Financial Analysis of Seaweed Farm in South Konawe District, Southeast Sulawesi, Indonesia

Rosmawaty, Yusriadin, Yani Taufik, Munirwan Zani, Muhammad Aswar Limi

Abstract—This study aims to find out the amount of income and the feasibility of seaweed farming in Konawe Selatan Regency. Population in this study were all seaweed farmers in South Konawe District, consist of 498 people, while the number of respondents was 221 people. Cluster Random and Simple Random Sampling methods were used to determine respondents. Types and sources of data used were primary data and secondary data. Direct interviews with respondents and literature studies were using to collect data and information. Price, production, fixed costs, variable costs, total costs and revenues have been used to determine income and R/C ratio of seaweed farms. The results showed that the amount of income earned by seaweed farmers in South Konawe District was IDR. 30,033,762 per year. Then the R/C ratio is 1.64, which is greater than 1, meaning that seaweed farming in South Konawe Regency is economically profitable and feasible to be developed.

Keywords: Financial, Farm, Sea weed, south Konawe district

1 INTRODUCTION

Indonesia is an archipelagic country, and as such has many coastal areas suitable for seaweed development. The magnitude of this potential causes the development of seaweed farming can be one solution to reduce unemployment and improve the welfare of people living in coastal areas. Market opportunities both at home and abroad are also quite large. Based on data from the Central Statistics Agency (BPS) seaweed exports as of July 2017 increased by 20.88% or valued at US $ 69.9 million from the same period in the previous year which was only US $ 57.6 million, estimated seaweed needs for the export market can reach 200,000 tons per year, while the domestic market needs reach 140,000 tons per year. Anggadiredja et al (2006) estimated that the world market of processed seaweed products increased by about 10% per year for carrageenan semirefine (SRC), agar and alginate for industry. While the alginate market for food increased by 7.5% and refined carrageenan increased by 5%. According to Nuryadi et al (2017) that seaweed marketing involves collecting traders and wholesalers.

South Konawe Regency is one of the seaweed production centers in Southeast Sulawesi Province which is also able to contribute to improving the economy of coastal communities and meeting domestic and foreign market demands. However, based on data from the Central Statistics Agency (2014 and 2015), there was a decline in seaweed production in Konawe Selatan District from 105,072 tons to 100,710 tons. The decline in seaweed production in Konawe Selatan by 4,362 tons as a result of falling seaweed prices in Konawe Selatan District which ranged from IDR 12,500 / kg - IDR 15,000 / kg in 2010 to IDR 10,000 / kg in 2013 and finally in 2015-2016 decreased to IDR 6,000 / kg (Fausayana, 2017). This condition occurs because there is a decrease in carrageenan concentration from 35% to 20-24% (Kasim and Asnani, 2012). Limi et al (2018); Muthalib (2019) environmental pollution factors and technological factors are thought to be the cause of the decline in seaweed production. In addition, Nuryad et al (2019) poor human resource causes an error in the allocation of funding is also one of the causes of the low production of seaweed because the use or allocation of costs greatly determines the success of farming, especially seaweed farming in Konawe Selatan District, then based on these conditions, it is interesting to conduct a study on "Financial Analysis of Seaweed Farming in Konawe Selatan District".

2 RESEARCH METHODS

This research was conducted in South Konawe Regency in January - May 2019. The population in this study was 498 seaweed farmers in Konawe Selatan District. Determination of research respondents was conducted using the Cluster Random Sampling method, then proceed with the Simple Random Sampling method. Determination of the number of samples using the Slovin formula to obtain a total sample of 221 people. Next, a proportional sampling was taken to find out the number of samples taken from each village. Data collection techniques used in this study were direct interviews with respondents and literature studies. Research variables include price, production, fixed costs, variable costs, total costs and revenues. Analysis of the data used is income analysis and R/C ratio analysis.

3 RESULT AND DISCUSSION

3.1 Income Analysis

There are three main components, namely revenue, costs and income in analyzing the income of seaweed farmers in

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Konawe Selatan Regency. Revenue is obtained from the multiplication of the amount of dried seaweed production, which is an average of 7,026 kg with seaweed prices which is IDR 11,000 / kg. While input costs are divided into two components, namely fixed costs and variable costs (Mubyarto, 1994). Fixed costs are costs that are not affected by the amount of seaweed production. The fixed cost of seaweed farming in Konawe Selatan Regency is an average of IDR 19,254,473 per year. While the variable costs are the amount of which is influenced by the amount of seaweed production. The variable cost of seaweed farming in Konawe Selatan Regency is IDR 27,972,489 per year. Then the income is the result of the reduction between the revenue obtained by the total costs incurred by the seaweed farmers. Regarding revenue, the total cost and income of seaweed farming in Konawe Selatan Regency can be seen in Table 1.

### Table 1: REVENUE, TOTAL COSTS AND REVENUE OF SEAWEED FARMING IN KONAWE SELATAN REGENCY IN 2019

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Value (IDR / Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Revenue:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Production (7,026 kg)</td>
<td>77,280,724</td>
</tr>
<tr>
<td></td>
<td>- Price (IDR 11,000/kg)</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Costs:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Fixed costs</td>
<td>19,254,473</td>
</tr>
<tr>
<td></td>
<td>- Variable costs</td>
<td>27,972,489</td>
</tr>
<tr>
<td></td>
<td>Total costs</td>
<td>47,226,962</td>
</tr>
<tr>
<td>3.</td>
<td>Income</td>
<td>30,053,762</td>
</tr>
</tbody>
</table>

**Source:** Primer data proceed, 2019.

The results showed that in seaweed farming activities in Konawe Selatan District, the average farmer earned an income of IDR 30,053,762. This figure proves that seaweed farming activities has potential to improve the economy of the community, especially in the coastal areas of South Konawe Regency. The income of seaweed farmers in South Konawe regency is the result of a reduction in the amount of revenue received by the total costs incurred by seaweed farmers within one year. The highest acceptance of seaweed farming in South Konawe Regency is IDR 77,286,000 per year. This figure is obtained from the product of the multiplication of 7,026 kg with seaweed price of IDR 11,000 per kilogram. The amount of seaweed production in Konawe Selatan District is obtained by multiplying the highest number of stretches of 1,000 ropes with an average production per stretch is 8 kg. The lowest income is IDR 17,600,000 per year. This figure is obtained from the product of the multiplication of 1,600 kg per year with seaweed price of IDR 11,000 per kilogram. The lowest amount of production is obtained by multiplying the number of stretches of 50 ropes with an average yield of 8 kg per stretch. Based on these conditions, it can be concluded that the acceptance of seaweed farming in Konawe Selatan District is influenced by the large number of stretch ropes used by farmers. The use of seaweed farming costs in Konawe Selatan Regency is divided into two components, namely fixed costs consisting of stretch ropes, anchor ropes, main ropes, bonding ropes, warping nets, tarpaulins, pearl buoys, buoy buoys and boats. Then the variable costs consist of seeds, labor and fuel. The results showed that the use of the largest inputs was seedlings, with an average of 2,195 kg per hectare (1000 m²), however the use of seaweed seedlings in Konawe Selatan Regency is still classified as low because based on the recommendation from WWF (2014) which states that a seaweed cultivation unit with a long line system with a size of 100 x 10 m² = 1000 m² or 1 ha requires 2400 kg of seeds requires. While the inputs with the smallest use are boats and engines, both of these inputs have a high enough price compared to other inputs, namely IDR 8,480,317 and IDR 5,133,484, respectively. Stretch ropes or ropes are ropes used in seaweed farming activities to bind seedlings. The average length of stretch rope used by seaweed farmers in Konawe Selatan District is 50 meters with a rope size of 4 mm. The highest use for stretch rope input is 500 kg and the lowest is 25 kg (1 kg = 100 meters). The size of the use of stretch ropes in seaweed farming activities in South Konawe Regency is influenced by the amount of construction owned by farmers. The average use of stretch straps is 110 kg at a price of IDR 55,000 / kg. Anchor ropes are used on both sides and all four corners of seaweed farming construction. This is done with the aim to strengthen the construction of ocean currents and the flow of marine vehicles that often cross around the construction. The size used for anchor straps is 8 mm or 10 mm. The highest use for anchor ropes is 24 kg and the lowest is 4.8 kg (1 kg = 50 meters). The size of the use of anchor ropes in seaweed farming activities in Konawe Selatan Regency is influenced by the number of constructions owned by farmers and the size of the ocean currents found at the seaweed farming location. The average use of anchor ropes is 6.1 kg at a price of IDR. 55,000 / kg. The main rope or also commonly called the foundation rope by seaweed farmers in Konawe Selatan District is a rope used as a place to tie a rope stretch of seaweed. The usual size for a main strap is 12 mm. The highest use of the main rope is 45 kg and the lowest is 9 kg (1 kg = 33 meters). The size of the use of the main rope in the activities of seaweed farming in Konawe Selatan Regency is influenced by the amount of construction owned by farmers and the size of the ocean currents found at the seaweed farming location. The average use of a main rope is 11 kg with a price of IDR. 55,000 / kg. A seedling strap is a 1.5 mm rope used to tie seaweed seeds to a stretch rope. Seeding straps are sold in bales at a price of IDR 40,000 / bales, usually the seed strap in one bales can be used for 5 stretch ropes. The highest use of seedling straps is 200 bales and the lowest is 10 bales. The size of the seed strap is influenced by the large number of stretch ropes used in seaweed farming activities.

Waring net is a net that is commonly used for idlers in the activity of tying seeds or in the process of drying seaweed. Waring net is sold per meter at a price of IDR 5,000 / meter. The highest use of waring net is 450 meters and the lowest is 20 meters. Usually the use of waring net is adjusted to the size of the drying area or where the seaweed seedlings are tied. Tarpaulin is a type of plastic that is commonly used to cover seaweed which is dried in the sun when it rains or at night. In addition, it is also commonly used for lazy activities in tying seaweed seeds. The highest use of tarpaulin is 5 pieces and the lowest is 1 piece. Similar to waring net, the use of tarpaulin is adjusted to the size of the area of the drying area or the place to bind the seeds. The average use of tarpaulin in seaweed farming activities in Konawe Selatan Regency is 1-2 units with an average size of 10 meters x 8 meters and the price is IDR 400,000 / unit. Pearl buoys by some seaweed farmers in Konawe Selatan District have the highest use of 20 and the lowest of 4. The use of pearl buoys is adjusted to the number of seaweed farming constructions owned by farmers. The average use of pearl buoys is 5 pieces at a price of IDR 125,000 / piece. Bottle buoys are used plastic bottles purchased by seaweed farmers from bottle collectors at a price of IDR 8,480,317 and IDR 5,133,484, respectively.
price of IDR. 300 / piece. The highest use of bottles is 5,000 and the lowest is 250. The average use of buoys from plastic bottles is 1,098 units. The size of the buoy use of plastic bottles is influenced by the large number of stretch of rope used in seaweed farming activities and is also influenced by the distance between the buoy of one bottle with another buoy. The use of bottle buoys is also influenced by the age of seaweed plants, if at a young age or when planting seaweed is still new, the use of bottle buoys is still small because the burden of seaweed is still relatively light, but when entering the harvest age, the use of bottle buoys is much more compared to before because of the growth of seaweed which resulted in weight gain in seaweed plants. The boat is a very important means of transportation in supporting seaweed farming activities. The average seaweed farmer has 1 boat, but not all boats are equipped with a katingting or outboard engine. The price of boats owned by farmers varies greatly depending on the size and age or duration of use of the boat because not all farmers who use the boat are obtained from the making of new boats but some are obtained from farmers from other regions who sell their boats (used boats). The price of boats owned by seaweed farmers in Konawe Selatan Regency is in the range of IDR. 3,000,000 - IDR. 17,500,000 per unit. However, if seen based on the average, the price of the boat is IDR 8,480,317 / unit. The use of fuel oil (BBM) shows that the highest number is 52 liters while the lowest number is 5 liters with an average of 7.8 liters. If viewed based on the amount, the use of BBM is not too much. This is because the average location of seaweed farming with farmers' residence is not too far away so as to minimize the use of fuel oil. The price of fuel that applies at the study site is IDR 10,000 / liter. The use of machinery as one of the inputs that support seaweed farming activities has been largely utilized by farmers, although there are still some farmers who have not used the engine to equip the boat in the farming activities. The average seaweed farmer in Konawe Selatan District has an engine with an average price of IDR 5,133,484 / unit.

3.2 Feasibility Analysis
The results showed that the seaweed farming in Konawe Selatan District gained acceptance with a fairly varied amount depending on the yields and farm management of the seaweed farmers. However, if seen from the average, the receipt of seaweed farming is IDR 77,280,724 per year. Then seaweed farmers in Konawe Selatan Regency have different input costs according to the level of needs of each farmer based on the area of construction and the number of stretches of rope. However, the average total cost is IDR 47,226,962 per year. The results of the feasibility analysis of seaweed farming showed the value of R / C ratio was 1.64. This means that the R / C ratio value is greater than 1, meaning that seaweed farming in South Konawe Regency is economically profitable and feasible to be developed. R / C ratio value of 1.64 shows that every IDR 1 of the costs incurred by farmers for seaweed farming development activities will receive revenue of IDR 1.64. Similarly, research conducted by Ngamel (2012) shows that the R / C value of the ratio of seaweed farming in Kei Kecil District is 1.88 which means that it is feasible to be developed. Effendi and Oktariza (2006) state that R / C ratio analysis is an analysis tool to see the relative profit of a business in one year against the costs used in these activities.

4 CONCLUSION
Based on the results of the study, it can be concluded that the amount of income obtained by seaweed farmers in the Konawe Selatan Regency is IDR. 30,053,762 per year. The R / C ratio value is 1.64, which is greater than 1, meaning that seaweed farming in Konawe Selatan Regency is economically profitable and feasible to be developed. Need to increase the use of seaweed seedlings in the South Konawe District as recommended. As a form of efforts to improve the economy of the community, it is necessary to have a follow up of the cultivation results, namely processing seaweed products.

REFERENCES