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Factors Affecting the Income of Labor Fishermen (Case Study: Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency)

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Abstract: Indonesia is a country that has a very large water area which is a large potential resource to be utilized for national development. This condition affects the strong weak economic activities of the village. The purpose of the study is to find out how much the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency and to find out what factors affect the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency. This research was conducted in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency, North Sumatra Province. This location was chosen intentionally (Purposive). The population in this study was 546 labor fishermen, the determination of the sample in this study used Arikunto's theory, namely if the total population was less than 100 people, then the number of samples was taken as a whole. But if the population is larger than 100 people then it can be taken 10-15% and 20-25% of the total population. The samples in this study were taken as much as 10% of the total population, so the number of samples in this study was 55 labor fishermen. Data collection techniques use primary data and secondary data, data analysis techniques in research use income analysis and multiple linear regression analysis. The results of the research on the working capital costs of labor fishermen amounted to Rp. 244,894/month, with an income of Rp. 4,128,386/month with an average of 12 trips a month of fishing. The results of multiple linear regressions that the working capital variable and the catch variable have a significant effect on the income of labor fishermen while the time variable at sea and experience variables do not have a significant effect on the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Keywords: Fishing; Labor fishermen; Population

Introduction

Indonesia is a country that has a very large water area which is a large potential resource to be utilized for national development. Fishery resources are the main potential that drives the economic activities of villages in coastal areas in particular (Vibriyanti, 2014; Fatmasari, 2016; Amiruddin, 2017; Purwanto et al., 2020; Satria, 2020; Untari et al., 2021). This condition affects the strong weak economic activities of the village. High income is an expectation for every fisherman in the fishing business. To obtain maximum income, you must be able to allocate funds appropriately in the sense of using minimal costs and expenses for other purposes that must be suppressed in such a way, so that if the productivity of the catch decreases, fishermen will not experience cost difficulties, both costs for living and costs for the purposes of fishing facilities and infrastructure (Panduwita, 2008).

In terms of ownership of fishing gear, fishermen can be divided into three groups, namely: juragan fishermen, private boats and labor fishermen. Fishermen (especially labor fishermen and traditional fishermen) are a community group that can be classified

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as the poorest social layer among other community groups in the agricultural sector (Arifin, 2006). The level of welfare of fishermen is largely determined from the marine products they get at sea or it can be called the production of catches and that becomes the income of fishermen (Onte, 2017; Rosni, 2017; Juliana, 2018; Audina, 2020; Kobi & Hendra, 2020; Toesan et al., 2023; Faizin & Suryani, 2023). The large number of catches in going to sea greatly affects the income of fishermen to meet their needs. The income of fishing communities in each region has different production. Such as water areas in Indonesia, especially in North Sumatra, which has considerable potential in the income of fish caught by them. This can be seen from data from the Central Statistics Agency (BPS) (2019) in Table 1.

Table 1. Fish Production by Catch Origin in North Sumatra, 2019

Districts/Cities	Fish production/ton
Central Tapanuli	299,499
Tanjung Balai	168,154
Asahan	70,892
Terrain	58,989
Sibolga	51,977
Deli Serdang	39,334
Serdang Bedagai	28,669
Coal	20,768
Labun Batu	17,375
Langkat	8,607
Total	764,264

Based on Table 1, it shows that fish production in 2019 in North Sumatra province which has the most fish production is in the Central Tapanuli area of 299,499 tons, while the lowest contributor to fish production is in Langkat Regency recorded at 8,607 tons. And followed by Serdang Bedagai Regency which is an area that contributes to fish production in the seventh (7th) order of 28,669 tons. This can be seen in the Table 1. Serdang bedagai Regency is one of the regencies in North Sumatra. Serdang Bedagai Regency is divided into 17 districts, one of which is in Tanjung Beringin district where most of the people work as fishermen.

Table 2. Number of Fishermen's Catch Production in Serdang Bedagai Regency, 2017

Districts	Production quantity/ton
Cape Banyan	7,702.9
Mengkudu Bay	6,046.3
Mirror Beach	5,062.8
Kalipah City	4,669.5
Shackling	1,289.2
Sei Rampah	592.3
Total	25,363

Source: Central Statistics Agency (BPS) (2017)

Serdang Bedagai Regency is one of the regencies in North Sumatra Province which has a fish production of 28,669 tons, this can be seen from the Table 1. Serdang Bedagai Regency has 17 districts spread across various places. And there are several districts that have very good potential from the sea, namely the production of fish caught by fishermen as can be seen in the Table 2.

Based on Table 2, it shows that there are six (6) sub-districts in Serdang Bedagai Regency that have the amount of fishermen's catch production. One of them is in Tanjung Beringin District which has the first highest amount of fish production, which is 7,702.9 tons, and the lowest production is found in sei rampah district, which is 592.2 kg, this can be seen in the Table 2. This points out that Tanjung Beringin District is an area that has very good potential in aquatic or marine natural resources. In the water or sea area, Tebing Tinggi village also has the potential for production in the sea fish or fishermen's catch, and some communities there work as fishermen who live close to the sea estuary, fishermen in Tebing Tinggi Village daily work as fishermen to meet family needs and other needs, Here are the number of jobs in high cliff villages this can be seen in the Table 3.

Table 3. Types of Work in Tebing Tinggi Village, Tanjung Beringin District, Bedagai Medium Regency

Types of Work	Sum	Percentage (%)
Farming	1,589	42
Fisherman	889	23
Merchant	726	19
Farm workers	467	12
Civil servants	41	2
Carpentry	35	0.9
Field service	29	0.7
Solder	8	0.2
Private employees	7	0.1
Employees of SOEs	5	0.1
Police	5	0.1
Total	3,801	100

The highest number of jobs is found in jobs as farming, followed by jobs as fishermen are in second place (2) at 889 with a percentage of 23%. This can show that most of the residents or communities in Tebing Tinngi village work as fishermen, from several villages in Tanjung Beringin District, this village has a fish auction place (TPI) as a means and infrastructure in marketing fish and is also the center of marine fish production in Serdang Bedagai Regency. Based on the information, it found that when conducting a survey from the field that fishermen in Tebing Tinggi Village there are 3 classifications of fishermen groups, namely labor fishermen, private boat fishermen and juragan fishermen. This can be seen in full in Table 4.

Table 4. Number of Fishermen Class Classifications in Tebing Tinggi Village

Fisherman class	Total population	Percentage (%)
Labor fisherman	546	61
Private boat fisherman	331	37
Juragan fisherman	12	2
Total	889	100

Source data for the Tebing Tinggi Village office, Tanjung Beringin District, Serdang Bedagai Regency 2019.

Based on Table 4, that in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency has three classifications of fishermen classes there, namely labor fishermen, private boat fishermen and juragan fishermen, in this study the researcher focused on labor fishermen because based on the number of fishermen class classification data in Tebing Tinggi Village that labor fishermen have the highest number of fishermen populations from the classification of fishermen class groups That is 546 population with a percentage of 61%. And the fact in the field that the most labor fishermen are encountered who are carrying out their activities such as, preparing the ship to check the condition of the ship. Labor fishermen are the lowest layer in terms of social status or class classification of fishermen so in the description above, the author is interested in conducting this research with the title Analysis of Factors Affecting the Income of Labor Fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Method

Problem Formulation

Based on the description and background, the formulation of the problem in this study are: How much do labor fishermen earn in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency?; What factors affect the income of fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency?

Research Objectives

Based on the formulation of the problem, the objectives of this study are: To find out the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency; To find out the factors that affect the income of fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Research Benefits

The benefits of this research include: It can be a source of information for the local government of Serdang Bedagai Regency and related agencies in increasing fishermen's income in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency and It can be used as one of the reference materials for further research and as an additional reference for research related to factors affecting the increase in fishermen's income.

Mind Map

The production of catches is a determining factor in fishermen's income. The more catches that fishermen get, the more income they get. Then, the amount of income of labor fishermen is determined by various production factors that affect them, namely working capital, length of sea, work experience, and catches obtained. After analyzing these factors, it can be seen whether these factors have a real effect or not on fishermen's income (Jamal, 2014; Asmita, 2016; Ridha, 2017; Balmed et al., 2021; Erlansyah et al., 2022; Maghfira et al., 2023; Tilohe et al., 2023).

Research Hypothesis

The hypothesis or conjecture in this study is: it is suspected that working capital, length of sea, experience and catch affect the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Population and Sample Determination Methods

The population in this study was labor fishermen who worked with boats or other people's fishing gear (juragan) located in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency with a total of 546 labor fishermen. Based on a pre-survey conducted where the number of pupulations of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency, was 546 labor fishermen, so in determining the number of samples in this study, namely using Arikunto (2008), the samples in this study were taken as much as 10% of the existing number of pupulations, namely 546 populations of labor fishermen, then it can be calculated 10/100 x 546 = 55 labor fishermen. So many of the samples in this study are as many as 55 labor fishermen who will be used as samples.

Data Collection Methods

Data collection techniques in this study used survey techniques, survey research techniques were used to obtain or collect information data about large poplations using a relatively smaller sample. The data collected is in the form of primary data and secondary data. Primary data collection was carried out by interviewing using a list of questions (questionnaires) to labor fishermen at the research site. Meanwhile, secondary data were obtained from research journals, literature, and literature books related to this research as

well as publications of the Central Statistics Agency (BPS) (2019).

Data Analysis Techniques

Data analysis is the most important part of the research process, data analysis used in identifying the formulation of the first problem which is to use income theory is used to find out how much income the labor fishermen (crew) earn, namely the profit sharing system with the formula:

Total Revenue:

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

Income of Labor Fishermen (crew):

$$PNB = 60\%(TR-TC) : n \quad (2)$$

Where:

TR : Total receipts earned in fishing (Rp/Trip)
TC : Total costs incurred by fishing business (Rp/Trip)
P : Selling price of fish (Rp)
Q : Total Catch (kg/Trip)
PNB : Income of labor fishermen (Rp/Trip)
n : Number of workers (Soul)

In solving the formulation of the second problem (2) which is to find out what factors affect the income of labor fishermen which will be analyzed with the multiple linear regression model, namely as follows.

$$Y = a + b\,1\,X1 + b\,2\,X\,2 + b\,3\,X\,3 + b\,4\,X4 + ei \quad (3)$$

Where:

Y : Income of labor fishermen (Rp/Trip)
X1 : Working Capital (Rp/Trip)
X2 : Long Time to Go to Sea (Hours)
X3 : Work Experience (Years)
X4 : Catch (kg/trip)
a : Constant value
ei : Disruptive factors
b1-b4 : Regression Coefficient

To obtain the standard value of the proportional regression coefficient, each free variable will be tested using statistical testing.

Simultaneous Test (F Test)

Simultaneous testing aims to find out whether free variables together affect bound variables. So that it can be known whether the hypothesis is accepted or not. If the prob F value is less than 0.05 then it can be concluded that the free variables together have a significant effect on the bound variables. Hypothesis testing can be done by comparing the value of the F_{count} with the F_{table}, that is, by the criteria:

-If $F_{count} \geq F_{table}$, then H0 is rejected; H1 accepted
-If $F_{count} \leq F_{table}$, then H0 is accepted; H1 is rejected

Partial Test (t-test)

To test how each free variable affects individually on bound variables, a t-test is performed. So that it can be known whether or not hypotheses one, two, and three are accepted. If the p-value is less than 0.05 then it can be concluded that there is a significant influence of each free variable on the bound variable. Hypothesis testing can be done by comparing the value of t_{count} with the t_{table}, that is, by the criteria:

-If $t_{count} \geq t_{table}$, then H0 is rejected; H1 accepted
-If $t_{count} \leq t_{table}$ then H0 is accepted; H1 is rejected.

Coefficient of Determination R^2 (R Square)

The coefficient of determination is generally used to measure how far a free variable is capable of describing a bound variable. The coefficient of determination (R2) is expressed in the presentation whose value ranges from 0 < R2A small R2 value means that the ability of dependent variables is very limited. A value close to one means that an independent variable variation provides almost all the information needed to predict dependent variables. In general, the coefficient of determination for cross-data (crossection) is relatively low due to large variations between each observation, while for timeseries data usually has a high coefficient of determination value.

Variable Operational Definition

To avoid misunderstanding, several definitions and operational limitations used in this study are described, namely: A fisherman is a person who actively carries out work activities by catching fish in the sea using a boat or boat to meet other needs. Labor fishermen are fishermen who do not have fishing gear or also fishermen who work with other people's fishing gear (juragan fishermen) to carry out fishing operations in the sea. Fishermen's income is the net income generated by fishermen from the sale of fish catch/production after deducting working capital or the result of deductions from receipts and total costs (Rp/Trip). Working Capital is the costs incurred by fishermen when going to sea, it consists of: food, cigarettes, diesel oil, and fishing equipment (Rp/Trip). The length of sea is the time taken or lived by fishermen in fishing in the sea, usually fishermen spend a long time in catching (Jam). Experience is a person who has been in his profession as a fisherman for a long period of time so that he better understands how to go to sea (Year). The catch is the amount obtained or the result obtained at the time of fishing (Kg/trip).

Characteristics of Research Samples

Based on Table 5, it can be found that the number of age of labor fishermen is divided into 5 parts of the group that is the most in the age group of 21-30 years, namely 23 people with a percentage of 41.81% while for fishermen the least labor is in the age group of 41-50, which is 1 person with a percentage of 1.81.

Table 5. Labor Fishermen by Age Group

Age group (Years)	Number (Souls)	Percentage (%)
10 – 20	7	12.72
21 – 30	23	41.81
31 – 40	22	40
41 – 50	1	1.81
51 – 60	2	3.63
Total	55	100

Results and Discussion

Fixed Fee (FC)

Fixed costs are costs of an unchanged nature, fixed costs will be incurred even if the production activity or process is not carried out. Fixed costs include, for example, ship depreciation costs such as repairing ship engines or GPS antennas, and other depreciation costs on fishing gear such as nets and buoys. Fixed costs are considered Rp 0 because all fixed costs are borne by juragan fishermen or ship owners. Meanwhile, labor fishermen only spend money only if they go to sea. This is in line with the results of research by Sitanggang et al. (2021).

Variable Costs (VC)

Variable costs are costs that change according to the production process. The variable costs incurred by labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency are the costs they will need when going to sea such as their supplies, for example food drinks and cigarettes, fuel oil costs and ice block costs to preserve fish while at sea. The following table describes the variable costs of labor fishermen. Those costs become very expensive because they buy by way of debt to nearby retailers by providing a small security deposit. The debt will be paid after going to sea and getting results (Fattah & Purwanti, 2017; Wati & Primastanto, 2018; Iry & Sabon, 2020).

Table 6. Description of Average Variable Cost of Labor Fishermen/Trips

Capital	Sum	Percentage (%)
Fuel	29,127	20.38
Ice block	12,909	9.03
Supplies	100,818	70.57
Total	142,855	100

Based on the results of the study, it can be seen that the average variable cost of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Regency, bedagai in one trip requires a cost of Rp. 142,855 where the cost for supplies is the largest cost, namely Rp. 100,818 or 70.57 (%) of the total cost, while the least cost is in the cost of ice blocks as fish preservatives amounting to Rp.12,909 or 9.03 (%) of the total cost of labor fishermen in one trip or once at sea.

Reception (TR)

Acceptance (TR) is the multiplication between the production obtained (Y) and the selling price (Py). Based on research data on the average revenue results obtained by labor fishermen in Tebing Tinggi Kecamatan Beringin Village, Serdang Bedagai Regency, it can be seen in Table 7 below.

Table 7. The average revenue results obtained by labor fishermen in Tebing Tinggi Kecamatan Beringin Village, Serdang Bedagai Regency

Types of fish	Catches (Kg)	Price (IDR)	Sum (IDR)
Bloating	248	15,000	3,720,000
Dencis	8	14,000	112,000
Cob	10	12,000	120,000
Selar	8	14,000	112,000
Mackerel	4	50,000	200,000
Total	278		4,264,000

Based on the results of the study, it can be seen in Table 7 that the average number of catches obtained by labor fishermen is Rp. 4,264,000. The largest receipts come from the type of mackerel whose number of catches is the most, namely Rp. 3,720,000 with a catch of 248 Kg. While the least acceptance comes from Dencis fish and Cob fish, which is 112,000 with a catch of 8 Kg. The profit sharing system for the acceptance of labor fishermen with fishermen who own boats in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency, is by dividing the catch of 60 (%) to labor fishermen and 40 (%) to fishermen who own boats or juragan fishermen.

Income

The income of a labor fisherman is the receipt (TR) minus all costs (TC). Income = TR – TC, where TR is the multiplication between the production obtained (Y) and the selling price of fish (Py). Total costs (TC) are the sum of fixed costs (FC) and variable costs (VC), hence TC = FC + VC (Soekartawi, 2002). Based on research data on the average income of labor fishermen in Tebing Tinggi Kecamtan Beringin Village, Serdang Bedagai Regency, it can be seen in table 8 below.

Table 8. Total Income of Labor Fishermen/12Trip/Year Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency

Description	Rp/Month	Rp/Year
Cost	244,894	2,938,728
Acceptance	4,373,280	52,479,360
Income	4,128,386	49,540,632

Based on the table above, it can be seen that the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency after being divided into the results by juragan fishermen, the average labor fisherman gets a result in a month, which is Rp. 4,128,386 This income is slightly greater than the UMR of Serdang Bedagai Regency, which is Rp. 2,869,291. The income of labor fishermen may change depending on favorable weather conditions and fish season. With unfavorable weather or rising sea water fishermen do not go to sea, if labor fishermen do not go to sea they fill the time with activities to check the condition of equipment such as buoy net nets and ship conditions.

Multiple Linear Regression Analysis

Multiple linear regression analysis aims to determine whether or not there is an influence of two or more free variables (X) on the bound variable (Y) (Ghozali, 2011). Data analysis with multiple linear regression testing serves to answer the analysis of factors affecting the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Table 9. The Results of the Calculation of Factors Affecting the Income of Labor Fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Variable	B	T-Count	Significant
Constant	211,708.470	2.123	0.039
X1 = Working Capital	-1.599	-2.679	0.010
X2 = Long Time to Sea	3,192.268	0.867	0.390
X3 = Experience	613.371	0.792	0.432
X4 = Catch	981.823	3.023	0.004
R-Square = 0.467			
F-Count = 10.943			
F_{Table} (0.05) = 2.553			
T_{Table} (0.05) = 2.009			

Based on Table 9 of the results of multiple linear regression analysis, the equation is as follows.

$$Y = 211,708,470 + 1,599\ (X1) + 3,192,268\ (X2) + 613,371\ (X3) + 981,823\ (X4) \quad (4)$$

Description:
Y = Labor Fishermen's Income (Rp/month)
X1 = Working Capital (Rp/month)
X2 = Long Time to Sea
X3 = Experience (Year)
X4 = Catch (kg/rp)

Conclusion

Based on the analysis that has been carried out, several conclusions can be obtained that the average income earned by labor fishermen is Rp. 4,128,386/month with an average of 12 trips a month of fishing. Based on the results of multiple linear regressions, the working capital variable and the catch variable have a significant effect on the income of labor fishermen while the old variable goes to sea and the experience variable does not have a significant effect on the income of labor fishermen in Tebing Tinggi Village, Tanjung Beringin District, Serdang Bedagai Regency.

Author Contributions

Rizal Aziz conceptualized the research idea, designed of methodology, management and coordination responsibility; Roni Paulus Sihombing and Rahma Sari Siregar analyzed data, conducted a research and investigation process; Saipul Sihotang conducted literature review and provided critical feedback on the manuscript.

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Conflicts of Interest

The authors declare no conflict of interest.

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