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Feasibility Analysis Seaweed (Eucheuma Cottonii) Long Line System in the Village District of Pa'jukukang Rappoa Bantaeng

Yuliana
Domestic Agricultural Polytechnic Pangkep, Indonesia
hj_yuliana10@yahoo.co.id

Abstract: This study aims to calculate and analyze the feasibility of seaweed farming (*Eucheuma cottonii*) long line system in the village of the District Rappoa Pa'jukukang Bantaeng. Subjects were farmer's seaweed farming in the village Rappoa. With the number of respondents as many as 30 people. Data were collected by using observation, interview and questionnaire administration. The data were analyzed qualitatively and quantitatively using criteria analysis: analysis of the feasibility of operating revenue, revenue analysis cost ratio (R / C), analysis and Breakeven point (BEP). This research was conducted in the village of the District Rappoa Pa'jukukang Bantaeng selected intentionally (purposive) based on the consideration that the village Rappoa Bantaeng located in the coastal city where people do a lot of seaweed farming activities, to meet their needs. The results showed that the analysis of revenues and revenue cost ratio (R / C) can be interpreted that the cultivation of seaweed at the water village of the District Rappoa Pa'jukukang Bantaeng experiencing gains, based on the criteria of the R / C is more than 1. While based Break Event point (BEP) break-even point will be reached when the cultivation of seaweed dried seaweed produce as much as 264 kg or breakeven will be achieved at the price of selling seaweed for Rp.5.461 / kg. So that it can be interpreted that the cultivation of seaweed (*Eucheuma cottonii)* long line system in the village Rappoa feasible, or can be explained that the capital Rp.3.429.482 we can get the seller by 1.46 times the amount of capital. So from the results of this study can be generalized that seaweed farming (*Eucheuma cottonii)* with Long line system in the village of the District Rappoa Pa'jukukang Bantaeng feasible.

Keyword: *Feasibility Analysis, Seaweed (Eucheuma cottonii) Long Line System*

1. Introduction

Seaweed or other designations known as kelp, seaweed or agar-agar is a marine biological resources that have significant potential. See today the need for seaweed growing, both to meet the needs of domestic and overseas. The need is obtained from the extraction process of seaweed are widely used as a food ingredient or as an additive to the food industry, pharmaceuticals, cosmetics, textiles, paper paints and others. Not only that, but it can be used as green manure and animal and fish feed components. Indirectly seaweed well as aquatic ecological balance. The above reflects that the overwhelming human needs in seaweed, then the best way to not always depend on the supply of natural is to make the cultivation of seaweed. Until now very large seaweed production is supported by cultivation. Based on data DKP 99, 73 percent of Indonesia's production is the result of natural cultivation (Fahmi, 2013). Sapto (2011) also cited the development of aquaculture business that developed and developing comprehensive prosecuted. Moving on from the year 2009 by the National aquaculture production by 70% every year to reach the target production is expected reach 353% in 2014. Seeing that Indonesia should be able to reach the achievement of the main line up to 353% and even more than that. Given this country has the potential of fishery resources been quite large with a wide variety of marine organisms, which allows providing considerable contribution to the development of the economy. Moreover, supported by the Indonesian State layout dubbed with this archipelagic country, has a coastline of 81,000 km. Of course, the land or the wide area will be support in the future to streamline farming, including the cultivation of seaweed course. On the other hand seaweed as high commodity and perspectives to be cultivated turns proportional result in increased income for the farmers / fishermen who live on the coast. Even for this effort can be done only by using technology that is very simple and relatively inexpensive. To perform seaweed farming is a lot of technique or method that can be done by farmers / fishermen. If the first cultivation of seaweed usually performed sea waters but now also has to be done in brackish waters (ponds). One of the most common techniques is a technique long line, because it is quite effective and relatively inexpensive in terms of operating costs. Simply by using a rope and a buoy in the form of a bottle of mineral traces. This long line technique is also one way chosen by the farmers cultivating seaweed in the village Rappoa, District Pajjukukang Bantaeng district which is the location of the research.

According to Heryati (2011) the development of seaweed farming at present is still focused on the technical aspects of production and has not paid much attention to marketing and financial aspects. For that purpose in creating an increase in seaweed farming is sustainable not only in terms of the stages of production, processing and marketing, but also the financial aspects provide significant influence in building and launch a business. Whether it's to see how big the feedback obtained in investing, a capital to an enterprise. But it can also be a reference or guidelines for developing and stop these efforts while if it has experienced a condition that does not allow getting a receipt or expected benefits. Given the reality on the ground is often discouraging farmers in buying and selling the harvest is due to unstable prices and chain sales. Sometimes the price determined by the traders are in line with expectations despite that peasant farmers still sell it and continue his efforts to grow seaweed in the hope that when the seaweed can be sold at the desired price. This has become a benchmark for researchers to conduct studies to assess the feasibility aspects of seaweed farming especially in rural districts Rappoa Pajjukukang Bantaeng district, which is one of the districts chosen as a center for the cultivation of seaweed in Indonesia. It is based on the Decree of the Director General of Processing and Marketing of Fishery Number: KEP.08 / DJ-P2HP / 2009, the contents of which stipulate that the district Bantaeng as one Seaweed Treatment Centers of 15 centers fishery industry development in Indonesia.

Formulation of the Problem: According to the background above, the problem in this research is how the feasibility in seaweed farming (Eucheuma cottonii) system Rappoa long line in the village, District Pa'jukukang Bantaeng district.

Research Objectives and Purpose: The purpose of this study was to determine the feasibility of seaweed farming (Eucheuma cottonii) long line system which was developed in the village Rappoa, District Pa'jukukang, Bantaeng district. While the usefulness of this study as a parameter or a simple tool that can be used by seaweed cultivator's long line system in calculating and analyzing financial business. Whether it's to see how much acceptance or profits and more than that with the feasibility analysis will facilitate farmers see when the business is in a state of breakeven, in the sense not suffered a loss or not nor profit.

2. Literature Review

In Indonesia seaweed cultivation is still performed quite simple. To determine the success of aquaculture and seaweed produce good quality, there are several factors to consider. These factors are (Fahmi, 2013): The choice of location that meets the requirements for seaweed species to be cultivated. This is necessary because there is a different treatment for each type of seaweed, election or selection good seed, seed supply and the way the nursery appropriate methods proper cultivation, crop maintenance, harvesting methods and post-harvest treatment correctly, coaching and mentoring continuously to farmers. Lina (2013) there are several factors to consider in site selection, among others, the risk factors, the ease factor (accessibility) and ecological factors. At the risk factors seen from several things, the first is the problem keterlindungan seaweed and its facilities were used from the effects of wind and big waves, it would require a protected location. The second is the issue of security from theft and sabotage acts that could possibly happen so we need good relations with the surrounding community. Third is the issue of conflict of interest, some fishing activities such as fishing, ornamental fish collectors and other activities such as tourism, sea transportation, and industry can also affect the activity of seaweed business and interfere with some means of rafts.

Lina (2013) in the provision of seeds should be selected good seed from the harvest to see some of the criteria that is highly branched, dense, and spiky, there are no patches and flaky, a specific color (bright), aged 25-35 days with heavy seed planted is between 50-100 grams per clump and not exposed to ice-ice disease. It also needs to be considered regarding the handling of the seeds in bringing order to avoid damage during transit. Seeds should be kept wet / humid during the trip, is not exposed to fresh water or rain, and is not affected by oil or other impurities. Then, away from heat sources such as vehicle engines and sunlight. Long line method is a method of cultivation by using a long rope stretched. Of the several existing methods Long line of choice that is in demand by the people of seaweed farmers because of the many advantages that can be gained among others (Wishnu, 2011): Plants receive enough sunlight, the plants more resistant to changes in water quality, free from pests usually attack from the bottom, it grows faster, easier way it works, the cost is cheaper, the quality of the resulting good seaweed.

Heryati (2011), the determination of whether or not a business is by comparing the respective value of the eligibility criteria with the limits of feasibility. There are two approaches that are typically used to evaluate the feasibility, namely financial and economic analysis (Erlan, 2012). Financial analysis therein is considered in terms of cash-flow which is the ratio between the proceeds or gross sales (gross sales) by the amount of the costs (total cost) expressed in value. The results of the feasibility analysis commonly called the private returns while economic analysis considered is the total yield or productivity gains from all sources that can be used in the project to the communities receiving the results of the project. The result is usually called the social return (Soetriono, 2011). Analysis of operating income can be calculated using the following formula:
π = TR-TC
Information:
Π: profit / revenue
TR: total revenue (total revenue)
TC: Total cost (total cost)
Criteria:
TR> TC: a profitable venture
TR = TC: attempt at a balance point (breakeven)
TR <TC: Business losses
Components of total costs comprise variable costs (variable costs) and fixed costs. Variable costs are the costs that a total change proportionally degan changes in activity, in other words the variable costs are the costs which amount is influenced by the amount produced, but the variable costs per unit are constant. While costs are always kept as a whole without being influenced by the level of activity (Heryati, 2011).

Kartika (2012) revealed that the Revenue-Cost Ratio Analysis (R / C) aims to look at the relative advantages of a business within one year of the costs used in the activity. The criteria used in the analysis of R / C ratio are as follows:
If the value of R / C ratio> 1 is said to be a viable and profitable business
If the value of R / C ratio <1 venture to say unworthy and unprofitable
If the value of R / C ratio = 1 break-even venture to say (no profit and no loss)
Mathematically to calculate the Revenue-Cost Ratio (R / C) of a business then used the formula below:
R / C = (Total Revenue) / (Total fixed costs + Total Variable Costs)

Break Event Point is an analytical technique to study the relationship between fixed costs, variable costs, profits and volume of activity. Therefore this analysis in the planning of profit is profit planning approach that is based on the relationship between cost (cost) and revenue / income (revenue) (Sapto, 2011). This analysis is also commonly referred to as the break-even analysis. An attempt is said to break even if the amount of proceeds from the sale of a business at a particular period is equal to the amount of costs incurred, so that the business does not suffer a loss, but also did not make a profit. If the results of these efforts are unable through this point, then the business cannot provide earnings (Heryati, 2011)
Break Event Point can be formulated as follows (Ontje, 2013):

$$\mathbf{BEP_{(Kg)} = \frac{Total\ Cost}{Priceeach\ unit}}$$

$$\boldsymbol{BEP_{(Rp)} = \frac{Total\ Cost}{Total\ Production}}$$

3. Methodology

Time and Place Research: This research was conducted in the village of the District Rappoa Pa'jukukang Bantaeng district for more than two months, starting from November-December 2015.

Data Collection Methods: Heryati 2011 cited that for research descriptive population sizes above 1000, a sample of approximately 10% is sufficient, but if the population size of about 100 the number of samples that

must be taken so that the results are representative of the population that is peling least 30%, and if the size of the population is 30, then the samples must be 100%. The method used in this research is descriptive research method by using qualitative and quantitative approaches. Based on the source, the data collected in this study included primary data and secondary data. The primary data obtained through interviews namely data collection techniques with a question and answer based on a list of questions that had been developed previously by the authors submitted to the seaweed farmers, as well as other parties who will support and dealing with issues that are being investigated. The researcher also observation and direct observation in the field to see the activities of farmers cultivating seaweed and administration of questionnaires during the study to get a more significant information regarding the profile data and component costs seaweed farming. Secondary data obtained from periodic data results seaweed cultivation in Bantaeng in government offices and agencies concerned.

Data Analysis: Data were obtained in the form of qualitative and quantitative data which will be processed in a simpler form to be easily read and interpreted, which will be displayed in the form of tables and descriptive data analysis. Based on the data obtained to analyze the feasibility of seaweed farming (Eucheuma cottonii) system long line then use the analysis by using the following formula:

Analysis of Operating Revenues
π = TR-TC
Information:
Π: profit / revenue
TR: total revenue (total revenue)
TC: Total cost (total cost)
Criteria:
TR> TC: a profitable venture
TR = TC: attempt at a balance point (breakeven)
TR <TC: Business losses

Analysis of Revenue Cost Ratio (R / C)
This analysis aims to look at the relative advantages of a business within one year of the costs used in the activity. The criteria used in the analysis of R / C ratio are as follows:
If the value of R / C ratio> 1 is said to be a viable and profitable business
If the value of R / C ratio <1 venture to say unworthy and unprofitable
If the value of R / C ratio = 1 break-even venture to say (no profit and no loss)
Mathematically to calculate the Revenue-Cost Ratio (R / C) of a business then used the formula below:
R / C = (Total Revenue) / (Total fixed costs + Total Variable Costs)

Break Event Point Analysis of Price and Production
Break Event Point is an analytical technique to study the relationship between fixed costs, variable costs, profits and volume of activity. Therefore this analysis in the planning of profit is profit planning approach that is based on the relationship between cost (cost) and revenue / income (revenue) (Sapto, 2011). This analysis is also commonly referred to as the break-even analysis.
Break Event Point can be formulated as follows (Ontje, 2013):

$$BEP_{(Kg)} = \frac{\text{Total Cost}}{\text{Price Per unit}} \quad \text{and,} \quad BEP_{(Rp)} = \frac{\text{Total Cost}}{\text{Total Production}}$$

4. Results and Discussion

Feasibility Analysis: Feasibility analysis is used to determine the level of financial viability of farmers in doing business. On average in a year respondents cropping season activities as much as 5 (five) times, so that in this analysis the calculation of total costs, depreciation, the amount of revenue and profits do perproduksi. Calculation of the feasibility of seaweed cultivation using analysis of operating revenue, revenue cost ratio analysis, cost benefit analysis and break-even point of price and production. In advance will be discussed about the costs of both investment costs and operating expenses including depreciation costs. Capital seaweed farming is detailed in the investment component to result in planting and harvest handling activities.

Investment costs: The investment cost is a permanent working capital or the costs incurred to acquire investment goods. Capital investment is generally a capital which is usually used in the long term. The value of investment capital will experience shrinking from year to year and even from month to month. For more details, capital investments seaweed farming can be seen in Table 1.

Table1: Average Price Cultivation Equipment and Depreciation Seaweed (Eucheuma cottonii) Rappoa Rural District of Pa'jukukang Bantaeng 2015

No.	Type Item	Number	Value (US $)	Total Number	Economic Age	Depreciation per Production
1	Seed	960	2.000	1,92 million	-	-
2	Straps seaweed (rope Pous)	17 ball	75.000	1.275 million	2 years	127.500
3	Ropes stretch of 5 mm	64 kg	34.000	2.176 million	2 years	217.600
4	Rope anchor	18 kg	34.000	612.000	2 years	61.200
5	Strap plot 12 mm (bund)	35 kg	34.000	1.19 million	2 years	119.000
6	Sacks (containing sand as an anchor)	24 pieces	2.000	48.000	2 years	4.800
7	Jergen (5 liters) to	16 pieces	5.000	80.000	2 years	8.000
8	Jergen (20 liters)	4 pieces	25.000	100.000	3 years	6.666
9	Aqua bottle (600 ml) as a float	720 pieces	200	144.000	2 years	14.400
10	Bottle aqua (1500 ml)	15 pieces	300	4.500	2 years	450
11	Boat	1 pieces	8.000.000	8.000.000	5 years	320.000
12	Machines Katinting	1 piece	1.500.000	1.500.000	5 years	-
13	Knives	20 pieces	10.000	200.000	2 years	20.000
14	Stretcher (tool hauling seaweed)	1 pieces	100.000	100.000	3 years	6.666
15	Sacks of plastic	30 pieces	2.000	60.000	2 years	6.000
16	Tarpaulins (8x6 meters)	1 pieces	240.000	240.000	3 years	16.000
17	Waring	48 meters	4.000	192.000	2 years	19.200
18	Points of drying (8x6 meters) (rack)	1 pieces	3.000.000	3.000.000	5 years	120.000
19	Fuel (watercraft)	30 liters	7.000	210.000	-	-
Total				18.661.500		999.482

Source: Primary Data after processing, 2015.

Table 2: Operational Costs of Business Seaweed (Eucheuma cottonii) Long Line System in the Village District of Pa'jukukang Rappoa Bantaeng

Cost Type	Costs
Fixed Costs	
Shrinkage	999.482
Total Fixed Costs	999.482
Variable Costs	
Seeding	1.92 million
gasoline (fuel boat)	210.000
Power binder seedlings	480.000
Workers planting	300.000
maintenance personnel	400.000
power harvesting	850.000
The drying power	400.000
Total Variable Costs	2.43 million
Total operating costs	3.429.482

Source: Primary Data after processing, 2015.

Operating Costs: The production costs are those costs incurred to finance all production activities. The production costs are calculated in seaweed farming activities are divided into two, namely fixed costs (fixed cost) and variable costs (variable costs). The operational costs seaweed farming used amounted to 3,429,482 rupiah. This is shown in Table 2 operating costs consists of fixed costs is the cost of depreciation and variable costs are labor costs. For more details can be seen in Table 2. The value of the eligibility criteria seaweed farming (Eucheuma cottonii) Long Line System in the Village Rappoa. Sub district Pa'jukukang Bantaeng district is as follows:

Analysis of Operating Revenues: The average size reception seaweed farmer respondents using formula TR = P x Q can be seen in Table 3.

Table 3: Average Revenue Seaweed Cultivation In the village of the District Rappoa Pa'jukukang Bantaeng, 2015

No	Revenue	Kg (Q)	Price (P)	TR (Total Revenue)
1	Dried Seaweed	720 kg	13.000	9.360,000,-

Source: Primary Data after processing, 2015.

Table 3 shows that the amount of revenue an average of 30 respondents in the research area is 9.36 million, - million is calculated based on an average production of 720 kg at an average price of 13,000 rupiah for one production. Thus the amount of total revenue (total revenue) obtained an admission per production. The value of TR and TC has been known so the average gains of 30 respondents can be calculated as follows:
π = TR-TC
π = 9.360.000- 3429482
π = 9.360.000- 3429482
π = 4734518
So that the average profit earned by the respondents in the study area is 4,734,518 million.

Analysis of Revenue-Cost Ratio (R / C): Revenue Cost Ratio analysis is an analytical technique that aims to see the relative advantages of a business within one year of the costs used in the business activities. The analysis Revenue Cost Ratio depends on total income or Total Revenue (T / R) and total expenditures or Total Cost (T / C) as follows:
R / C = TR / TC
R / C = (Total Revenue) / (Total fixed costs + Total Variable Costs)
R / C = 8,164,000 / (999,482 + 2,430,000)
R / C = 8.164 million / 3429482
R / C = 2.38
Based on the calculation analysis of revenue cost ratio (R / C) obtained values of R / C for the dry seaweed is 2.38. Based on the criteria of revenue cost ratio (R / C) obtained values of R / C> 1, so that it can be interpreted that seaweed farming in the village Rappoa profitable.

Analysis of Break Event Point (BEP): BEP shows a picture that must be achieved to obtain a breakeven point (no profit and no loss). The state of the breakeven point is a situation where the seaweed business receipts (TR) together with the costs (TC) or TR = TC. The following results BEP calculation:

$$BEP_{(Kg)} = \frac{Total\ Cost}{Price\ Per\ unit}$$

$$BEP_{(Kg)} = \frac{3.429.482}{13.000}$$

$$BEP_{(Kg)} = 264\ kg$$

And

$$\mathrm{BEP}_{(\mathrm{Rp})} = \frac{\mathrm{Total\ Cost}}{\mathrm{Total\ Production}}$$

$$BEP_{(Rp)} = \frac{3.429.482}{628\ kg}$$

$$BEP_{(Rp)} = 5460,95$$

or
$BEP_{(Rp)} = 5461$

Thus, the value of Break Event Point (BEP) production from the calculation of 264 kg means that the cultivation of seaweed (Eucheuma cottonii) system long line as conducted in the study experienced a breakeven during business production reached 264 kg. BEP value price of Rp.5461, - suggests that seaweed farming in the study experienced a breakeven or no profit and no loss at the time of the sale price of dried seaweed Rp.5461, - per kg.

5. Conclusion and Recommendations

Analysis of operating revenues and Revenue Cost Ratio (R / C) can be interpreted that the cultivation of seaweed at the water village of the District Rappoa Pa'jukukang Bantaeng district experiencing gains, while based Break Event Point (BEP) break-even point will be reached when the cultivation of seaweed produces grass 264 kg of dried sea or breakeven will be achieved at the price of selling seaweed for Rp.5.461 / kg.

Recommendations: From the research that has been done, it could be said a few suggestions as follows:

- Required role of government in setting the selling price of seaweed that is stable in the research area.
- Institutional strengthening such cooperation should be improved in order to provide for the welfare of society, especially the seaweed farmers in facilitating the needs of the cultivation of grass types cotton ii method Rappoa Long line in the village of the District Pa'jukukang Bantaeng.

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