

# The analysis of economic feasibility from Bubu Dasar fishing gear (Bottom fish pots) in Tepian Muara Sembakung, Nunukan (Indonesia)

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**Submission date:** 03-Jan-2021 03:49PM (UTC+0700)

**Submission ID:** 1482600305

**File name:** ttom\_fish\_pots\_in\_Tepian\_Muara\_Sembakung,\_Nunukan\_Indonesia.pdf (522.91K)

**Word count:** 8210

**Character count:** 38333

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To cite this article: Agus Indarjo *et al* 2020 *IOP Conf. Ser.: Earth Environ. Sci.* **564** 012070

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## The analysis of economic feasibility from Bubu Dasar fishing gear (*Bottom fish pots*) in Tepian Muara Sembakung, Nunukan (Indonesia)

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**Abstract.** The society of Tepian Muara Sembakung village, Nunukan Regency (Indonesia) render Sembakung waters as a potential resource that can be used as one of their income. The fisherman used Bubu Dasar fishing gear (Bottom fish pots). This research aims to analyze the economic feasibility business model of Bubu Dasar fishing gear (Bottom fish pots) in Tepian Muara Sembakung, Nunukan Regency, Indonesia. The sampling was conducted for 3 months, from November 2019 to January 2020. The research used a quantitative descriptive method with a case study approach. The Data was collected using survey with interview, observation based on catches from bottom fish pots as many as 14 times, and laboratory-scale method by doing identification of main catch, such as giant prawns (*Macrobrachium rosenbergii*) and by-catch composition like mangrove crab (*Scylla serrata*); catfish (*Pangasius hypophthalmus*); crossbreed fish (*Plotosus canius*); cand hopstick fish (*Toxotes jaculatrix*). The results obtained an average daily income of fishermen was IDR 379,286 with an average gross income in each month was IDR. 3,792,857 with total expenses in the form of maintenance costs, depreciation costs and operational costs of IDR. 444,868, so the average profit of fishermen in each month was IDR. 3,347,990. The business analysis can be seen from the average ROI index value as 33.4; the average BEP index value was 12.4 and the average benefit cost ratio (B/C ratio) index was 8.5, so the results of the three indices



explain that the bottom fish pots business analysis results are profitable and worthy of profit catching giant prawns (*M.rosenbergii*) using bottom fish pots in Tepian village, Sembakung sub-district, Nunukan district.

## 1. Introduction

Nunukan Regency is a part of North Kalimantan Province, where it consists of several Subdistricts that have abundant coastal biological potential, one of them is Tepian village [1]. The Tepian Village is an area that has biological resources of coastal ecosystems which consists of various ecosystems with high economic potential from mangrove, freshwater, river, aquatic, and estuary ecosystems. The river in Tepian village was estuary waters and it was influenced by tidal activities.

The estuary waters area has good potential fisheries resources to be utilized maximally and sustainably so that many fishing business activities carried out by the local community, one of them uses basic bubu fishing gear (bottom fish pots). Bottom fish pots are one of the fishing gear made by the local community by self-assembling so that they are easy to obtain and it was cheap relatively [2,3], where these fishing gear are environmentally friendly and passive which have trapping properties, so does not damage the ecosystem environment and aquatic biota in the waters of Estuaria, Tepian Village. Bottom fishing pots are used by the local community to become one of the livelihoods in carrying out business activities of catching potential estuary water resources so that the main catches and by-products are obtained. The main catches from bottom fish pots are the species of giant prawns (*Macrobrachium rosenbergii*) and bycatch such as chopsticks (*Toxotes jaculatrix*), catfish (*Pangasius hypophthalmus*), cross-fish (*Plotosus canius*) and mangrove crabs (*Scylla serrata*).

The main catch is used due to it has a high economic value. Based on the results of interviews and direct surveys in the field, the price range of giant prawns is determined by size, where size 1 (large) has a quite high price of IDR 85,000, while sizes 2 and 3 (medium and small) have a fairly economical price of IDR 30,000.

The problem that exists in bottom fish pots is that there is no welfare of the community in Tepian village in using of bottom fish pots as one of the livelihoods because fluctuations of giant prawn catch (*M.rosenbergii*) [4], so it is necessary to have research on economic analysis in using of bottom fish pots fishing gear in the business of catching giant prawns (*M.rosenbergii*) in the village of Tepian, Sembakung district, Nunukan Regency.

The purpose of this study was to analyze the economic feasibility model in the business of using bottom fish pots in the Tepian Muara Sembakung Village, Nunukan Regency, Indonesia.

## 2. Methodology

The research method was conducted using quantitative descriptive methods with a case study approach. Sampling of giant prawns data from this study was carried out by the experimental fishing method by conducting a direct survey in the field with two methods. The method of direct survey in the field is based on the results of interviews, questionnaires for bottom fish pots fishermen, and direct observation in the field by following the fishermen based on guidelines for clarifying the results of interviews and questionnaires regarding the composition of the catch [18]. The sampling method originating from bottom fish pots fishermen as many as 14 bottom fish pots based on bottom catches, there are three, namely the composition of the main catch in the form giant prawns (*M. rosenbergii*) and bycatch catch composition.

The research method by taking data from the catches of bottom fish pots in the Sembakung estuary. The identification analysis of species caught by fishermen was carried out in the Laboratory of Fisheries Biology, Fisheries, and Marine Sciences Faculty, University of Borneo Tarakan.

### 2.1. Time and Place

The study was conducted in Tepian Muara Sembakung, where it is a fishing ground area for fishermen who use bottom fish pots to catch giant prawns (*M. rosenbergii*) which used as the main catch. The research was carried out for 3 months, from November 2019 to January 2020.

### 2.2. Types and Data Collection Methods

The method of collecting data based on three ways, the first was survey and observation by following the fishermen and measured the catches based on the composition and total weight (main catches, byproducts and bycatch); the second was using an interview with basic bubu fishing gear by analyzing the fishermen's income level using a questionnaire and; the third by using a laboratory-scale method to measure the catch of Bubu dasar.

The data collection by using purposive sampling, where it is based on specific objectives, namely basic bubu fishing gear fishermen in Tepian Village. The observation method in the field based on the composition and catch of bottom fish pots fishermen with the activity of catching giant prawns by fishermen carried out 1 time in 3 days, so everyone conducts fishing activities as 10 times. A sampling of giant prawns for catch measurement is carried out with 15 samples, with a total of 30 base traps for each fisherman. Based on the number of samples taken around 150 giant prawns from 30 base traps, so that 10% of 15 giant prawns were taken [5–9].

The next data collection was a direct survey in the field using the interview method, where the interview based on the purposive sampling which records the total number of fishermen (survey in the field) using bottom fish pots as many as 14 fishermen by conducting an interview using the purposive sampling method where the interview was carried out directly using a questionnaire that has been prepared in accordance with the needs of the study.

2.3. *Analysis Method.* The analysis method used a quantitative descriptive by analyzing the research variables of total income, expenditure and profits [10,11] as follows

#### 2.3.1. Revenue Analysis:

1. Research variables to get the total income by using bottom fish pots according to Suyanto (2011) [11], the formula as follows:

$$TR = P \cdot Q \quad (1)$$

Note: TR = Total Revenue (Total Revenue in IDR)  
P = Price (selling price in IDR)  
Q = Quantity (catches in kg)

2. The total expenditure research variable based on Suyanto (2011) [11] stated that the benchmark in measuring the total measurement used for bottom fish pots in the Tepian Village, Sembakung District, Nunukan Regency is in the form of maintenance, supplies, depreciation, and so on. The formula as follows:

$$TC = TFC + TVC \quad (2)$$

Note: TC = Total Cost  
TFC = Total Fixed Cost  
TVC = Total Variable Cost

3. The research variable for profit, according to Sutawi (2002), explained that the income as an appreciation of the effort to carry out the work is managerial production organization, production factors, and risk accountability. Income for bottom fish pots entrepreneurs in Tepian Village, Sembakung Subdistrict, Nunukan Regency is the total income from catches reduced by the total expenditure costs. The formula as follows:

$$\pi = TR - TC \quad (3)$$

Note:  $\pi$  = Benefits  
TR = Total Revenue (catch x price of fish)  
TC = Total Cost (fixed costs + variable costs)

The criteria used in capture business are:

TR > TC, profitable fishing business  
TR = TC, capture effort at the breakeven point  
TR < TC, an attempt at arrest

#### 2.4. The Analysis of business activity variables.

Kasmir and Jakfar (2003) [12] uttered that financial ratios are receipts derived from the total costs (RCR) which are explained in an index (number) that the amount of profit or loss by comparing the receipts and total costs of expenses. Business analysis, according to Kasmir and Jakfar (2003) [12]; Rahardi (2007) [13], there are three indexes, namely ROI index, BEP index and B / C Ratio index.

2.4.1. *Return on Investment (ROI) Index.* According to Kasmir and Jakfar (2003) regarding the Return of Investment (ROI) index is a number (index) that describes the overall capital investment in generating net profits. The formula based on Kasmir and Jakfar (2003) in calculating the ROI index is [12]:

$$ROI\ index = \frac{Profit}{Investment} \times 100 \quad (4)$$

Note: ROI = Index return on investment  
Profit = total income (IDR)  
Investment = total business capital (IDR)

ROI Index criteria in catching business using bottom fish pots in Tepian Sembakung was:

ROI < 1, then the business is not feasible to try.

ROI = 1, it is worth the effort.

ROI > 1, then the business is very feasible.

2.4.2. *Break Even Point Index (BEP).* According to Rahardi (2007)[13] about the Break-Even Point index is a number (index) that describes the business that is at the break-even point (zero points) by comparing the production capital that has been issued with the income earned. BEP index formula formulation, according to Rahardi (2007); Mulyadi (2014); Suyanto (2011) is:

$$BEP\ index = \frac{Bep}{Q} \times 100 \quad (5)$$

Note: BEP = index break even point  
Bep = cost of production capital (IDR)  
Q = quantity of income earned (IDR)

BEP index criteria in the fishing effort using bottom fish pots in the Tepian Sembakung sub-district, Nunukan Regency, namely:  
BEP <1, then the business is detrimental.  
BEP = 1, then break-even (no profit or no harm).  
BEP > 1, then the business is profitable.

2.4.3. *B / C Ratio Index (Benefit / cost ratio)*. According to Kasmir and Jakfar (2003)[12] ; Rita (2019) [4]; Tibrani and Sofyani (2010) regarding the B / C ratio is an index that explains the comparison that comes from the total gross income earned in the business of catching giant prawns using bottom fish pots and the total cost of expenditure during fishing. Formulation of the B / C Ratio index formula according to Kasmir and Jakfar (2003) [12]; Tibrani and Sofyani (2010) [16]are:

$$Index\ B/C\ ratio = \frac{Total\ Gross\ Income}{Total\ expenses} \quad (6)$$

Criteria:

B / C Ratio <1: then the business has a loss and is not feasible to run.  
B / C Ratio = 1: then the business is not profitable and not losing (break-even)  
B / C Ratio > 1: then, the business makes a profit and is feasible to run.

### 3. Results

The study results by interviewing respondents as many as 14 bottom fish pots fishermen found that in Tepian Sembakung, there were basic bubu fishermen with the main catch of giant prawns (*M. rosenbergii*) where it was a type of crustaceans, which have a larger size than freshwater shrimp; however, giant prawns (*Macrobrachium rosenbergii*) in Tepian Sembakung are estuary type shrimp whose habitat contains salinity. The giant prawns in Tepian Sembakung are very good to be developed because they have high economic value, due to the selling price of giant prawns in Tepian Sembakung was IDR 40,000 ± 10,000 to IDR 85,000 / kg. The bottom fish pots used for catching giant prawns because they are passive and trapping so that the quality of giant prawns is still alive. This shows that the shrimp that are caught can not only be sold alone but can be cultivated so that the shrimp population can increase and grow continuously.

There are three categories of bottom fish pots catch, i.e., main catch, bycatch, and discard. The main catches was giant prawns (*M. rosenbergii*), while the by-products are chopsticks (*Toxotes jaculatrix*), catfish (*Pangasius hypophthalmus*), cross-fish (*Plotosus canius*) and mangrove crabs (*Scylla serrata*). However, They are pisces and one species of crustacean, sometimes become discarded because the fish caught are still small in size so that they are discarded by fishermen.

The results of interviews with fishermen respondents that the price of the main catch has a different price, where size 2 and 3 per kilogram is worth a price of IDR 30,000 and for size 1 each kilogram is worth to IDR 85,000. The bycatch does not have a selling price so it is only used as consumption by the fisherman and if it is still very small, the fish is discarded while the catch is not found.

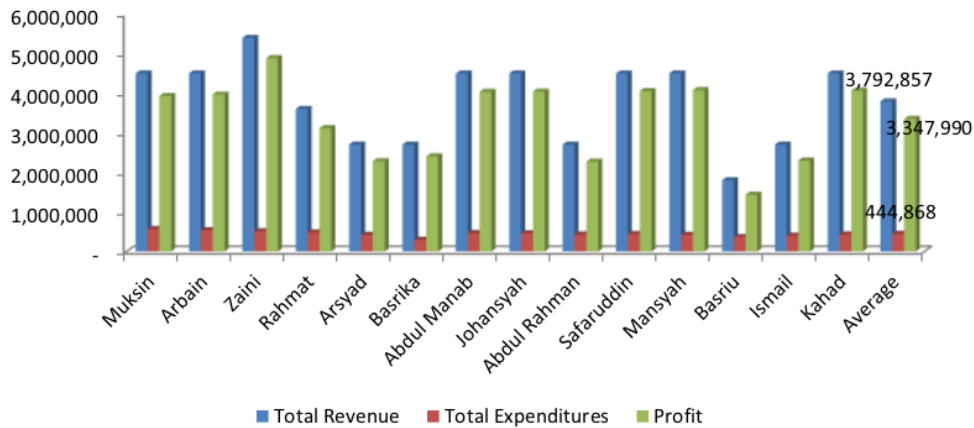
**Table 1.** The Amounts And Prices Based On The Composition Of The Fishermen’s Catches

No	Composition of results	Catch Type of bubu (species)	Catching trap (kg)	Price of each species (IDR)
1	Main catch	Giant prawn Shrimp ( <i>Macrobrachium rosenbergii</i> )	59	30.000,00
2	Bycatch	Catfish ( <i>Pangasius hypophthalmus</i> )	0.1	-
		Chopsticks Fish ( <i>Toxotes jaculatrix</i> )	0.1	-
		Sembilang fish ( <i>Plotosus canius</i> )	0.1	-
		Mangrove crab ( <i>Scylla serrate</i> )	0.1	-
3	Discard	-	-	-

Based on the results of research by conducting interviews with bottom fish pots fishermen, where the process of marketing or selling the catch is done by selling directly to the shrimp in the Tepian Sembakung. The shrimp suppliers buy fishermen's catches by looking for the size 2 and 3 with IDR 30,000 / kg, then size 1 with the price of IDR 85,000. The contractor buys giant prawns (*M.rosenbergii*) in sizes 2 and 3 with a price of IDR 30,000 / kg that sells directly to consumers IDR 40,000 / kg and for size 1 purchased with a price range of IDR 85,000 that sells to consumers with a price of IDR 100,000. The shrimp contractor commits shrimp sellers to post in Tarakan with a price of IDR 30,000 sold at the price of IDR. 70,000, while the shrimp price is IDR. 85,000 is sold at IDR. 110,000. The price range based on two different categories, namely small size with a price range of IDR 30,000 and large size with a price of IDR 70,000 ± 10,000. However, many fishermen get shrimp in a small range with IDR 30,000.

3.1. Revenue Analysis

3.1.1. Revenue Variable: The cost of capital is a major factor in a running business included a fishing business for the smooth running to benefit from the business of catching giant prawns (*M.rosenbergii*) using bottom fish pots in the Tepian Sembakung, Nunukan Regency.



**Figure 1.** The Analysis Of Bottom Fishing Pots Income Variable In Tepian Sembakung



Table 2. Investment And Expenditure Of Fixed Costs From Bottom Fish Pots In Tepian Sembakung

No	Name of the Fisherman	bottom fishing pots (IDR)			Fishing Boat (IDR)			Fishing boat engine (IDR)		
		Investment	Maintenance	Depreciation	Investment	Maintenance	Depreciation	Investment	Maintenance	Depreciation
1	Muhsin	4,018,000	5,581	117,333	1,500,000	23,583	21,875	3,500,000	23,667	10,417
2	Arbain	3,030,000	5,050	102,083	1,500,000	17,500	15,625	4,000,000	23,667	31,250
3	Zaini	2,890,000	3,441	59,583	1,800,000	22,333	8,333	4,300,000	23,667	21,875
4	Rahmat	2,830,000	3,369	62,083	1,800,000	19,417	29,167	3,200,000	32,000	16,667
5	Arsyad	1,740,000	3,625	40,000	700,000	6,317	33,333	2,000,000	23,667	49,722
6	Basrika	2,274,000	6,317	64,917	1,500,000	21,250	8,333	6,000,000	23,667	5,556
7	Abdul Manab	2,938,000	4,081	50,667	1,500,000	17,500	20,833	5,000,000	32,000	13,889
8	Johansyah	2,600,000	4,333	46,667	2,500,000	20,250	20,833	5,500,000	23,667	10,417
9	Abdul Rahman	2,620,000	4,367	44,583	1,500,000	23,583	31,250	5,000,000	23,667	10,417
10	Safaruddin	2,758,000	3,831	63,167	1,500,000	23,583	6,250	5,000,000	32,000	10,417
11	Mansyah	1,940,000	3,750	44,167	1,500,000	21,917	20,833	5,000,000	23,667	13,889
12	Basriu	1,600,000	3,333	50,000	1,500,000	17,833	20,833	3,000,000	32,000	20,833
13	Ismail	1,440,000	4,000	52,917	1,500,000	22,333	8,333	4,000,000	32,000	31,250
14	Kahad	2,260,000	3,767	56,250	1,500,000	23,583	15,625	5,000,000	23,667	15,625
	<b>Average</b>	<b>2,495,571</b>	<b>4,203</b>	<b>61,030</b>	<b>1,557,143</b>	<b>20,070</b>	<b>18,676</b>	<b>4,321,429</b>	<b>26,643</b>	<b>11,627</b>

Table 2 describes investment and fixed cost expenditures from fishing business activities from bottom fish pots that cause giant prawns (*M. rosenbergii*) as one of the livelihoods in Tepian Sembakung. There are 14 samples of fishermen who have been researched and there are 3 (three) basic investments that are most important in the business with maintenance costs and depreciation of equipment, which is required investment between IDR 2,729,000 + 1,289,000 with an average price was IDR 2,495,571 where there are maintenance costs with a price range of IDR 4,825 + 1,492 with an average of IDR 4,203, so that in using the equipment there is a depreciation of prices with IDR 78,667 + 38,667 and the average was IDR 61,030; fishing boat investment with a price range of IDR 1,600,000 + 900,000 with an average was IDR 1,557,143. There are maintenance costs with a price range of IDR 14,950 + 8,633 with an average was IDR 20,070, thus in using the equipment there is a depreciation of prices during usage of IDR 19,792 + 13,542 with an average of IDR 18,676; and investment in fishing boat engines with a price range of IDR 4,000,000 + 2,000,000 with an average was IDR 4,321,429. The maintenance costs was IDR 27,833 + 4,167 with an average of IDR 26,643 and the price reduction during usage was IDR 27,639 + 22,083 with an average of IDR 11,627.

**Table 3.** Investment, Total Expenditure / Fixed Costs, Variable Costs And Total Production Costs From Bottom Fish Pots Fishing Gear

No	Name of the Fisherman	Total investment (IDR)	Expenses (Fixed costs) (IDR)				Expense costs			Expense costs total
			Maintenance/ day	Maintenance / month	Depreciation / day	Depreciation / month	Operational/ Day	Operational/ month	Operational/ month	
1	Muksin	9,018,000	1,761	52,831	4,988	149,625	202,456	36,333	363,333	565,789
2	Arbain	8,530,000	1,541	46,217	4,965	148,958	195,175	34,000	340,000	535,175
3	Zaini	8,990,000	1,648	49,441	2,993	89,792	139,232	37,333	373,333	512,566
4	Rahmat	7,830,000	1,826	54,786	3,597	107,917	162,702	32,000	320,000	482,702
5	Arsyad	4,440,000	1,120	33,608	787	23,611	57,219	36,333	363,333	420,553
6	Basrika	9,774,000	1,708	51,233	2,627	78,806	130,039	16,667	166,667	296,706
7	Abdul Manab	9,438,000	1,786	53,581	2,846	85,389	138,969	32,667	326,667	465,636
8	Johansyah	10,600,000	1,608	48,250	2,597	77,917	126,167	33,333	333,333	459,500
9	Abdul Rahman	9,120,000	1,721	51,617	2,875	86,250	137,867	29,000	290,000	427,867
10	Safaruddin	9,258,000	1,980	59,414	2,661	79,833	139,247	30,333	303,333	442,581
11	Mansyah	8,440,000	1,644	49,333	2,630	78,889	128,222	29,333	293,333	421,556
12	Basriu	6,100,000	1,772	53,167	3,056	91,667	144,833	22,000	220,000	364,833
13	Ismail	6,940,000	1,944	58,333	3,083	92,500	150,833	25,000	250,000	400,833
14	Kahad	8,760,000	1,701	51,017	2,917	87,500	138,517	29,333	293,333	431,850
	<b>Average</b>	<b>8,374,143</b>	<b>1,697</b>	<b>50,916</b>	<b>3,044</b>	<b>91,332</b>	<b>142,249</b>	<b>30,262</b>	<b>302,619</b>	<b>444,868</b>

Table 3 explains the total investment costs of a giant prawn (*Macrobrachium*) using bottom fish pots in Tepian Sembakung, which consists of investment in bottom fish pots, fishing boats and boat engines fishermen, where there is a total investment with a price range of IDR 7,520,000 ± 3,080,000 with an average of IDR 8,344,143. The expenditures for *Macrobrachium*'s shrimp fishing business consist of fixed costs, that is maintenance and depreciation costs of the total investment price and consist of operational costs. The fixed expenses (depreciation and maintenance costs) obtained a total range of IDR 129,838 ± 72,618 with an average of IDR 142,249 and variable expenses (operational costs) with a range of IDR 270,000 ± 103,333 with an average of IDR 302,619. Total expenses consist of variable costs added to fixed costs so as to get a range of total expenses of IDR 431,247 ± 134,542 with an average of IDR 444,868.

**Table 4.** Total Receipts From Giant Prawn Catching (*M.rosenbergii*) Business Activities Using Bottom Fish Pots

No	Name of the Fisherman	Amount of catch / Trip (kg)	Selling price / kg (IDR)	Day activities (trip)	Total number of trips/day	Revenue/day (IDR)	Total Revenue / month (IDR)
1	Muksin	5	30,000	3	15	450,000	4,500,000
2	Arbain	5	30,000	3	15	450,000	4,500,000
3	Zaini	6	30,000	3	18	540,000	5,400,000
4	Rahmat	4	30,000	3	12	360,000	3,600,000
5	Arsyad	3	30,000	3	9	270,000	2,700,000
6	Basrika	3	30,000	3	9	270,000	2,700,000
7	Abdul Manab	5	30,000	3	15	450,000	4,500,000
8	Johansyah	5	30,000	3	15	450,000	4,500,000
9	Abdul Rahman	3	30,000	3	9	270,000	2,700,000
10	Safaruddin	5	30,000	3	15	450,000	4,500,000
11	Mansyah	5	30,000	3	15	450,000	4,500,000
12	Basriu	2	30,000	3	6	180,000	1,800,000
13	Ismail	3	30,000	3	9	270,000	2,700,000
14	Kahad	5	30,000	3	15	450,000	4,500,000
	<b>Average</b>	<b>4</b>	<b>30,000</b>	<b>3</b>	<b>12</b>	<b>379,286</b>	<b>3,792,857</b>

Table 4 explains that there is a total revenue or total income from the business of catching giant prawns (*Macrobrachium rosenbergii*) which obtained per 14 fisherman sampling trips: selling price of catching giant prawns; capture activities on each trip for one day; Daily receipts and monthly receipts generated from the capture business. The number of catches using bottom fish pots ranges between 4.0 ± 2.0 kg per trip for 1 day wherein 1 activity there are 3 trips; thus the total range from total trips in a day between 12 + 6 trips with the average fisherman sells for IDR 30,000. The giant prawns found in the range of sizes 2 and 3, so that the daily income from bottom fish pots is about IDR 360,000 ± 180,000 with an average of IDR 379,286. The total income of bottom fish pots in one activity that there are 3 trips so that in a month, they only use the bottom fish pots for 10 catches. They get dirty catch for a month is about IDR 3,600 ± 1,800,000 with an average gross income for each fisherman was IDR 3,792,857 (figure 1), where the catch of giant prawns (*M.rosenbergii*) is obtained in a range of 40 ±20 kg.

Table 5. The Benefits Of Bottom Fish Pots In Tepian Sembakung

No	Name of the Fisherman	Total Revenue (TR = P. Q)			Total Expenditures (TC = TFC + TVC)			Total Profit ( $\pi = TR - TC$ )	
		Activity / trip	Activities / day	Activity / month	Activities / day	Activity / month	Activities / day	Activity / month	
1	Muksin	150,000	450,000	4,500,000	18,860	565,789	468,860	3,934,211	
2	Arbain	150,000	450,000	4,500,000	17,839	535,175	467,839	3,964,825	
3	Zaini	180,000	540,000	5,400,000	17,086	512,566	557,086	4,887,435	
4	Rahmat	120,000	360,000	3,600,000	16,090	482,702	376,090	3,117,298	
5	Arsyad	90,000	270,000	2,700,000	14,018	420,553	284,018	2,279,447	
6	Basrika	90,000	270,000	2,700,000	9,890	296,706	279,890	2,403,294	
7	Abdul Manab	150,000	450,000	4,500,000	15,521	465,636	465,521	4,034,364	
8	Johansyah	150,000	450,000	4,500,000	15,317	459,500	465,317	4,040,500	
9	Abdul Rahman	90,000	270,000	2,700,000	14,262	427,867	284,262	2,272,133	
10	Safaruddin	150,000	450,000	4,500,000	14,753	442,581	464,753	4,057,419	
11	Mansyah	150,000	450,000	4,500,000	14,052	421,556	464,052	4,078,444	
12	Basriu	60,000	180,000	1,800,000	12,161	364,833	192,161	1,435,167	
13	Ismail	90,000	270,000	2,700,000	13,361	400,833	283,361	2,299,167	
14	Kahad	150,000	450,000	4,500,000	14,395	431,850	464,395	4,068,150	
	<b>Average</b>	<b>126,429</b>	<b>379,286</b>	<b>3,792,857</b>	<b>14,829</b>	<b>444,868</b>	<b>394,115</b>	<b>3,347,990</b>	

Table 5 explains the benefits of bottom fish pots fishing gear from total fisherman's income minus total expenses (operational costs, depreciation and maintenance). Total income (gross income) of fishermen from activities in 1 trip generates a range of IDR 120,000 ± 60,000 with an average of IDR 126,429 / trip. The activities in a day are carried out as many as 3 times a trip. However, the implementation is carried out for 3 days where the total income in one day with 3 trips is around IDR 315,000 ± 135,000 with an average of IDR 379,286. Within a month, fishermen complete 10 times of fishing because the fishing gear is determined based on tidal water. Total expenditure obtained is based on Table 3 where daily expenses have a range of costs about IDR 14,375 ± 4,485 with an average of IDR 14,829, while the total expenditure in a month obtained a range costs at IDR 431,247 ± 134,542 with an average of IDR 444,868 (figure 1). The daily profit of bubu dasar fishing gear comes from daily profits reduced by daily expenses so that a net profit was IDR 374,623 ± 182,462 with an average of IDR 394,115 and monthly net income about IDR 3,161,301 ± 1,726,134 with an average of IDR 3,347,990 (figure 1).

3.2. *The Business Analysis Variable*  
 The results of the study are derived from the analysis variables of the bottom fish pots fishing gear activities in Tepian, Sembakung which can be seen in Table 6 as follows.

**Table 6.** The Business Analysis Variables Of Bottom Fish Pots Fishing Gear In Tepian Sembakung

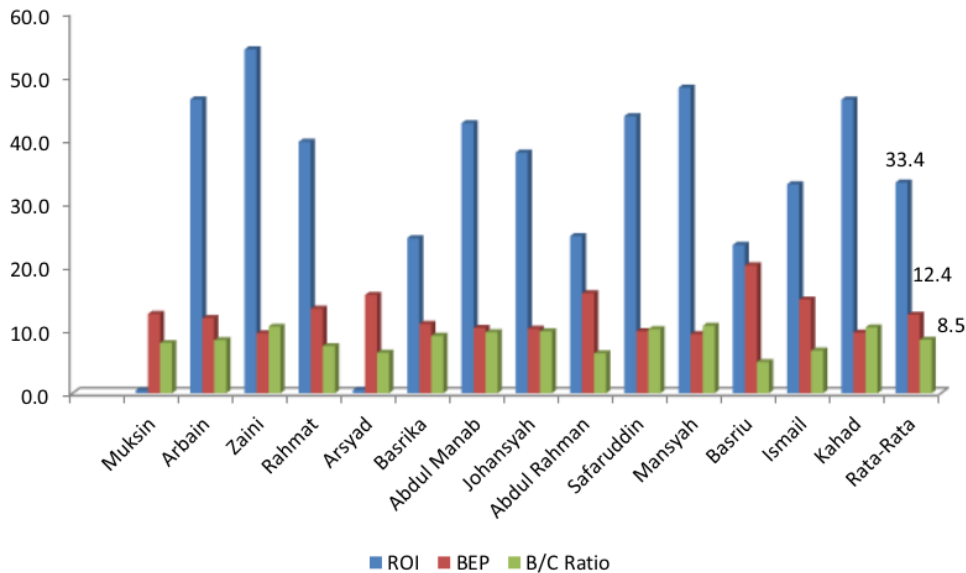
No	Name of the Fisherman	Total Profit (IDR)	Investment (IDR)	Production Costs Total Expenditures	Gross income (IDR)	ROI	BEP	B/C Ratio
1	Muhsin	3,934,211	9,018,000	565,789	4,500,000	43.6	12.6	8.0
2	Arbain	3,964,825	8,530,000	535,175	4,500,000	46.5	11.9	8.4
3	Zaini	4,887,435	8,990,000	512,566	5,400,000	54.4	9.5	10.5
4	Rahmat	3,117,298	7,830,000	482,702	3,600,000	39.8	13.4	7.5
5	Arsyad	2,279,447	4,440,000	420,553	2,700,000	51.3	15.6	6.4
6	Basrika	2,403,294	9,774,000	296,706	2,700,000	24.6	11.0	9.1
7	Abdul Manab	4,034,364	9,438,000	465,636	4,500,000	42.7	10.3	9.7
8	Johansyah	4,040,500	10,600,000	459,500	4,500,000	38.1	10.2	9.8
9	Abdul Rahman	2,272,133	9,120,000	427,867	2,700,000	24.9	15.8	6.3
10	Safaruddin	4,057,419	9,258,000	442,581	4,500,000	43.8	9.8	10.2
11	Mansyah	4,078,444	8,440,000	421,556	4,500,000	48.3	9.4	10.7
12	Basrii	1,435,167	6,100,000	364,833	1,800,000	23.5	20.3	4.9
13	Ismail	2,299,167	6,940,000	400,833	2,700,000	33.1	14.8	6.7
14	Kahad	4,068,150	8,760,000	431,850	4,500,000	46.4	9.6	10.4
	<b>Average</b>	<b>3,347,990</b>	<b>8,374,143</b>	<b>444,868</b>	<b>3,792,857</b>	<b>33.4</b>	<b>12.4</b>	<b>8.5</b>

Table 6 explains the analysis of the bottom fish pots in Tepian Sembakung with three components of the index variable, namely the ROI (Return of Investment), the BEP (Break-even point) and benefit-cost ratio index (B / C ratio) variables.

The ROI index variable is a comparison between profit and investment in 100 times, where the profit of fishing gear ranges from IDR 3,161,301 ± 1,726,134 with an average of IDR 3,347,990 divided by investment in fishing gear with a range of IDR 7,520,000±3,080,000 with an average of IDR 8,344,143. The result in an ROI index with a range between 38.9 ± 15.4 with an average was 33.4 (figure 2).

The BEP index variable is a comparison between production costs (total expenditure) and gross income of catches at 100 times, where the production costs (total expenditure) from the use of bottom fish pots is obtained in the range of IDR 431,247 ± 134,542 with an average about IDR 444,868 divided by gross income from sales obtained a range of IDR 3,600,000 ± 1,800,000 with an average of IDR 3,792,857. The result in a BEP with an index range about 14.8 ± 5.5 with the average was 12.4 (figure 2).

The benefit and cost ratio (B / C ratio) variable is the ratio between gross income and total expenditure. Gross income from sales of giant prawns (*M.rosenbergii*) was obtained in the range of IDR 3,600,000 ± 1,800,000 with an average of IDR 3,792,857 divided by the total expenditure from the use of business equipment to catch using bottom fish pots obtained a range from IDR. 431,247 ± 134,542 with an average of IDR 444,868. Thus, we get a value.



**Figure 2.** The Analysis Of Business Giant Prawn Fishing Activities (*M.Rosenbergii*) Variable

#### 4. Discussion

##### 4.1. Revenue Analysis

4.1.1. *Income variable:* The revenue is one of the important parts in doing business, especially the business of catching giant prawns (*M.rosenbergii*) using bottom fish pots, due to it requires several components that support in running the business.

Based on the research results conducted in table 2 explains that the total income is an investment made by the community in Tepian Sembakung, where the income is in the form of three important variables, they are fishing boat, fishing boat engines, and bottom fishing pots variables. The total income or investment from bottom fish pots fishing gear is shown in table 2 where the lowest total income was IDR 4,440,000 and the highest was IDR 10,600,000, then the total income range was IDR 7,520,000  $\pm$  3,080,000 with an average was IDR 8,374,143.

This explains that total income or investment requires a large enough cost in carrying out activities or businesses to get the maximum profit. According to Yanuartoro et al (2013)[17] explained that the costs in each business activity, especially in this case, it has different capital according to the economic capabilities of the fishing community so that there are many factors that influence the fishing effort, one of them is entrepreneurs/fishermen who buying new goods for their business needs in accordance with the family economy.

*4.1.2. Expenditure variable:* The expenditure variable is a collection of various expenditure costs needed in calculating estimates in accordance with supporting components; one of them is fixed costs and costs variable. Fixed cost component is a component that must be spent by a bottom fish pots fishing gear in the effort to catch giant prawns (*M.rosenbergii*) and fishermen still take into account the production of giant prawn catching (*M.rosenbergii*) such as depreciation costs and goods maintenance costs. The depreciation of fishing gear or investment components such as fishing boats, bottom fish pots, fishing boat engines, affected by age/age and duration was used, so the maintenance costs are needed to support the activities of catching giant prawns (*M.rosenbergii*) in Tepian Sembakung.

Based on the results of research conducted in table 3 explains that the total expenditure comes from expenses that spending fixed costs and variable costs. Expenditures fixed costs, maintenance costs and expenses incurred are operational costs. The lowest total expenditure of bottom fishing pot fishermen was IDR 296,706 and the highest was IDR 565,789 where the total expenditure range was IDR 431,247  $\pm$  134,542 with an average of IDR 444,868. According to Yanuartoro et al. (2013) [17] explained that the expenditure costs vary according to income or investment from entrepreneurs, especially in using of bubu dasar fishing gear in Tepian Sembakung. According to Suyanto (2011) [11] statement also supported that expenses consist of fixed costs and variable costs.

*4.1.3. Profit variable:* Profit is one of the main standards in running a business or activity, such as the use of bottom fish pots by fishing communities in Tepian Sembakung for their profit. Profit is the excess obtained from all revenue / net income minus all expenses incurred in running a business or production.

Based on the results of the research found in table 5, it is proof that the profit from the catch of giant prawns (*M.rosenbergii*) using bottom fish pots fishing gear in Tepian Sembakung obtained the lowest profit was IDR 1,435,167 and the highest was IDR 4,887. 435, thus the range of benefits was IDR 3,161,301  $\pm$  1,726,134 with an average of 3,347,990. The average profit is obtained based on the gross income from the catch of giant prawns (*M.rosenbergii*) amount to IDR 3,792,857 reduced by the total expenditure from fixed costs in the form of depreciation and maintenance, but no costs fixed from operational costs so that an average total expenditure of IDR 444,868 is obtained. This explains that the average net income of fishermen in Tepian Sembakung is quite large of IDR 3,347,990, the income exceeds the standard of the minimum wage stipulation (UMR) set in North Kalimantan Governor Decree Number 188.44 / K.719 / 2019 concerning Kaltara Province's minimum wage in 2020 for the Nunukan Regency UMR was IDR 3,083,182.

## 4.2. Business Analysis

**4.2.1. ROI (Return of Investment) Variable Index:** The ROI (Return of investment) index variable, according to Kasmir and Jakfar (2003) explains that the index or figure is derived from a comparison between overall capital investment and net profit.

Based on the results of the research shown in table 6 and figure 2, the lowest ROI (return of investment) variable is 23.5 and the highest is 54.4, so the ROI range was  $38.9 \pm 15.4$  with an average ROI variable of 33.4. According to and Jakfar (2003) [12] stated the value of the ROI index variable is more than one (ROI  $33.4 > 1$ ), the activity is very feasible to be undertaken. This explains that based on the research found in table 6 that the average profit value of fishermen in the village of Tepian Sembakung was IDR 3,3347,990 with an average fishermen investment value of IDR 8,374,143, where the difference between the two variables between profit and investment not much different so that the ROI value obtained more than 1.

**4.2.2. BEP Index (Break Event Point) Variable:** The BEP (Break event point) variable showed that this analysis is an index or number used to study expenses consisting of fixed costs, costs variable and gross revenue volume of activities and profits. The business activities in catching giant prawns using bottom fish pots with certain production volumes can suffer losses because income from sales of giant prawns (*M.rosenbergii*) only covers variable costs and small portion of fixed costs.

According to Rahardi (2007) [13] uttered the calculation of BEP in accordance with the production unit that generates income so that the business does not experience losses. Production volume is used to compare the average expenditure costs with the average production costs sold, one of them was the catch of giant prawns (*M.rosenbergii*).

Based on the results of the study in table 6 and figure 2, it is found that the lowest BEP index variable is 9.4 and the highest is 20.3, thus the BEP range is  $14.8 \pm 5.5$  with an average BEP index variable of 12.4. According to Rahardi (2007)[13] stated that the value of the BEP index if more than 1 (BEP  $12.4 > 1$ ) then the business is profitable. This explains, based on the research in table 6 that the profits from the catch of giant prawns (*M.rosenbergii*) earn an average profit of IDR 3,347,990. Three-component fishing gear, they are ordinary shrimp scratching equipment; chain modification shrimp catcher; modified tin shrimp scratching tool obtained break-even point of production to cover a total cost of 192.09 kg; 192.5 kg; 192.43 kg, so the break-even point for the shrimp scratching in order to cover the total cost was IDR 53,779/kg; IDR 29,358; IDR 25,524 respectively.

### 4.2.3. Variable B / C Ratio

The B / C Ratio index variables showed that the index or figures obtained are based on a comparison between revenue receipts and production costs that will be used in carrying out business activities, one of them is the analysis of giant prawn catching business (*M.rosenbergii*) using bubu dasar fishing gear (bottom fish pots) in Tepian Sembakung.

Based on the results of the research in Table 6 and Figure 2, it is found that the variable value benefit index ratio (B/C ratio) of the lowest sample equal to 4.9 with the highest of 10.7, so the range of B/C ratio obtained by  $7.8 + 2.9$  with an average of the cost-benefit ratio was 8.5. Based on the criteria of Kasmir and Jakfar (2003); Tibrani and Sofyani (2010) [16] explain that if the value of the benefit-cost index is more than one (B / C Ratio  $> 1$ ), then the catching of giant prawns (*M.rosenbergii*) used bottom fish pots to produce profits and feasible for running where the average profit of fishermen was 3,347,990. The R/C ratio  $> 1$  of 1.45; 1.74; 1.92 for ordinary shrimp scratching equipment; chain modification shrimp catcher; Modified shrimp scratching fishing gear explains that the three fishing gear has business feasibility. However, tin modified shrimp scratching fishing gear has higher business viability than the others due to the high R/C ratio value.



## 5. Conclusions and Policy Recommendations

### 5.1. Conclusion

The conclusion of this research is the business analysis of giant prawn catching activities (*M.rosenbergii*) using three different variable components, such as ROI (Return of investment), BEP (Break-even point) and B/C ratio (benefit-cost ratio) obtained more than one number (ROI, BEP, B / C ratio > 1). Those explain that the bottom fish pots is a fishing gear that is very feasible to try and generate profits.

The advantage of the main catch using bottom fish pots, that is giant prawns (*Macrobrachium rosenbergii*) get the average gross income IDR 3,792,857 in a month with a routine expenditure. The fishermen spending about IDR 444,868 for maintenance costs, depreciation, and operational costs in a month; thus the average net profit from bottom fish pots was IDR. 3,347,990 in a month.

### 5.2. Policy Recommendation

The policy recommendation that can be given based on economic analysis of bottom fish pots in Tepian Sembakung that bottom fish pots offered high yields and these fishing gear get permits and support from the Nunukan Regency government that it is sustainable catches.

## Acknowledgment

The authors give thanks to Hariyadi with NPM 16.401020.037 for the thesis, the Aquatics Department of Fisheries and Marine Science Faculty, University of Borneo Tarakan, The government of Nunukan Regency, BPS Nunukan Regency, and The fishermen of bottom fish pots that had been provided information to support the intended research.

## References

- [1] Statistik B P 2013 *Kabupaten Nunukan dalam Angka* (Nunukan: Badan Pusat Statistik)
- [2] Hariyanto S, Irawan B and Soedarti 2008 *No Title* (Surabaya: Universitas Airlangga Press.)
- [3] Najamuddin 2012 *Rancangbangun Alat Penangkapan Ikan* (Makasar: Arus Timur)
- [4] Rita 2019 *Analisis Pendapatan Nelayan Tangkap Pukat Belanak (Gill net) Di Desa Salimbatu Kecamatan Tanjung Palas Tengah* (Tarakan: Universitas Borneo)
- [5] Suharsimi A 2006 Prosedur penelitian suatu pendekatan praktik *Jakarta: Rineka Cipta*
- [6] Salim A 2009 Pembenuhan Udang Windu Dan Produksi Pakan Alami Di Balai Budidaya Air Payau (BBAP) Ujung Batee Kabupaten Aceh Besar NAD *Politek. Negeri Jember. Jember*
- [7] Salim G 2015 Analisis Pertumbuhan Allometri dan Indeks Kondisi Caesio cunning Didapatkan dari Hasil Tangkapan Nelayan Kota Tarakan *J. Harpodon Borneo* **8** 35–42
- [8] Salim G and Kelen P B 2018 El Von Bertalanffy and Mortality from Fish Kurau (*Polynemus taenitatus*) of the Catch Fisherman in Waters Bunyu *Insist* **3** 165–9
- [9] Indarjo A, Salim G, Zein M, Susiyanti., Soejarwo P, Nugraeni C, Bija S and Pham Y 2020 Characteristics of Von Bertalanffy Growth, Allometric, Condition Index and Mortality of *Periophthalmus barbarus* in Mangrove and Bekantan Conservation Area (KKMB), Tarakan, North Kalimantan *Indones. J. Mar. Sci.* **1**
- [10] Faqih A 2010 *Manajemen agribisnis* (Deepublish)
- [11] Suyanto B 2011 Mekanisme Survival, Identifikasi Kebutuhan dan Pemberdayaan Nelayan Miskin dalam Masa Kritis Akibat Kenaikan Harga BBM *LPPM Univ. Airlangga* **24** 74–83
- [12] Kasmir J 2003 Studi Kelayakan Bisnis *Jakarta: Prenada Media*
- [13] Rahardi 2007 *Agribisnis Buah-Buahan* (Jakarta: Penebar Swadaya)
- [14] Suyanto S 2011 *Analisis Regresi untuk Uji Hipotesis* (Yogyakarta: CAPS (Center for Academic Publishing Service))
- [15] Mulyadi 2014 *Auditing* (Jakarta: Salemba Empat)
- [16] Sofyani T 2012 Pengorganisasian Dan Analisis Usaha Perikanan Keramba Di Waduk Plta Koto

Panjang Kabupaten Kampar *Berk. Perikan. Terubuk* **38**

- [17] Yanuartoro R, Ismail and Sardiyatmo 2013 Analisis Kelayakan Finansial Usaha Perikanan Tangkap Multigear di Desa Margorejo Kecamatan Cepiring Kabupaten Kendal *J. Fish. Resour. Util. Manag. Technol.* **2** 233–242
- [18] Salim G, Firdaus M, Alvian MF, Indarjo A, Soejarwo PA, Daengs A, Prakoso LY 2019 Analisis sosial Ekonomi Dan Keramahan Lingkungan Alat Tangkap Sero (Set Net) Di Perairan Pulau Bangkudulis Kabupaten Tana Tidung, Kalimantan Utara *Buletin ilmiah marina Sosial Ekonomi Kelautan Dan Perikanan.* **5** 85-94

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