INPUT ANALYSIS AND MARKETING OF OYSTER MUSHROOMS

Irenius Oddo[1*], Hani Sri Handayawati[2], Risca Kurnia Sari[2]

[1]Student of Undergraduate in Agribusiness Program Study, Faculty of Agriculture, Malang Agricultural Institute, Malang
[2]Lecturer of Agribusiness Program Study, Faculty of Agriculture, Malang Agricultural Institute, Malang
Jl. Soekarno-Hatta, Malang 45162 Indonesia
*Email: irenodo95@gmail.com

ABSTRACT

The aim of this study is to analyze the production and marketing input of oyster mushrooms in Sumberagung Village, Ngantang District, Malang Regency, which was conducted in August 2019. The method used in this study was exploration and direct interviews with the oyster mushroom entrepreneurs. Data were analyzed using business effectiveness (R/C) analysis, ROI or Return On Investment analysis and marketing effectiveness analysis. The results show that oyster mushroom production inputs were all forms of input such as production facilities and infrastructure, capital and business costs for oyster mushrooms, labor and production sites. Oyster mushroom marketing system was carried out starting from harvesting, post-harvest and marketing activities that were still simple and traditional. Analysis of business effectiveness (R/C), ROI analysis or Return On Investment and analysis of marketing effectiveness of the initial period of oyster mushroom business shows that the use of oyster mushroom business input such as initial capital is economically ineffective but the following period of venture capital is effectively business (R/C), ROI or Return On Investment analysis and marketing effectiveness analysis are effective.

Keywords: Input, Marketing, Oyster Mushrooms

ABSTRAK

Tujuan dari penelitian ini ialah untuk menganalisis input produksi dan pemasaran jamur tiram di Desa Sumberagung, Kecamatan Ngantang, Kabupaten Malang yang dilaksanakan pada bulan Agustus 2019. Metode yang digunakan dalam penelitian ini ialah opservasi dan wawancara langsung ke pada pengusaha jamur tiram. Data dianalisis menggunakan analisis efektivitas usaha (R/C), analisis ROI atau Return On Investment dan analisis efektivitas pemasaran.Hasil menunjukkan bahwa input produksi jamur tiram segala bentuk masukan seperti sarana dan prasarana produksi, modal dan biya usaha jamur tiram tenaga kerja dan tempat produksi. Sistem pemasaran jamur tiram yang dilakukan mulai dari pemanenan, pasca panen dan kegiatan pemasaran yang masih bersifat sederhana dan tradisional. Analisis efektifitas usaha (R/C), analisis ROI atau Return On Investment dan analisis efektivitas pemasaran periodel awal usaha jamur tiram menunjukkan bahwa penggunaan input usaha jamur tiram seperti modal awal usaha secara ekonomi belum efektif namun modal usaha periode berikutnya secara efektivitas usaha (R/C), analisis ROI atau Return On Investment dan analisis efektivitas pemasaran sudah efektif.

Kata kunci : input, pemasaran, jamur tiram

INTRODUCTION

National economic growth is highly dependent on the agricultural sector. The number of working people in Indonesia from year to year (2016 to 2018) has decreased to 124.01 (from 124.54 million). The population working in agriculture at the end of 2018 amounted to 35.7 million, equivalent to 28.79 percent of the working population (124.1 million).

The development of agricultural sector is not only consisting of food crops, but also estate crops and horticulture. Agricultural activities, especially in the horticulture sector, are divided into four groups, namely fruit plants, vegetable crops, medicinal plants and flower plants which are increasingly popular among farmers, because these groups of horticulture sector are able to provide higher profits compared to secondary crops in the same area.

The demand of mushrooms from one year to another year widely increases until entering the international market, but the amount of national mushroom production has not been able to meet the figure of consumer demand. The national oyster mushroom production decreased by 60 percent from 2010-2014 (from 61.37 tons/m2 to 37.41 tons/m2) (BPS, 2016a) .

The increase of oyster mushroom production in East Java increased by more than 50%. Oyster mushroom production centers in East Java are Sidoarjo, Pasuruan, Malang Regency / City, Batu, Magetan, Mojokerto, Jombang and Jember districts. The national demand of oyster mushrooms in 2013 was 107,617.50 tons, while the production produced by East Java was 88,445.00 tons so that 82.20% of the national demand could be fulfilled from the production centers of East Java. The mushroom production of Malang Regency was 2,081,455 tons/year ((BPS, 2016b).

Oyster mushroom is one of the foodstuffs that has complete amino acids and has nutritional value, which contains 15.7% protein of dry matter compared to the protein content in other foodstuffs, which ranges from 15-20% of the dry matter. The relatively small fat content is 2.66% of the dry matter and high carbohydrate content is 64.1% of the dry matter, so that oyster mushroom is one of the alternative food commodities.

Based on the description above, the comparison of the nutritional content contained in oyster mushroom commodities with other food commodities that are significantly different construct the basis of investigating the Input Analysis and Marketing of Oyster Mushroom in Sumberagung Village, Ngantang District, Malang Regency.

The objectives of this research are a.) to know the production input of oyster mushroom business. B.) to know the marketing system of the oyster mushroom business.

RESEARCH METHODS

A. Location and Time

The research location was in Sumberagung Village, Ngantang District, Malang Regency.

The research was conducted from July to August 2019.

B. Data Collection and Instrument

A preliminary survey was conducted before the research conducted to collect the preliminary information about the general conditions of the research site, farming and marketing of oyster mushrooms.

Literature study was conducted to collect the information about farming analysis and marketing of oyster mushrooms which were obtained from literature, internet and journals.

The data collected in this study were primary data generated from field observations and interviewing the oyster mushroom entrepreneur about some cases, such as the capital, costs, production infrastructure, labor, harvest, marketing data and income of oyster mushroom entrepreneurs.

The instruments used in the research were a camera for documenting and a diary to help researchers identify events encountered in the field and when conducting interviews with respondents through direct interviews. The research object is the oyster mushroom entrepreneur.

C. Respondents Determination

The method used was through observation and direct interviews with some oyster mushroom entrepreneur in Malang.

D. Data Analysis

The data obtained were analyzed using the following methods:

1) Farm Efficiency

Analysis of R/C (Return Cost Ratio) was used to determine the efficiency of the oyster mushroom entrepreneur.

$$R/C : \frac{\text{Total Revenue}}{\text{Total Cost}}$$

R/C assessment criteria according to Soekartawi (2006):

Table 1. Assessment Criteria of Revenue Cost Ratio

Assessment Criteria	Description
>1	The business is profitable or feasible to run
<1	The business is at a loss or not feasible to run
=1	The business is at break-even point or has no profit but also does not experience a loss

2) ROI or Return On Investment

ROI calculation used the following formula:

$$ROI = \frac{\text{Operating profit}}{\text{Start-up Capital}} \times 100\%$$

Assessment criteria of ROI according to Sumardjo, (2004):

Table 2. Assessment criteria of ROI

Assessment criteria	Description
ROI > i (prevailing interest rate)	The business is eligible to be developed
ROI < i (prevailing interest rate)	The business is not eligible to be developed

3) Marketing Effectiveness

Technical effectiveness indicators (TE) according to Soekartawi (2002):

$$TE = \frac{\text{Marketing Cost}}{\text{The value of the marketed product}} \times 100\%$$

Operational Definition and Variable Measurement

1. Factors of production such as nature, labor, and capital aim to generate production and income in the agricultural sector.
2. Costs are all efforts that need to be made for a production process which is stated in units of money according to the prevailing market price, both those which have occurred or those which will occur.
3. Capital is all assets or goods in the company which have a productive function.
4. Means of production are anything that can be used as a means of achieving an objective or goal. Meanwhile, production infrastructure is anything of the main support for the implementation of a process.
5. Oyster mushroom production is the process of changing input or production factors to produce oyster mushrooms.
6. Oyster mushroom marketing is an exchange process which includes a series of activities aim at moving commodities from producer farmers to final consumers.
7. Market is a physical place or location where sale and purchase transactions occur.
8. Marketing strategy is a planning analysis process designed to satisfy consumer needs and wants.

RESULTS AND DISCUSSION

A. The Overview of Research Location

Sumberagung Village is located in Ngantang District with an area of 1,409 ha. Sumberagung Village which is administratively included in Ngantang District area described as follows:

- To the north, it is bordered by Tulungrejo Village
- To the east, it is bordered by protected forest
- To the west, it is bordered by Mulyorejo Village
- To the south, it is bordered by Kaumrejo Village

The topography of Sumberagung Village includes village which is located at 7.5093 LS, 112.2242 East Longitude which have fairly fertile land, with hilly land surfaces, moderate productivity and mountainous conditions. The population of Sumberagung Village is 5,145 people, consisting of 2,632 men and 2,513 women with 1,569 families.

B. The History of Oyster Mushroom Business

Oyster mushroom entrepreneurs have a background of experience as farmers as well as wood furniture entrepreneur. The scarcity of wood supply in the market caused an expensive market price of wood, resulting in a reduced supply of raw material (wood).

The decrease in the supply of wood resulted in the stagnation of a furniture business and a decline in the number of consumers, the tendency to be unable to meet consumer demand.

Failure in the furniture business did not kill the entrepreneur's creativity, so that by working as a tire repairman while pursuing a hobby of raising goats and fish, it was hoped that he would be able to meet the economic needs of the family.

C. Oyster Mushroom Production

a) Means of Production

The facilities or equipment in the production of oyster mushrooms support the sustainability of the oyster mushroom business. The equipment that supports the oyster mushroom business is shown in **Table 3**.

b) Production Infrastructure

Coming after the means of production, production infrastructure in the oyster mushroom business is also the most important part to support the needs of the production process. Details of the oyster mushroom business production infrastructure are described in **Table 4**.

Table 3. Oyster Mushroom Business Equipment or Facilities

Equipment	Size	Number of (pieces)	Economic Life (years)
Blower	-	1	> 1
Farm tool sprayer	-	1	> 1
Water hose	15 m	1	> 1
ARTCO / Carts	-	1	> 1
Seed sower	30 and 15 cm	2	> 1
Sterilizer	544 baglog	1	> 1
Sieve	2x1m	1	> 1
Ax	-	1	> 1

Source: Processed Primary Data, in 2019

Table 4. Infrastructure or Production Equipment

Infrastructure	Size	Total	Description (Production Process)
Baglog Cylindrical Ring	-	1,000 pieces	3 x
Spirit	1 liter	1 package	1-2 x
Rubber band	Pak	1 pack	1-2 x
Double folio and A4 cover paper	10,5x10 cm, 21 x 29 cm	167 sheets, 125 sheets	1-2 x
Alternative roof / banner	15x 5 m	1 piece	> 3 x
Mulch plastic	150 m x 120 cm	1 roll	> 3 x
Paranet	15 m	1 piece	> 3 x
Baglog Plastic Wrapped	5 kg	1 pack (200 sheets)	1 x
Rafia String	-	1 roll	> 3 x

Source: Processed Primary Data, in 2019

Table 5. Oyster Mushrooms Harvesting Per Week

Week-	Yield on day- (kg)								Total (kg)
	1	2	3	4	5	6	7	8	
I	5	6	7	8	9	10	11	12	68
II	-	-	-	-	-	-	4	5	9
III	6	7	12	11	10	9	8	7	70
IV	6	7	5	4	8	9	7	6	52

Source: Processed Primary Data, in 2019

c) Initial Capital of Oyster Mushroom Business

The initial capital for the oyster mushroom business was Rp 7,173,500.00 with details of fixed costs Rp. 1,350,000.00 and variable costs Rp. 5,823,500.00 so that the capital spent by the oyster mushroom entrepreneur was quite large.

d) Labor

There were only one businessman and three part-time workers needed by the entrepreneur who were only for filling the oyster mushroom baglog.

e) Production Site

Two oyster mushroom production sites were built in the area of 3.5x15 m and 4.5x8 m on a private land area.

D. Oyster Mushroom Marketing System

a. Oyster mushroom harvesting

Harvesting was carried out in the morning (03:00 a.m) after the age of the mushrooms was four days after growing. Harvesting in the morning is part of the farmers' response to follow the morning market flow. The harvested mushrooms should not be exposed to water so that the water content is reduced and protected from damaged. The harvest which was carried out every day can be described in **Table 5**.

Table 5 shows that the fluctuations in the yield of oyster mushrooms were caused by unpredictable natural factors so that the temperature and humidity of the oyster mushrooms were not balanced causing the lowest yields in one production period that was 9 kg in the week-II, and the largest yield in one time production period was in week I that was 70 kg. The oyster mushrooms harvesting in mushroom house (*kumbung*) with a capacity of 3,000 baglogs of oyster mushrooms experienced one rest period which could reach seven to ten days after one harvesting process. The total harvest in one production process depended on the total capacity of the mushroom baglog produced.

b. Post-harvest

Post-harvesting was done in a simple way, starting from the preparation of plastic baskets and the harvesting process using a plastic basket as a container to put the oyster mushrooms, then the oyster mushrooms were ready to be transported to the traditional market using two-wheeled transportation without weighing them first. The weighing of oyster mushrooms was carried out in the market, then the oyster mushrooms were ready for sale.

c. Oyster Mushrooms Marketing

Marketing of oyster mushrooms was sold only for the consumers of Ngantang traditional market which was open every day from 04:00 to 08:00 am.

Direct marketing to consumers with the consideration of that oyster mushrooms are a perishable commodity, thus to avoid damages on the oyster mushrooms after harvesting is to market them quickly.

The price set for oyster mushrooms was IDR 10,000/kg. The price decision taken was based on the considerable competition of other mushroom farmers, so that harvest marketing had to compete with other mushroom farmers. Based on the selling price consideration above, it was quite effective because all of the total yields were marketable.

d. Oyster Mushroom Marketing and Input Analysis

a. Capital and initial costs

a.1 The initial capital is described in **Table 6**.

Table 6. Costs and Initial Capital for Oyster Mushroom Business

No	Description	Size	Amount (Rp)	Total
I	Fixed Costs			
1	Electricity		100.000,00	
2	Ownership of land	Private land	1.250.000,00	
	Total			1.350.000,00
II	Variable Costs (Equipment)			
1	Blower	1	250.000,00	
2	Farm tool sprayer + Water hose	15 m	260.000,00	
3	Artco/Cart	1	275.000,00	
	Cart tire	1	15.000,00	
4	Seed sower	2 unit	125.000,00	
5	Strerilizer	1	2.000.000,00	
6	Sieve	2x1m	50.000,00	
7	Ax	1	34.500,00	
	Total			3.199.500,00
	Equipment for planting media			
1	Baglog Ring	Rp.200,00 x1000	200.000,00	
2	Spritus, rubber dan paper		50.000,00	
3	Banner	15x5m Rp 9.000,00/ m	675.000,00	
4	Mulch plastic	1 roll	280.000,00	
5	Paranet	15mx15.000,00	225.000,00	
6	Baglog Plastic Wrapped	Contain of 200 lembar(5kg)	105.000,00	
7	Rafia String	1 roll	17.000,00	
	Total			1.552.000,00
	The need for planting media			
1	Sawdust	30 sack x7.000,00/ sack	270.000,00	
2	Bran	1000 log(120 kg)	216.000,00	
3	Calcium	6kgxRp 1.000,00	6.000,00	
4	Firewood	½ pickup truck	120.000,00	
5	Seeds	35 botlles Rp7.000,00/ botlle	245.000,00	
	Total			857.000,00
	Labor			
1	Labor (wholesale workers)	Rp 200,00 x1000	200.000,00	
	Family workers	Women 5000/hour		
		Men 7.500/hour	230.000,00	
	Total			430.000,00
	Marketing			
1	Round-trip transport		15.000,00	
	Plastic		5.000,00	
	Total			20.000,00
	Total number			7.408.500,00

Source: Processed Primary Data, in 2019

Table 7. Capital and Initial Costs of Oyster Mushroom Business in One Production Period

No	Land Area (m^2)	Desription	Costs (Rp)	
			Fixed cost	Variable costs
1	3,5 x15 m and 4,5 x 8 m	land and electricity	1.350.000,00	-
2		Equipment	-	3.199.500,00
3		Planting media infrastructure	-	1.552.000,00
4		The needs for planting media		857.000,00
5		Labor		430.000,00
6		Marketing		20.000,00
Total			1.350.000,00	6.058.500,00

Source: Processed Primary Data, in 2019

Table 6 shows that the expenditure of production costs in the initial period in one production process was Rp. 7,408,500. Details of the initial costs of the oyster mushroom business are listed in **Table 7**.

Table 8 shows that the capital and business costs of oyster mushrooms economically per company were Rp. 7,408,500.00 which was divided into fixed cost of Rp. 1,350,000.00 and variable costs of Rp. 6,058,500.00. The initial harvest period was carried out in one month if it was calculated based on the total harvest of 199 kg. The selling price per kg was Rp. 10,000.00 so that the oyster mushroom business suffered a considerable loss of Rp. 5,418,500. However, a change of emphasis on the operating expenses was quite small. Thus, in the next period, the oyster mushroom business could still survive.

a.2 Startup Capital

The business capital issued in the next period is the cost of operating the business with costs details listed in **Table 8**.

Table 8. Oyster Mushroom Business Costs

No	Description	Size	Amount (Rp)	Total (Rp)
I	Fixed cost			
1	Electricity		100.000,00	
	Total			100.000,00
II	Variable Cost			
	Equipment (planting media)			
1	Spirit, rubber dan paper		50.000,00	
2	Baglog Plastic	Contained of 200 sheets (5kg)	105.000,00	
	Total			155.000,00
	The need for planting media			
1	Bran	1000 log(120 kg)	216.000,00	
2	Calsium	6kgxRp 1.000,00	6.000,00	
	Total			222.000,00
	Labor			
1	Labor (wholesale workers)	Rp 200,00 x1000	200.000,00	
	Total			200.000,00
	Marketing			
1	Round-trip transport		15.000,00	
	Plastic		5.000	
	Total			20.000,00
	Total number			697.000,00

Source: Processed Primary Data, in 2019

Table 8 shows that the total capital or operational costs of the oyster mushroom business in the next period were Rp. 697,000, which included fixed cost and variable costs of the oyster mushroom business.

Table 9. Oyster Mushroom Production Period

No	Harvest Period	Total of Yield (kg)
1	Week- I	68
2	Week-II	9
3	Week- III	70
4	Week- IV	52
Total		199 kg

Source: Processed Primary Data, in 2019

The total of mushroom yields in one production period was 199 kg with the most varied production of 70 kg and the lowest production of 9 kg due to (1) unbalanced natural factors such as weather (2) simple maintenance factors such as only controling the temperature and humidity of the mushroom house or *kumbung* with water (3) the less sterile factor such as the seed filling process without controling the condition of the seed filling space from the incoming air.

b. Business Income

Oyster mushroom business income was influenced by the amount of production in one production process as presented in **Table 9**.

Oyster mushroom business income in the initial period of one production period is described in **Table 10**.

Table 10. The Oyster Mushroom Business Income in the Early Period

Total of mushroom yields (kg)	Cost (Rp)	Revenue (Rp)	Income (Rp)
199	7.408.500,00	1.990.000,00	-5.418.500,00

Source: Processed Primary Data, in 2019

Table 11. Oyster Mushroom Business Income in the Next Period

Total of mushroom yields (kg)	Cost (Rp)	Revenue (Rp)	Income (Rp)
199	697.000,00	1.990.000,00	1.293.000,00

Source: Processed Primary Data, in 2019

Table 12. The Effectiveness of Oyster Mushroom Business in the Early Period

Production (kg)	Costs (Rp)	Revenue (Rp)	R/C
199	7.408.500,00	1.990.000,00	0,26

Source: Processed Primary Data, in 2019

Table 13. The Effectiveness of Oyster Mushroom Business in the Next Period/ Month

Production (kg)	Costs (Rp)	Revenue (Rp)	R/C
199	697.000,00	1.990.000,00	2,85

Source: Processed Primary Data, in 2019

Table 14. ROI Calculations of the Early Period

Business Profit (Rp)	Start-up Capital (Rp)	ROI (%)
-5.418.500,00	7.408.500,00	-73,13

Source: Processed Primary Data, in 2019

Table 15. ROI Calculation of the Next Period

Business Profit (Rp)	Start-up Capital (Rp)	ROI (%)
1.293.000,00	697.000,00	185,50

Source: Processed Primary Data, in 2019

Table 16. Marketing Effectiveness of Oyster Mushrooms/ Month

Production (kg)	Marketing Cost (Rp)	Revenue (Rp)	Technical Effectiveness (TE-%)
199	80.000,00	1.990.000,00	4,020

Source: Processed Primary Data, in 2019

Table 10 shows that the total of initial cost of the oyster mushroom business was Rp. 7,408,500.00 andthe total revenue was Rp. 1990,000.00 as a result of the total harvest that was 199 kg per month, so that the profit obtained was Rp. -5,418,500.00.

However, a change of emphasis on the operating expenses was made in the next period, so that the mushroom business income for the next period in one production period could be described in **Table 11**.

Table 11 shows that the income from the oyster mushroom business was calculated after one month of planting or mycelium formation which is usually called as the incubation period.

c. Business effectiveness

The business effectiveness of oyster mushrooms can be determined by R/C (Return Cost Ratio) analysis. The efficiency of oyster mushroom business in the early period can be described in **Table 12.**

The results of R/C (Return Cost Ratio) analysis show a figure of 0.26 with the understanding that the oyster mushroom business was not feasible to be developed. However, the mushroom entrepreneur decided to continue and develop this business, thus, the next period of production experienced success. The total revenue and business costs of oyster mushrooms in the next period can be described in **Table 13**.

The result of R/ C (Return Cost Ratio) analysis shows a figure of 2.85, explaining that every Rp. 100.00 costs incurred there is an additional income of Rp. 285.00. it can be concluded that the oyster mushroom business was profitable and feasible to run.

d. Return On Investment (ROI) Analysis

The analysis to determine the return on investment (ROI) in the initial period is described in **Table 14**.

The result of ROI analysis shows that the percentage of -73.13% with the understanding that the oyster mushroom business is not feasible to be developed. However, a change of emphasis on the operating expenses was made, the results of the ROI analysis are described in **Table 15**.

The result of ROI analysis shows that the percentage was 185.50% with the understanding that each additional of Rp. 100.00 cost made by oyster mushroom farmers got an income of Rp. 18,550. Oyster mushroom farmers experienced loss if the ROI value is below 185.50%.

e. Marketing effectiveness

The marketing effectiveness of the oyster mushroom business can be divided into two analysis, that are analysing the initial period and the next period using the analysis of marketing effectiveness indicators. The analysis of marketing effectiveness of the oyster mushroom business is shown in **Table 16**.

TE figure of 4.020% explains that every Rp. 100.00 marketing costs would get an additional income of Rp. 402.00.

CONCLUSIONS

The results concluded that the input of oyster mushroom production is all forms of input such as production facilities and infrastructure, capital and business costs of labor and production sites.

The marketing system for oyster mushrooms started from harvesting, post-harvest and marketing activities that were still simple and traditional.

REFERENCES

BPS. 2016a. *Pengaruh Jenis Media Tanam Serbuk Kayu Dan Beberapa Dosis Dolomit (Camg(CO3)2) Terhadap Pertumbuhan Dan Produksi Jamur Tiram Putih (Pleurotus Ostreatus (Var.) Florida)*. http://scholar.unand.ac.id/15433/2/BAB I pdf.pdf.

BPS. 2016b. *Produksi Tanaman Sayuran Menurut Kecamatan dan Jenis Sayuran di Kabupaten Malang.* https://malangkab.bps.go.id/ statictable/ 2016 / 09/ 06/547 /produksi – tanaman – sayuran - menurut-kecamatan-dan-jenis-sayuran-di-kabupaten-malang-2016.html.

Sumardjo, dkk. 2004 . *Teori dan Praktik Kemitraan Agribisnis.*