

# Analysis of Costs for Maintenance and Readiness of Fishing Machines Against Motorboat Revenues for Fishermen Era of Eradication of Illegal Fishing

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## -----ABSTRACT-----

*This study aims to determine the relationship between maintenance costs and engine readiness to the operating income level of fishing boats in the era of eradicating illegal fishing. In addition, it is also to find out how the relation between maintenance costs and the readiness of the fishing engine to the operating income level of the Fishing Motor Boat. This research was conducted at Fisherman Motor Vessels (KMN AIMAR 54 located in Flores district, Nusa Tenggara Timur Province. Data collection was carried out by conducting surveys and interviews. The results of this study showed the analysis as follows: First, the results of Horizontal Analysis showed an increase in income of USD. 129,725,000, or 36.89%, indicating an increase in the catch of the era of eradicating illegal fishing, a positive and significant effect on the income of ship owners and an increase in Maintenance Costs has a positive and significant effect on Revenue. Maintenance costs together have a positive effect on income. Based on the results and discussion of the study, from the Horizontal and Vertical analysis the correlation coefficient of 4.81 can be concluded that the era of eradication of illegal fishing between maintenance costs and the readiness of the engine catch gan fish catch income has a very strong or very close correlation and means that the increase / decrease in maintenance costs and readiness of fishing machines will be followed by an increase / decrease in catch*

**KEYWORDS;-** Maintenance and Readiness Costs for Catching, Fishing, and Catching machines

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## I. INTRODUCTION

The province of Nusa Tenggara Timur (NTT) is located between 8 ° -12 ° South Latitude and 118 ° - 125 ° East Longitude. The development of fisheries in Nusa Tenggara Timur is supported by the potential of a coastline length of ± 5,700 Km and an area of sea reaching 15,141,773.10 Ha. Potentials that support the fisheries sector are Mangrove Forest covering ± 51,854.83 Ha (11 species), ± 160 species of coral reefs from 17 families, 42,685 fishery households, 808 coastal villages / villages, 1,105,438 coastal inhabitants, 194,684 people fishermen (± 9.9% of the total number of coastal villagers) (BPS, NTT in 2012 figures).

Potential of capture fisheries, consisting of: Sustainable Potential (MSY) 388.7 Tons / Year; number of economical fish: (1) Pelagic fish (tuna, skipjack, mackerel, fly, selar, bloating); (2) demersal fish (grouper, yellow tail, snapper, bambang); (3) other commodities: (lobster, squid, blood clams).

East Flores Regency, one of the Regencies in Nusa Tenggara Timur (NTT) Province, has an estimated fisheries resource potential of; 13,764 tons / year of pelagic fishery resources and 7,411 tons / year of demersal fishery resources.

The policy of eradicating illegal fishing, the moratorium on foreign fishing vessels, the prohibition of transients and the prohibition on the use of fishing equipment are not environmentally friendly. The efforts made were fruitful, based on the 2016 National Fish Assessment Commission data, fish stocks have reached 12 million tons. The community fish consumption rate also increased from 36 kg per capita in 2014 to 43 kg per capita in 2016.

Increasing fish stocks and community fish consumption are opportunities or strategies to increase fishing income and develop what they already have. This also applies to fishing businesses, given the need to improve the quality and quantity of catches, carry out maintenance and readiness of fishing machines. Ship owners must take into account the costs that must be incurred during the operation of the ship. By knowing what costs are incurred and the amount, the ship owner can take into account the benefits.

Fishing equipment are facilities and equipment or other objects used for fishing (Minister of Fisheries No. 02 of 2012). Care systems that are planned for preventive and corrective maintenance are the main guidelines for the maintenance and readiness of fishing engines, both those carried out by the crew and the basement appointed by the ship owner. It is expected that maintenance and maintenance can reduce damage so that fishing operations can increase the fishermen's exchange rate, namely increasing the income of fishing businesses.

## **II. MATERIAL AND METHOD**

This research is on pole and line fishing boat motors; Name of KMN Ship. Aimar 54, registration place for Larantuka, East Flores Regency, Nusa Tenggara Timur Province, registration sign 2018 oof no. 79 / N, vessel size L x B x D (M) 13.26 x 2.27 x 1.00, gross tonnage of 10 GT, 4 ton net tonnage, Year of construction 2015, MITSUBISHI 160 PK main drive, Fiber Material main vessel glass, number of propellers one unit.

### ***Analisis horizontal.***

Horizontal analysis according to Jumingan (2009: 44) the type of analysis commonly used in financial statement analysis) is horizontal analysis and vertical analysis. Horizontal analysis or also called dynamic analysis is the analysis of the development of financial data and company operating data from year to year in order to find out the financial strengths or weaknesses of the company concerned.

Vertical analysis or also called static analysis is the analysis of financial statements for the problem of the effect of maintenance costs and improvements to KMN ship income. Aimar - 54 owned by Fishermen in 2016-2018; according to Sugiyono (2004: 11) is a study that aims to determine the relationship between two or more variables.

### ***Research sample.***

Data Collection Method The author uses quantitative research methods; According to Sugiyono (2015: 14), the research method which is based on positivism philosophy, is used in examining the sample and research output, the sampling technique is generally done by random sampling, while data collection is done by utilizing the research instruments used, analysis the data used is quantitative / can be measured with the aim of testing the hypotheses previously set. "This quantitative research was taken from samples where the samples were fishing boats, and data was taken from ship owners, in the form of primary data and secondary data, primary data, namely documents of damage, especially fishing vessel engines; covers all ships, including: Hull, Fish hatch, Painting, Propeller shafts, Propeller shafts, bearings, Rudder Blade, Rudder sticks, Rudder shoes, Fuel filters, Injector Nozzle and reports on maintenance and repair costs. Secondary data was taken from library studies.



**Figure 1.** KMN. Aimar 54



**Figure 2.** Main Engine MITSUBISHI 160 PK



**Figure 3.** Propeller

### **III. Results.**

Operational costs of fishing motor boats in 2016-2018 include ship daily costs and maintenance costs and readiness of fishing engines. Total daily cost of Ship 82,588.90 USD; 86,715.42 USD; 90,159.05 USD Total maintenance costs 2,438.58 USD; 1,565.61 USD; 2,898.68 USD. There are also financial report data that show the costs of maintaining ship hull painting and repairs in 2017 and 2018 with a value of zero (USD. 0) in (Table 2).

#### **Ships Daily Cost.**

Daily costs of fishing motorboats; based on financial report data recorded between 2016 and 2018 (Table 1). fuel costs are costs that must be incurred in connection with the fuel consumption needs needed as long as the stationary or operating vessels carry out fishing from fishing bases to fishing ground or vice versa. 9,663.45USD; 10,810.14USD; 11,679.92USD. The amount of this fee depends on the type of propulsion engine of the ship and also the length of time of fishing operations. Supplies are costs incurred by logistics such as food and beverages for the crew and ship owners 20,414.80USD; 19,170.69USD; 20,803.75USD. Lubricating oil costs are costs that must be incurred in connection with the lubrication requirements for the operation of the vessel 2,272.08USD; 2,662.60USD; 2,449.59USD. The cost of fresh water for this fee is related to the need for fresh water for the crew for cooking, bathing, washing 1,711.16USD.; 2,005.82USD; 2,094.58 USD. For ships with refrigeration systems using bulk ice cubes in each operation, it costs money to provide ice as a catch for cooling fish of 5,634.76USD. 79,360,000; 6,092.02USD; 6,212.72USD. Feed costs are the costs needed to provide bait requirements in fishing operations, 6,461.23USD. ; 6,638.74USD; 6,731.04USD. Additional costs are operating license fees and anchoring ports etc. 1,001.14USD; 1,136.04USD; 1,207.04USD. Costs incurred to

pay the salaries of the crew are taken 50% of the net profit of the vessel 28,401.02USD; 30,034.08USD; 29,466.06USD. For shipowners taken as necessary for living costs and taken from profits that have been taken from the cost of the crew of 7,029.25USD; 8,165.29USD; 9,514.34USD.

Table 1

The daily cost of the ship is based on historical data recorded between 2016 and 2018

Ships Daily Cost	2016	2017	2018
Fuel	9,663.45	10,810.14	11,679.92
Supplies	20,414.80	19,170.69	20,803.75
Lubricating oil	2,272.08	2,662.60	2,449.59
Fresh water	1,711.16	2,005.82	2,094.58
Bulkice cube	5,634.76	6,092.02	6,212.72
Fish bait	6,461.23	6,638.74	6,731.04
Additional	1,001.14	1,136.04	1,207.04
Crew	28,401.02	30,034.08	29,466.06
Owner	7,029.25	8,165.29	9,514.34
<b>Total daily cost</b>	<b>82,588.90</b>	<b>86,715.42</b>	<b>90,159.05</b>

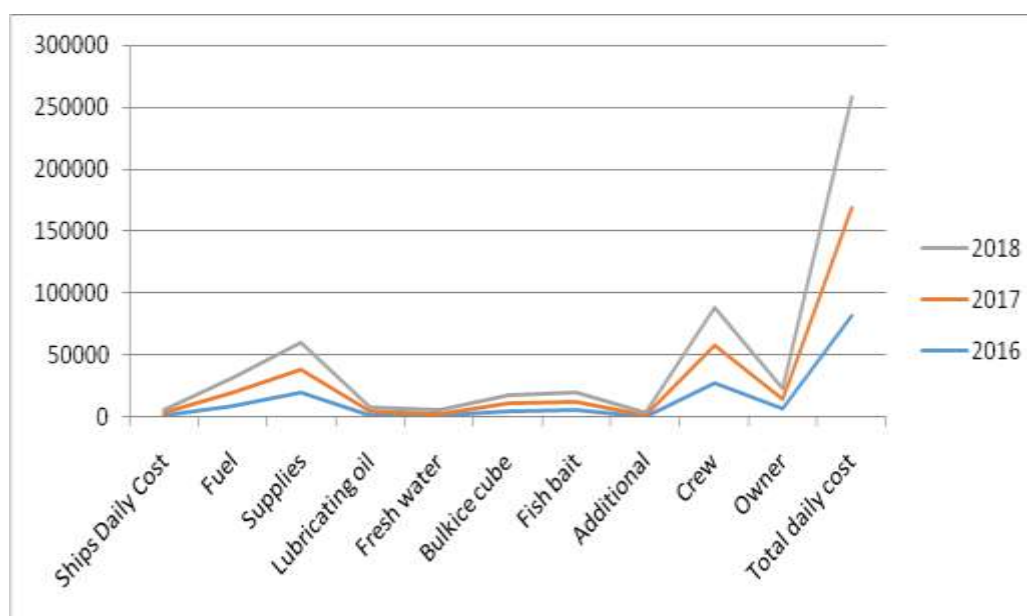


Figure 5. Ship Daily Cost

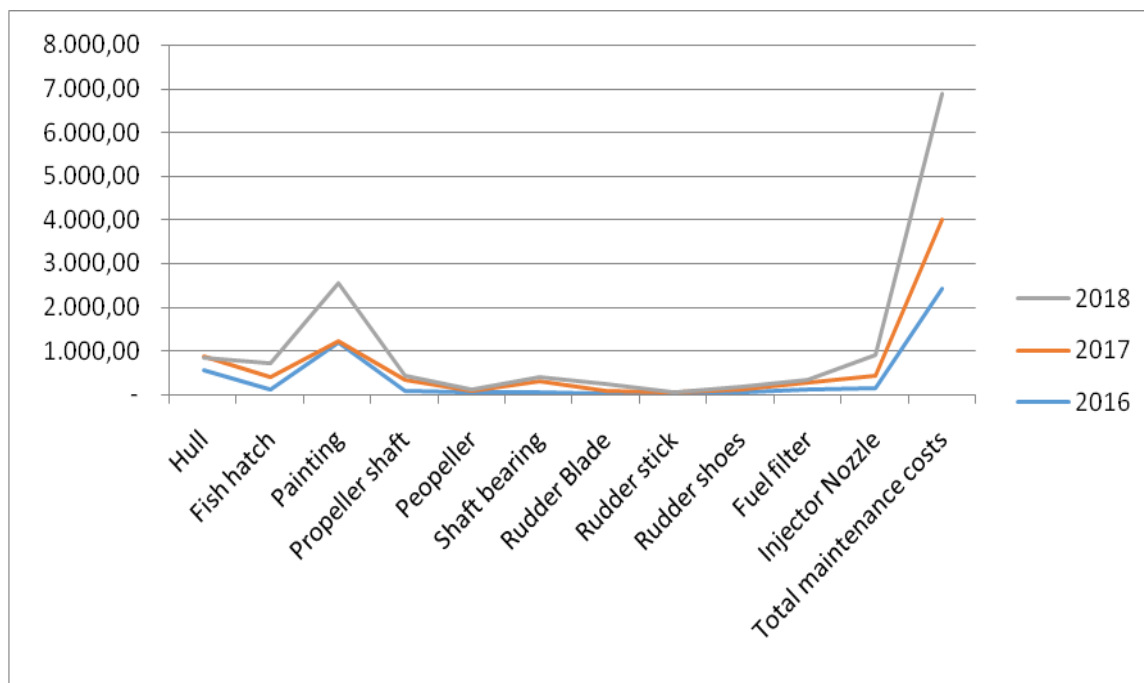
### Maintenance Cost.

Maintenance and readiness of fishing machines (Table 2) include routine, periodic and docking costs for ships; Routine maintenance is maintenance of ship construction carried out on a regular basis every day which includes construction of ships that are above sea level. Periodic maintenance is ship construction maintenance, especially carried out every period of six months which includes the construction of ships that are below sea level. For periodic maintenance, the ship must be dredged. Dredging ships, dredging fishing motorboats in the traditional way is determined by the high and low tides in the area around the coast. If the tidal difference is high enough, the ship is sufficiently grounded on land and then sack pads are filled with sand and the supporting beams on the hull are left and right of the ship so that the ship stays in an upright position, in docking carried out traditionally; the bottom of the water must be sand or mud. Maintenance of fishing vessels carried out on board and on land covers all ships, including: Hull 568.02 USD; 284.01USD.; USD. 0, Fish hatch 106.50 USD; 284.01 USD; 355.01 USD. Painting 1,207.04 USD; USD. 0; 1,349.05 USD. Propeller shaft 85.20 USD; 227.21 USD;127.80USD. Propeller 42.60 USD; 35.50 USD; 49.70 USD. shaft bearing 71.00 USD;

213.01 USD; 142.01 USD. Rudder Blade 28.40 USD; 42.60 USD; 177.51 USD. Rudder stick 24.50 USD; 17.75 USD; 23.08 USD. Rudder shoes 56.80 USD; 35.50 USD; 85.20USD. Fuel filter 106.50 USD; 142.01 USD; 92.30 USD. Nozzle Injector 142.01 USD; 284.01USD; 497.02 USD. Total maintenance costs 2,438.58 USD; 1,565.61 USD; 2,898.68USD.

MAINTENANCE COST	2016	2017	2018
Hull	568.02	284.01	-
Fish hatch	106.50	284.01	355.01
Painting	1,207.04	-	1,349.05
Propeller shaft	85.20	227.21	127.80
Peopeller	42.60	35.50	49.70
Shaft bearing	71.00	213.01	142.01
Rudder Blade	28.40	42.60	177.51
Rudder stick	24.50	17.75	23.08
Rudder shoes	56.80	35.50	85.20
Fuel filter	106.50	142.01	92.30
Injector Nozzle	142.01	284.01	497.02
<b>Total maintenance costs</b>	<b>2,438.58</b>	<b>1,565.61</b>	<b>2,898.68</b>

**Table 2.** Maintenance costs and readiness of fishing engines in connection with aspects of fishing safety in general and ship safety in particular.



**Figure 6.** Maintenance cost

#### IV. DISCUSSION.

Ship operating costs per year in three years (Table 3) are the amount of costs to be incurred by the fishing motor boat owner (vessel daily costs plus maintenance and readiness of fishing engines). From tabulation of data Daily ship costs (Table 1); maintenance and readiness of engine catch costs (Table 2) fishing motor boats in East Flores Regency, Nusa Tenggara Timur, the ship's operational costs at the time of the research are as follows:

OPERATIONAL COST	2018	Precent	2017	Precent	2016	Precent
Incom	127,236.58	100%	113,249.08	100%	100,610.62	100%
Operational Cost	-		-		-	
Maintenance	2,898.68	2%	1,565.61	1%	2,438.58	2%
Fuel	11,679.92	9%	10,810.14	10%	9,663.45	10%
suppiles	20,803.75	16%	19,170.69	17%	20,414.80	20%
Lubricating Oil	2,449.59	2%	2,662.60	2%	2,272.08	2%
Fresh water	2,094.58	2%	2,005.82	2%	1,711.16	2%
Bluk ice cube	6,212.72	5%	6,092.02	5%	5,634.76	6%
Fish bait	6,731.04	5%	6,638.74	6%	6,461.23	6%
Additional	1,207.04	1%	1,136.04	1%	1,001.14	1%
Crew	29,466.06	23%	30,034.08	27%	28,401.02	28%
Owner	9,514.34	7%	8,165.29	7%	7,029.25	7%
Total operational costs	93,057.73	73%	88,281.03	78%	85,027.48	85%
Profit	34,178.86	27%	24,968.05	22%	15,583.14	15%

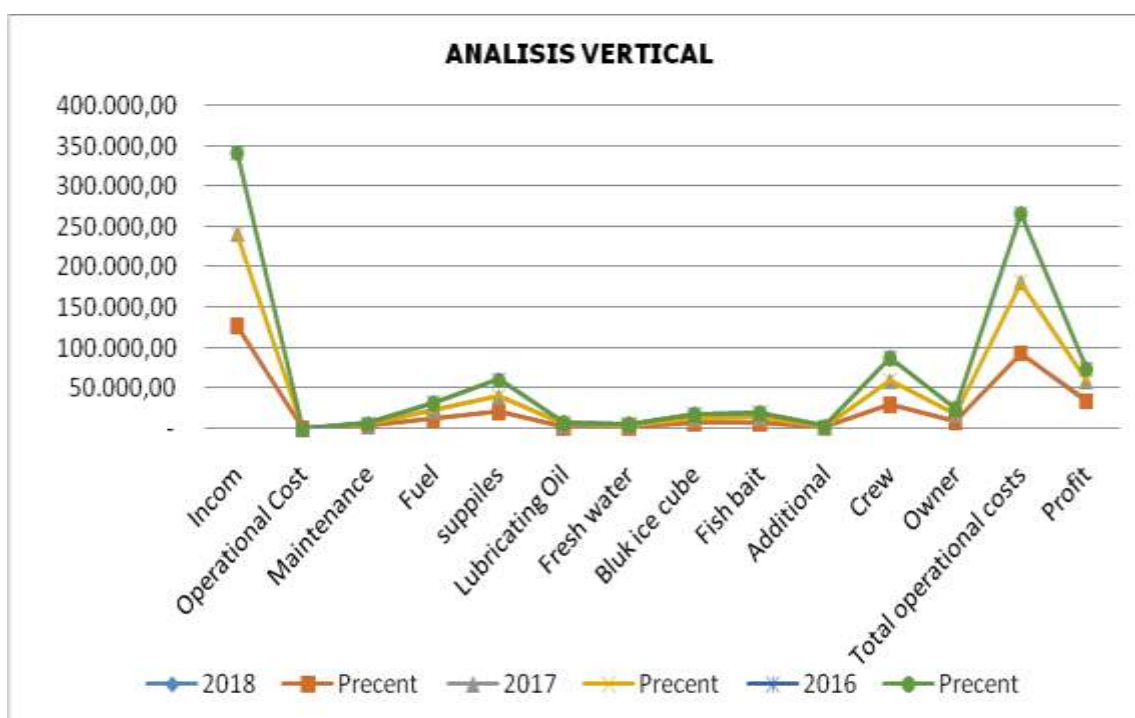
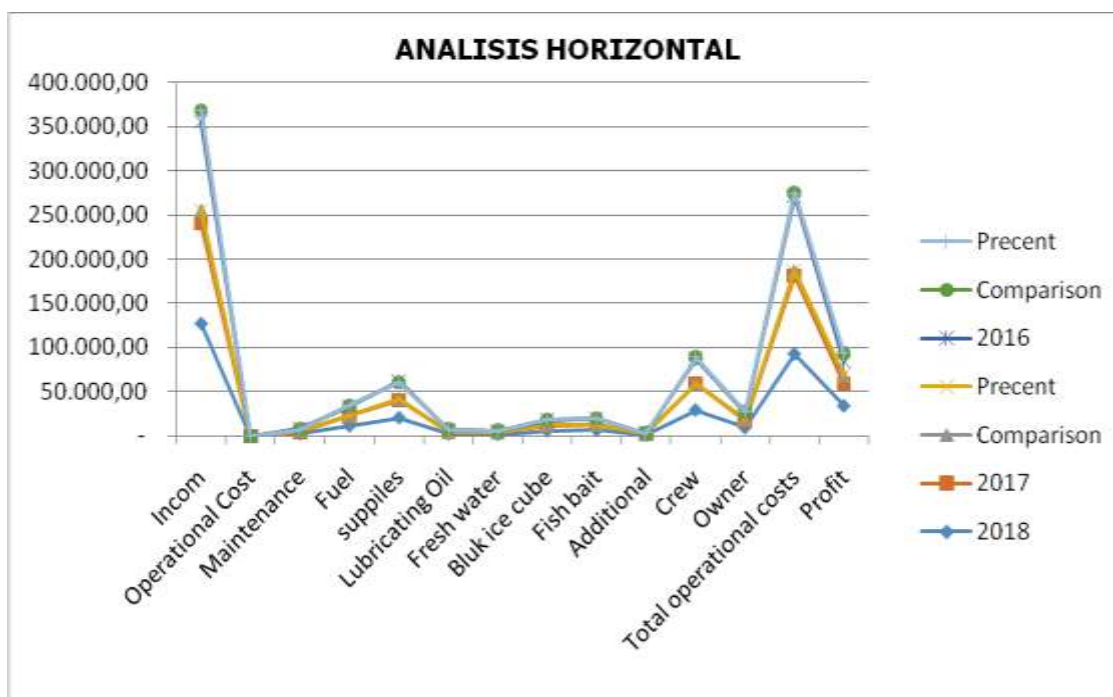


Figure 7. Analysis of financial statements for the year (2016-2018)

The graph above (Table 3) Analysis of financial statements shows good trends and adverse trends that affect the KMN profit and loss report. AIMAR 54. The increase in wages of ship owners is 0.22% (6.99% - 7.21%) and 0.27% (7.21% - 7.48%) as well as an increase in other expenses of 0, 98% (0.02% - 1.00%) and 0.05 (1.00-0.95) are less favorable trends. a good tendency is a decrease in wage burden of 1.71% (28.23% -26.52%) and 3.36% (26.52% -23.16%), as well as a decrease in the cost of provision of costs of 3.36 % (20.29% - 16.93%) and 0.58% (16.93% -16.35%). Maintenance costs and daily expenses as a percent of accounting services income are constant. The net result of this trend is that net income as a percent of accounting services revenue rose from 15.49% to 26.86%

OPERATIONAL COST	2018	2017	Comparison	Precent	2016	Comparison	Precent
Incom	127,236.58	113,249.08	13,987.50	12.35%	100,610.62	12,638.45	12.56%
Operational Cost	-	-	0.00		0.00		
Maintenance	2,898.68	1,565.61	1,333.07	85.15%	2,438.58	-872.98	-35.80%
Fuel	11,679.92	10,810.14	869.78	8.05%	9,663.45	1,146.69	11.87%
suppiles	20,803.75	19,170.69	1,633.06	8.52%	20,414.80	-1,244.11	-6.09%
Lubricating Oil	2,449.59	2,662.60	-213.01	-8.00%	2,272.08	390.51	17.19%
Fresh water	2,094.58	2,005.82	88.75	4.42%	1,711.16	294.66	17.22%
Bluk ice cube	6,212.72	6,092.02	120.70	1.98%	5,634.76	457.26	8.11%
Fish bait	6,731.04	6,638.74	92.30	1.39%	6,461.23	177.51	2.75%
Additional	1,207.04	1,136.04	71.00	6.25%	1,001.14	134.90	13.48%
Crew	29,466.06	30,034.08	-568.02	-1.89%	28,401.02	1,633.06	5.75%
Owner	9,514.34	8,165.29	1,349.05	16.52%	7,029.25	1,136.04	16.16%
Total operational costs	93,057.73	88,281.03	4,776.70	5.41%	85,027.48	3,253.55	3.83%
Profit	34,178.86	24,968.05	9,210.81	36.89%	15,583.14	9,384.90	60.22%

**Table 4.** Horizontal analysis (analysis of the development of financial data and operating data of the company from year to year to determine the financial strengths or weaknesses of the company concerned).



**Figure 7.** Development of financial data and fishing operations data from the Year (2016-2018) to determine the financial strengths or weaknesses of the KMN. Aimar 54

Horizontal analysis, also called dynamic analysis, is an analysis of the development of financial data and fishing operations data from 2016 to 2018 to determine the financial strengths or weaknesses of fishing boats. Analysis shows that the increase in fish sales income is a good tendency, as well as a decrease in equipment load. a bad trend is an increase in shipowner's burden, other expenses. This expense increased faster than sales revenue, with total operating expenses increasing by 5.41%. Overall, net income increased by USD9,210.80 or 36.89%, which is a trend or trend that shows an increase from the previous trend. The magnitude of the increase (decrease) of various financial statement accounts and their causes must be traced further to find out whether the company's operations can still be improved in efficiency. For example, one of them is the increase in utility expenses due to the increase in the number of fishing operations from before so that it requires a larger daily cost of ships. This explains the increase in vessel ownership burden by 16.52% and an increase in other loads by 6.25% due to the increase in ship mooring by the fishing port. Likewise with increasing income, this increase in income comes from the increase in fish catches that occur in the current

period. So the decision to reduce the crew and to adjust the capacity of the ship's gross tonnage is a very appropriate decision. The above example provides an overview of the use of horizontal analysis (horizontal analysis) in interpreting and analyzing financial statements. The horizontal analysis shown above can also be used for analysis of balance sheet reports, owner's equity reports, and cash flow reports from fishing operations.

## V. CONCLUSIONS.

The results of the study as described in (Table 3) and (Table 4) above show that an increase / decrease in maintenance costs and readiness of fishing machines will be followed by an increase / decrease in operating income for Fishermen's Motor Vessels. And the author suggests that KMN. Aimar 54 can do the right analysis to determine the optimal maintenance costs and readiness of fishing machines so that it can optimize the operating income of the fishing business.

## VI. SUGGESTIONS.

For Further Researchers In connection with the limited data regarding maintenance costs and engine capture readiness and the operating income level of Fishing Boat Motors in East Flores Regency, Nusa Tenggara Timur Province, the next researcher felt interested in examining the problem of the relationship between maintenance costs and engine readiness against income levels of Motorbike Fishing Boats The era of Illegal Fishing eradication is recommended to be carried out on other fishing boats that have a large / varied maintenance and the amount of maintenance costs is still significant and with a greater number of samples.

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