

## THE EFFECT OF FUEL PRICE FLUCTUATIONS ON FISHERMEN INCOME IN THE WEST COAST WATERS OF SUMATRA, INDONESIA

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### ABSTRACT

*Research on the effect of fuel prices fluctuating on the income of fishermen in the West Coast Waters of Sumatra have been conducted on February 2015 to February 2016. Its purpose the effect of fuel price fluctuations on the long trip of fishing, the wage system and the results as well as income received by fishermen owners and tenants. Fishing gear that used on the research are , hand line and purse seine fishing with third consideration this tool using the fuel in operation with large pelagic fish catches. The method used is survey by doing five times observed. Observations were made a month after the increase and decrease in fuel prices. Based on the survey results revealed that fluctuations in fuel prices did not affect the long trip catching, fishing ground, and the frequency of fishing for each type of fishing gear were observed. Fluctuations in fuel prices did not affect the wage system and the results for each type of fishing gear were observed. In addition, the calculation results show that there is no correlation between fluctuations in fuel prices with fluctuations in the income of fishermen each fishing gear observed. Furthermore, seasonal fluctuations had a significant relationship with the income of fishermen.*

**Keywords:** Fuel, Price, Fluctuations, Fishermen, Income

### 1. INTRODUCTION

#### Background

Fishing activities by the fishermen in the west coast waters of Sumatera using various types of fishing gear. They are Trolling, hand line and purse seine. In use the fishing gear is usually fishermen should be supported by means of a motor boat. The motor boat requires fuel as the main raw material to conduct fishing activities.

The technological advances in improving the boat a positive effect on the development of fishing activities. But this caused a high dependence on the use of fuel. Fuel become the most important component in operating costs at sea and cause fishermen should provide substantial initial capital to buy this fuel. According to Diatin (2003), the fuel cost incurred for fishing operations ranging 41-48% of the total operating costs of fishing, thus fuel effect on fishing operations costs and will ultimately affect the income of fishermen.

On the year 2015, Indonesian government took measures to sell fuel in accordance with

economic price. This situation results in fluctuations in the price of fuel, while the fishing operation cost of fuel is the biggest cost in the components of operating costs.

The problem that occurs is the operational costs to be incurred fishermen be increased if the rising fuel prices and operating costs do not necessarily fall if the price of fuel goes down. This situation will directly affect the overall operating costs and ultimately affect the income of fishermen. Based on this, researchers are interested to see how the effect of fuel price fluctuations on the income of fishermen in west coast waters of Sumatera.

The aimed of this study is to knowing the effect of fuel price fluctuations on the long trip fishing, fishing ground and the frequency of fishing, and the second is to find out the influence of fluctuations in the price of fuel to the wage system and the profit sharing of fishermen. And the last aim is analyzing the relationship fuel prices fluctuations and fishing trip to income of owners and tenants fishermen.

## 2. RESEARCH METHODS

### Time and place

This study was conducted in February 2015 until February 2016 in the waters of the West Coast of Sumatra. The location determination is done by purposive in consideration that this area is one of the areas that have the potential of fishing is big enough.

### Research methods

The method used in this study is a survey method. This research was conducted in five observations in accordance with fuel prices fluctuations that occurred, except in the third observation. Data collection is done a month after the increase in fuel prices, they are (1) on February 2015; (2) April 2015; (3) June 2015; (4) November 2015) and (5) in February 2016. Observations in June 2015 do not because of fluctuations in fuel prices, but rather to influence season to fishing.

Respondents in this study were fishermen who operate fishing gear by Trolling, Hand Line and Purse seine fish landed in Padang beach, West Sumatra Indonesia. The number of respondents for each fishing gear set as many as five people were chosen to cover fishing gear operated. Data operating costs and catches obtained based on the average yield of each fishing.

### Data analysis

To find out the income of fishermen, that is using by revenue analysis. According Soekartawi (2002), the revenue can be calculated by mathematical equations as follows:

$$I = TR - (FC + VC)$$

$$I = TR - TC$$

Where :

I = Income

TR = Total Revenue

TC = Total Cost

FC = Fixed Cost

VC = Variable Cost

An then to find out the relationship of fuel prices fluctuations with income, and fishing season with income is done by correlation test Spearman that using SPSS application. Spearman correlation test is a statistical test is intended to determine the relationship between two or more variables ordinal scale. Spearman correlation test assumptions are: (1) Data are not normally distributed, and (2) Data measured in ordinal scale (Firdaus, 2012).

## 3. RESULTS AND DISCUSSION

### Fishing Gear

Fishing gear were observed in this study is that the operation of fishing gear used and the type of fuel relatively many catches obtained is Large Pelagic Fish (LPF). In the waters of the west coast of Sumatra in general and western Sumatra in particular, tools for catching large pelagic fish are Trolling, Fishing elongation and Purse seine.

Trolling-operated by motor boat 5 and 6 Gross Ton (GT) with four and five crew. The operating time of the fishing in a single trip and 10-13 days in a year to able to fishing 18-20 trip. Investments for with the size of the 5 GT is IDR..285.000.000 and 6 GT is IDR..341.000.000. 20% of their catch is Tuna fish while the remaining 42% and 38% are Mackarel and Skipjack Fish.

Fishing gear of hand line using the motor boat tahts measures 30 GT and 50 GT with crew in five and eight persons. Time operation which is 14 and 21 days in one trip fishing and within a year can be carried out fishing of 14 and 10 trip. Investments fishing gear of hand line with the size of the motor boat 30 GT amounting IDR..971.000.000,- and sizes of motor boat in 50 GT which amounted IDR..1.436.845.000,- the fishing yeild 90% is Tuna while the remaining are mackarel and Skipjack.

Purse seine fishing gear using a motor boat of the size 88 GT and 117 GT with number of crews are 30 and 35 persons. Teh operation time at 15 and 60 days per trip and in a year can make an fishing as many as 18 and 5 trip. The investment of purse seine in 88 GT is IDR..1.540.000.000,- and investments purse seine 117 GT that IDR..1.961.650.000,- 35% of the fishing yeild is 35% Tuna, Skipjack 35% and 30% of fish other fish.

The Fishing ground to fishing gear of Trolling in waters of west sumatera with a distance of over 60 miles from Padang Beach, fishing ground to hand line fishing in the waters of the West Coast of Sumatra in Mentawai and South Nias and Enggano Island with a distance of 80-200 miles of Padang Beach.

### Production

Production Trolling fishing gear, hand line fishing and purse seine are influenced by

the seasons or no of fish at the time of fishing. The fishing season can be categorized into three categories, that first, is more fish seasons that occur in June to September, middle fish season was that happened in October-November and April-May, and the little fish season occurred in December-March.

The calculated production per trip of fishing in accordance with the type of fishing

gear operated. Based on the results obtained recording the average production at each observation as shown in Table 1. Based on production data known to every type and size of motor boat used different production number. It is caused by a type of fishing gear, the size of the motor boat is used and the length of the operational details of fishing. for the data of production based on motor boat size and the time of observation can be seen in Table 1:

Table 1. Production Value of Fishing Gear, Trolling, Hand Line and Purse seine

Observation	Production (Kg)					
	Trolling		Hand Line		Purse Seine	
	5 GT	6 GT	30 GT	50 GT	88 GT	117 GT
February 2015	1220	1570	1042	2008	4988	26984
April 2015	1800	2100	2018	3002	5841	28802
June 2015	2300	2600	2510	3560	6892	30675
November 2015	1950	2050	1920	3014	5946	28757
February 2016	1240	1560	1022	2019	4995	26992
	Production value (IDR.000,-)					
February 2015	21830	28270	37934	73086	91358	494079
April 2015	30620	35720	76684	114076	105988	522615
June 2015	34960	41620	92870	131720	123922	551538
November 2015	31590	34870	72960	114532	107889	521797
February 2016	22568	29648	37206	73476	91456	494221

Source: Prime Data, 2016

Based on data of production and fishing trip can be explained that was fuel price fluctuation is not effect as significantly to fishing trip. Fishermen said, "eventhough the fuel price in fluctuation but the fishing trip and time fishing is not change as same activities. This is caused by the fuel price fluctuation as relatively in low, so the fishermen in sustainable on operational cost.

Pasaribu said (2008) with the fuel price increase of more than 100% in 2005, resulting in a change purse seine time fishing in the area of North Sumatra is from 6 to 7 days, that are relatively at the same fishing yeild. In addition, there is a significant income difference before and after the increase in fuel prices.

#### Operational costs of Fishing

Fishing operational costs consist of the cost of fuel, the cost of consumption, purchasing ice, maintenance and others. In this study, the operational costs are grouped into three sections: the cost of fuel, cost of consumption and other costs. Other expenses in question here is the cost of such a purchase ice, ship maintenance costs, engine maintenance costs, maintenance costs of fishing gear and boat maintenance costs.

#### Cost of Diesel Fuel

Diesel fuel is the main fuel used by fishermen in any fishing activities. A large number of diesel fuel needed depends on the operation of the old diesel engine owned by each boat. This means the amount of diesel fuel needed depends on the distance of fishing grounds and the amount of hauling and setting.

Fluctuations in the price of fuel will affect the operating costs of fishing. According Dlatin (2003) incurred fuel costs for fishing operations ranging from 41-48% of the total operating costs of fishing, thus fluctuations in fuel prices will affect to revenue earned by fishermen.

Furthermore, according to research by Mira *et al* (2014), a reduction in fuel subsidies is estimated to have a negative impact to the fisheries business, such as the reduction in fishermen's welfare, rising fish prices and increasing illegal fishing in PPS Nizam Zachman.

For more details, number and value of money spent per fishing trip due to fluctuations in fuel prices can be seen in Table 2:

Table 2. Cost of Diesel Fuel

Observation	Number of Diesel Fuel (Liter)/ Trip					
	Trolling		Hand Line		Purse Seine	
	5 GT	6 GT	30 GT	50 GT	88 GT	117 GT
February 2015	700	800	2510	3505	2910	15015
April 2015	680	785	2480	3485	2880	14980
June 2015	670	770	2465	3465	2865	14965
November 2015	685	780	2485	3480	2885	14985
February 2016	705	795	2500	3500	2900	15000
	<b>Value (IDR.000,-)</b>					
February 2015	4480	5120	16064	22432	18624	96096
April 2015	4692	5417	17112	24047	19872	103362
June 2015	4623	5313	17009	23909	19769	103259
November 2015	4590	5226	16650	23316	19330	100400
February 2016	4195	4730	14875	20825	17255	89250
<b>1 Trip of Fishing</b>	10-13 day	10-13 day	13-15 day	20-23 day	14-16 day	55-60 day

Based on Table 2 that the amount of fuel consumed by each fishing gear has not changed despite experiencing fluctuating fuel prices. This situation explains that fluctuations in fuel prices did not affect the time of operation and the fishing trip.

The price of fuel used in this study is fluctuate, which in February 2015 diesel prices prevailing at IDR 6,400,- / liter, April 2015 amounting to IDR 6,900,- / liter, in June 2015 amounting to IDR 6,900,- / liter, November 2015 amounting to IDR 6700,- / liter and February 2016 amounted to IDR 5,950, - / liter. The high costs to purchase of fuel took place in April and June 2015 and the smallest in February 2016.

#### Costs of Consumption and Others

Consumption costs are costs incurred for bag lunches to all workers during fishing activities. Provisions consumption required such as rice, cooking oil, chili, salt, vegetables, cigarettes, coffee, sugar, water and others. The biggest size of ships and labor causes consumption charges incurred will be larger. Other expenses are different types of costs incurred to support the process of catching up as the cost of purchasing ice, ship maintenance costs, machine maintenance, maintenance of fishing gear. More details can be seen in Table 3:

Table 3. Costs of Consumption and Other

Observation	Costs of Consumption (IDR.000,-)					
	Trolling		Hand Line		Purse Seine	
	5 GT	6 GT	30 GT	50 GT	88 GT	117 GT
February 2015	1.565	2.340	2.825	5.880	11.259	48.500
April 2015	1.839	2.752	3.157	6.468	12.385	53.350
June 2015	1.898	2.802	3.357	6.856	13.128	56.556
November 2015	1.916	2.852	3.512	7.130	13.652	58.816
February 2016	1.936	2.898	3.584	7.273	13.926	59.988
	<b>Others Cost (IDR.000,-)</b>					
February 2015	2.035	2.160	837	1.940	467	2.367
April 2015	2.161	2.248	938	2.152	524	3.689
June 2015	2.162	2.250	938	2.152	524	3.689
November 2015	2.284	2.298	940	2.178	525	3.681
February 2016	2.284	2.298	940	2.178	525	3.681

In Table 3 it can be seen that the fluctuating fuel prices do not affect linearly

with consumption costs and other costs, with the cost of consumption and other costs

continue to increase although at the same time fuel prices decline. The increase in fuel by 7.8% (from February to April 2015) raised the cost of an average consumption of 12.8%. The same fuel price in April and June 2015, but still cause an increase in consumption expenditure incurred on average by 4.9%. The decline in fuel prices (diesel) 2.9% (June-November 2015) still lead to increased costs incurred consumption on average by 3.2%. Nor has the decline in fuel prices by 11.2% (November 2015 - February 2016) remain raised the cost of an average consumption of 1.8% as well as with other costs continue to increase.

### System of Wages and Sharing Income

The wage system and the results will affect the income received by owners and fishermen fishermen tenants. Enterprises gear observed in this study have a system for different results. fishing gear have a system where operational costs are borne by the owner, 8% of the value of the catch is calculated as the cost of maintenance and depreciation, where the catch is divided 50% for owners and 50% to the tiller. That is, fluctuating fuel prices do not affect the income of fishermen tenants but the effect on fishermen's income owners.

Enterprises using the hand line fishing gear fixed wages and salaries of the catch for fishermen tillers, where operational costs are borne by the owner. Wages remained composed on daily wages and premium wages. While salaries catches obtained from IDR 5.000, - / kg production output for the entire fishing cultivators. Enterprises using the purse seine in the form of profit sharing system operating costs are shared by the owners and tenants of fishermen. After the reduction in operating costs, net income would be divided by the proportion of 60% for owners and 40% for fishermen tenants.

To facilitate the discussion, fishermen are divided on fishermen owners and fishermen tenants. Fishermen tenants grouped into 3 namely Fishing master, supporting and labor. Fishing master usually doubles as the helmsman with an average experience of over 15 years. Supporting role as technicians as the interpreter engine, cooks and others with experience of 5-10 years. While labor tasked to assist in fishing activities with less than 5 years of experience.

For results and wages for fishermen tenants based on the role and position for fishing gear, purse seine fishing and stalling can be seen in Table 4, Table 5 and Table 6.

Table 4. Sharing Income of Trolling Fishing Gear

Sharing Income of Trolling Fishing Gear 5 GT					
Status	amount (person)	Part	Percentage	Total of Part	Total Percentage
Fishing Master	1	2	40	1	40
Supporting	1	1	20	1	20
Labour	2	1	20	2	40
Total	4			5	100

Sharing Income of Trolling Fishing Gear 6 GT					
Status	amount (person)	Part	Percentage	Total of Part	Total Percentage
Fishing Master	1	2	33,3	2	33,3
Supporting	1	1	16,7	1	16,7
Labour	3	1	16,7	3	50,0
Total	5			6	100

Table 5. Sharing Income *Purse Seine*

Sharing Income Purse Seine 88 GT					
Status	amount (person)	Part	Percentage	Total of Part	Total Percentage
Fishing Master	1	3	3	7,1	7,1
Supporting	14	1,5 – 2	24,5	57,6	4,1

Labour	15	1	15	35,3	2,4
Total	30		42,5	100	
Sharing Income Purse Seine 117 GT					
Fishing Master	1	3	3	6,3	6,3
Supporting	14	1,5 – 2	24,5	51,6	3,7
Labour	20	1	20	42,1	2,1
Total	35		47,5	100	

Table 6. The Salary of Hand Line Fishing

Sharing Income Hand Line Fishing 30 GT				
Duty of person	Salary a day/ trip (IDR.000,-)	Salary on Fishing yield / trip (IDR.000,-)	Total Income (IDR.000,-)	
Fishing Master	1.600	1.900	3.500	
Supporting	1.142	1.900	3.042	
Labour	1.002	1.900	2.902	
Sharing Income Hand Line Fishing 50 GT				
Fishing Master	2.715	1.755	4.470	
Supporting	1.778	1.755	3.533	
Labour	1.515	1.755	3.270	

Fluctuating fuel prices had no effect on the results of the business conducted by fishing gear is being investigated. For the outcome is determined by agreement between the owner and fisherman fishermen tenants each gear or determined directly by the ship owners. As shown in Table 4, Table 5 and Table 6 for results and reward systems used by each of the different fishing gear. Systems for business results conducted by *Trolling* fishing gear and purse seine in traditional form of sharecropping system, while businesses overextend fishing gear using fixed wages and salaries catches.

From the third of the wage system and the results of these pro to fishermen tenants are wage system for the results of *Trolling* and hand line fishing gear, because with this system the proportion received by illustrate the income received by fishermen, the discussion is conducted every trip arrest, it aims to compare the income of fishermen every fishing fleet operated. Revenue received by the fishermen affected by the type of fishing gear operated and

fishermen tenants by 52% and 48%. Profit-sharing system for purse seine fishermen proportion received by fishermen tenants by 40% in accordance with the Law on Production Sharing No. 16 Year 1964.

This situation will affect the income of fishermen, where the sharing system based on the Law of the causes of income received smaller tenants fishermen when compared with the results and the prevailing local wage.

#### Fishermen Income

Income is calculated per trip fisherman catching accordance with the agreement between owners and tenants. Income in the calculation above are net income received by fishermen. To

production, operating time and gear wage system and the results applied by each gear. The income of fishermen is a reduction of the value of production costs. For more details, can be seen in Table 7, Table 8 and Table 9:

Tabel 7. Income Per Trip of Fishermen Trolling

Income Per Trip of Fishermen Trolling 5 GT				
Observation	Income (IDR.000,-)			
	Owner	Fishing Master	Supporting	Labour
February 2015	6.875	2.750	1.375	1.375
April 2015	10.964	4.386	2.193	2.193
June 2015	13.138	5.255	2.628	2.628
November 2015	11.400	4.560	2.280	2.280
February 2016	7.077	2.831	1.415	1.415
Pendapatan Per Trip Nelayan Trolling 6 GT				
February 2015	9.325	3.077	1.557	1.557
April 2015	12.652	4.175	2.113	2.113
June 2015	15.627	5.157	2.610	2.610
November 2015	12.247	4.042	2.045	2.045
February 2016	9.861	3.254	1.647	1.647

Tabel 8. Income Per Trip Fishermen by Hand Line Fishing

Income Per Trip Fishermen by Hand Line Fishing 30 GT

Income (IDR.) (IDR.000,-)				
Observation	Owners	Fishing Master	Supporting	Labour
April 2015	35.279	3.618	3.160	3.020
June 2015	70.530	4.606	4.149	4.009
November 2015	38.824	3.611	3.154	3.014
February 2016	3.211	2.622	2.165	2.025
Pendapatan Per Trip Nelayan Pancing Ulur 50 GT				
February 2015	13.533	3.970	3.033	2.770
April 2015	46.753	4.591	3.654	3.391
June 2015	83.099	5.215	4.278	4.015
November 2015	54.430	4.599	3.661	3.399
February 2016	14.082	3.977	3.039	2.777

Tabel 9. Fishermen Income per Trip of Fishing by *Purse Seine*The Fishermen Income per Trip of Fishing by *Purse Seine* 88 GT

Income (IDR..000,-)				
Observation	Owners	Fishing Master	Supporting	Labour
April 2015	25.915	2.744	1.601	915
June 2015	32.791	3.472	2.025	1.157
November 2015	26.401	2.795	1.631	932
February 2016	20.588	2.180	1.272	727
Fishermen Income per Trip of Fishing by <i>Purse Seine</i> 117 GT				
February 2015	124.434	11.788	6.877	3.929
April 2015	130.379	12.352	7.205	4.117
June 2015	140.668	13.326	7.774	4.442
November 2015	129.074	12.228	7.133	4.076

February 2016	122.073	11.565	6.746	3.855
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Based on Table 7, Table 8 and Table 9 is known that fluctuations in fuel prices did not affect the income of fishermen. Based on the research results Saptanto, *et al* (2014) stated that the 36% rise in fuel prices resulted in a decrease in the income of fishermen by 25-55% depending on the size of the motor boat operated. Furthermore, the smaller the size of the motor boat operated, the greater the impact of reduced revenue received by a fisherman in the ocean Fishing Port Nizam Zachman.

In this study, fluctuations in fuel prices did not significantly affect the income of fishermen is expected because of fluctuations in fuel prices was relatively small is below 8%.

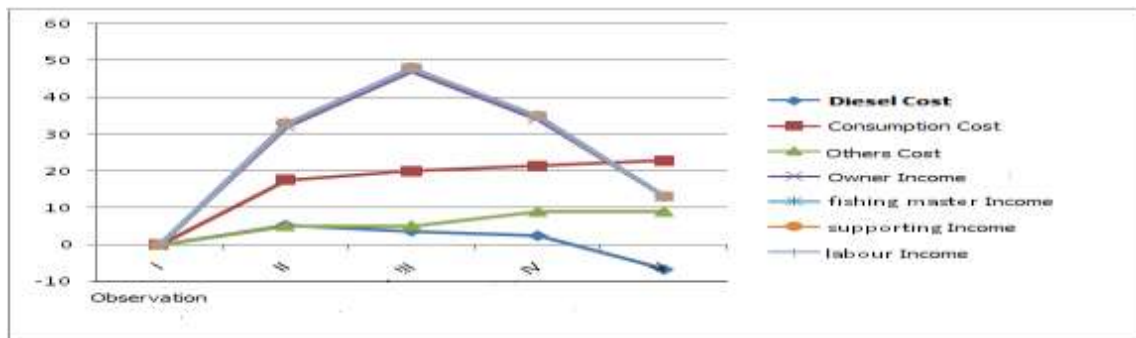
**Percentage Change Cost of diesel fuel, consumption costs, other costs and income**

Changes in the price of diesel will affect the operating costs. Total operational costs incurred by the fishing experience changes following the change in diesel fuel prices. For more details can be seen in Table 10:

Fluctuating price of diesel fuel is not very significant effect on the cost of consumption and other costs. This can be seen in April 2015 the price of diesel fuel has increased while the cost of consumption as relatively is not the change.

Table 10. Costs change percentage of diesel fuel, consumption, others and income fishing by Trolling Fishing Gear

	Diesel Cost	Consumption Cost	Others Cost	Income of owner	Fishing Master Income	Supporting Income	Labour Income
Observation I	0	0	0	0	0	0	0
Observation II	5,3	17,56	5,1	32	33	33	33
Observation III	3,59	19,95	5,17	47	48	48	48
Observation IV	2,38	21,38	9,02	34	35	35	35
Observation V	-6,69	22,76	9,02	13	13	13	13



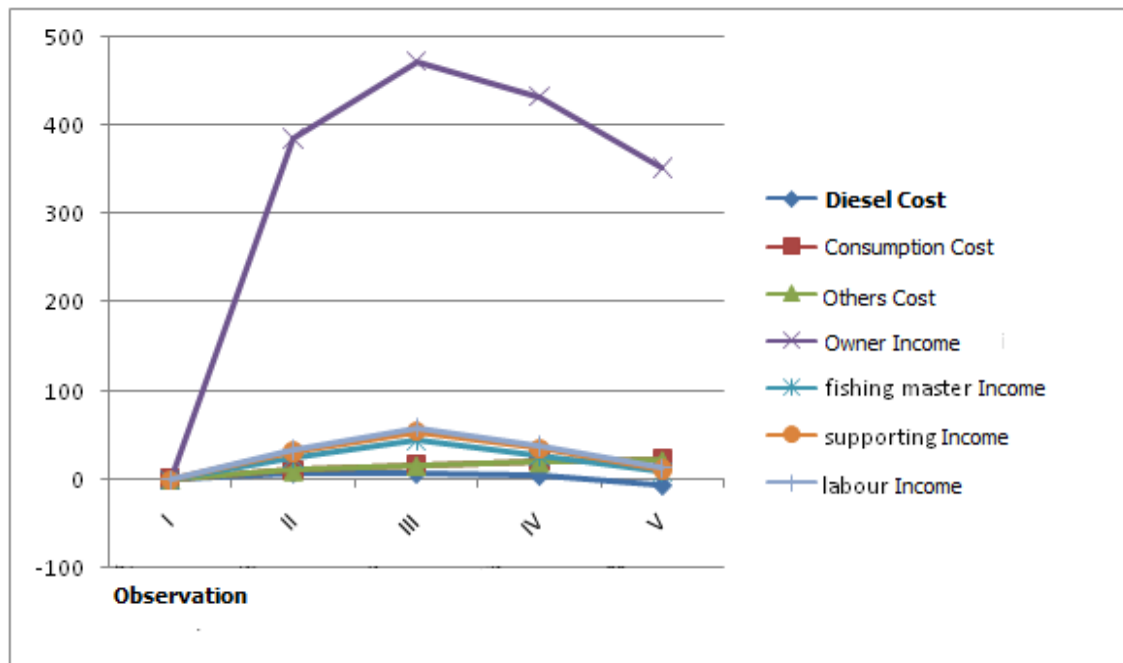
Picture 1. The costs change percentage of diesel fuel, consumption, other and income by Trolling

Tabel 11. Costs change percentage of diesel fuel, consumption, other and income by Hand Line Fishing

Observation	Diesel Cost	Consumption Cost	Others Cost	Income of owner	Fishing Master Income	Supporting Income	Labour Income
Observation I	0	0	0	0	0	0	0



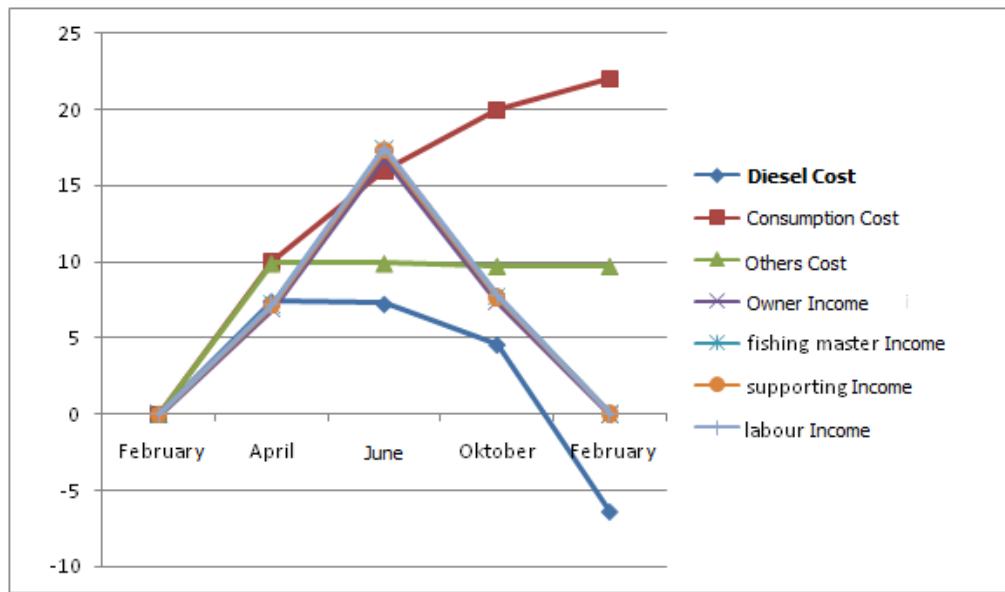
Observation II	6,92	10,57	10,00	386	24	31	33
Observation III	6,33	16,68	16,01	473	44	54	58
Observation IV	4,00	20,79	20,01	434	27	35	38
Observation V	-6,67	22,81	22,01	353	8	12	13



Picture 2. The costs change percentage of diesel fuel, consumption, other and income by Hand Line Fishing

Table 12. The costs change percentage of diesel fuel, consumption, other and income by *Purse seine*

Observation	Diesel Cost	Consumption Cost	Others Cost	Income of owner	Fishing Master Income	Supporting Income	Labour Income
Observation I	0	0	0	0	0	0	0
Observation II	7,42	10,00	9,90	6,95	7,19	7,16	7,22
Observation III	7,25	16,01	9,90	16,85	17,38	17,31	17,44
Observation IV	4,57	20,01	9,72	7,39	7,73	7,69	7,76
Observation V	-6,47	22,01	9,72	-0,05	0,03	0,03	0,03



Picture 2. The costs change percentage of diesel fuel, consumption, other and income by Purse seine

The Relationship of Fuel Price Fluctuation, Fishing Season With Owners and Tenants Income of Fishing by Trolling, Hand Line Fishing and Purse Seine.

The relations fluctuations in fuel prices, fishing season with earnings owners and tenants to fishing by Trolling, purse seine, hand line fishing, analyzed using correlation test (rank spearman) as shown in Table 13 and Table 14

Table 13. Correlation of Fuel Price Fluctuation, Fishing Season With Owners and Tenants Income of Fishing by Trolling, Hand Line Fishing and Purse Seine.

		Fuel Price Fluctuation	Owner Income	Fishing Master Income	Supporting Income	Labour Income
Fuel Price Fluctuation	Correlation Coefficient	1.000	.821	.872	.872	.718
	Sig. (2-tailed)	.	.089	.054	.054	.172
	N	5	5	5	5	5

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 13 shows the correlation between fluctuations in fuel prices with income of owners and tenants of fishing by Trolling, hand line fishing and purse seine. Fluctuations in fuel prices do not have a significant relationship with the owner income (Sig. = 0,089>0,05), master of fishing income (Sig. = 0,054>0,05), supporting income (Sig. = 0,054>0,05), and labour income (Sig. = 0,172>0,05). Besides

the income of fishermen affected by the operational costs are also affected by fishing season. Based on the results obtained correlation fluctuations in fuel prices is not related to the level of income received by fishermen. Furthermore, to see the relationship between fishing season with the revenue earned by each fisherman to test the correlation the same as in Table 14.

Tabel 14. Corelation of Fishing Season, With Owners and Tenants Income of Fishing by Trolling, Hand Line Fishing and Purse Seine.

		Fishing Season	Owner Income	Fishing Master Income	Supporting Income	Labour Income
Fishing Season	Correlation Coefficient	1.000	.800	1.000**	1.000**	.900*
	Sig. (2-tailed)	.	.041	.	.	.037
	N	5	5	5	5	5

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*\*. Correlation is significant at the 0.01 level (2-tailed).

Table 14 shows the correlation between the frequency of fishing with owner income and tenants income of fishing by Trolling, hand line fishing and purse seine. Fishing season does not have a significant relationship with the owner income (Sig. = 0.041 < 0.05), while the fishing season had a significant association with the master of fishing income (Sig. = 0.00 < 0.01), supporting income (Sig. = 0.000 < 0.01), and labor income (Sig. = 0.037 < 0.05). Based on Table 14 fishing season has a positive correlation with the income of each fisherman, whereby when the fishing season of income received by each fisherman also increased.

#### 4. CONCLUSION

The fluctuations in fuel prices do not affect the long trip fishing, fishing ground, and the frequency of fishing for the fishing gear by Trolling, hand line fishing and Purse seine. Fluctuations in fuel prices did not affect the wage system and profit sharing or income for each type of fishing gear equipment is being operated.

Based on calculations showed that there is no correlation between fluctuations in fuel prices with fluctuations in the income of fishermen each fishing gear. Furthermore, fluctuations fishing season had a significant relationship with the income of fishermen owners and tenants.

Research on the relationship of fuel price fluctuations with the income received by fishermen should be seen in a longer period with fluctuations in fuel prices is greater. For further research suggested doing research on other fishing areas such as the southern coast of Java, Indonesia East with the same or different tools. To increase the income of fishermen tiller government should review the legislation regarding the

profit-sharing system has been established for this.

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