

**Nível de prosperidade e rendimento de pescadores no porto de pesca de Sadeng Beach,
região de Gunung Kidul**

**Prosperity level and fishermen income at Sadeng Beach fishery port, Gunung Kidul
regency**

**Nivel de prosperidad e ingresos de pescadores en el puerto de pesca de Sadeng Beach,
región de Gunung Kidul**

Recebido: 02/03/2020 | Revisado: 03/03/2020 | Aceito: 10/03/2020 | Publicado: 23/03/2020

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Resumo

A pobreza é o principal fator que desencadeia o alto nível de exploração dos recursos pesqueiros. A prosperidade dos pescadores torna-se a chave primária no desenvolvimento da pesca. O nível de renda dos pescadores é o principal fator para melhorar a prosperidade dos pescadores. A existência de uma estação de fome é o principal problema dos pescadores para atender às principais necessidades. Por esse motivo, esta pesquisa é realizada com o objetivo de verificar o nível de renda dos pescadores na temporada de peixes, a época da fome e a renda média dos pescadores para determinar o nível de bem-estar dos pescadores com base no tipo de barco usado. O método está usando a análise de negócios da pesca, o nível de bem-estar dos pescadores com base na análise descritiva dos critérios da Agência Central de Estatísticas da Indonésia. O método básico usado nesta pesquisa é a análise descritiva, a análise comercial das pescas, o nível de bem-estar dos pescadores com base nos critérios da

Agência Central de Estatísticas da Indonésia. Os resultados são o tipo de embarcação maior, o nível de bem-estar e a renda aumentarão, mas a sustentabilidade econômica é menor porque navios maiores, risco de perda, tempo e distância ao mar também aumentam, de modo que a influência da estação da fome será maior, a renda média de os pescadores estão acima do salário mínimo regional e o nível de bem-estar dos pescadores é incluído na categoria moderada ou de bem-estar. Assim, para aumentar a renda e o bem-estar dos pescadores, é necessário aumentar os níveis de educação, programas habitacionais subsidiados, trabalho alternativo e aumentar o tipo de embarcação, se houver apoio e garantias do governo.

Palavras-chave: Renda dos Pescadores; Porto de Pesca; Pesca de Captura; Bem-Estar dos Pescadores.

Abstract

Poverty is the main factor triggering the high level of exploitation of fisheries resources. Prosperity of fishermen becomes primary key in fisheries development. Fisherman income level is primary factor in improving fishermen prosperity. The existence of a famine season is primary fishermen problem in fulfill the main needs. Because of it, this research is done with the purpose to see the fishermen income level in fish season, famine season and the average income of fishermen to determine the level of welfare of fishermen based on the type of boat used. The method is using fisheries business analysis, fishermen welfare level based on the Indonesian Central Statistics Agency criteria descriptive analysis. The basic method used in this research is descriptive analysis, business analysis of fisheries, the level of welfare of fishermen based on the criteria of the Indonesian Central Statistics Agency. The results is the greater boat type, welfare level and income will increase, but the economic sustainability is lower because larger ship, loss risk, time and distance to sea also increases so that influence of the famine season will be greater, the average income of fishermen is above the regional minimum wage and the welfare level of fishermen is included in the moderate or well-being category. Thus, to increase the income and welfare of fishermen, it is necessary to increase education levels, subsidized housing programs, alternative work and increase boat type may be done if there is capital support and guarantees from the government.

Keywords: Fishermen Income; Fishing Port; Capture Fisheries; Fishermen Welfare.

Resumen

La pobreza es el factor principal que desencadena el alto nivel de explotación de los recursos pesqueros. La prosperidad de los pescadores se convierte en la clave principal del desarrollo

pesquero. El nivel de ingresos de los pescadores es el factor principal para mejorar la prosperidad de los pescadores. La existencia de una temporada de hambruna es el principal problema de los pescadores para satisfacer las principales necesidades. Debido a esto, esta investigación se realiza con el propósito de ver el nivel de ingresos de los pescadores en la temporada de peces, la temporada de hambruna y el ingreso promedio de los pescadores para determinar el nivel de bienestar de los pescadores en función del tipo de barco utilizado. El método utiliza el análisis del negocio pesquero, el nivel de bienestar de los pescadores basado en el análisis descriptivo de los criterios de la Agencia Central de Estadística de Indonesia. El método básico utilizado en esta investigación es el análisis descriptivo, el análisis empresarial de la pesca, el nivel de bienestar de los pescadores según los criterios de la Agencia Central de Estadística de Indonesia. Los resultados son que el mayor tipo de embarcación, el nivel de bienestar y los ingresos aumentarán, pero la sostenibilidad económica es menor porque el barco más grande, el riesgo de pérdida, el tiempo y la distancia al mar también aumentan, por lo que la influencia de la temporada de hambruna será mayor, el ingreso promedio de los pescadores están por encima del salario mínimo regional y el nivel de bienestar de los pescadores se incluye en la categoría moderada o de bienestar. Por lo tanto, para aumentar los ingresos y el bienestar de los pescadores, es necesario aumentar los niveles de educación, programas de vivienda subsidiada, trabajo alternativo y aumentar el tipo de embarcación si se cuenta con el apoyo del capital y las garantías del gobierno.

Palabras clave: Ingresos de los pescadores; puerto pesquero; pesca de captura; bienestar de los pescadores.

1. Introduction

In managing fisheries resources in a sustainable manner, economic aspect of fishermen is often ignored, even though important role holder in management is the fishermen's economy. If their economic needs has been fulfill it will create an ownership sense, which grows because they do not want to lose their source of income. This will be the main factor for fishermen to preserve the fisheries ecosystem itself. The pressure and destruction which is quite high especially in fisheries resources use by using irresponsible fishing tools due to the welfare of fishermen who are not fulfilled, even many areas began to experience overfishing. If this is allowed in continuously, it is feared it will experience extinction in the future.

Commitment in the utilization of fisheries resources is still lacking. This is showed in reality that the fishermen as main actor in this sector is still under the poverty line (Syahroni, 2010). Based on Data from the Central Statistics Agency (BPS, 2017), the poor population in Indonesia reached 26.58 million peoples and 61.36% of them are people who live in coastal and rural areas. The pressure on coast resources is often aggravated by the high poverty rates in those areas. Poor become the main factor of triggered a satanic circle because poor citizen is often blamed for the damage to the coastal environment, and it is the poor who will suffer the effects of environmental damage. Some factors causing the fishermen in servant poverty, are capital limitations to develop the effort, low education levels, low incomes, economic attitude fishermen household which tends to be wasteful, none livelihood alternative (livelihood), and not supported regional planning (Sadik, 2016).

In the research of (Nikijuluw, 2002) explains that in managing fisheries resources, the main factor that is key existence of rules that bind people. The importance of human factors as the key to successful management of fisheries resources lies not in their fish resources, but in the human resources that utilize them.

The main problem is a famine season that causing the fishermen cannot do a fishing business so that he cannot meet his daily needs. Part of fishermen is never counting the truly income from the results of the sea effort in fish season and famine season with the average income of fishermen to determine welfare level of fishermen.

Fishermen prosperity is very influence by income level and fishermen education. The fishermen is already fulfilled his needs will experience a shift in needs, this thing is showed that those fishermen is already prosperous in financial. Fishermen prosperity will be the key in fisheries development in which prosperous fishermen will not force capture but instead will maintain the balance of the ecosystem due to a sense of ownership from the main source of livelihood. This is what will encourage the creation of sustainable fisheries. Therefore there is a need for research on welfare level and income of fishermen.

2. Methodology

The basic method is using descriptive analysis. According (Sugiyono, 2009) descriptive method is a method that functions to describe or gives illustration on the research object from data or sample that has been collected as is, without conducting analysis and making conclusions that are applicable to the public. Said to be descriptive because it aims to obtain an objective explanation of the calculation analysis.

This research is done in Sadeng Beach Fishery Port (Pelabuhan Perikanan Pantai Sadeng, 2019) (PPP) Sadeng Gunung kidul district Special region of Yogyakarta. Location determination of research is using purposive sampling method that is done intentionally with consideration based on statistical data on fisheries and marine in DIY. Sadeng PPP is the biggest port and has the highest fishing potential in DIY. This research was conducted in May 2019.

The sampling method is using accidental sampling method, namely the determination of fishermen determination samples based on accidental, the fishermen who become respondents are fishermen who are around sampling location at the Sadeng Beach Fishery Port. This method is used because fishermen's unpredictable fishing hours and fishing time. The number of samples was determined purposively of 65 fishermen with dividing sample type based on the social fishermen status and boat type used, called ship owner as many as 11 people, the captain of 14 people and the crew ship (ABK) as many as 40 people. The sampling method is explained in the following Table 1:

Table 1. Research Respondent Type

Fishermen Status	Social Boat	Outboard Boat	Motor Boat (5-30 GT)	Motor Boat (30-45 GT)	Total
Owner	6		3	2	11
Captain	0		12	2	14
The crew	14		9	17	40
Total	20		24	21	65

Resources: Data Primer Analysis, 2019

How to differentiate fishermen respondent type based on boat type that used based on recording of Sadeng Beach Fisheries statistical data. This method is used because differences in boat types are considered as a maximum limit on the number of fish that can be brought by fishermen and also as a limit on the range of fishing grounds.

Analysis of fishermen's income calculation is divided into 3 types of income are the average income, counting used input cost and median output that used by fishermen, income in famine season is calculate using the lowest input cost and lower output, while income in fishing season using the highest input and output. Acceptance of fishing business can be calculated by multiplying production with the prevailing selling price (Soekartawi, 1985), or it can be written as follows:

$$TR = Y \cdot P_y$$

TR = Total revenue

Y = Production obtained in fishing business

P_y = Price of Y

To calculate the income of fishing business can be calculated using the following formula:

$$P_{ut_c} = TR - TC_{(explicit)}$$
$$TC_{(explicit)} = FC + VC$$

TC_(explicit) is the costs incurred significantly for the purposes of fishing business

FC is a fixed cost in rupiah in the form of investment value and depreciation, tax

VC is a variable cost incurred to carry out fishing operations

Meanwhile, to calculate the profitability of fishing business is done by using the following formula:

$$J = TR - TC_{(explicit + implicit)}$$
$$TC_{(explicit + implicit)} = FC + VC + C_{(implicit)}$$

Implicit costs in this case are costs that were not previously calculated, such as the improvement of fishing gear and fisherman group fees.

Prosperity level analysis is using questionnaires and interview on fishermen after that it do the tabulation from answer result to gives scoring as with the indicator table of prosperity family according to BPS. This analysis is become 2 approach assessment. First step I gives value/score in each respondent answer.

Each answer gives score then calculates and the sum results are entered into one of the 3 criteria in the BPS indicator. According to (Badan Pusat Statistik, 2015) the Central Statistics Agency (2015), the criteria for each indicator can be seen in the following Table 2:

Table 2. Prosperous Family Indicators Based on BPS Criteria

No.	Prosperous Indicator	Criteria	Score
1	Fisherman household income	Very High (>IDR 3.500.000,-)	4
		High (IDR.2.500.000 - Rp.3.500.000,-)	3
		Medium (IDR.1.500.000,- Rp.2.500.000,-)	2
		Low(<IDR.1.500.000,-)	1
		Very High (>IDR 3.500.000,-)	4
2	Fisherman household expenses	High (IDR.2.500.000 - Rp.3.500.000,-)	3
		Medium (IDR.1.500.000,- Rp.2.500.000,-)	2
		Low(<IDR.1.500.000,-)	1
		High (> 12 school year)	3
3	Education Level	Enough (7 - 11 school year)	2
		Low (0 - 6 school year)	1
		Permanent (9 - 12)	3
4	Residence Circumstances	Semi Permanent (5 - 8)	2
		Non Permanent (1 - 4)	1
A	Floor space	Large (> 15 m2)	3
		Medium (8 – 15 m2)	2
B	Type of floor	Narrow (< 8 m2)	1
		High quality tiles / ceramics / wood	3
		Low quality tiles / cement / or wood Ground	2
C	Roof type	Ground	1
		Roof tile / concrete / shingle	3
		Iron sheet/ asbestos	2
D	Wall type	Used fibers / thatch / zinc	1
		Wall	3
		Half wall / brick without plaster / wood	2
5	Residence facilities	Bamboo / used wood	1
		Complete (11-15)	3
		Enough (6-10)	2
		Less (1 - 5)	1
A	Type of lighting	Electricity	3
		Petromak, aladin	2
B	Water sources	Lights, flashlights, torches	1
		PAM (clean water)	3

		Drilling well / water pump	2
		River, lake, rain water	1
		Latrine itself	3
C	MCK facilities	Latrine together	2
		Public latrines, no	1
		Sit	3
D	Latrine type	Goose neck shape	2
		Ordinary cement / latrine times	1
		Use a septic tank or wastewater treatment plant (WWTP)	3
E	Sewer	Use a holding tank	2
		Directly flowed into the river	1
		House Owner	3
6	House Owner Status	Rent / rent house	2
		Owned by parents / siblings	1
		High (> 2,000 kcal)	3
7	Consumption Pattern / Nutrition Value	Medium (1,000 - 2,000 kcal)	2
		Low (<1,000 kcal)	1

Resources : (Sukmawardhana, Nugroho., Bambang, Azis Nur., and Rosyid, 2013) (Updated)

The second step is after determining the criteria of each answer are determined and determined the value of the score according to the table, and then entire the values are added up. Categorization is done by reducing the highest score with the lowest score then divided into 3 categories called low, medium or sufficient, and high categories using the following formula:

$$\text{Interval} = \frac{\text{Higher Score} - \text{Lower Score}}{\text{Total Category Score}}$$

Then the amount of welfare score level is determined as follows:

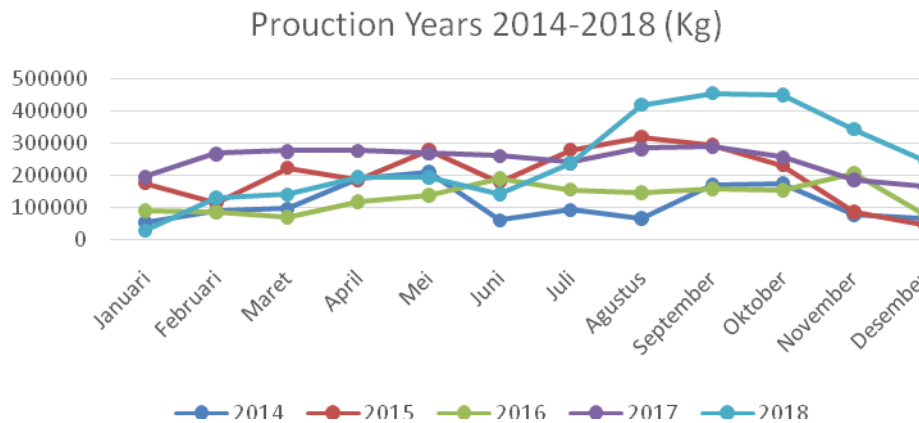
- a) High welfare level: Score 34 – 50
- b) Moderate welfare level: Score 17 – 33
- c) Low welfare level: Score 1–16.

3. Result and Discussion

3.1 Production of Sadeng Beach Fishery Port

Fish catches production results of Sadeng Beach Fisheries Port in 2014-2018 are explained in the following Figure 1:

Figure 1: Production years 2014-2018 (Kg)



Resources : Sadeng PPP Fisheries Production Data, 2019 (Pelabuhan Perikanan Pantai Sadeng, 2019)

In 2018 the highest production is happen in August, September, October, with a top production in September. While the lowest production in January, February and March with the lowest production level in January. In January to March, fishermen are considered as a famine season which occurs for 3 months in a year because in that month of fish reproduce, so the catch decreases and the size of the fish is small.

3.2 Profit Sharing Systems in the Sadeng Beach Fishery Port.

Fishermen income is influenced by weather and climate conditions, because of it the fisherman is not have definite income. In one operation fishermen catcher is implementing a profit sharing system, so that each fisherman has a different income according to what was agreed upon before conducting the fishing operation. Each region has a different revenue sharing system. In the Sadeng region the yield sharing system is explained as follows:

a) Profit sharing system according fishermen status.

Income sharing according by fishermen status in the ship is divided into 3 types which is Owner, Captain, and crews. Sharing income can be explained as below:

1) Owner Ship

Owner Ship has biggest sharing income is part from a net profit in one go to sea. If written in the equation as follows:

$$\text{Boat owner income} = \frac{\text{Total results of sale of catches} - \text{Fixed costs}}{2} - \text{Fixed Costs}$$

Ship owner get the big income because the owner is bear whole depreciation, ship maintenance costs, and the cost of repairing damage to fishing gear. If the ship owner using migrant fishing services, so the entire primary needs of fishermen is borne by ship owner. Moreover, the owner is bear permanent of loss from catch operation cost if not get any catches at all which losses will be accumulated in the profits from fishing operations.

2) Captain

Captain is a people that steer the ship and be responsible for the catch and safety of the crew. Captain in sharing income get 2 part from the rations of the crew, if it written in the equation as below:

$$\text{Captain Owner} = \left(\frac{\text{Total Sales Results} - \text{Ship Operational Costs}}{\text{Number of ABK}} \right) \times 2$$

Captain gets the 2 Income part from crew because fully responsible if not get catches and if a ship accident occurs.

3) The Crew

The crew is often called as fishing laborer get 1 part of half the profit once at sea, if written in the equation as follow:

$$\text{Crew Income} = \frac{\text{Total Sales Results} - \text{Catches Operational Cost}}{\text{Total Crew} + 1}$$

In the crew income added one because ration from captain is counting 2 so it is assumed in calculation of the number of crew added one.

4) Ship Caretaker

In motor boat and Inka Mina drainer ship get part of catches income. Ship drainer is working to cleaning and takes care of the ship. Sharing result to drain the ship itself varies according to ship type. For motor boat type <30 GT the drainer gets a share of 1 piece or equivalent of 10 kg of fish caught with the condition that

the catch of the ship is more than 1 quintal, on Inka Mina ships the boat gets a portion of 30% of the crew's ration.

b) Sharing special result of belt fish type.

In Sadeng Beach Fishery Port it is found special sharing result for belt fish catch result. This sharing is due to the local fishermen feel the loss if using production sharing system as usual. Belt fish regarded as special catch result because the price is quite high and this fish is easily provoke. Special sharing result for belt fish is not much different with usual which is for the ownership permanent owner get 2 part, while for captain 1½ part, the crew get 1 part and drainer get 1 part.

3.3 Income and Profit from Fishing Business at Sadeng Beach Fishing Port.

In Sadeng Beach Fishery Port effort go to sea become 3 types of ship are Outboard Motorboats, 5-30 GT Motorboats, and 30-45 GT Motorboats. In this research, income calculation follows the division of fishermen based on the type of boat used in accordance with the distribution of statistical data recording by the port. Fishermen income according to boat type used is explained as follows:

3.3.1 Income from Fishing by Outboard Fishing Boats

Outboard motor boat in Sadeng Beach fishery port average size is 2 GT (*Gross Tonnage*). Catching tools that used by fisherman outboard motorboat is fishing rods and nets, with different fishing distances with fish type target that will catch. The result composition of outboard motor boat is explained in the Table 3:

Table 3. The Result Composition of the Catches from Outboard Motor Fish

Kind of fishes	Latin	Fish Production (Kg)
Bullet Tuna (Lisong)	<i>Auxis rochei</i>	133.638
Ray-Finned Bony	<i>Scomberomorus commersonii</i>	36
White cheek Shark	<i>Carcharias dussumieri</i>	423
Blue Spotted Sting Ray	<i>Trygon kuhlii</i>	24.451
Giant Guitar Fish	<i>Rhynchobatus djiddensis</i>	15.940
Ariid Catfish	<i>Arius Bilineatus</i>	35.394

Belt Fish	<i>Trichiurus savala</i>	136.260
Timor Snapper fish	<i>Lutjanus timoriensis</i>	1.527
Asian Sea Bass/Barramundi	<i>Lates calcalifer</i>	732
Estuary Cod	<i>Epinephelus coiodes</i>	214
Big Eye Trevally	<i>Caranx sexfaciatus</i>	469
Portunidae	<i>Portunus pelagicus</i>	738
White Pomfret	<i>Pampus argenteus</i>	1.620
Sulphure Goatfish	<i>Upeneus sulphureus</i>	23.279
Yellow Pike Conger	<i>Congresox talabon</i>	2.010
Spiny Lobster	<i>Panulirus Versicolor</i>	11.398
Long Tongue Sole	<i>Cynoglossus lingua</i>	22.591
Total		410.720

Resources: Sadeng PPP production data, 2019 (Pelabuhan Perikanan Pantai Sadeng, 2019)

Based on fishery statistic in 2018, most of outboard motor boat catches is belt fish with percentage 33% from total catches is 136.260 Kg, the second is bullet tuna fish with percentage 33% from total catches or 133.638 Kg. the third most catches is ariid cat fish with percentage 9% from total catches or 35.394 Kg, while ray-finned bony fish become being the smallest fish with a total catch of 36 Kg. Total catches of outboard motor boat in 2018 as much as 410.720 Kg with total production value catches of IDR. 11.880.570.000,00 (Table 4).

Table 4. Operational Outboard Motorboats

Information	Unit	Min	Max	Mean	Deviation Standard
Number of crew members	Person	1	4	3,05	0,69
Distance to sea	Milles	1	45	27,45	13,60
Long to sea	Hour	6	24	21,05	6,19
The amount of fishing	Trip/month	20	30	22,2	2,61
Production amount	Kg/Trip	31,27	259,59	155,17	90,35

Resources: Primary data analysis, 2019

From result of this study, long sailing outboard motor boat average is 21 hours with deviation standard 6,19. Based on table of fishing distance from outboard motor boat is average fishing distance is 27,45 miles for one operation of fish catches with deviation standard 13,60. Based on catches data statistic in 2018 the results obtained that catches result

of 155,16 Kg/trips with deviation standard of 90,35. In outboard motorboats, the average number of trips is 22 trips per month with a standard deviation of 2.61. In fishing season, everyday do fishing catches operation or total 30 times per month while on normal days fishermen go on trips 21 times per month. In outboard motor boat total of the crew ship average is 3 people with deviation standard of 0,69. Total crew will affect the amount of fishermen's income.

Operational ship is influenced by in boat type and the season, the bigger the ship, the bigger and longer the ship's operation will be done. In fishery season, operational ship will more bigly because total catches fish and total fishing is while in the operational the ship will be lowered to avoid losses, but the type of outboard motor boat is not affected in the lean season because this boat type can still be operated along the coast.

1. Infestation Value of Fishing Effort by Outboard Motor Boat in Sadeng Beach Fishery Port.

Description of investment cost components in do an effort of fishing outboard motor boat is explained in the Table 5:

Table 5. Investment Effort of Outboard Motor Boat

Information	Unit	Amount	Price	Economic age	Percentage (%)
Ship	GT	1	22.000.000	10 Years	24,96
Ship engine	PK	1	27.000.000	8 Years	30,63
Fishing Gear	Hook	750	1.320.000	1 Year	1,50
Fishing Net	pis	50	25.000.000	1 Year	28,36
Generator set	Unit	1	3.000.000	5 Years	3,40
Lamp	Unit	4	270.000	2 Months	0,31
Cool box fish	Box	3	2.100.000	5 Months	2,38
Battery	Unit	1	7.000.000	2 Months	7,94
Goad	Unit	3	450.000	5 Months	0,51
Amount			86.740.000		100

Resources: Primary data analysis, 2019

Biggest investment value in machine purchase of 30,63%, the second in catching tools of 28,36%, and the third is ship purchase of 24,96%, total investment value for doing a fishing outboard boat is IDR 86.740.000. The ship price that used in this research is the size boat 2 GT with fiberglass boat type, this ship price is expensive rather than wooden ship because more durable rather than wooden hip, but more easily damaged if exposed to coral. Machine price that used in this research is Yanmar brand engine with size 15 PK.

2. Average Variable Price of Fishing Effort Outboard Motor Boat.

In fishing effort variable price is supply cost that used for one catches operations, include accommodation ship supply and food supply from fisherman. The amount of variable costs depends on the number of crew, length of sea and distance to sea. The variable costs of an outboard boat fishing business are explained in the following Table 6:

Table 6. Statistics on the Use of Inputs in an Outboard Fishing Boat at Sadeng Beach Fisheries Port

Cost Type	Unit	Minimal	Maximal	Mean	Deviation Standard	Price per unit (rupiah)
Fuel	liter	10	80	56	28,64	7.650
Lubricant	liter	0,5	1	0,95	0,15	50.000
Use of ice	Block	0	3	1,93	1,29	22.000
Food supplies	Rupiah	10.000	300.000	222.750	122.232,25	100.000
Repair fishing rod	Hook	10	50	33	19,63	1.100
Bait	Rupiah	25.000	300.000	186.250	90.493,89	15.000
Fisherman group contributions	Rupiah	10000	10000	10000	0	10.000

Resources: Primary data analysis, 2019

The using of price Pertalite type fuel with price per liter IDR.7, 650 the average use of fuel is 56 liters with a standard deviation 28.64. Lubricants use the two most dominant brands, which is Mesran and Yamalube with an average use of 1 liter and a standard deviation 0.15 per unit price of IDR.50, 000 / liter. Bait type that used by fisherman is varied based on fish type of the main target catches, bait type that used is divided into two there are artificial bait, made from shiny fabric and paper and natural bait which is fish meat bait, such as tuna and low quality belt fish. The price of natural bait is varies, for Mackerel Tuna fish IDR.10, 000.00 per Kg while belt fish IDR.15,000.00 per Kg.

3. Income and Profit of Fisherman From Outboard Motor Boat

Income of fisherman from outboard motor boat is explained Table 7:

Table 7. Income and Profit of Fishing Using Outboard Motor Boat

Information	Average		Famine Season		Fish Season	
	Per trip	Per Month	Per Trip	Per Month	Per Trip	Per Month
Production (Kg)	155,17	3413,74	31,27	687,94	259,59	5710,98
Price Of Arius Bilineatus Fish (Kg / IDR)	10.000	10.000	10.000	10.000	10.000	10.000
Price Of Auxis Rochei Fish (Kg / IDR)	12.000	12.000	12.000	12.000	12.000	12.000
Price Of Trichiurus Savala Fish (Kg / IDR)	30.000	30.000	30.000	30.000	30.000	30.000
Receipt (IDR)	2.689.613	59.171.493	542.013	11.924.293	4.499.560	98.990.320

Fuel (IDR)	428.400	9.424.800	76.500	1.683.000	612.000	13464000
Lubricant (IDR)	50.000	1.100.000	50.000	1.100.000	50.000	1100000
Ice Use (IDR)	44.000	968.000	66.000	1.452.000	66.000	1452000
Food Supplies (IDR)	222.750	4.900.500	10.000	220.000	300.000	6600000
Bait (IDR)	186.250	4.097.500	25.000	550.000	300.000	6.600.000
Total Variable Cost	931.400	20.490.800	227.500	5.005.000	1.328.000	29.216.000
Boat Maintenance (IDR)	1.894	41.666	1.894	41.666	1.894	41.666
Machine Maintenance (IDR)	1.705	37.500	1.705	37.500	1.705	37.500
Ship Tax (IDR)	682	15.000	682	15.000	682	15.000
Compilation (IDR)	150.549	3.312.083	150.549	3.312.083	150.549	3.312.083
Total Fixed Cost (IDR)	154.830	3.406.249	154.830	3.406.249	154.830	3.406.249
Fishing Gear Repair (IDR)	36.300	798.600	11.000	242.000	55.000	242.000
Fisherman Group Contribution (IDR)	10.000	220.000	10.000	220.000	10.000	220.000
Implicit Costs (IDR)	46.300	1.018.600	21.000	462.000	65.000	462.000
Benefits (IDR)	1.557.084	34.255.843	204.684	4.503.043	2.951.730	64.938.070
Owner Income (IDR)	701.127	15.424.796	24.927	548.396	1.398.450	30.765.910
Crew Income (IDR)	285.319	6.277.016	59.919	1.318.216	517.760	11.390.720

Resources: Primary data analysis, 2019

Based on the calculation, it can conclude that owner higher income is IDR. 30.765.910,00 and the lower is IDR. 549.396 Per month. Amount of the crew ship of outboard motor boat is 3 peoples until so the amount of income for the crew is divided into 3. The highest income of fisherman outboard motor boat is IDR. 11.390.720,00 and the lowest is IDR 1.318.216,00 Per Month. The crew income is bigger because is not deducted by the fixed costs of the ship borne by the owner. The lowest of crew is obtained while the ship is not get the result of fishing or is often called with food allowance originating from ship owners amounting to Rp.50,000.00 per trip.

3.3.2. Effort Income of Sail Fishing 5-30 GT Motor Boat

Motor boat that located in Sadeng Beach Fishery Port area is sized 5-30 GT. Catching tool that used is fishing rod and net. Catches result is varies from the type and amount of catches, the composition from catches result it explained in the Table 8.

Table 8. The Composition of Catches Result Using 5-30 GT Motor Boat in 2018

Kind of Fish	Nama Latin	Fish Production (Kg)
Tuna (Madidihang)	<i>Thunnus albacores</i>	180.225
Sword Fish	<i>Xiphias gladius</i>	16.262
Skipjack Tuna	<i>Katsuwonus pelamis</i>	683.256

Mackerel Tuna (Komo)	<i>Euthynnus affinis</i>	170.130
Mahi-mahi/Dolphin fish	<i>Coryphaena hippurus</i>	61.451
Rainbow Runner	<i>Elagatis bipinnulatus</i>	3.352
Narrow-Barred Spanish Mackerel	<i>Scomberomorus commersonii</i>	1.205
White cheek Shark	<i>Carcharias dussumieri</i>	1.662
Belt fish	<i>Trichiurus savala</i>	48.752
Clown triggerfish (ayam-ayam)	<i>Balistoides conspicillum</i>	1.675
Squid	<i>Loligo spp.</i>	15.388
Amount		1.183.358

Source: Sadeng PPP production data, 2019 (Pelabuhan Perikanan Pantai Sadeng, 2019)

From the table above it showed that the catches composition based on Sadeng fishery data statistic in 2018. The most dominant fish catches is skipjack tuna fish which is 683.256 KG or 58% from catches total, the second is tuna madidihang with catches result of 180.225 Kg or amount of 15% from catches total, and the third is mackerel tuna fish with catches result of 170.130 Kg or amount of 14% from catches total. While sword fish become the lowest catches which is 79 Kg. motor boat catches total 5-30 GT in 2018 is amount of 1.183.358 Kg with catches production total of 21.770.024.000,00.

Table 9. 5-30 GT Motor Boat Operational

Information	Unit	Min	Max	Mean	Deviation Standard
Total of the crew ship	people	4	17	5,25	2,57
fishing distance	Miles	20	100	55,42	20,62
fishing long time	Days	4	10	6,17	1,93
Fishing amount	Trip/month	3	5	3,25	0,53
Production amount	Kg/trip	500,97	4.283,75	1.970,43	1.260,55

Resources: Primary data analysis, 2019

Based on the average long fishing of motor boat is 6 days with deviation standard 1,93. Based on fishing distance average table from motor boat is 55,42 miles with deviation standard 20,62. Based on catches data statistic in 2018 is obtained that fish catch per boat on motor boats ranges 500,97-4.283,75 Kg/trip and catches result average of 1.970,43 Kg/trip with deviation standard of 1260,55. In motor boat 5-30 GT amount of fishing range between 3-5 trip/month with average trip of 3,25 trip per month an deviation standard of 1,93.

In fish season, the fisherman is do catches operation more than usual while in the famine season fishermen do 2 trips a month to avoid losses that are too large because it cannot cover the costs of arrest operations. The crew amount range between 4-17 peoples with average crew ship is 5 peoples and deviation standard of 2,57. Fishermen who are close to fishing will use less crew than those who go far to sea.

1. Investment Value in Fishing Effort of 5-30 GT Motor Boat in Sadeng Beach Fishery Port.

Describing the investment cost components in doing fishing effort by outboard motor boat can be explained in the table below:

Tabel 10. Investment Fishing Effort Cost By 5-30 GT Motor Boat.

Information	Unit	Total	Price	Economic ages	Percentage (%)
ship	GT	1	300.000.000	10 Years	64,26
Ship machine 1	PK	1	22.000.000	8 Years	4,71
Ship machine 2	PK	1	5.000.000	5 Years	1,07
Fishing catching tool	Hook	750	1.320.000	1 Year	0,28
fishing gear nets	pis	10	30.000.000	3 Years	6,43
Generator	unit	1	6.200.000	5 Years	1,33
Lamp	unit	11	6.600.000	3 Years	1,41
Fishing aggregating	unit	1	50.000.000	3 Years	10,71
GPS	unit	1	2.500.000	5 Years	0,54
cool box fish	box	4	36.000.000	5 Years	7,71
Aki	unit	1	7.000.000	2 Years	1,50
Goad	unit	3	210.000	5 Years	0,04
Total			466.830.000		100,00

Resources: Primary data analysis, 2019

Based on the table the biggest investment cost is in highest ship investment of 64,26% from investment cost total, the second in fish aggregating is 10,71% from investment cost total. The fish aggregating purchase is do with sharing system in group with other owner ship or can be individual, however most of fisherman in Sadeng area choosing with sharing system. The third highest purchasing is mount of 6,43% from investment total cost and the fourth in machine purchasing is amount of 5,71% machine that used by motor boat is amount of 2 machines with main machine with Yanmar brand with 30 PK capacity, and the second machine Jiandong with 30 PK capacity, the use of two engines is intended in addition to a reserve of propulsion, also for increase the speed of the ship for reduce travel time to the fishing location (fishing ground).

2. Average Fishing Effort Variable Cost of 5-30 GT Motor Boat

Cost variable in motor ship sized 5-30 GT is bigger than the outboard motor boat that sized 2 GT, the greater vessels volume, the variable costs also increase. The description of the variable costs on motorboats of size 5 - 30 GT, is explained in the following Table 11.

Table 11. Statistics on the Use of Inputs in Sailing Business 5-30 GT Motorboats at Sadeng Beach Fishing Port

Price type	Unit	Minimal	Maximal	Mean	Deviation Standard	Price per unit (IDR.)
Fuel	Liter	90	700	310,42	100,28	9.800
Lubricant	Liter	4	10	6,96	2,97	50.000
Ice using	Block	30	70	42,71	12,51	22.000
Food supplies	Rupiah	1.000.000	3.000.000	1.750.000	675.663,92	250.000
fishing rod repairs	Hook	10	150	100,42	43,39	2.000
Repair of net tools	Rupiah	12.000	35.000	23.458,33	4.845,25	12.000
Bait	Rupiah	25.000	300.000	186.250	90.493,89	15.000
Fisherman group contributions	Rupiah	10.000	10.000	10.000	0	10.000
Mooring costs	Rupiah	15.000	15.000	15.000	0	15.000

Resources: Primary data analysis, 2019

Type of fuel that used is biodiesel with cost of per liter is IDR. 9.800,00, average using fuel to do one catches operation is 310,42 liter per trip n deviation standard of 100,28. Lubricant that used consist of various brands is Mesran, Pertamina oil, and Yamalube, lubricant using average is 6,96 liter per trip with deviation standard of 2,97. Food supplies minimal for one catches operation is IDR. 1.000.000,00 per trip with average using of IDR. 1.750.000,00 per trip and deviation standard of 675.663,92.

Ships that have a volume size are more than 5 GT tethered fee of IDR. 15,000.00 Per port. Bait type that used is consist of 2 type are artificial baits and natural baits, artificial baits made from cloth and natural baits from tuna meat cuts and belt fish, the price of tuna for bait is IDR. 10,000.00 per kilo and belt fish IDR. 15,000.00 per kilo. The type of bait used depends on the type of fish to be caught.

3. Income and Profit of Fisherman 5-30 GT Motor Boat.

Fisherman income from 5-30 GT motor boat explained in the Table 12:

Table 12. Income and Profit of Fishing Effort by 5-30 GT Motor Boat

Information	Average		Famine Season		Fishing Season	
	Per trip	Per month	Per trip	Per month	Per trip	Per month
Production (Kg)	1.970,43	5911,29	500,97	1502,91	4.283,75	12851,25
Price of <i>Katsuwonus pelamis</i> fish (Kg/Rp)	13.000	13.000	13.000	13.000	13.000	13.000
Price of <i>Thunnus albacore</i> s fish (Kg/IDR)	18.000	18.000	18.000	18.000	18.000	18.000
Price of <i>Euthynnus affinis</i> fish (Kg/IDR)	15.000	15.000	15.000	15.000	15.000	15.000
Reception (IDR)	30.213.260	90.639.780	23.853.231	71.559.694	65.684.167	197.052.500
Fuel (IDR)	3.042.116	9.126.348	882.000	2.646.000	6.860.000	20.580.000
Lubricant (IDR)	350.000	1.050.000	200.000	600.000	500.000	1.500.000
Ice usage (IDR)	946.000	2.838.000	660.000	1.980.000	1.540.000	4.620.000
Food supplies (IDR)	1.750.000	5.250.000	1.000.000	3.000.000	3.000.000	9.000.000
Bait (IDR)	186.250	558.750	25000	75.000	300.000	900.000
Mooring cost (IDR)	15.000	45.000	15000	45.000	15.000	45.000
Total Variable cost	6.289.366	18.868.098	2.782.000	8.346.000	12.215.000	36.645.000
Boat Maintenance (IDR)	166.667	500.000	166.667	500.000	166.667	500.000
Machine maintenance (IDR)	333.333	1.000.000	333.333	1.000.000	333.333	1.000.000
FAD care (IDR)	16.667	50.000	16.667	50.000	16.667	50.000
Ship Tax (IDR)	69.444	208.333	69.444	208.333	69.444	208.333
Compilation (IDR)	2.122.741	6.368.222	2.122.741	6.368.222	2.122.741	6.368.222
Total Fixed Cost (IDR)	2.708.852	8.126.555	2.708.852	8.126.555	2.708.852	8.126.555
Fishing gear repair	223.458	670.375	32.000	96.000	335.000	1.005.000
Fisherman group contributions	10.000	30.000	10.000	30.000	10.000	30.000
Implicit Costs (IDR)	233.458	700.375	42.000	126.000	345.000	1.035.000
Benefits (IDR)	20.981.584	62.944.751	2.148.688	6.446.064	50.415.315	151.245.944
Vessel Owner Income	12.397.778	27.409.098	1.074.344	3.223.032	23.853.231	71.559.694
Commander income	7.253.315	21.759.945	237.172	711.516	12.981.042	38.943.125
Income of Ship Men	3.626.658	10.879.973	118.586	355.758	6.490.521	19.471.563
Drain ration of the ship	150.000	450.000	150.000	450.000	150.000	450.000

Resources: Primary data analysis, 2019

In motor boat type 5-30 GT involving part rations of captain and ship's drain. Captain of the ship get 2 times part ration by crew ship, while ration for drainer ship is amount of 1 blong or 10 Kg catches fish, amount of IDR. 150.000,00 Per trip with catches requirement to reach 1 quintal. Based on the counting result can be concluded the highest income of IDR. 71.559.649,00 and the lowest is mount of IDR. 3.223.032,00 per month. The highest income of captain is IDR. 38.943.125,00 and the lowest is IDR. 711.516,00 Per month. Amount of the crew of 5-30 GT motor boat is 3 peoples until the highest income for the crew ship is divided become 3. The highest income crew ship is IDR. 19.471.563,00 and the lowest is IDR. 355.758,00 Per month.

Ration of drainer constant ship as much as IDR. 150.000,00. Per trip both in famine season or fishing season. The lowest income of the crew ship is get while the ship is not get the catches from fishing or it often called with food that from the owner ship as much as IDR. 50.000,00 per trip while for captain is IDR.100.000,00 per trip.

A. Fishing Effort Income By 30-45 GT Motor Boat

Motor boat type that exist in Sadeng Beach Fishery Port is divided into two as the recording of data statistic of Sadeng fishery is motor boat sized 5-30 GT with catching tools fishing and net and motor boat sized 30-45 GT or is often called Inka Mina ship is producing various kind of fishing with catching tools by Purse Seine net. In one operation, catching tools in Inka Mina ship can produce various kinds of fish catches from type and amount of catches rather than with other ship that in Sadeng. The catches result composition of catches Inka Mina ship can be explained in the Table 13.

Table 13. 30-45 GT Motor Boat Catches Composition in 2018

Kind of fish	Latin names	Fish Production (Kg)
Tuna (Madidihang)	<i>Thunnus albacores</i>	191.000
Sword Fish	<i>Xiphias gladius</i>	79
Skipjack Tuna	<i>Katsuwonus pelamis</i>	482.115
Mackerel Tuna (Komo)	<i>Euthynnus affinis</i>	234.223
Mahi-mahi/dolphin fish	<i>Coryphaena hippurus</i>	46.866
Rainbow Runner/Sunglir	<i>Elagatis bipinnulatus</i>	9.021
narrow-barred Spanish mackerel	<i>Scomberomorus commersonii</i>	1.659
White cheek shark	<i>Carcharias dussmieri</i>	319
Indian scads	<i>Decapterus russelli</i>	340.847
White barramundi	<i>Lates calcalifer</i>	65
Clown Trigger fish (Ayam-ayam)	<i>Balistoides conspicillum</i>	16.147
Squid	<i>Loligo spp.</i>	73.685
Total		1.396.026

Sumber data: Data produksi PPP Sadeng, 2019 (Pelabuhan Perikanan Pantai Sadeng, 2019)

Based on (Pelabuhan Perikanan Pantai Sadeng, 2019) Sadeng Fishery data statistic in 2018, the dominant catches from Inka Mina is skipjack tuna with catches amount of 482.115 Kg or 35 % from catches total, the second is mackerel scad with catches amount of 340.847 Kg or 24% from catches total, the third is mackerel tuna of 234.223 Kg or 17% from catches total and the fourth is tuna fish madidihang as much as 191.000 Kg or 14% from catches total, while sword fish become being the fish type that is the least caught is as much as 79 kg.

Table 14. 30-45 GT Motor Sized Operational.

Information	Unit	Minimum	Maximum	Mean
Fishing longtime	Days	5	10	5
Fishing distance	Miles	50	120	70
Production total in each ship	Kg/trip	7.025,50	22.326,13	13.066,09
Total fishing in a month	Trip	1	5	3
Total of the crew ship	People	19	29	25

Resources: Primary data analysis, 2019

Long time to fishing range is about 5-10 days and with average is 5 days. The distance of the ship to arrive at the location of fishing (fishing ground) ranges from 50-120 miles with an average of 70 miles. The average number of catches per ship ranged between 7,025.50-22,326.13 kg/trip, with the average catch per ship 13,066.09 kg/trip. Fishing amount while in month is range between 1-5 times trips, with average 3 trips in a month. In fishing season, Inka Mina ship is able to do catch operation as much 5 trip in a month while in famine season, Inka Mina ship is doing 1-3 trip in a month to avoid the big loss. In Inka Mina ship is amount of the crew ship a range about 19-29 peoples, with average crew ship is 25 peoples.

1. Investment Value on Fishing Effort by Using 30-45 GT Motor Boat In Sadeng Beach Fishery Port

The description of investment cost in doing an fishing effort motor boat 30-45 GT is explained in the Table 15.

Table 15. Investment Cost of Fishing Effort 30-45 GT Motor Boat.

No	Information	Unit	Total	Price (IDR)	Economic ages	Percentage (%)
1	Ship	GT	1	1.500.000.000	10 years	75,26
2	Fish machine	PK	1	100.000.000	5 years	5,02
3	axle engine	PK	1	30.000.000	5 years	1,51
3	Fishing catching tools	unit	6	6.000.000	3 years	0,30
4	Fishing Net	pis	100	200.000.000	7 years	10,04
5	Generator	unit	1	30.000.000	5 years	1,51
6	Lamp	unit	20	18.000.000	3 years	0,90
7	fish aggregating device	unit	2	100.000.000	3 years	5,02
8	GPS	unit	1	9.000.000	5 years	0,45
Total				1.993.000.000		100,00

Resources: Primary data analysis, 2019

The biggest investment cost in fishing effort by 30-45 GT motor boat is on the ship investment as much 75,26% from investment cost total, the second is purse seine catching tools is 10,04% from investment cost total, and the third in ship machine cost is 5,02 % from investment cost total. The ship cost that used is wooden ship type with sized 30 GT.

2. Average Fishing Variable Cost In 30-45 GT Motor Boat.

Variable cost in motor ship sized 30-45 GT bigger rather than with motor ship sized 5-30 GT, is bigger the volume of the ship, the variable cost is also will more increase. The description of variable cost in motor boat sized 5-30 GT, is described in the Table 16.

Table 16. Statistics on Use of Inputs in the Sailing Business of a 30-45 GT Motor Boat at Sadeng Beach Fishery Port

Price type	Unit	Minimal	Maximal	Mean	Deviation standard	Price per unit (IDR)
Fuel	liter	1000	1500	1.300	1.300	10.200
Lubricant	liter	1	10	6,67	3,85	130.000
Ice usage	block	15	280	175,48	98,69	22.000
Food supplies	Rupiah	4.000.000	9.000.000	6.357.142,86	1.871.782,95	200.000
Repair of net tools	pis	2.000.000	5.000.000	3.628.571,43	1.078.491,01	2.000.000
Mooring Costs	Rupiah	25.000	25.000	25.000	0	25.000
Retribution	Rupiah	2,5%	2,5%	2,5%	0	2,5%

Resources: Primary data analysis, 2019

The fuel type that used in Inka Mina ship is diesel Dexlite with per liter cost is IDR. 10.200, and average using fuel for one catches operation is 1.300 liter and deviation standard 1.300. The lubricant is using Mesran brand with the price is IDR. 130.000,00 Per liter and average using for one catches operation is 6,67 liter with deviation standard value is 3,85. Retribution cost for one times to do catches operation is 2,5 % from catches selling total.

3. Income and Profit of Fisherman by 30-45 GT Motor Boat

Income and profit of fisherman by 30-45 GT motor boat can be described Table 17.

Table 17. Income and Profit of Fishing Effort by 30-45 GT Motor Boat

Information	Average		Famine Season		Fishing season	
	Per trip	Per month	Per trip	Per month	Per trip	Per month
Production (Kg)	13.066	39.198	7.026	21.077	22.326	66.978
Price of <i>Katsuwonus pelamis</i> fish (Kg/IDR)	15.000	15.000	15.000	15.000	15.000	15.000
Price of <i>Decapterus russelli</i> fish(Kg/IDR)	15.000	15.000	15.000	15.000	15.000	15.000
Price of <i>Euthynnus affinis</i> fish (Kg/IDR)	15.000	15.000	15.000	15.000	15.000	15.000

Penerimaan (IDR)	195.000.000	585.000.000	105.382.500	316.147.500	334.891.950	1.004.675.850
Fuel (IDR)	13.260.000	39.780.000	10.200.000	30.600.000	15.300.000	45.900.000
Lubricant (IDR)	867.100	2.601.300	130.000	390.000	1.300.000	3.900.000
Square ice (IDR)	3.872.000	11.616.000	330.000	990.000	6.160.000	18.480.000
Food supplies (IDR)	6.357.143	19.071.429	4.000.000	12.000.000	9.000.000	27.000.000
Mooring price (IDR)	25.000	75.000	25.000	75.000	25.000	75.000
Taxes retribution (IDR)	9.750.000	29.250.000	5.269.125	15.807.375	16.744.598	50.233.793
Total Variable Cost	34.131.243	102.393.729	19.954.125	59.862.375	48.529.598	145.588.793
Boat Maintenance (IDR)	2.500.000	30.000.000	2.500.000	30.000.000	2.500.000	30.000.000
Machine maintenance (IDR)	9.000.000	108.000.000	9.000.000	108.000.000	9.000.000	108.000.000
FAD care (IDR)	100.000	1.200.000	100.000	1.200.000	100.000	1.200.000
Ship Tax (IDR)	4.166.667	50.000.000	4.166.667	50.000.000	4.166.667	50.000.000
Compilation (IDR)	24.316.667	291.800.000	24.316.667	291.800.000	24.316.667	291.800.000
Total Fixed Cost (IDR)	40.083.333	481.000.000	40.083.333	481.000.000	40.083.333	481.000.000
Repair of net tools	3.628.571	10.885.714	2.000.000	6.000.000	5.000.000	15.000.000
Implicit Costs (IDR)	3.628.571	10.885.714	2.000.000	6.000.000	5.000.000	15.000.000
Benefits (IDR)	20.981.584	62.944.751	2.148.688	6.446.064	50.415.315	151.245.944
Owner Income	64.175.648	192.526.945	27.767.618	83.302.854	125.459.554	376.378.663
Captain bonus	1.083.333	3.250.000	585.458	1.756.375	1.860.511	5.581.533
Commander income	7.131.033	21.393.098	4.379.700	11.382.726	12.682.140	38.046.419
Income of Ship Men	2.116.695	6.350.084	1.123.074	3.369.223	4.547.540	13.642.620
Drainage ration of the ship	907.155	2.721.465	481.318	1.443.953	863.274	2.589.823

Resources: Primary data analysis, 2019

On the 30-45 GT motor boat type, there is a ration of the captain and drainage of the ship. Captain of the ship is getting the ration as much 2 times from the ration of crew ship and added captain bonus as much IDR.250,00 per Kg from the heavy catches amount while drainer ship ration is 1/3 part of the crew ship. Based on the counting result can be conclude the highest income owner ship is IDR. 376.378.663,00 and the lowest is IDR. 83.302.854,00 per month. The highest income captain IDR. 43.627.952,00 and the lowest is IDR. 13.139.101,00 per month.

The total of the crew ship is 25 peoples until the highest income for the crew ship is divided become 25. The highest income of the crew ship is IDR. 13.642.620,00 and the lowest is IDR. 3.269.223,00 per month. The highest drainer ship ration is IDR. 2.589.823,00 and the lowest is IDR. 1.443.953,00 per month it is depend on the catches result. The lowest income for the crew ship can get while the ship is not get the result of fishing or it meal allowance from the ownership with range amount is IDR. 50.000,00 per trip while for captain is IDR. 100.000,00 Per trip.

Table 18. The Comparison of Fishing Effort by Outboard Boat and Motor Boat in Sadeng Beach Fishery Port

Information	Outboard Motorboats		Motorboats 5-30 GT		Motorboats 30-45 GT	
	Permonth (IDR/Month)	Pertrip (IDR/Trip)	Permonth (IDR/Month)	Pertrip (IDR/Trip)	Permonth (IDR/month)	Pertrip (IDR/Trip)
Total Revenue	59.171.493	2.689.613	90.639.780	30.213.260	585.000.000	30.213.260
Variable total cost	21.509.400	977.700	19.568.473	6.522.824	113.279.443	6.522.824
Total fixed costs	3.406.250	154.830	8.126.556	2.708.852	40.083.333	2.708.852
Total Profits	34.255.843	1.557.084	62.944.751	20.981.584	431.637.224	20.981.584
Owner Income	15.424.796	701.127	27.409.098	12.397.778	27.409.098	12.397.778
Commander income	0	0	21.759.945	7.253.315	21.759.945	7.253.315
Income of Ship Men	6.277.016	285.319	10.879.973	3.626.658	6.350.084	2.116.695

Resources: Primary data analysis, 2019

Based on the table above the income in outboard motor boat have the lowest income level with small variable cost until if loss happen so the owner is not responsible the bigger risk. The highest income can get from 30-45 GT motor boat fishing effort or Inka Mina ship with variable cost and investment is also high so the risk that will be borne by the owner when experiencing losses is also large. The average income in one month not more than the minimum salary regional in Gunung Kidul district in 2020 which is IDR. 1.705.000,00 per month with *ceteris paribus* assumption means no more the price changes and the fisherman is always getting the same kinds of fish with scale of the same catches.

3.4 The Prosperity of Fisherman Household in Sedang Beach Fishery Port

The scale of fisherman prosperity household is divided into 3 types of the ship which is outboard motor boat, the 5-30 GT motor boat, and the 30-45 GT motor boat/Inka Mina. The prosperity is scaled using 7 Indicator and 9 sub Indicator which is household fisherman income, fisherman household outcome, education indexes, the livelihood condition, livelihood facility, consumption pattern/nutrition value, house owner status. The description about those indicators is explained below:

1. Prosperity Level Of Fisherman By Outboard Motor Boat

The results of the calculation of the prosperity level of outboard motor boat fishermen in Sadeng Beach Fishery Port shows that as much as 16 peoples or in 80% outboard motor boat fisherman is included in the lowest category to indicator of education, and 13 fisherman or 65% fisherman is not yet having a house. Based on that explanation it can conclude that number of outboard motorboat fishing households that including in the category of prosperity level in high, medium, and low as it explained in the Table 19.

Table 19. Prosperity Level from Outboard Motor Boat Fisherman

Prosperity level	Amount (People)	Percentage (%)
Low	0	0,00
Medium	14	70,00
High	6	30,00
Amount	20	100,00

Resources: Primary data analysis, 2019

Based on the results of the calculation of the number of fishing households that including in medium category is 70%, while those while the rest are included in the high category, so it can be conclude that outboard motor boat fisherman in Sadeng Beach Fisherman Port is including in category of medium or enough of prosperity.

2. Prosperity Level Of 5-30 GT Outboard Motor Boat Fisherman

The results of the calculation of the welfare level of 5-30 GT motor boat fishermen is showing that as much as 21 peoples or 87,50% 5-30 GT outboard motor boat fisherman including in medium category of education and 11 peoples or 45 % fisherman is in the low category in the indicator of home ownership status. This is showing that it needed a improving in education and program for fisherman is able to have a house. Based on those calculations, number of fishing households that include in fisherman household welfare level categories as explained in the Table 20.

Table 20. Prosperity Level Of Outboard Motor Boat Fisherman

Prosperity level	Amount (People)	Percentage (%)
Low	0	0,00
Medium	15	62,50
High	9	37,50
Amount	24	100,00

Resources: Primary data analysis, 2019

Based on the calculation result, it known that fisherman household that including in medium category is 62,50%, while the rest is including in high category until it can conclude

5-30 GT Motor Boat fisherman in Sadeng Beach Fishery Port is including in category of medium or enough of prosperity.

3. The Prosperity Level of 30-45 GT Motor Boat Fisherman

Based on the calculation of the welfare level of 30-45 GT motor boat fishermen showing that 15 peoples or 71,42% from 30-45 GT motor boat fisherman is including in category of low in indicator of education level. This is showed that it needed improvement in category of education of 30-45 GT motor boat fisherman (Table 21).

Table 21. Prosperity Level Of 30-45 GT Motor Boat

Prosperity level	Amount (People)	Percentage (%)
Low	0	0,00
Medium	9	42,86
High	12	57,14
Amount	21	100,00

Resources: Primary data analysis, 2019

Based on Table 21 above, the results of the calculation of the number of fishing households that include in high category of 57,14% while the rest is include in medium category, so it can conclude that prosperity level of 30-45 GT motor boat fisherman in Sadeng Beach Fishery Port is including in high category.

4. Prosperity Level Fisherman in Sadeng Beach Fishery Port

Based on the Results of measurement of the welfare level of fishermen is showing that 52 people and 21 fishermen or 32,30% fisherman is not yet have house. This is showing that it needed an improving in fisherman education level and programs to improve home ownership from fishermen. To knowing the entire total of fisherman household that including in categories of welfare are low, medium and high are calculated as indicated on the Table 22.

Table 22. Prosperity Level of Fisherman in Sadeng Beach Fishery Port

Prosperity level	Amount (People)	Percentage (%)
Low	0	0,00
Medium	42	64,62
High	23	35,38
Amount	65	100,00

Resources: Primary data analysis, 2019

Based on the calculation of the number of fishing households included in the moderate welfare level was 64.62%, while the rest is including in high category until it can conclude that prosperity level of fisherman in Sadeng Beach Fishery Port is including in medium category or enough prosperity.

4. Conclusion

The greater the type of boat, the greater the level of income of fishermen but the risk of loss from fishing effort is also improves. This is because the bigger the ship, the business capital needed to make the capture effort will be even greater so that the risk of loss will be even greater. The bigger the ship also makes time and the longer and farther distance to sea. The operation of large ships is very dependent on the season so that the level of economic sustainability will be even lower. The average income of fishermen in the Sadeng Fisheries Port area is above the minimum wage in Gunung Kidul Regency.

Fisherman prosperity level in Sadeng Beach Fishery Port is including in medium category or enough prosperity. In home ownership and education status indicators are still in the low category. The fisherman prosperity level of outboard motor boat is including in medium or quite sustainable. In 5-30 GT motor boat prosperity level is including in medium category or enough prosperity. The Prosperity level in 30-45 GT motor boat is including in high category or prosperity. Based on those it conclude it can be concluded that the larger the ship the fishermen's welfare level is higher because of the greater fishermen's income.

Suggestion

Based on this research, so the suggestion it can gives as below:

1. There needs to be a capital guarantee so that fishermen can operate large ships, it needed an institution that able to gives capital loans to fishermen and it also the existence of insurance to cope with the amount of loss when operating large ships. Ship rotation from the bigger ship to small size ship, the fisherman in the bigger ship in famine season can be rotated on small ships so fishermen can still earn income during the lean season and financial institutions that can manage finances from fishermen. The existence of alternative jobs is such as farming or raising livestock to overcome the lean season.
2. For improving the fisherman prosperity in Sadeng are it needed an improving the education level in conduct training, fisheries counseling or education programs and the need for subsidized housing for fishing workers so that fishermen who are included as fishing workers can buy houses with flexible and affordable price installments.

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Yogyakarta Special Region Governor Regulation No. 257 of 2020 about Regency Minimum Wages/ City of 2020 in Yogyakarta Special Region. Special Regions of Yogyakarta.

Percentage contribution of each author in the manuscript

Himawan Dwi Putra - 40%

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