouli farming in the research area is 0.29 which is obtained from value of profit Rp. 6,965,306 divided by the total cost of Rp23,478,962. Means that for every additional cost of Rp100, a profit of Rp29 will be obtained. The value of π/C of 0.29 (29%) means that patchouli farming in the research area is profitable and feasible because the value of $\pi/C = 29\%$.

3.6. Breaking Point Analysis (BEP)

Break Event Point (BEP) analysis or break even point analysis is a means to determine the production capacity that must be achieved from a farming business in order to make a profit.

Table 7. BEP Analysis on Patchouli Farming in Burana Village, Tabullahan District, Mamasa Regency

Description	Unit	Amount
BEP Production Volume	Kg	53,458
BEP Production Price	Rp	336,025

Source: Processed data, 2022

3.6.1. Calculation of Break-Even Point (BEP) Production Volume (Q)

BEP production volume describes the minimum product produced by patchouli farmers so as not to lose. This production volume is to compare the average costs incurred with the average price of the products traded. Can be calculated using the formula:

$$\text{BEP (Q)} = \frac{TC}{\text{Price of Product}} = \frac{23.521.073}{439.995} = 53,458 \text{ kg}$$

This means that for a product of 53,458 kg, the patchouli business is profitable to run because the product number of 53,458 kg is below the average product number of 69,998 kg, then the patchouli farmer's business is profitable, if the production volume obtained is 53,458 kg, the business does not lose or gain.

3.6.2. Calculation of Break Event Point (BEP) Production Price (P)

BEP production price is a description of the lowest price of patchouli products produced. BEP production price is to compare the average cost incurred with the average product produced. In order for the patchouli business to be profitable, farmers must sell patchouli products on this basis, the calculation of the BEP for product prices can be seen as follows:

$$\text{BEP (P)} = \frac{TC}{\text{Total Production}} = \frac{23.521.073}{69.998} = 336.025$$

BEP (P) of Rp336,025 shows that it is still below the market price of Rp439,995, means that the patchouli business is profitable and feasible, if the oil price is equal to Rp336,025/Kg, the business does not make a profit, it does not lose.

The results of the Break Event Point analysis conducted by Efendi (2016) revealed that the BEP production volume showing that when the production is obtained at 10,819 kg, the farmer's income will not gain profit or loss and the BEP production price shows that when the tomato price at the farm level is Rp2,734, the tomato business income does not provide any profit or loss [10].

By knowing the following values, it can be depicted in Fig. 1 where:

BEP Volume = 53,458 kg

BEP Production Price = Rp.336,025

TFC = Rp.791,489 ($FC = TFC:Q$)

FC = Rp. 15,830

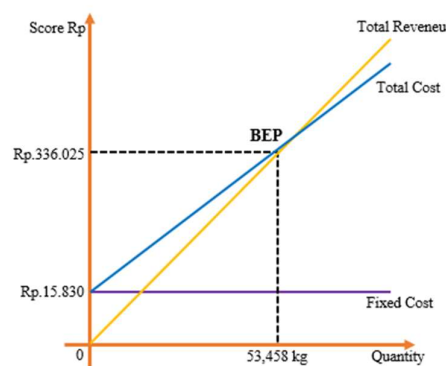


Figure 1. Analysis of BEP for Patchouli Farming

4. Conclusion

The average respondent's land area is 47.22 acres, with an average production cost of Rp23,521,073, and the average revenue earned Rp. 30,486,379, then the average net income of each respondent is Rp6,965,306. Based on the analysis of the return cost ratio (R/C), capital productivity (π/C) and break-even point (BEP) patchouli farming in Burana Village, Tabulahan District is feasible to cultivate patchouli. R/C Ratio indicates 1.3. It means every 1 that is spent by farmers for patchouli farming costs will generate a profit of IDR 1.3. Because the R/C ratio is greater than 1 ($RC > 1$), patchouli farming is feasible. Obtained π/C of 0.29. This means that for every additional Rp100, a profit of Rp29 will be obtained. The π/C value of 0.29 (29%) means that patchouli farming in the study area is profitable and feasible to cultivate because the π/C value = 29%. The production volume BEP for patchouli farming is 53,458 kg, meaning that for a product of 53,458 kg, the patchouli business is profitable to run because the patchouli product figure is 53,458 kg which is below the average product figure of 69,998 kg and the

production price BEP for patchouli farming is Rp336,025 shows that it is still below the market price of Rp439,995, meaning the patchouli business is profitable.

REFERENCES

- [1] Umikalsum, "Analisis Pendapatan dan Kelayakan Ekonomi Usaha Tani Padi di Daerah Agropolitan Kel. Pulokerto Kec. Gandus Palembang," *AgrIBA*, vol. 3, no. 1, pp.14-21, 2013.
- [2] United Nations Comtrade Database, "*Indonesia Patchouli Oil Export Trade Flows 2001-2018*," [Online]. Available: <http://comtrade.un.org>, 2019.
- [3] A. Bimo. "Harga Minyak Nilam Naik Hampir 2 Kali Lipat Dalam Sepekan Terakhir," *kompas.tv*. <https://www.kompas.tv/article/99123/harga-minyak-nilam-naik-hampir-2-kali-lipat-dalam-sepekan-terakhir> (accessed July. 1, 2022).
- [4] Nasir, A. "*Kecamatan Tabulahan Dalam Angka 2019*," Badan Pusat Statistik Kabupaten Mamasa. BPS, 2019.
- [5] Kasmir and Jakfar, "*Studi Kelayakan Bisnis*," Jakarta: Kencana, 2012.
- [6] V. Heriati, "*Analisis Pendapatan Pada Usaha Tani Nilam di Desa Terpedo Jaya Kecamatan Sabbang Kabupaten Luwu Utara*," Skripsi, Prodi. Manajemen, Univ. Muhammadiyah Makassar, 2020.
- [7] S. Astuti, "*Produktivitas Tanaman Nilam (Pogestemon cablin Benth) pada Hutan Rakyat di Desa Leling Utara Kecamatan Tommo Kabupaten Mamuju*," Skripsi, Prodi. Kehutanan, Univ. Muhammadiyah Makassar, 2019.
- [8] Asnidar and Asrida, "Analisis Kelayakan Usaha Home Industry Kerupuk Opak Di Desa Paloh Meunasah Dayah Kecamatan Muara Satu Kabupaten Aceh Utara," *S. Pertanian*, vol. 1, no. 1, pp. 42-43, 2017.
- [9] N. Saidin, "Model Produktivitas, Risiko dan Perilaku Petani Menyikapi Risiko Produksi Usahatani Padi Sawah di Kabupaten Tebo," *Jurnal Ilmiah Sosio-Ekonomi Bisnis*, vol. 24, no. 2, 2021.
- [10] Y. Efendi, "Analisis Usahatani Tomat (*Lycopersicone esculentum* Mill) di Desa Mandesan Kecamatan Selopuro Kabupaten Blitar," *Jurnal Viabel Pertanian*, vol. 10, no. 2, pp. 51-61, 2016.