

## Feasibility Analysis of Porang Farming (*Amorphophallus Muelleri* Blume) in Klangon Village, Saradan District, Madiun Regency



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**ABSTRACT:** Klangon Village, the center of producing porang plants in Madiun Regency is faced with problems, namely low selling prices of porang and rising production costs. This study aims to analyze the costs, revenues, and incomes of farmers and analyze the feasibility of porang farming. The place of this research was conducted in Klangon Village, Saradan District, Madiun Regency. Purposive sampling technique with 92 respondents. The first objective is analyzed using revenue analysis and the second objective with feasibility analysis includes Revenue Cost Ratio (R/C Ratio), Benefit Cost Ratio (B/C Ratio), and Break Event Point (BEP). The results showed that the average income received by farmers was Rp. 7,983,800/ha. With an average revenue of Rp. 15,149,843/ha and an average total cost incurred by farmers of Rp. 7,166,043/ha. The results of the feasibility analysis of porang with an R/C Ratio showed a value of 2.11 and a B/C Ratio of 1.11. The results of the BEP analysis of revenue amounted to Rp. 531,605/ha, BEP production amounted to 165/kg/ha, and BEP price amounted to Rp. 1,525/kg. The analysis of the R/C Ratio, B/C Ratio, and BEP shows that porang farming is worth cultivating.

**KEYWORDS:** Porang Farming, Cost, Revenue, Income, Feasibility of Farming.

### I. INTRODUCTION

Porang commodity is an agricultural sub-sector commodity that is quite superior in East Java. In recent years, porang has become a popular plant because it is shade tolerant, easy to cultivate, high productivity, resistant to pests and diseases that attack relatively small plants, increased market demand, and has high economic value in providing new jobs, regional income, and foreign exchange earnings both exports and processed products. Based on data from the Quarantine Agency of the Ministry of Agriculture (2021), it is stated that the increase in the export value of porang by 160%, namely in the first semester of 2019 was recorded at 5.7 thousand tons and semester 1 of 2021 at 14.8 thousand tons. The Ministry of Agriculture is currently encouraging the potential of porang tubers to be further redeveloped, to increase export volumes.

Madiun Regency is one of the districts in East Java Province that has natural resource potential, one of which is in the form of forest land. The state forest area in Madiun Regency is approximately 40,631 Ha. While the forest area intended for the people reaches an area of approximately 5,821 Ha. With the area of the forest area, it can be used as an effort to cultivate porang plants.

Madiun Regency consists of 10 sub-districts where each sub-district produces porang production. The total production of porang (umbi basah) in Madiun Regency that has been obtained, namely porang production in 2019 amounted to 9,132.35 tons. Then it rose in 2020 to 10,325.01. A rapid increase in production occurred in 2021 where porang production reached 50,427.78 tons. In 2022, porang production until September has decreased to 44,362.00 tons. In 2022, porang production showed a decrease from the previous year, which was 6,065.78 tons. Of the 10 sub-districts in Madiun Regency, the district with the most porang production is Saradan District. In 2019 porang production was 6,399.75 tons, then fell in 2020 to 4,209.34. Furthermore, in 2021 there was a very drastic increase in production of 24,398.70 tons. From 2022 until September, porang production in Saradan District is 23,460.00 tons.

One of the villages in Saradan District that has the most porang production in the last three years (2019-2021) is Klangon Village. Klangon Village has a planting area 2021 of 977 ha and a harvest area of 900 ha. From the planting area, porang production obtained as much as 8,100.00 tons, an increase from the previous year which only produced production of 2,400.00 tons. Klangon Village itself is the center of porang production in Madiun Regency. This area is at the foot of Mount Pandan, so it is suitable for the growth and development of porang plants both vegetatively and generatively. Most of the people of Klangon make a living as porang farmers.

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Table 1. Price of Porang (Rp/kg) in Klangon Village in 2019-2022

No.	Year	Price (Seed)	Price (Umbi Basah)	Price (Chips)
1	2019	125.000	12.000	55.000
2	2020	350.000	13.000	60.000
3	2021	150.000	6.500	50.000
4	2022	25.000	3.400	25.000

Source: Agriculture and Fisheries Office of Madiun Regency, 2022

It can be seen in Table 1 data that porang farmers are faced with problems, namely related to the low selling price of porang, besides being low and uncertain (fluctuating). The price of porang (Rp/kg) shows that from 2019 to 2022, both the price of porang seeds, wet tubers, and chips increased and decreased. The main reason for this price drop is due to export constraints to China. While China itself is the largest industry of porang. China previously closed imports of porang from Indonesia because the quality of porang was not good. This causes the porang in the factory to accumulate and makes the price of porang drop dramatically. Not only does the price of porang fluctuate, but another problem lies in the cost of production also increasing, for example, the cost of herbicides. The cost of such herbicides on average rises by 70-90%. In addition, although the price of porang fell, then production costs rose but labor wages remained. Porang workers do not want their wages to be reduced even though the price of porang is falling. The increase in production costs but not accompanied by an increase in the price of porang can affect the income received by farmers. Seeing these problems, the author is interested in knowing whether porang farming is still feasible or not by conducting research aimed at analyzing the costs, revenues, and incomes of farmers and analyzing the feasibility of porang farming.

## II. LITERATURE REVIEW

### A. Porang

Porang (*Amorphophallus muelleri* Blume) is one type of root plant. This plant is a shrub (herbaceous) that can be found in tropical and sub-tropical regions (Dewanto and Purnomo, 2009). Not many have cultivated porang which are usually found growing wild in forests, under bamboo thickets, on river banks, and on mountain slopes (in humid areas) Porang can be managed with an agroforestry system because it can grow in the shade, so it is suitable to be developed into interstitial plants among woody plants or trees.

### B. Farming

Farming is the study of how a farmer cultivates and coordinates production factors in the form of land and the surrounding nature as capital that can later provide the best benefits (Suratiah, 2015). According to Soekartawi (2016), farming science is defined as the science that studies how farmers allocate existing resources effectively and efficiently to obtain high profits at a certain time.

### C. Cost

Cost in a broad sense is the sacrifice of economic resources, measured in units of money, that has occurred or is likely to occur for a particular purpose. The cost itself is useful to find out the cost of goods produced in a certain month, as a basis for making cost decisions in the future, as well as to clarify the duties and authorities, and responsibilities of each manager (Mulyadi, 2015). According to Lanen, Anderson, and Maher (2017), the cost is a sacrifice made to acquire resources.

### D. Revenue

Revenue in farming is all income received from production activities that generate money without deducting the costs incurred (Husni & Maskan, 2014), in other words, revenue is the result of multiplication between the amount of production and the selling price. The sales proceeds are referred to as total revenue (Total Revenue / TR = Quantity Price). Total receipts will increase if:

- The number of items sold rose, but the price did not change.
- The number of items sold is fixed, but prices are rising.
- The number of goods sold increases and prices also rise.

### E. Farm Income

Sutrisno (2019), suggests that income is the difference between revenue and costs incurred. Income serves to be used in meeting daily needs and continuing farming activities. Much of the little farm income obtained can be used to measure the success of

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farmers in managing their farms. According to the Big Dictionary of Indonesian, income is defined as the result of work (effort and so on). Income is income obtained from carrying out activities, businesses, and jobs.

### F. Feasibility of Farming

According to Kasmir and Jakfar, (2012), a business feasibility study is an activity that studies in depth about a business or business to be run, to determine whether or not the business is run. Agricultural feasibility is used to determine whether a farm can be sustainable and profitable for farmers or entrepreneurs, and it is a goal that farmers want to achieve. In the feasibility analysis of farming, several provisions are used, namely land productivity, B/C (Benefit Cost ratio), labor productivity, and capital productivity. a business is called feasible to continue if the value of B/C > 1 and if the value of B/C < 1 then the business is not worth continuing (Suratijah, 2015).

### III. RESEARCH METHODOLOGY

This research was conducted in Klangon Village, Saradan District, Madiun Regency. For purposive sampling technique with respondents of as many as 92 porang farmers. According to Sugiyono (2018), purposive sampling is a sampling technique with certain considerations. The sample criteria taken are farmers who cultivate porang plants and have previously harvested porang plants and sold porang products (umbi basah).

The data analysis methods used to answer the research objectives are as follows:

#### A. Income Analysis

The income analysis according to (Ramadhani et al., 2018) is as follows:

##### 1. Total production cost (total cost)

Production costs are costs incurred to process raw materials into finished products that are ready for sale (Mulyadi, 2015). Formula:  $TC = FC + VC$

##### 2. Total Revenue

Revenue is the result of the multiplication between the amount of production and the selling price. Formula:  $TR = P \times Q$

##### 3. Revenue

Sutrisno (2019), suggests that income is the difference between revenue and costs incurred. Formula:  $\pi = TR - TC$

#### B. Feasibility Analysis

##### 1. Revenue Cost Ratio (R/C Ratio)

Revenue Cost Ratio comparison between total revenue and total costs. The R/C Ratio formula is as follows (Mahmud, 2020). Formula:

$$R/C \text{ ratio} = \frac{TR}{TC}$$

Provided that:

- If the R/C > 1, then porang farming is profitable/worth trying.
- If the R/C = 1, then porang farming is not profitable and does not lose (breakeven)
- If the R/C < 1, then porang farming is not profitable/not feasible.

##### 2. Benefit Cost Ratio (B/C Ratio)

B/C Ratio is a ratio comparing profits with costs used in realizing planning and operating a business and seeing the benefits obtained from the business (Mahmud, 2020). The greater the B/C Ratio, the greater the value of the benefits obtained from the business. Formula:

$$B/C \text{ ratio} = \frac{\pi}{TC}$$

Provided that.

- If the B/C > 1, then porang farming is profitable/worth working.
- If the B/C = 1, then porang farming does not profit and does not lose (breakeven)
- If the B/C < 1 Then porang farming is not profitable/unfeasible (Sipayung, 2019)

##### 3. Break Event Point (BEP)

###### a. BEP Revenue (Rp)

BEP revenue (Rp) is the amount of rupiah sales value that must be received to get the break-even point (no loss and no profit). Here is the formula for BEP revenue (Rp):

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$$\text{BEP revenue} = \frac{FC}{1 - \frac{VC}{S}}$$

### b. BEP Production (kg)

Production BEP is a BEP that indicates the minimum production that must be obtained in agricultural activities so as not to experience losses. Here is the formula for BEP production (kg):

$$\text{BEP production} = \frac{FC}{P - AVC}$$

### c. BEP Price (Rp/kg)

BEP price is the price set by farmers to be in break-even conditions (BEP). Formula:

$$\text{BEP price} = \frac{TC}{Y}$$

## IV. RESULT AND DISCUSSION

### A. Analysis of Porang Farm Income

#### 1. Production Cost of Porang Farm

In this study, the production costs incurred by farmers in one planting season include fixed costs and variable costs. Fixed costs are costs that are not affected by the large amount of production. Fixed costs in this study are in the form of equipment depreciation costs. While variable costs are costs that depend on the amount of production or run out in one production process. Variable costs in the results of this study are in the form of costs of seeds, fertilizers, herbicides, other costs such as sacks, raffia, and transportation, as well as the cost of using labor. a. Fixed Costs

The cost of equipment depreciation in this study is several costs incurred for the procurement of agricultural equipment for use over a relatively long period. The average purchase price of the highest tool on the lawn mower is Rp. 594,022/unit and the lowest average price of the tool is a sickle of Rp. 50,380/unit. The average value of depreciation of agricultural equipment in porang farming issued by respondent farmers is Rp. 400,793 per farmer in one planting season. After conversion in 1 ha to Rp. 290,338/ha. The cost of the equipment includes hoe depreciation of Rp. 18,132/ha, a sprayer machine of Rp. 118,181/ha, a sickle of Rp. Rp. 22,232/ha, a lawn mower of Rp. 113,406/ha and a ganco of Rp. 18,388/ha. b. Variable Costs

#### 1) Seed Cost

Farmers in Klangon Village use a type of seed, namely bulbil/katak. This bulbil/frog seed is easier to obtain because it comes from plants owned by the porang farmers themselves. The average seed requirement in porang farming is 96 kg/ha/MT. The average total cost price per farmer is Rp. 2,560,489/MT. Meanwhile, the average cost of seeds after conversion in hectares is Rp. 1,854,843/ha.

#### 2) Fertilizer Cost

Fertilizer costs are costs incurred by farmers to buy a number of fertilizers during one growing season. Fertilizers used by farmers in Klangon Village vary such as organic fertilizer, phonska, urea, Mutiara, Phonska Plus. The average cost of fertilizer for porang farming activities incurred by farmers is Rp. 1,095,728/MT, after converting to hectares to Rp. 793,756/ha. The most fertilizer costs are allocated for the purchase of phonska fertilizer with an average cost per planting season of Rp. 407,480/ha. While the average expenditure of the least fertilizer costs is phonska plus fertilizer costs, which is Rp. 10,157/ha. Many farmers use phonska plus fertilizer because it is a subsidized fertilizer from the government so the price is cheaper.

#### 3) Herbicide Cost

The cost of herbicides in this study is the cost incurred by farmers to buy drugs used to eradicate weeds during one growing season. There are various types of herbicides used by farmers, namely roundup, sidafos, gempur, noxone, lindomin, ranger, and supremo. The average cost of herbicides incurred by respondent farmers for one porang planting season was Rp. 573,772/ha. The cost of herbicides is highest in the roundup herbicide type, which on average costs Rp. 397,181/ha. Meanwhile, farmers' expenditure is the least on noxone herbicide which is only Rp. 3,110/ha.

#### 4) Miscellaneous Expenses

These other costs are costs incurred by farmers to buy other needs that can support porang farming activities. Other costs in this study include sacks, raffia, and pick-up/truck hauling. the average total miscellaneous costs incurred by farmers amounted to Rp. 641,397/MT after conversion to hectares to Rp. 464,634/ha. Details of sack costs incurred by farmers for porang farming is Rp.

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179,823/ha. For raffia costs as much as Rp.47,803/ha. Meanwhile, the average cost expenditure for transporting pick-ups/trucks incurred by porang farmers is Rp. 327,174/MT or the expenditure of transporting pick-ups/converted trucks per hectare is Rp. 237,008/ha.

### 5) Labor Cost

Labor costs are costs incurred as wages for the utilization of labor in carrying out agricultural activities. Farmers incur labor costs for porang farming in land clearing activities before planting, embroidery, fertilization, weeding, clearing land before harvest, marking tubers, harvesting tubers, and transportation. Male labor costs are more expensive because the activities carried out by the male labor force are heavier and more numerous. The average cost of using labor in porang farming in Klangon Village is Rp. 4,401,793/MT or Rp. 3,188,701/ha/MT. The largest use of labor in tuber harvesting activities is to spend Rp. 1,733,696/MT or after conversion per hectare the cost is Rp. 1,,255,906. While the use of labor is the least in transportation activities at a cost of Rp. 58,268/ha because in this transportation activity, not all farmers use motorbikes, some use transportation with pick up/truck which is calculated at other costs.

### 2. Total Production Cost

Total production costs are obtained from the sum between fixed costs and variable costs. To obtain optimal revenue, one way that can be done is to minimize production costs and increase production results. Production costs for each respondent farmer vary depending on the products produced and in terms of activities carried out by farmers. The average total fixed costs and variable costs in porang farming in Klangon Village are as follows:

**Table 2. Average Total Cost of Porang Farming in Klangon Village in 2022**

No	Description	Average Total Cost (Rp/ha)
Fixed Costs		
1.	Tool Depreciation Cost	290.338
Total Fixed Costs		290.338
Variable Costs		
1.	Seed Cos	1.854.843
2.	Fertilizer Cost	793.756
3.	Herbicide Costs	573.772
4.	Miscellaneous Expenses	464.634
5.	Labor Costs	3.188.701
Total Variable Costs		6.875.705
Total Cost		7.166.043

**Source:** Primary data after processing, 2023

Based on Table 4.21, it can be seen that the average production cost of porang farming in Klangon Village incurred by farmers is in hectares of Rp. 7,166,043/ha. Among them are fixed costs consisting of equipment depreciation costs of Rp. 290,338/ha and also consisting of variable costs with a total cost of Rp. 6,875,705/ha incurred for the purchase of seeds, fertilizers, herbicides, miscellaneous costs, and labor.

### 3. Production and Revenue of Porang Farming

The revenue of porang farmers is obtained from the multiplication between production and the selling price of porang products. The higher the selling price of the product, the more. High acceptance of porang farmers, and vice versa if the selling price of products decreases, the more losses experienced by porang farmers.

**Table 3. Average Production and Receipt of Porang in Klangon Village in 2022**

Description	Average (Kg/ha)
Porang Production (Kg)	4.698
Price (Rp)	3.223
Revenue	15.149.843

**Source:** Primary data after processing, 2023

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Table 3. It can be seen that the amount of porang production produced by farmers in Klangon Village is 4,698 per hectare. From the results of the study, the price of porang per kg ranges from Rp. 2,500-Rp. 4,000/kg. So that the average price of porang from respondent farmers is Rp. 3,223 per kg From the production and selling price, the average is Rp.15. 149,843 per hectare. The production and revenue of porang farmers in Klangon Village are influenced by the area of land owned by farmers. In addition, it is also influenced by several factors such as land conditions, use of production facilities, labor, and technology as well as cultivation carried out.

### 4. Porang Farm Income

Porang farming income is the difference between porang revenue and all production costs in the farming process during one planting season (Soekartawi 2006). The income in this study is the result of farmers' revenue minus the costs incurred in one growing season.

**Table 4. Average Porang Production Income in Klangon Village in 2022**

Description	Average Revenue (Rp/ha)
Revenue	15.149.843
Total Production Cost	7.166.043
Income	7.983.800

Source: Primary data after processing, 2023

Table 4. shows the average income of porang farmers in Klangon Village of Rp. 7,983,800 per hectare. This income result is obtained from the average total revenue of Rp. 15,149,843/ha minus the average total cost of Rp. 7,166,043/ha.

### B. Feasibility Analysis of Porang Farming

Knowing the feasibility of porang farming by using the analysis of Revenue Cost Rati (R/C Ratio), Benefit Cost Ratio (B/C Ratio), and Break Event Point (BEP). The following is a description of the feasibility analysis of porang farming:

#### 1. Revenue Cost Ratio (R/C Ratio) Analysis

R/C Ratio analysis is the average value of revenue compared to the average value of production costs. The B/C Ratio analysis of porang farming is as follows:

**Table 5. Analysis of the B/C Ratio of Porang Farming in Klangon Village in 2022**

Description	(Rp/ha)
Revenue	15.149.843
Total Production Cost	7.166.043
R/C Ratio	2,11

Source: Primary data after processing, 2023

Based on Table 5, it can be seen that the average income of porang farmers obtained by farmers is Rp. 20,913,370 / MT or Rp. 15,149,843/ha/MT and the average cost incurred by farmers is Rp. 9,892,255/MT or Rp. 7,166,043/ha so that the R/C Ratio value is 2.11. This means, for every 1 rupiah of farmers' expenditure for their porang farming activities, farmers will get revenue of 2.11 rupiah. Because the R/C Ratio value is > 1, porang farming is feasible to be cultivated and developed.

#### 2. Benefit Cost Ratio (B/C Ratio) Analysis

B/C Ratio analysis can be known by comparing the income of farmers with the amount of farmers' production costs. The B/C Ratio analysis of porang farming is as follows:

**Table 6. Analysis of the B/C Ratio of Porang Farming in Klangon Village in 2022**

Description	(Rp/ha)
Income	7.983.800
Total Production Cost	7.166.043
B/C Ratio	1,11

Source: Primary data after processing, 2023

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Table 6 shows that the average income of porang farmers obtained by farmers is Rp. 10,954,050/MT or Rp. 7,935,217/ha and the total average costs incurred by farmers are Rp. 9,892,255/MT or Rp. 7,166,043/ha so that a B/C Ratio value of 1.11 is obtained. This means, for every 1 rupiah of farmers' expenses for their porang farming activities, farmers will get income or profits of 1.11 rupiah. The results of the B/C Ratio analysis  $> 1$  where the B/C Ratio value is 1.11, then porang farming in Klangon Village is feasible and profitable.

### 3. Break Event Point (BEP)

Break Event Point (BEP) is a condition where farmers are in a state of no profit and no loss or break-even. Farmers who make a profit are above breakeven. The BEP analysis in porang farming is as follows:

Table 7. BEP Analysis of Porang Farming

Description	Value/Ha
Average Production	4.698/kg/ha
Average Fixed Costs	Rp. 290.338
Average variable costs	Rp. 6.875.705
Average Total Cost	Rp. 7.166.043
Variable Cost Per Unit	Rp.1.463/kg
Average Acceptance	Rp. 15.149.843
Product Price	Rp. 3.223/kg
BEP Revenue	Rp. 531.605
BEP Production	165 kg
BEP Price	Rp.1.525/kg

Source: Primary data after processing, 2023

Based on table 7 shows the results of the BEP analysis of porang farming. It can be seen that the BEP of porang farming revenue is Rp. 531,605 per hectare. The calculation between BEP revenue and the income of porang farmers themselves is greater than the revenue received by farmers, which is Rp. 15,149,843/ha. The calculation of BEP production is 165/kg per hectare. The average production value of porang is 4,698/kg per hectare. This shows that the average production of porang is much greater than the value of BEP Production. For the BEP value, the price of porang is Rp. 1,525/kg. The average price of porang in Klangon Village is also much higher than the BEP price value of Rp. 3,223/kg. According to the results of the BEP calculation, porang farming is feasible. To be cultivated because the value of BEP revenue, BEP production, and BEP prices is smaller than the value of receipts, production, and the average price of porang received by farmers in Klangon Village.

## V. CONCLUSIONS

Based on the results of the study, the following conclusions were obtained:

- 1) The results showed that the average income received by porang farmers was Rp. 7,983,800/ha. With an average revenue of Rp. 15,149,843/ha and an average total cost of Rp. 7,166,043/ha
- 2) The results of the feasibility analysis of the Porang R/C Ratio show a value of 2.11 and the B/C Ratio analysis obtained a value of 1.11 which means that porang farming is feasible to cultivate because the value of the R/C Ratio and B/C Ratio  $> 1$ .

The results of the BEP analysis of porang farming in Klangon Village obtained BEP revenue of Rp. 531,605/ha, BEP production of 165/kg/ha, BEP price of Rp. 1,525/kg.

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