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Analysis Fishermen Term of Trade in Pangandaran Subdistrict of Pangandaran Regency

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ABSTRACT

Fisheries are one of the agricultural sub-sectors that have abundant natural resources and high production value, but that does not make small fishermen prosper. This study aims to determine the level of welfare of capture fishermen households in Pangandaran Sub-district of Pangandaran Regency and the factors that influence it. This study used descriptive basic methods. The research location is in Pangandaran Sub-district of Pangandaran Regency. Sampling takes the accidental sampling method. The data used are primary and secondary data with interview techniques and observations. For the analysis using the Fisher Exchange Rate formula and multiple linear regression analysis. The results showed that the average Term of trade of fishermen in Pangandaran Sub-district was 0.96 or below one (<1). This means that fishermen have not been able to meet household needs and it can be said that fishermen's households are less prosperous. The factors that influence it are the outflow of work time (X2) with the regression coefficient of 0.017 and income (X3) with a regression coefficient of 0.045.

Keyword: Fisheries, Term of trade of Fishermen, Fisherman's Household, Welfare, Pangandaran

1. INTRODUCTION

The link between commodity prices and macroeconomic performance has been hotly debated in the literature, with some studies finding that commodity booms raise growth while others suggest a “resource curse” that undercuts sustainable growth. Unfortunately, the

commodity-price data used in this literature reflect either the aggregate terms of trade, or else simply the price of one or two key commodity exports, rather than the theoretically more relevant country-specific measure of commodity-price fluctuations that depends on the composition of the particular country's commodity export and import baskets (Rotemberg, 1982; Blattman et. al., 2007).

Indonesia is the largest archipelago in the world, has an area of about six million square miles, two thirds of which are in the form of oceans. Marine resources that can be utilized and have great potential for Indonesia, namely capture fisheries. The utilization of fisheries resources in Indonesia is still dominated by traditional capture fisheries, namely by using fishing gear that is simple and does not require a large cost. However, the constraints faced by traditional capture fisheries business are still quite large, including low productivity of fishermen, capital, technology, and socio-economic conditions that are very influential on the level of income earned by fishermen, both fishermen and fishermen, boat owners. Fishermen communities, especially traditional fishermen, are often identified with poor communities (Rizal et. al., 2017). In addition, fishermen are also considered stupid, weak, inefficient, and unable to plan for the future.

Marine fisheries are the most dominant fishing activity in Pangandaran Sub-district. This can be seen with the existence of two villages namely Pananjung Village and Pangandaran Village in Pangandaran Sub-district which are the center of capture fisheries activities in Pangandaran Regency. Fishing activities in Pangandaran Sub-district are generally small-scale and traditional. Based on various studies it is known that fishermen's income is classified as low, so it is necessary to find alternative solutions to increase the income of fishermen. The level of life of fishermen in Pangandaran Subdistrict is estimated to be still low, however there is not enough data to be used in finding alternatives to increase fisherman logging (CBS of Pangandaran Regency, 2017). So that the study that examines the analysis of the exchange rate of capture fishermen in Pangandaran Sub-district is urgent.

Term of trade of fishermen (TOT) is one of the main performance indicators of the Ministry of Maritime Affairs and Fisheries which is considered able to describe the development of fishermen's revenues and expenditures simultaneously. Term of trade of fishermen (TOT) is related to the ability and purchasing power of fishermen in financing their household living (Singer, 1950; Mendoza, 1995; Bidarkota & Crucini, 2000). In connection with these conditions, an exchange rate analysis of fishermen in Pangandaran Regency is needed. So that it can be used as information material for the government to develop the economy of fishermen in Pangandaran Regency.

2. METHODS

This research was conducted from February to August 2018 in Pangandaran District, Pangandaran District, West Java. The research method used in this research is survey method. Survey research is an information gathering technique that is carried out by compiling a list of questions submitted to respondents (Rizal & Nurruhwati, 2019). The data collected consists of primary data and secondary data. Primary data in the form of direct data collected through interviews with respondents and using tools, namely questionnaires.

In this study the sampling technique used is by accidental sampling technique. Accidental sampling is accidental sampling by taking a case or respondent who happens to be present or

available somewhere in accordance with the research context (Rizal & Nurruhwati, 2019). In this study researchers took a sample of 45 respondents.

The data collected consists of primary data and secondary data. Primary data in the form of direct data collected through interviews with respondents. Secondary data comes from data from the Department of Fisheries and Maritime Affairs of the Pangandaran District, Bappeda, and the literature sourced from relevant agencies.

This study uses qualitative descriptive analysis method. Descriptive method aims to interpret data relating to situations that occur systematically, factually and accurately about the facts and relationships between variables to get the truth, while the quantitative method aims to raise the facts, circumstances of the variables and phenomena that occur now and present as is (Rizal & Nurruhwati 2018).

2. 1. Fishermen's Welfare Analysis

Welfare analysis uses Term of trade of fishermen (Singer, 1950; Mendoza, 1995; Bleaney & Greenaway, 2001). TOT is formulated as follows:

$$TOT = \frac{\sum P_{xi} Q_{xi}}{\sum P_{yi} Q_{yi} + \sum P_{yj} Q_{yj}}$$

where :

- TOT : Term of trade of fishermen,
- P_{xi} : Fisheries Commodity Prices
- Q_{xi} : Quantity of Fisheries Commodities
- P_{yi} : Production Input Price
- Q_{yi} : Production Input Quantity
- P_{yj} : Household Consumption Prices and
- Q_{yj} : Quantity of Household Consumption Goods

Conclusions drawn based on TOT are as follows:

- TOT > 1 means of prosperity
- TOT = 1 meaning is quite prosperous and
- TOT < 1 means less prosperity.

2. 2. Analysis of Factors Affecting Welfare by Multiple Linear Analysis

The method of analysis carried out in this study is the multiple linear regression analysis method. In analyzing the factors that influence fishermen in Pangandaran Sub-District of Pangandaran Regency, the model:

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

where:

- Y : Fishermen's Welfare,
- A : Constants,
- X₁ : Number of Family Members,

- X2 : Man power per hours of fishermen
- X3 : Fisheries Revenue
- X4 : Work Experience and
- $\beta_1-\beta_4$: Coefficient value of each variable,
- e : Error, estimation of regression variable coefficient with the Ordinary Least Square (OLS) method, so that the e (error) value is minimized.

3. RESULTS AND DISCUSSION

The geographical structure of Pangandaran which is a coastal and coastal area makes many people choose the profession as fishermen. Based on the Statistics Economic of Pangandaran final report, the number of fishermen in Pangandaran District as of 30 August 2017 was 4,411 people. Pangandaran Regency has 5 coastal areas including Kalipucang Sub-District, Pangandaran Sub-District, Sidamulih Sub-District, Parigi Sub-District, and Cijulang Sub-District.

3. 1. Characteristics of Fishermen

3. 1. 1. Age

According to CBS of Pangandaran Regency (2017), the age group considered productive is aged 15-55 years. From the results of the questionnaire data shows that fishermen in Pangandaran District, Pangandaran District are of productive age, as seen from the age data obtained (Table 1).

Table 1. Age of Fishermen in Pangandaran District, Pangandaran District, 2018.

No	Parameter	Value (Year)
1	Max Age	64
2	Min Age	25
3	Average Age	45,47
4	Median Age	46
5	Modus Age	42

Source: Primary Data, 2018

3. 1. 2. Education

Education is one of the factors that play an important role in increasing the strength of one's life. According to Rizal et al (2017) a higher level of education will be able to guarantee continuous improvement in the level of technology used by the community. Fishermen perceive that formal education is not important, skills and skills are needed to obtain maximum catch.

Table 2. Final Education for Fishermen in Pangandaran District, Pangandaran District, 2018

No	Parameter	Value
1	Max Education	4
2	Min Education	1
3	Average Education	1,96
4	Median Education	2
5	Modus Education	1

Source: Primary Data, 2018

where:

Elementary School (ES) = 1; Junior High School (JHS) = 2; Senior High School (SHS) = 3; University = 4.

3. 1. 3. Number of Family Members

Family coverage is a burden that needs to be met every day, the number of family dependents is generally related to household expenses. The more family members in the fisherman's household, the greater the expenditure made by fishermen.

Table 3. Number of Fisherman Family Members in Pangandaran Sub-District, Pangandaran District, 2018.

No	Parameter	Value (Person)
1	Max Number of Family Members	4
2	Min Max Number of Family Members	2
3	Average Number of Family Members	3,3
4	Median Number of Family Members	2
5	Modus Number of Family Members	4

Source: Primary Data, 2018

3. 1. 4. Work Experience

One factor for fishermen to develop their business in fishing is the work experience. The longer the experience the fisherman has in fishing, the greater the ability of the fisherman to be more aware of fishing techniques, skilled capture use.

Table 4. Experience of Working as a Fisherman in Pangandaran Sub-District, Pangandaran District, 2018.

No	Parameter	Value (Year)
1	Max Work Experience	46
2	Min Work Experience	3
3	Average Work Experience	23,4
4	Median Work Experience	22
5	Modus Work Experience	20

Source: Primary Data, 2018

3. 1. 5. Outpouring Working Time

This workload is calculated in trip / month. Fishermen's income in Pangandaran District is influenced by the outflow of work used to go to sea. With the more frequent they go to sea, it will increase income which will affect their income.

Table 5. Outpouring of Fishermen's Working Time in Pangandaran District, Pangandaran District, 2018

No	Parameter	Value (Trip)
1	Max Outpouring Working Time	25
2	Min Outpouring Working Time	7
3	Average Outpouring Working Time	20,7
4	Median Outpouring Working Time	20
5	Modus Outpouring Working Time	20

Source: Primary Data, 2018

3. 1. 6. Fisheries Acceptance

Acceptance of costs not including fees for fishing activities which will significantly reduce the amount of money earned to meet their needs (Table 6). This revenue is income derived from the results of the multiplication between income per trip and trips made in months.

Table 6. Reception of Fishermen's Household Households in Pangandaran Sub-District, Pangandaran Regency, 2018

No	Parameter	Value (IDR)
1	Max Fisheries Acceptance	20,700,000
2	Min Fisheries Acceptance	2,100,000
3	Average Fisheries Acceptance	9,555,556
4	Median Fisheries Acceptance	9,500,000
5	Modus Fisheries Acceptance	9,500,000

Source: Primary Data, 2018

3. 1. 7. Household Expenditures

The household digging pattern is an indicator that can provide an overview of the welfare of the population. The expenditure of capture fishermen households in Pangandaran District consists of all households on basic ingredients in a month.

Table 7. Household Catching Household Consumption Expenditures in Pangandaran Sub District, Pangandaran Regency, 2018.

No	Parameter	Value (IDR)
1	Max Household Expenditure	3,796,000
2	Min Household Expenditure	1,164,000
3	Average Household Expenditure	1,908,400
4	Median Household Expenditure	1,852,000
5	Modus Household Expenditure	1,600,000

Source: Primary Data, 2018

3. 1. 8. Fisherman Revenue

Households fishing generally in fishing activities, are the same as fishing in Pangandaran District mostly, only for fishing only

Table 8. Income of Fishermen Capturing in Pangandaran District, Pangandaran District, 2018.

No	Parameter	Value (IDR)
1	Max Revenue	9,100,000
2	Min Revenue	500,000
3	Average Revenue	2,688,889
4	Median Revenue	2,250,000
5	Modus Revenue	1,500,000

Source: Primary Data, 2018

3. 2. Analysis Term of trade of fishermen

Term of trade of fishermen (TOT) is used by the Central Statistics Agency to consider all revenue and all family fisheries expenditure, The usefulness of TOT is to measure the level of welfare of fishermen communities in relative terms and is a measure of the ability of fishermen's families to meet subsistence needs (Rizal, et al, 2018),

Table 9. Term of trade of fishermen in Pangandaran Sub-district of Pangandaran Regency, 2018.

No	Description	Average
1	Fisheries Business Revenues	9,555,556
2	Fishermen Spending	
	a) Fisheries Business	3,057,111
	b) Household Expenditures	1,908,400
	c) Quantity	4,965,511
3	Term of trade of fishermen	0,96

Source: Primary Data, 2018

From the analysis above (Table 9) it can be seen that Term of trade of fishermen is captured in Pangandaran District which is 0,96 or <1 which means that fishermen's households have not been able to meet their household needs or it can be said that the house of fishermen catches in Pangandaran District is less prosperous.

Table 10. Number of Fishermen by Fishermen's Catch Value in Pangandaran District, Pangandaran District, 2018.

No	TOT	Quantity	(%)
1	<1	23	51,2
2	1	4	8,8
3	>1	18	40
Quantity		45	100,0

Source: Primary Data, 2018

Based on (Table 10) the number of fishermen who have TOT < 1 is 51.2%, TOT = 1 is 8.8% while those with TOT > 1 are 40%,

3. 3. Analysis of Factors Affecting Term of trade of fishermen

The data analyzed using multiple linear regression analysis produces the following equation:

Table 11. Analysis of Regression Results for Influence of Variable Inputs on TOT.

Variabel	Koefisien	Pvalue	Information
X ₁	0,009	0,955	Number of Family
X ₂	0,040	0,017	Outpouring of Work Time
X ₃	-0,027	0,045	Revenue
X ₄	0,006	0,339	Work Experience

Source: Primary Data, 2018

$$Y = a + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + e$$

$$Y = -0,028 + 0,009 X_1 + 0,040 X_2 - 0,027 X_3 + 0,006 X_4 + e$$

Independent variables that have significant effect on TOT capture in Pangandaran District are X₂: Outpouring of Work Time (0,017) and X₃: Revenue (0,045), Variable Outlay of work time and income has a significant effect on the level of 95% of TOT value in Pangandaran District due to P- Value of work outflow 0,017 < 0,05 and income P-Value 0,045 < 0,05.

Individual income has a significant effect on the exchange rate of capture fishermen in Pangandaran District (Table 11), According to Broda (2004) that fisheries income is a very important factor related to the ability of fishermen households to meet their household needs,

Outpouring of work time for individual fishermen has a significant effect on the exchange rate of capture fishermen in Pangandaran District, The more time fishermen go to sea, the more time they use to produce (fish).

Work experience as individual fishermen does not significantly affect the exchange rate of capture fishermen in Pangandaran District, Although experience is distributed as a characteristic of one's success with his profession, experience on the other hand is not a guarantee that can affect the level of success.

The number of individual family members has no real influence on the exchange rate of capture fishermen in Pangandaran District. This can be due to capture fisherman family members in Pangandaran Subdistrict which are classified as productive so that they are not a burden on fishermen's expenses that many family members negatively affect fishermen's welfare in relation to the number of family members, especially if family members many are classified as non-productive age,

3. 4. Statistic Performance Test

3. 4. 1. Goodnes Test (R^2)

The coefficient of determination (R^2) can be seen from the results of the regression test of the summary (attached) model, which obtained a result of 0,564 which means that the variables X_1 , X_2 , X_3 , X_4 , used in the model can explain that 56% of TOT can be explained from the six the variables in the multiple linear regression model, while the remaining 44% are explained by other variables not mentioned in the model,

3. 4. 2. F -Test

Tests are carried out at a 95% confidence level, The test results showed a p-value of 0,170, this means that the independent variables consisting of fisheries income, the number of dependents of family members, work experience as fishermen, and the outpouring of work as fishermen together had no significant effect on the dependent variable, namely the exchange rate, Capture fishermen in Pangandaran Regency because the p-value is $0,170 > \alpha 0,05$

3. 4. 3. t-student Test

Tests are carried out at a 95% confidence level, Based on the discussion above the number of family members and work experience as fishermen does not have an individual significant effect on the capture Term of trade of fishermen,

3. 4. 4. Normality Test

In the figure shows that the value of Y (TOT) spreads around the diagonal line and follows the direction of the line, So that the model meets normality standards.

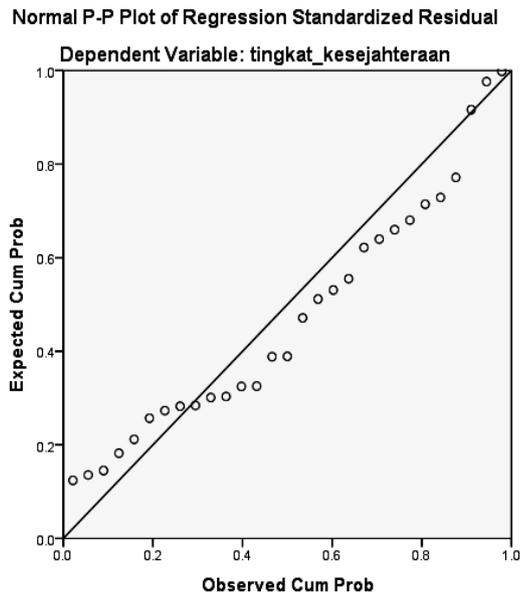


Figure 1. Normal Graph

3. 4. 5. Test of Multicollinearity

The test results show the VIF value is in the lowest value range of 1,020 and the largest is 1,195, These results show the VIF value <10 so that there is no correlation between the independent variables in the model used and the data is normal (Warren, 1971; Aggarwal & Ranganathan, 2016).

3. 4. 6. Test of Heteroscedasticity

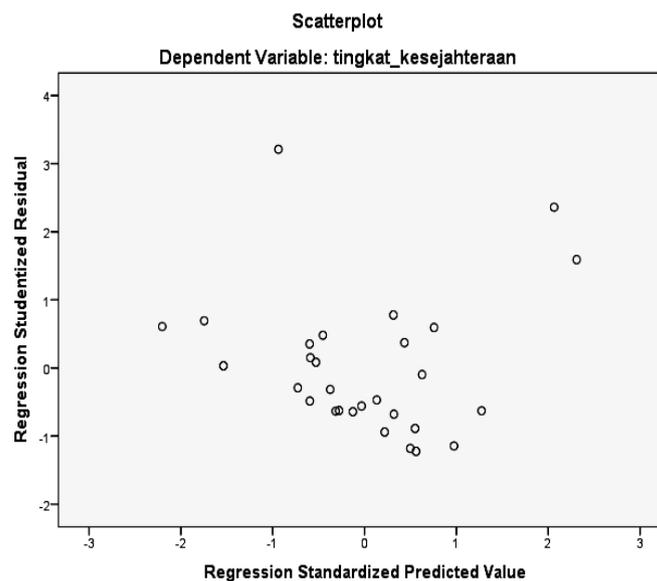


Figure 2. Scatterplot of dependent Variabel

From the picture above shows that the distribution of dots does not form a particular pattern or plot, so it can be concluded that heteroscedasticity does not occur or in other words homoskedasticity occurs (Barro, 1999),

4. CONCLUSION

Average Capture Term of trade of fishermen (TOT) in Pangandaran District is 0,96 or less than 1 (<1) means that capture fishermen in Pangandaran District have not been able to meet household needs, A low TOT can be interpreted as the amount of fishermen's expenditure is greater than the amount of fishermen's fishery revenue,

Factors that influence the level of welfare of fisherman households in the District of Fishermen are the outpouring of working time (X_2) with the regression coefficient value of 0,017 and (X_3) Revenue with a regression coefficient value of 0,045.

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