

## **Feasibility Analysis as the Development Livelihood Alternative Fishermen in Karanrang Island Of South Sulawesi**

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**Abstract:** The purpose of this research is to know alternative livelihoods are desired fishing households and determine the feasibility of the technical and financial aspects. The location of this research Karanrang Island, the total sample of 66 respondents. The method of data collection used is FGD (Focus Group Discussion) and surveys. Analysis of the Data to Determine the technical feasibility will be described related natural resources, human resources (HR), business processes, and market opportunities and financial feasibility of the calculated profit, business profitability, NPV (net present value), net B / C ratio, and IRR (internal rate of return). The results showed that the desired alternative livelihoods fishing is seaweed cultivation, manufacture shredded, making cakes, floating net cages, ornamental fish farming and hydroponic plants. Based on the analysis of the feasibility of the technical and financial aspects worthy of note that the alternative livelihoods is a seaweed cultivation, manufacture shredded, making cakes and floating net cages, with the profit per year ranged up to USD 28.018 million Rp1.025.000, business profitability (R) ranges between 5.33% to 55.82%. NPV ranged between USD 2.2182 million to Rp55.739.680, net B/C ratio ranged from 1.94 to 7.17, and the IRR ranges from 65.73% to 305.64%.

**Keywords:** Alternative Livelihoods, Household fishermen, business feasibility, technical feasibility and financial viability.

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### **I. Introduction**

Indonesia is the largest archipelago in the world, where the number of islands as much as 17,504 islands (Fauzi, 2005). Potential extensive coral reef ecosystem reaches 50 875 square kilometers or 18% of the total area of the world's reefs (Wilkinson, 2008). For the mangrove ecosystem has an area of approximately 3,189,359 hectares is the largest mangrove in the world and has 48 species (FAO, 2007). While a sea grass ecosystem is estimated at 30,000 square kilometers, of which there are 30 of the 60 species that exist in the world (Nontji, 2013). This potential 60% of the population live in coastal areas. With great potential is only a fraction of fishermen live well the rest remains largely underdeveloped or wealthy or poor. BPS (2008) that amounted to 64.37% of the poor live and rural coastal region.

Poverty is caused by underdevelopment, marginalization, low investment, low productivity, low savings, and low income (Suman, 2009). Fishermen backwardness in terms of education, the average fisherman 60% completes primary school (Zein, 2006). Many fishermen who do not have the capital to just rely on the work so that low income attributable profit sharing system (Retnowati, 2011). Outpouring of special fishing spare time working for 7.81 hours/day while women fishing for 8:38 hours/day (Wisdom, dkk.2008).

Household income will increase should take the time to create or business activities that help the household economy fisherman. Household livelihood strategy divided into two strategies on farm and off farm strategy (Wijayanti, et al. 2013). Anonymous (2006) states that the conception of participatory approaches to development and empowerment, partnership approach (partnership) and sustainable approach.

### **II. Material And Method**

The research was conducted on the island Karanrang Pangkep South Sulawesi. In the months from July to September 2014. The number of household population of fishermen as much as 439 households. According Sugiyono 2010 stated that 10% of the population can be sampled. So samples taken by 15%, so that a sample of 66 respondents. The data collection method used is the FGDs and surveys. FGDs were conducted to determine the needs and desires of the community in improving household incomes of fishermen (Bungin, 2007). The results of the focus group discussion activities collected and analyzed the feasibility; feasibility in the second, namely the technical feasibility and financial viability, for technical feasibility conducted by survey. The data required for the technical feasibility namely natural resources, human resources (manpower), business processes and market opportunities. After the effort declared technically feasible then continued financial feasibility

analysis. To determine the financial feasibility of having the formula feasibility (Umar, 2000 in Swastawati, 2011) can be seen as follows:

1. Advantages of business = TR – TC
2.  $R = \frac{L}{M} \times 100\%$
3. NPV ( net present value) =  $\sum NPV (-) + \sum NPV (+)$
4. Net  $\frac{B}{C}$  Ratio =  $\frac{\sum NPV (+)}{\sum NPV (-)}$
5.  $IRR = i_1 + \frac{NPV_1}{NPV_1 - NPV_2} (i_2 - i_1)$

Having examined the financial feasibility, so he found a decent livelihood developed.

### III. Results And Discussion

#### 3.1 Characteristics of Respondents

Identity fishing families respondents include: level of education, age and number of dependents. The results of the characteristics of the respondents can be seen in the following table:

**Table 1. Characteristics of Respondents by Education Level, Age, Number of dependents in Karanrang Island**

Category	Criteria	Frequency	Percentage
<b>Education</b>	Not End Elementary School	3	4.55
	Primary School	61	92.42
	High School	2	3.03
<b>Age (years old)</b>	20-29	7	10.61
	30-39	32	48.48
	40-49	22	33.33
	50-59	4	6.06
	60-69	1	1.52
<b>The number of dependents (people)</b>	2-3	31	46.97
	4-5	24	36.36
	6-7	11	16.67

Data Sources: Primary data, processed in 2014

Based on Table 1 that there is 92.42% of fishermen elementary education level and 4.55% did not finish primary education level thus concluded that the respondents' education is very low. Lack of education weakens the competitiveness of households in terms of competition better job, Lack of education will as expressed Nugraheni (2012) that the education level of the coastal area is still low. Adriani (2013) stated that the higher the education, the more likely to earn higher incomes.

Based on the age of the respondent highest percentage in the range of 30 years-39 years at 48.48%, followed by the age of 40 years-49 years amounted to 33.33% and the lowest in 60 years-69 years of age. Therefore concluded that the age of the respondents were generally productive age.

Based on the number of family dependents 46.97% dependents of fishermen have 2-3 people, number of dependents 36.36% dependents of fishermen have 4-5 people and the number of family dependents amounted to 16.67% with the number of dependents of 6-7 people, so it was concluded that number of family dependents fishing is big enough.

Fishing gear used in the location of research, namely nets, fishing squid and tools spear/arrow usually equipped compressor. The type of fish caught is mackerel (*Rastrelliger sp*), snapper, grouper, shrimp, sea cucumber, squid, overpasses, tinumbu.

Income varies According fishermen fishing season, the which in peak season, fishermen sail Often typically up to 25 times, in the medium, the fishermen go fishing as much as 19-22 times while in the bad season, and fishermen went to sea as much as 13-15 times. These differences lead to differences in the fishing season down to sea and this is because in peak season abundant catches of fishermen. While the famine rarely go to the sea because of their catch is reduced. The difference this season makes the results of different fishing income. Other than income distinguishing season, stratification also distinguish fishermen fishing income. For more details can be seen in the image below Medium season.

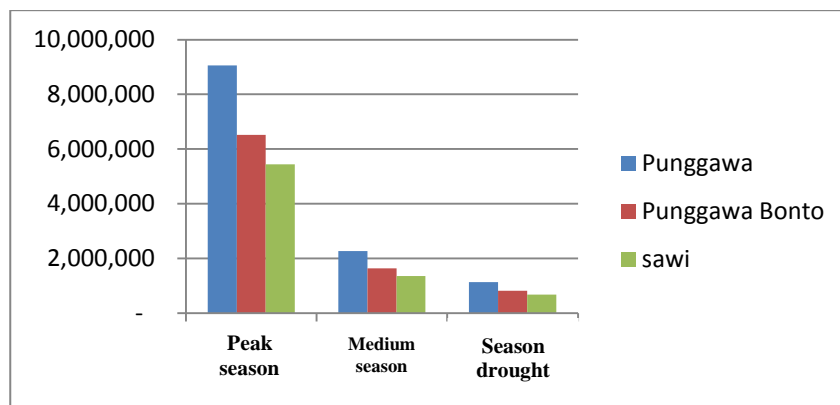


Figure 1. Total Household Income Fishermen stratification based on the season and fishing

Based on Figure 1, it is seen that most fishermen highest income owners. In the peak season and the owner of the above retainer Minimum Wage Rates while mustard under the Minimum Wage Rates, where the Minimum Wage Rates southern Sulawesi Rp 1,800,000. The season being and famine retainer and mustard under the Minimum Wage Rates. The low income of fishermen needed additional revenue to meet the needs of the domestic life of fishermen. To increase the income of fishermen need an alternative business in accordance with the wishes and needs. To know the desires and needs of the fishing is done FGD method. In the FGD activities fishermen want to add to the household income due to the bad season sometimes not conduct arrests, the peak season price of fish is very low. So to fix the price of fish is necessary activities to add value to the price of fish one of which is formed if the fish products. Woman fishing in general do not have productive activities, to take advantage of the time. With his spare time can do productive activities that add value to the business of fish products and others in accordance with the skill that once women fishermen follow.

### 3.2 Alternative Livelihoods

FGD results obtained in Karanrang Island can be seen in the following table:

Table 2. Alternative Livelihoods Karanrang Island

No	Alternative Livelihoods	Frequency	Percentage
1	Seaweed cultivation	66	20.00
2	Manufacture of shredded	66	20.00
3	Making cakes	61	18.48
4	Floating net	62	18.79
5	Ornamental fish culture	27	8.18
6	Hydroponic plants	48	14.55
<b>Total</b>		330	100.00

Data Sources: Primary data, processed in 2014

Based on Table 2 shows that the livelihood of the most desirable alternative fishing households, respectively, are seaweed and shredded making business by 20%, floating net cages at 18.79%, making cakes at 18:48%, at 14:55% hydroponic plants and fish farming ornamental at 8:18%. This effort was tested technically. Technical feasibility in terms of natural resources, human resources, business processes and market opportunities. To determine the technical feasibility of alternative livelihoods as follows:

#### 3.2.1 Technical Feasibility of Business

##### a. The Technical Feasibility of Seaweed Cultivation

###### 1) Natural Resources

A raw material (seeds) of seaweed is very easy to Obtain. Seedlings only once bought at the first cultivation of seaweed seedlings next taken from the results of previous cultivation of seaweed on the condition that has many branches and bright colors.

###### 2) Human Resources

Seaweed farming is a business that is already known by the coastal communities, where the seaweed effort involving members of the household (housewives and daughter can sort the seeds that will be used, the binder seed at harvest seaweed and seaweed can eject from his bonds, and drying seaweed to dry while the father and son can bring to the location seaweed cultivation, put seaweed, and harvesting seaweed).

###### 3) The process of seaweed farming

Seaweed farming is a business that is not difficult, to implement, time not too long maintenance only 40 days already harvest, does not require high investment. Location of seaweed cultivation is in the waters. In the

know that the waters of the open access to local governments regulate the cultivation location so as not to conflict.

4) Market

Market opportunities for seaweed is great because there is a company engaged in the field of seaweed that is PT. Bantimuring in Maros. The company has an agent in producing areas of seaweed. Where the marketing chain is not too long. In accordance with (Mahatama, E. et al. 2013) states that the marketing of seaweed split 2: 1) seaweed farmers to traders and traders village sub-district and then export and processing plant; and 2) seaweed farmers to traders and sub-districts to export and processing factory. So that the technical feasibility of seaweed cultivation feasible to be developed.

**b. Technical Feasibility *Abon* (shredded) Enterprises Creation**

1) Natural resources

Readily available raw materials. Since the raw material is fish. The location used for making business can use shredded fish fishing community kitchen so do not need a new one.

2) Human Resources

Labor required in the manufacture of shredded fish that is labor with women specifications. These activities are usually held the training of local governments and universities. Woman fishing on the island is generally only keep children and husband waiting from fishing. So can take the time and utilize the knowledge gained in training.

3) Business Process Making *Abon* (shredded)

Shredded raw materials business of making abundant during the peak season, when the fish is very cheap prices. Type of technology is very simple and very easy mastery. Location shredded manufacture does not require additional space as it can be made in a kitchen fishermen.

4) Market

Shredded very good market opportunities. Because this business is ready to be taken away to sea for fishermen, can be brought to the holy land, shredded content of food is also one of the bread.

**c. Technical Feasibility Cake Making Business**

1) Natural resources

Readily available raw materials, since many are sold in stores.

2) Human Resources

3) Workforce can use the wives of the fishermen. Fishing woman more time wasted for domestic activities. To take advantage of the time you should use the time productively.

4) Cake Making Business Processes

5) The process of making this cake is very cheap and easy. The place used to do in the kitchen fishermen.

6) Market

7) Cake making business market opportunity that is both on the island itself can also be entrusted in stores. Request much that when the day of aid feast.

**d. Technical Feasibility Enterprises *Keramba* Cage**

1) Natural resources

Business location floating net cages are still many locations because of the waters. Seeds are used widely sold in the market. Seedlings are also found in nature, because the catch is not quite ready for export, it is necessary first cultivated a new sale.

2) Human Resources

This effort can be carried out by members of the fishing community. Family members can help in feeding the fish.

3) Business Process *Keramba* Cage

Business process floating net cages is not too difficult an important feeding considered. Noteworthy in this cultivation is if there is a fish that is in contact with pests, when taxable pest fish quickly separated so as not contagious to other fish. Usually fish are in contact with these pests in the given treatment in a particular place or basin.

4) Market

Groupers very large market opportunity that is for the domestic market (large restaurant, hotel star) and for export markets (Japan, Hong Kong, Taiwan, Singapore, Malaysia and the USA).

**e. Technical Feasibility Ornamental Fish Farming**

- 1) Natural resources  
The raw material of ornamental fish is still lacking. On average seed ornamental fish caught in the wild.
- 2) Human Resources  
Labor for this effort is all family members.
- 3) Business Processes  
Ornamental fish farming is not so good because the treatment is very difficult, in comparison of freshwater ornamental fish. Where the business processes require electricity to run the electricity on the island of its generators while Karanrang not lit for 24 hours.
- 4) Market  
Market opportunities for very large ornamental fish because fish to be exported.

**f. Technical feasibility Hydroponics Plant Business**

- 1) Natural resources  
The raw material for hydroponic businesses can be purchased in stores farmer in Pangkep or in Makassar.
- 2) Human Resources  
This attempt to use the labor of household member's fishermen
- 3) Business process  
Hydroponic plants business is an activity that requires fresh water, where hard freshwater during the dry season.
- 4) Market  
Market opportunities on the island are not too good because fishermen household habits do not eat vegetables. Which became a substitute vegetable is cooked fish water

From the above discussion, we conclude that the effort is worth it or not alternative livelihoods technically feasible can be seen in the following table:

**Table 3. Feasibility technical effort Karanrang Island**

No	Alternative Livelihoods	Technical Feasibility			
		Natural Resources	Human Resources	Business process	Market Opportunities
1	Seaweed cultivation	Feasible	Feasible	Feasible	Feasible
2	Manufacture of shredded	Feasible	Feasible	Feasible	Feasible
3	Making cakes	Feasible	Feasible	Feasible	Feasible
4	Floating net	Feasible	Feasible	Feasible	Feasible
5	Ornamental fish culture	Not feasible	Feasible	Not feasible	Feasible
6	Hydroponic plants	Feasible	Feasible	Not feasible	Feasible

Data Sources: Primary data, processed in 2014

Based on Table 3 showed that there are four operations that are technically alternative livelihoods can be developed that seaweed cultivation, manufacture shredded, baking, and floating net cages, while there are two businesses that are not technically feasible that ornamental fish farming and hydroponic plants.

**3.2.2 Financial Feasibility**

**a. Financial Feasibility Seaweed Farming**

Seaweed farming with 100 stretches. The investment required is that 1) the rope Rp 4.888 million; 2) rope stretch of USD 2.808 million; 3) The main rope Rp810.000; 4) ballast Rp 94.500 5) buoy USD 420,000; 6) boat and engine Rp10.200.000 so the total USD 19.2205 million. This effort depreciation 5 years so Rp3.844.100.-

The operational costs of this effort: 1) seed Rp 750,000; 2) labor costs Rp 270,000; 3) Fuel oil (BBM) Rp 320,000 to Rp 1.34 million so in total, this business is done 2 times a year to Rp 2.68 million production.

Acceptance of this effort one time production of Rp 9.375 million, so the total revenues in the year to Rp 18.75 million.

So advantages seaweed farming Rp12.225.900 year, seaweed farming profitability of 63.61%, NPV seaweed farming Rp 37.2824 million, net B/C ratio of seaweed farming by 1.94, which means that every capital increase cultivation of grass Rp 1 and be increased by Rp 1.94. Thus it is feasible to be developed, seaweed farming IRR of 65.73%. The obtained value is greater than the value of the bank interest rate applicable is 14%.

**b. Financial Feasibility of The Business of Making Shredded**

The business of making investments that have shredded 1) skillet Rp 150,000, 2) pot 150,000, 3) stove Rp 200,000, 4) sodet, sieve, forks, knives, oil filter 100,000, 5) basins and buckets of Rp 50,000, 6 ) scales Rp 55,000 so the total Rp705.000, long use of tools for 3 years so depreciation is Rp235,000.-

This business is conducted once every week or fish where the raw material is needed as much as 50 kg at a price of Rp 25,000 so 1,250,000 total raw materials needed a month to Rp 5,000,000, seasoning Rp 500,000, gas Rp 60,000, 120,000 plastic, wages work Rp 500,000 to Rp 6.18 million would happen. This effort is done in a year so that the total production cost of Rp 18.54 million.

Shredded making business profits Rp 1.025 million per year, making business profitability shredded by 6.55%, the NPV of the business of making shredded Rp 2.9232 million, net B/C ratio of 4.15 shredded making business, which means that each additional working capital manufacture of shredded Rp 1 and be increased by USD 4.15. Shredded making business IRR of 172.73%. The obtained value is greater than the value of the bank interest rate applicable is 14%.

**c. Financial Feasibility of The Business of Making Cakes**

This business is an investment that is 1). Oven Rp 100,000, 2) stove Rp 200,000, 3) basin Rp 25,000, 4) mixer so the total Rp 172,000 to Rp 497,000. Use the old appliance is 3 years so the cost of depreciation of Rp 165 700.

This business is conducted once a week which require as much as Rp 120,000 wheat flour for a month so it takes as much as Rp 480,000, Rp 72,000 sugar, eggs Rp 60,000, Rp 20,000 gas, labor Rp 40,000, the total cost of USD 672,000. This business is conducted in a year so that the necessary operational costs Rp 8.064 million a year.

Cake making business profits per year USD 1.3703 million, cake making business profitability by 17.94%, the NPV of the business of making cakes for Rp3.563.520, Net B/C ratio of 7.17 for the cake-making business, which means that any capital increase manufacturing business cake Rp 1 it will be an increase of USD 7.17. Cake making business IRR of 305.64%. The obtained value is greater than the value of the bank interest rate applicable is 14%.

**d. Business Financial Feasibility Floating Net Cages**

Enterprises have a floating net cage aquaculture farm size measuring 4m x 3m x 3m and thus require an investment that is 1) net Rp 1.800.00, 2) wood Rp 2,000,000, 3) strap Rp 120,000, 4) nails Rp 160,000, 5) the making guard house Rp 3,000,000, 6) boat and engine Rp 10.2 million so the total of Rp 17,280,000. Duration of use of investment for 5 years so the cost of depreciation of Rp 3.456 million per year.

Seeds are needed as much as 500 head with a size of 10 cm at a price of @ 15,000 so the need of seed budget of Rp 7,500,000. Rp2.916.000 trash feed, pellet feed Rp 6.25 million, solar Rp 3.36 million where labor is 2 people per month Rp 1,000,000 per person, 8 months duration of this activity so that the total labor costs Rp 16 million, so the total operational cost of Rp 36.026 million.

Floating net business profit of Rp 28.018 million per year, business profitability floating net cages at 52,56%, NPV floating net cages effort RpRp.55.739.680 million, net B/C ratio floating net cages effort of 4.23, which means each addition, floating net working capital of Rp 1 and be increased by USD 4.23, IRR effort floating net cages at 171.5%. The obtained value is greater than the value of the bank interest rate applicable is 14%.

Alternative livelihoods efforts financially feasible can be seen in the following table:

**Table 4. Worth the Effort alternative livelihoods tested in Financial**

No	Alternative Livelihoods	Financial Feasibility				
		Profit	Profitability	NPV	Net B/C ratio	IRR
1	Seaweed Cultivation	12.225.900	55,82	18.061.900	1,94	65,73
2	Making Abon	1.025.000	5,33	2.218.200	4,15	173,73
3	Making Cakes	1.370.300	16,01	3.066.520	7,17	305,64
4	Keramba Cage	28.018.000	52,56	55.739.680	4,23	171,5

Based on Table 4 can illustrate that all businesses financially viable alternative livelihoods. Where the profit is positive, profitability over 1%, the NPV is positive, the value of the net B/C ratio must be greater than 1. For IRR accordance with the prevailing bank interest rate. Where the value of the applicable interest rate of 14%.

Alternative livelihoods that can be developed is financially viable seaweed cultivation, manufacture shredded, baking, and floating net.

## IV. Conclusions And Recommendations

### 4.1 Conclusions

- a. The livelihoods of people want that seaweed cultivation, manufacture shredded, making cakes, floating net cages, ornamental fish farming and hydroponic plants.
- b. Effort decent livelihood developed that seaweed cultivation, manufacture shredded, making cakes and floating net.

### 4.2 Recommendations

The number of items of alternative livelihoods efforts should be examined again more deeply, so that the business model of alternative livelihoods get the best on the island Karanrang.

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