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SOCIO-ECONOMIC ANALYSIS OF SEA FARMING IN PANGANDARAN (CASE STUDY IN COASTAL PANGANDARAN, PANGANDARAN DISTRICT, WEST JAVA PROVINCE)

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Key Words
Sea Farming, Social Economy, Grouper, Pompano, Star Pomfret

ABSTRACT

This research is aimed at analyzing employers' knowledge of the socio-economic value of *sea farming* and analyzing the feasibility of model business *sea farming* in Pangandaran. This research was conducted in January-July 2019. The research method used in this study was a case study method and quantitative descriptive analysis. The sampling technique was carried out in the form of *purposive sampling*. The results of this study indicate that the respondents' understanding of model *sea farming* only 29% of respondents understood model *sea farming* and 71% of respondents did not understand model *sea farming*. The feasibility of fish farming in floating net cages in Pangandaran has a profit of Rp. 83,294,500. The *B / C value of the ratio* average for cultivation in floating net cages is 2.02, which means that the business is feasible to run. *Break even point of* production produced by grouper is 502 kg / year, BEP of Pompano production is 1047 kg / year, BEP production of starfruit fish is 819 kg / year. The BEP value of grouper fish is IDR 150,572, the BEP value of Pompano fish is IDR 135,347, the BEP value of star pomfret is IDR 163,746. *The payback period* needed to obtain profits is 11 months 3 weeks.

INTRODUCTION

Most of Indonesia's territory consists of coastal areas. According to Akbarini (2012) coastal areas are areas inhabited by people with distinctive family characteristics. Use of fish resources in Indonesia is faced with the problem of scarcity and overfishing from conditions of open access. First, fisheries resources are not limited to being accessed by an unlimited number of vessels and can cause damage to fisheries resources. Second, there is no control over ship access, regulation of catches, and a decrease in the level of welfare of fishermen who are part of the socio-economic conditions (Nurhayati 2018).

Water of Pangandaran Regency are areas that are between Pananjung Bay and Parigi Bay, Pangandaran east coast is quite calm waters (Kusmato and Wahyu 2013). For the majority of Pangandaran people the profession as fishermen is the main choice apart from the limited employment opportunities on land, the Pangandaran community in general also considers that the fishing profession is a way of life that is inherited from generation to generation. Problems faced by fishermen are uncertainty over time both economic and natural factors (Nurhayati 2013).

With model of *sea farming* fishermen can predict the time factor needed to cultivate fish. Because model *sea farming* applied can help control fish farming. Model *sea farming* carried out in Pangandaran waters has several main activities in it, namely fish farming (hatchery and enlargement), *restocking of* fish resources, marine tourism activities, and rehabilitation of fisheries resources and the marine environment (Bramana 2015). One system in aquaculture is the Floating Net Cage system. Floating net cage activity is one of models *sea farming* which is seen as an alternative in increasing marine fish production and can maintain better conditions for the marine environment. Because program *sea farming* is a fishery activity that tends to be more environmentally sound in managing coastal and marine resources optimally and sustainably (Bramana 2015). Purpose of this study was to analyze the knowledge of entrepreneurs on socio-economic *sea farming values* and analyze the feasibility of model business *sea farming* in Pangandaran.

Ismail et al**.** (2001) translating *sea farming* is "gardening in the sea" which, when analogous to gardening on land, requires planting or spreading seeds through a seeding or breeding process first so that if the conditions are planted or raised stronger (disease resistance and changes in the weather). According to the *Japan Sea Farming Association, sea farming* is an activity of maintaining fish from upstream to downstream as a whole and involves various business components including master management, egg handling, seed production, production or spindling, enlargement which in further development into stocking efforts (*stock enhancement*) in a water with *rational fisheries*.

Process of the activities *of sea farming* is the selection of the type of fish that will be a parent *(seed selection),* candidates of the parent is raised*(brood-stock management),*do the spawning process from start gathering eggs, hatching, the enlargement of larvae to obtain seeds*(hatchery management)*. Because the seeds produced are still in a weak state, it needs to be seeded in the floating net cage at sea (*intermediate rearing*). After being large enough so that it is estimated that it is able to deal with predators immediately deployed to the sea (*releasing*). Next step is to regulate his arrest (time, size and number of catches) or *management resources* or *rational fisheries* and this is popularly called *responsible fisheries*. As a final action, it is monitoring and evaluating the results of activities *sea farming* (Ismail et al. 2001). Role of *sea farming* in Indonesia for the future is as an important supplier in fisheries production, extinction prevention of certain species, controlling over capture (*over fishing*), utilization & preservation of natural resources, provision of new business fields, employment and poverty alleviation, increased foreign exchange (Nurdjana, 2001).

Floating net cage technology is one of the most productive and intensive aquaculture techniques with construction composed of net cages installed on floating rafts in coastal waters (Sunyoto,

1994). One of the advantages of fish cultivation with KJA compared to technology other than KJA is that fish can be maintained at high densities without worrying about lack of oxygen (Basyarie, 2001). Floating net cage system consists of several components such as frames, net bags, buoys, road inspections and guard houses. Net bags are made of polyethylene and polyprophelen with various sizes of webs of various sizes. Buoys made of plastic, iron drums with a volume of 200 liters, *Styrofoam* or cork wrapped in a tarpaulin cloth that serves to keep the net bag floating near the surface of the water (Rochdianto, 2005).

Floating net cages have many angles such as hexagon, seismic or quadrilateral. Based on the location of the cages in the waters, there are three types of cages. Floating net cages are usually used in deep rivers, lakes or reservoirs and dams. This cage is located on the surface of the water, where each float is on the surface of the water (Kiswaloejo, 2004). The construction of floating net cages in addition to being influenced by species maintained is also influenced by environmental conditions, methods of cultivation, properties, and skills of local workers. Ideally the material used for floating net cages must be strong, lightweight, weather resistant and corrosion, easy to work on and repair, friction free, smooth texture so as not to injure fish. In addition, the floating net cage layout must be calculated based on the direction and strength of the current because the shape of the floating net cages in the sea is strongly influenced by currents (Achmad 1995).

According to Suriawan (2014), the selection of cultivation locations must consider various requirements and must pay attention to various aspects that must be in accordance with the needs of fish. The first thing to consider is brightness and turbidity. Brightness is one indicator used to determine the location for cultivation. Waters with very high brightness levels are indicated by clear waters, and waters like this can be said to be very good for cultivation sites. Brightness of the water location suitable for enlarging groupers is> 2 meters below the surface of the water (Jumadi, 2011). In the life cycle of young groupers live in coastal reef waters with a depth of 0.5-3.0 meters, then stepping into mature water into deeper waters between 7.0-40 meters.

Temperature is something that really needs to be considered in fish farming. Temperatures in Indonesian waters generally range from 28^{o}-30^{o}C. Surface temperatures are strongly influenced by meteorological conditions such as rainfall, evaporation, air humidity, angina speed and light intensity. The good temperature quality for the cultivation of tiger grouper is around 24^{o}-31^{o}C. Salinity is one indicator that must be interpreted. Salinity is the concentration of all saline solutions obtained in sea water. Waters with a high level of salinity are not recommended as a place for cultivating tiger grouper because the salinity fluctuations can affect the growth and appetite of the grouper that is maintained. According to Ahmad (2009), the optimal quality of salinity in the waters for grouper growth is between 30-33 ppt.

Coastal communities are a group of people (fishermen, fish farmers, fish traders, and other fishers) who live together to inhabit coastal areas to form and have distinctive cultures associated with their dependence on coastal resource utilization (Fatmasari 2016). Socioeconomic characteristics of coastal communities are that most coastal communities generally make a living in the marine sector such as fishermen, fish farmers, sand mining and sea transportation. In terms of the education level, most coastal communities are still low. As well as the environmental conditions of coastal communities, especially fishermen, they are still not well organized and seem to be slum. With the socio-economic conditions of the people who are relatively low in welfare, then in the long run the pressure on coastal resources will be even greater in order to meet the needs of coastal communities (Fatmasari 2016).

Socio demography comes from the words social and demographic. Social has non-demographic components such as education, employment, and others. Demography is the study of the population of a region, especially regarding the number, structure that includes age, religion, gender, and others. Sociodemographic aspects of fishermen will then be seen whether they affect their activities or not, both activities as fishermen and daily activities. Philip M Hauser and Dudley

Duncan (1959) proposed the definition of demography is to study the number, distribution, territorial, and composition of the population and their changes and causes of change, which usually arise due to fertility, mortality, territorial movement (migration) and social mobility (status change).

According to Gray *et al*. (1992), financial analysis is an analysis of the flow of funds and there are two types of estimates, namely the calculation of profit and balance losses in the business. This profit and loss calculation describe all revenues and expenses made by fishermen for a certain period of time. Opportunities for developing a business are inseparable from economic considerations, such as large profits and long returns on investment. Business analysis in the field of fisheries is a financial examination to determine success during the fisheries business (Rahardjo and Linting, 1993). Business feasibility calculations are conducted to assess the success or failure of an activity.

RESEARCH METHODS

This study was carried out in the cultivation of rare cages on the east coast of Pangandaran, Pangandaran Regency, West Java. The implementation of this research will last for 7 months, namely from January 2019 to July 2019. The research method used in this study is the census method. *Sampling* Saturatedis a technique of determining the sample if all members of the population are used as samples (Sugiyono, 2012: 96). This is often done if the population is relatively small, less than 30 people, or research who want to make generalizations with very little errors. Another term saturated sample is a census, where all members of the population are sampled. In general, data and information include: identity, family background, history of physical growth, history of education and learning evaluation results, testing results data, interests and hobbies, future plans, social interaction networks, and other data relating to the difficulties that appear now (Winkel & Sri Hastuti 2004).

Data source needed in this study is about the socio-economic analysis of *sea farming* in Pangandaran. Sources of data obtained by means of observation, interviews with the parties concerned, literature studies, giving questions through questionnaires. Data used will be primary data and secondary data. Sampling technique used in this study was purposive sampling technique. Which is where purposive sampling is a technique for determining research samples with certain considerations aimed at making the data obtained later be more representative (Sugiyono 2010). Key informants were selected based on their duties and authority in the cultivation of floating cages in Pangandaran.

Analytical method used in this research is quantitative descriptive analysis method. Quantitative method is an approach that scientifically views a reality that can be classified, concrete, observed, and measured in a structured manner, and the relationship of variables that are causal where the research data in the form of numbers and analysis using statistics (Sugiyono, 2008). Descriptive analysis aims to interpret the data that takes place with situations that occur systematically, factually and accurately about facts and the relationship between variables to get the truth, while the quantitative method aims to raise facts, state variables and phenomena that occur now and present in what it is (Sugiyono 2003).

According to Lipsey *et all* (1990) profit is the difference between income received from sales and opportunity cost of the resources used. To find out how much income will be obtained by entrepreneurs cultivating model *sea farming*, the following equation is used:

$$\Pi = TR - TC$$

Description:
Π : Advantages
TR : *Total Revenue* (Total Revenue)
TC : *Total Cost* (Total Cost)

Analysis *B // C Ratio* an approach with a systematic procedure to compare a series of costs relevant to

an activity or project.

$$\text{B / C ratio} = (Total\ Revenue\ (B)) \ / \ (Total\ Production\ Cost\ (TC))$$

If B / C Ratio> 1, business is feasible. If B / C Ratio <1, business is not feasible.

Break Even Point is break-even point or main return point on an income, where total revenue equals total cost. The longer a company reaches the pulp point, the greater the loss balance because the profits received still cover the costs incurred (Ibrahim 1998). In the calculation of Break Even Point (BEP) with a decrease in the formula that can be expressed such as:

$$BEP\ Q\ =\ TFC\ /\ (P - AVC)$$

$$BEP\ (Rp)\ =\ TFC\ /\ (1 - AVC\ /\ P)$$

Description:
P : Selling price per unit
AVC : Variable cost
TFC : Fixed costs

The *payback period* (PP) method is a method that calculates how fast the investment is biased again. PBP analysis needs to be displayed to find out how long a new business can work on reversing investment. Faster return on investment in a business, the better it will be more smoothly the screening of capital (Ibrahim 1998). PBP is calculated from the comparison between total variable costs and profits obtained, PBP is formulated as follows (Husnan and Muhammad 1999):

$$Payback\ Period\ =\ (Total\ Investment\ /\ Profit)\ x\ 1\ Year$$

RESULTS AND DISCUSSION

Pangandaran Regency is one of coastal areas in south of West Java which is between Pangandaran bay and Parigi bay. In southern part protrudes Tanjung Pananjung and eastern part is bordered by Ciputrapinggan river which empties into bay of Pangandaran and western part is bordered by Ciambulungan river which empties into Cikembulan. The geographical area of Pangandaran Regency is at position 108°30' to 108°40' East Longitude and 7°40°20" to 7°50°20" South Latitude. Viewed on the map of West Java, Pangandaran Regency is in the southeastmost position (Martasuganda 2016).

Pananjung East Coast is one of the areas in Pangandaran Village, Pangandaran District, Pangandaran Regency. East Coast of Pananjung has a beach length of 2,368 m and a white sand area that is still part of the nature reserve located on the East side of Tanjung Pananjung. This area has an average rainfall of 3,196 mm / year with temperatures ranging from 25-30°C and air humidity ranging from 80-90% (BBKSDA 2016).

Characteristics of Respondents

Characteristics of respondents seen from business experience, education, and age of entrepreneurs. Chosen respondents were people who carried out aquaculture activities using model *sea farming*. Respondents were divided into two categories, namely floating net cage entrepreneurs and floating net cages workers. The following is a description of the characteristics of community respondents *sea farming* in Pangandaran.

Age of Cultivators

Distribution of age of fishermen cultivating in floating net cages in Pangandaran is as follows:

Table 1. Distribution age of cultivated fishermen

No	Age (Year)	Frequency	Percentage
1	20-26	1	7.14%
2	27-33	2	14.29%
3	34-40	5	35.71%
4	41-47	3	21.43%
5	48-54	3	21.43%
Total		14	100.00%

Source: Primary Data (processed) 2019

Results from processed data can be seen from the table that the highest age group of fishermen cultivated in Pangandaran is 34-40 years with a percentage of 35.71% and the lowest percentage is the age group of 20-26 years with a percentage of 7.14%. The age of fishermen cannot be a benchmark as the level of work experience of fishermen in running a business.

Level of Education

Level of education can influence one's proficiency in decision making and problem solving. Education level of fishermen in floating net cage aquaculture in Pangandaran are as follows:

Table 2.Level of Education

No.	Education	Frequency	Percentage
1	Elementary School	5	35.70%
2	Junior High School	6	42.90%
3	High School	3	21.40%
Total		14	100.00%

Source: Primary data (processed) 2019

Results of data that have been processed above can be seen that education of fishermen cultivating in floating net cages in Pangandaran is mostly at elementary and junior high school levels. Where level of high school education can be said to be the lowest percentage. On average, fishermen who only have education up to elementary or junior high school are employees who work for floating net cage entrepreneurs. They are also usually not lords who carry out fishing activities. For fishermen who can get education up to the high school level, average is the owner of the floating net cage business itself. From this percentage we can see that level of education can make someone have a better job.

Work Experience The

Following is experience data based on the length of time being a fisherman in Pangandaran:

Table 3. Experience of Cultivating Fishermen

No	Experience (Year)	Frequency	Percentage
1	3-9	5	35.70%
2	10-16	2	14.29%
3	17-23	4	28.59%
4	24-30	1	7.14%
5	31-37	1	7.14%
6	38-44	1	7.14%
Total		14	100.00%

Source: Primary Data (processed) 2019

Results of data processing above show that the fishermen's working experience in Pangandaran is highest in the range of 17-23 years with a percentage of 28.59%. Lowest working experience of aquaculture fishermen is in the range of 24-30, 31-37, 38-44 years, where the three ranges of the year have a percentage of 7.14%. based on the questionnaire the experience data is calculated starting from fishermen who used to work as fishermen.

Understanding of Cultivators

Perception is interpreted as a view or understanding of someone about something or how to see something, where everyone sees things differently (Leavitt 1978 in Sriyanti et al. 2006). Self-understanding comes from understanding words that have correct meaning and also as a process of treatment and deed by means of understanding. In an understanding also used methods and methods used to find out things that need to be known, in an understanding itself includes several behaviors, goals also a message that describes in a communication, in an understanding includes the broad meaning used for the material to be studied (Purnawa 2001). In terms of the understanding of farmers regarding model *sea farming* applied in the Pangandaran Beach area.

Interviews were conducted to respondents to determine the extent of respondents' knowledge about model *sea farming*. Respondents interviewed were farmers who carried out cultivation activities in floating net cages. Number of cultivators conducting cultivation activities is 14 people. Fishing business group cultivating in floating net cages does not cover all entrepreneurs, there are only groups within individuals. However, the relationship owned by fishermen cultivating in floating net cages is very good. Fisherman can exchange information about cultivation techniques and market prices.

Respondents knowledge of *sea farming is* still very minimal. Entrepreneurs of fish farming in floating net cages only rely on field experience to cultivate fish. This happens because the average education level of the respondents is only elementary school graduates (SD), so the respondents' insights are not as broad as those of high school level respondents. High percentage of cultivators who already understand and do not understand about floating net cages shows that there is a perceived inequality about *sea farming*. This can happen because of the lack of assistance from the surrounding service regarding *sea farming* so that the community can only learn from the experience gained in the field.

Floating Net Cage Cultivation Techniques in Pangandaran

Cages used for cultivation are preparing nets. The nets to be used must be checked first so that no nets are damaged. In addition to the inspection of the damaged net, a net cleaning will be used. The size of the cage pool is 3x3 meters, with a total of 16 ponds. The net used for cultivation has a net mesh of 1-1.5 inches.

Next is the seed extraction for cultivation. The seeds used for cultivation are seeds measuring 8-10 cm. In selecting seeds to be used for cultivation, the seeds must have a uniform size. The seeds used must also have a bright body color, move agile, and no one is defective. Sowing the seeds is done after finishing selecting the seeds to be cultivated. Spread of seeds is usually carried out in the morning and evening, because to maintain the temperature of the water which ranges from 22-25^{o}C. The density of each pool for the size of 8-10 cm seeds is as much as 100-300 tails.

Giving fish food is done twice a day. At 05.00 and at 17.00 The feed used is usually fresh food in the form of trash fish that has been cut previously. The feed for trash fish used in the day of feeding is as much as 100 kg. Feeding is done by spreading evenly to each pool. Harvesting of fish can be done after 6 months of fish care. Fish that can be harvested are fish that have a body weight of 500-1200 grams. Harvested fish will be examined first if the fish is healthy or not. After passing the inspection process the fish will be weighed to check the weight of the fish.

Analysis Advantages of Floating Net Cage Cultivation Business

Benefits of cultivation in floating net cages are calculated in one cultivation period. Table 5 shows the data on the profit from the cultivation of floating net cages in Pangandaran.

Table 5. Analysis of Advantages

No.	Cost Type	Price (Rp)
1	*Fixed Cost*	Rp. 20,298,500
2	*Variable Cost*	Rp. 15,355,000
3	Operating Cost	Rp. 45,385,333
Income		Rp. 164,333,333
Expenditure		Rp. 81,038,833
Profit		Rp. 83,294,500

Source: Primary2019

Data shows that the income of aquaculture entrepreneurs is obtained from the sale of fish that has been cultured. The income of entrepreneurs is Rp. 164,333,000. Expenditures are calculated from investment costs, maintenance costs, and operational costs. Expenditures for aquaculture in floating net cages are Rp. 81,038,000. Business profits can be calculated from income and expenditure, the profit from this business is Rp. 83,294,500.

Table 6. Analysis Advantages of Groupers

Analysis Advantages of Groupers	
Total Fixed Cost	Rp10.086.000
Variable Cost Total	Rp65.200.000
Total Operational	Rp75.286.000
Total Revenue	Rp105.600.000
Advantage	Rp30.314.000

Source: Primary Data2019

AnalysisTable 7. Analysis Advantages of Pompano

Analysis Advantages of Pompano	
Total Fixed Cost	Rp10.086.000
Variable Cost Total	Rp63.200.000
Total Operational	Rp73.286.000
Total Revenue	Rp77.000.000
Advantage	Rp3.714.000

Source: Primary Data2019

Table 8. Analysis Advantages of Star Pomfret

Analysis Advantages of Star Pomfret	
Totalfixed Cost	Rp10.086.000
TotalVariable Cost	Rp63.600.000
Total Operational	Rp73.686.000
Total Revenue	Rp81.000.000
Advantages	Rp7.314.000

Sumbe Primary Data 2019

Table 6 shows that the advantages gained by employe cultivation grouper from the sale. Total income earned by grouper aquaculture is Rp. 105,600,000. Operational costs are calculated from the total *fixed costs* and *variable costs* get results of Rp 75,286,000. Business profits obtained by grouper aquaculture entrepreneurs are Rp. 30,314,000. Advantage is obtained from two cultivation seasons.

Table 7 shows the profit data from the Pompano cultivator in floating net cages. Total income from the sale of Pompano for the two cultivation seasons is Rp. 77,000,000. The operational costs for Pompey cultivation are Rp. 73,286,000. The business profits obtained by the Pompano Cultivator are Rp. 3,714,000.

Table 8 shows the profit data from the entrepreneurs of Pompano fish in floating net cages. Total income from the sale of Pompano for the two cultivation seasons is IDR 81,000,000. operational costs for Pompano cultivation are Rp. 73,686,000. Business profits obtained by the Pompano Cultivator are Rp. 7,314,000.

Depreciation Costs

According to Romita (2015) the benefits obtained depend on total revenues and total costs incurred, if the processor can reduce production costs as little as possible, then the profits received are greater.

This depreciation value is obtained from reducing the purchase value or investment value with residual value divided by age economic. Residual value referred to is the resale value of business unit after passing economic age or selling value desired by the entrepreneur when they want to sell the cultivation business unit. The economic life of floating net cages is 5 years.

Table 9. Analysis of the Costs of Bamboo Depreciation

Year	Costs	Accumulated	Final Value
0	-	-	Rp1,750,000
1	Rp350,000	Rp350,000	Rp1,400,000
2	Rp350,000	Rp700,000	Rp1,050,000
3	Rp350,000	Rp1,050,000	Rp700,000
4	Rp350,000	Rp1,400,000	Rp350,000
5	Rp350,000	Rp1,750,000	Rp00,00

Source: 2019 Primary Data

Table 9 shows the depreciation value of bamboo used to make cages of Rp. 350,000 / year. Because economic age of floating net cages is 5 years, after fifth year the final value of the shrinkage value is 0. This happens because the bamboo used for the construction of floating net cages cannot be used.

Table 10. Cost Analysis Depreciation Net

Years	Cost	Accumulated	Final Value
0	-	-	Rp7.560.000
1	Rp1.209.600	Rp1.209.600	Rp6.350.400
2	Rp1.209.600	Rp2.419.200	Rp5.140.800
3	Rp1.209.600	Rp3.628.800	Rp3.931.200
4	Rp1,209,600	Rp.4,838,400	Rp.2,721,600
5	Rp1,209,600	Rp.6,048,000	Rp1,512,000

Source: 2019 Primary Data

Table 10 shows the depreciation value of the net used for floating net cages is Rp.1209,600 / year. Final value of this net shrinkage after 5 years is Rp. 1,512,000, because net can be damaged that is not so large but cannot be used for fish farming. So that this net has a large residual value.

Table 11. Analysis of Mine Depreciation Costs

Year	Costs	Accumulated	Final Value
0	-	-	Rp576000
1	Rp92,160	Rp92,160	Rp483840
2	Rp92,160	Rp184,320	Rp391,680
3	Rp92.160	Rp276,480	Rp.299,520
4	Rp92,160	Rp368 .640	Rp.207,360
5	Rp92,160	Rp460,800	Rp115,200

Source: 2019 Primary Data

Table 11 shows the depreciation value of mine used in floating net cages of Rp 92,160 / year. Final value of mine depreciation that has been used for 5 years is Rp. 115,200.

Table 12. Cost Analysis of Cement Anchor Depreciation

Years	Cost	Accumulated	ValueEnd
0	-	-	200,000
1	Rp40,000	Rp40,000	Rp160,000
2	Rp40,000	Rp80,000	Rp120,000
3	Rp40,000	Rp120,000	Rp80,000
4	Rp40,000	Rp160,000	Rp40,000
5	Rp40,000	Rp200,000	Rp0.00

Source: Primary Data 2019

Table 12 shows the value of cement to anchor used to create cages of Rp. 40,000 / year. Because economic age of floating net cages is 5 years, after fifth year the final value of the shrinkage value is 0. This happens because the cement for the anchor used for the construction of floating net cages cannot be used.

Benefit Cost Ratio Analysis

Table 13 is result of calculation of the average *B / C ratio* of cultivation in floating net cages in Pangandaran :

Table 13. Average Value of *B / C Ratio*

No.	Business Type	Value B / C Ratio	Business FeasibilityBusiness
1	Floatingm Net Cage	2.02	Eligible for Business

Source: 2019 Primary Data

Result of the table above show the average value of B / C Ratio from cultivation to cages. The B / C ratio obtained is equal to 2.02, which means that business is feasible to run. Values that show more than 1 means that business is feasible.

Analysis *Break Even Point*

There are 2 types of *break even points*, namely *Break Even Point* Production and *Break Even Point* Prices.

Table 14. *Break Even Point* Fish Production

No.	Fish Species	Operating Costs	Price	Total (Kg)
1	Grouper	Rp75.286.000	150,000	502
2	Poached Fish	Rp73.286.000	Rp70.000	1047
3	Star Pomfret	Rp73.686.000	Rp90,000	819

Source: Primary Data (2019)

Table 15. *Break Even Point* Fish Price

No.	Fish Species	Operational Costs	Total Production	Total (Rp)
1	Grouper	Rp75,286,000	500	Rp150,572
2	Poached Fish	Rp73,286,000	550	Rp133,247
3	Star Pomfret	Rp73,686,000	450	Rp163,746

Table 14 show that the *Break even point* (BEP) value of production in groupers will break even if the production value reaches 502 kg / year. The BEP value of Pompano production will break even if it produces 1047 kg / year. The BEP value of production for star pomfret will break even if it produces 819 kg / year. Table 15 shows the *Break even point* (BEP) value of production in groupers will break even if the price value reaches Rp150,572. BEP value of Pompano prices will break even if it produces Rp133,247. The BEP value of the price for star pomfret will break even if it produces Rp. 163,746.

Payback Period

Table 16 shows the value of the *payback period*.

Table 16. *Payback Period*

No.	Component Cost	Total Cost (Year)
1	Total Cost	Rp162,077,667
2	Profit	Rp166,589,000
	Total	0.97

Source: Primary Data (2019)

Table 17. *PaybackPeriod* Fish Species

No	Fish Type	*PaybackPeriod*
1	Grouper	0.33
2	Pompey Fish	2.72
3	Star Pomfret	1.38

Source: 2019 Primary Data

Table 17 shows value *payback period* for each type of fish. *Payback period* smallest grouper with a value of 0.33 years. *The payback period* for Pompano is 2,272 years. *The payback period* for star pomfret is 1.38 years. The value of the *payback period* is the size value to find out how long the operational costs incurred by the entrepreneur can return. The greater value *payback period* , the longer the time needed for returning operational costs.

Conclusion

Conclusion of this research are as follows, social conditions of Pangandaran people who run a business in floating net cages of 14 people. Questionnaire results show that respondents' knowledge of *sea farming is* still very minimal. Entrepreneurs of fish farming in floating net cages only rely on field experience to cultivate fish.

The feasibility of fish farming in floating net cages in Pangandaran has a profit of Rp. 83,294,500. Profit value of each fish is as big as groupers, Rp. 30,314,000 for Rp. 3,714,000 for Pompano fish, and Rp. 7,314,000 for Star Pomfret. The *B / C value of theratio* average for cultivation in floating net cages is 2.02, which means that the business is feasible to run. *B/C Ratio value* of each type of fish is grouper 0.40, 0.05 pompano, and 0.10 star pomfret. *Break even point of* production produced by

grouper is 502 kg / year, BEP of Pompano production is 1047 kg / year, BEP production of starfruit fish is 819 kg / year. BEP value of grouper fish is IDR 150,572, the BEP value of Pompano fish is IDR 135,347, BEP value of star pomfret is IDR 163,746. *The payback period* needed to obtain profits is 11 months 3 weeks. *Payback period* for each type of fish is grouper for 3 months, Pompano for 2 years, and starfish for 1 year.

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