

## The Analysis of Fishermen's Fishing Income Business and Factors Affecting in Medan Belawan District

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**Abstract:** The objective of the research done in the subdistrict of Medan Belawan is to quantify the extent of the disparity in fishermen's catch business revenue and examine the elements that contribute to it. The approach employed is a survey, including both secondary and primary data acquired from a variety of sources. This research use stratified random sampling and gini ratio analysis to achieve its objective. Using stratified sampling, responses from fishermen were collected. The income from fishing for motorized and non-powered boats in the Medan Belawan subdistrict was somewhat unequal, according to the study's findings. The moderate inequality indication in the group of fishermen who use boats with outboard motors can develop for a number of causes, including those listed below : The employment of more modern fishing equipment enables them to sail to more expansive fishing grounds/areas. Consequently, their catch rates are often substantially greater than those of non-motorized boat fishermen. There is a potential that if the Gini Ratio Index is computed for merging with groups of fishermen who have superior fishing means, then the Gini Ratio Index calculation results will be greater (income distribution is more unequal). The catch per trip of motorized boat fishermen in the Medan Belawan District has a beneficial impact on revenue. The catch has a substantial beneficial influence on the revenue of motorboat fisherman over the course of a year.; While it is negatively influenced by the expense of traveling to sea, the time spent going to sea, and the season, it is positively affected by the amount of fish caught. Positive influences on the revenue of motorbike-riding fisherman are the catch and the cost of traveling to sea, whereas negative influences are the number of employees, the time spent, and the season.

**Abstract:** Penelitian yang dilakukan di wilayah kecamatan Medan Belawan bertujuan untuk menghitung besarnya perbedaan pendapatan usaha tangkap nelayan dan menganalisis faktor-faktor yang mempengaruhinya. Metode yang digunakan adalah metode survey, data diperoleh dari berbagai sumber baik dalam bentuk sekunder maupun data primer. Objek penelitian ini menggunakan metode stratified random sampling dan menggunakan analisis ratio gini. Responden nelayan diambil secara stratified sampling. Hasil penelitian menemukan bahwa pendapatan usaha tangkap nelayan perahu motor dan perahu tanpa motor di kecamatan Medan Belawan termasuk dalam ketimpangan yang sedang. Indikator ketimpangan yang sedang pada kelompok nelayan yang menggunakan perahu dengan motor tempel dapat terjadi disebabkan ada beberapa sebab antara lain : penggunaan peralatan penangkapan ikan yang sudah lebih maju, sehingga mereka lebih mampu berlayar dengan daerah/areal penangkapan ikan (fishing ground) yang lebih luas/jauh. Oleh sebab itu jumlah hasil tangkapan mereka pada umumnya jauh lebih banyak dibandingkan dengan kelompok nelayan perahu tanpa motor.



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## INTRODUCTION

The fishing industry contributes to the improvement of the welfare of fishermen, particularly fisherman. The fishing industry contributes to the improvement of the welfare of fishermen, particularly fisherman. In this instance, fisheries are one of the Natural Resources (SDA) that play a significant and strategic role in the growth of the national economy, particularly in expanding job possibilities within the fisheries industry.

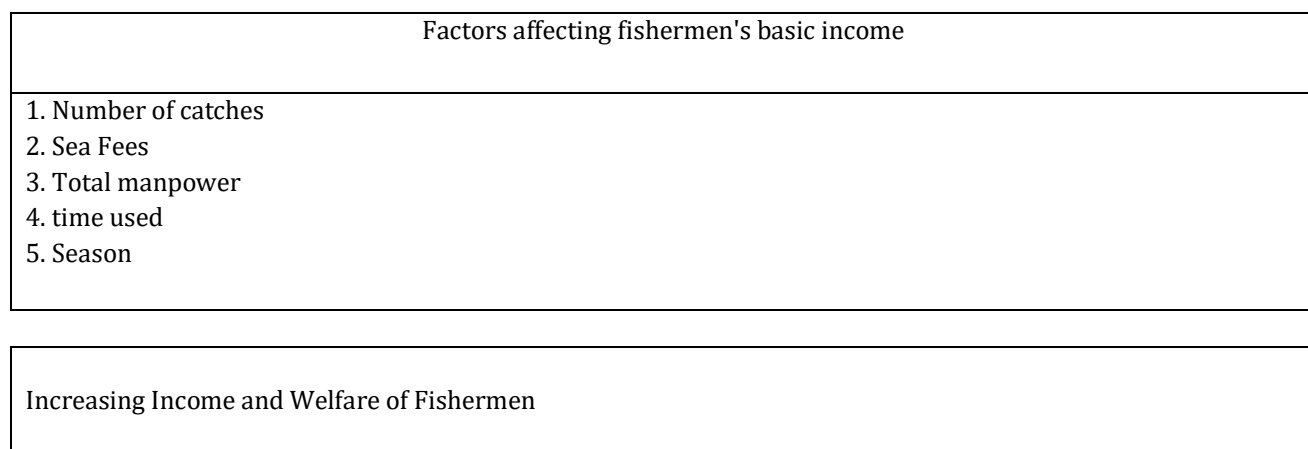
In this instance, it is evident that fishermen receive marine fish output that differs among their peers based on the type of fish caught; thus, the price of marine fish will vary based on the type of marine fish. According to Fauzi (2010: 102), exploiting (fishing) in a body of water necessitated the use of diverse techniques. The facility is an input component known as an effort or exertion. These inputs consist of physical capital (vessels and fishing equipment), labor required to generate fish stocks or fisheries production, and fish pricing depending on output or fish production units. According to Mankiw (2009:336) Land, capital, and labor are all components of production that are required for production activities. With the presence of these production elements, the manufacturing process may be carried out. It is believed that the catch of fisherman is impacted by the quantity of catch, work, time spent, and season.

The majority of community members in the subdistrict of Medan Belawan whose primary source of income is fishing utilize boat facilities and boats without outboard motors as owners, according to the findings of this research. Revenue of fishermen when fishing is the primary source of income for fishermen. The number of captures was the number of catches collected by fisherman when entering the water. When fisherman venture out to sea, they incur fishing expenses.

According to Mubyarto et al. (1984), coastal settlements have the lowest standard of living in comparison to other communities on land. Even fisherman are among the poorest in all nations deemed "the poorest of the poor" (the lowest of the poor) (Nikijuluw, 2002). The occurrence of low fisherman's welfare is a common concern, particularly among traditional fishermen, which inhibits the growth of the fisheries subsector, particularly capture fisheries. Achieving fisheries development goals, including boosting the welfare of fishermen, fish farmers, and other coastal communities (Decree of the Minister of Maritime Affairs and Fisheries No.18/Men/2002), is hampered by the low level of fishermen's welfare. In relation to these conditions, it is vital to study the disparities in revenue between motorized and non-powered fishing boats in each South Sulawesi coastal area, as well as the variables that impact the income of fishing enterprises.

## RESEARCH METHODS

### Framework



Influencing / Minimizing Inequality in Fishermen's Income Distribution

## **Location and Time of Research**

This research is located in the Medan Belawan district. The primary reason for selecting this site is that the majority of the population relies on fishing for a living and the Medan Belawan District has a fishing port that is extremely beneficial to the fisheries subsector. In accordance with the significant potential of the fisheries subsector, the residents of the Medan Belawan subdistrict are employed in the subsector as fisherman, dealers, and entrepreneurs of fishery goods.

## **Method of collecting data**

The survey approach was used to acquire the necessary data for this research, which was obtained from both secondary and primary sources.

Secondary data will be obtained through institutions that can provide data for the purposes of this research such as: Fisheries Service dati I North Sumatra, Fisheries Service Dati II Medan City, BPS Office North Sumatra, Bappeda Level I North Sumatra and Bappeda Level II Medan City as well as Government Agencies at the sub-district level of Medan City.

While the primary data was collected from all sample fisherman (sample size Equals population size) via direct interviews utilizing a predetermined list of questions.

## **Sampling Method**

This research concentrates on fishermen with a fishing home research unit by means of stratified random sampling. The total number of fishermen are categorized according to their fishing gear. From these groupings, two types of fisherman were identified: those who utilized boats without outboard engines and those who used outboard motors. These two groups of fishermen became both the population and samples (as determined by the census).

## **Operational definition**

The definitions and limitations of the variables used in this study are as follows :

*Fisherman :*

Are members of the community whose main source of livelihood is fishing by using boats.

*Fishermen's Income :*

Is the primary (major) source of revenue for fisherman, namely the catch (Rp. 000, -).

*Number of catches :*

Is the amount of catches fishermen make when they set out to sea (kg).

*Sea fees :*

Is the expense incurred while voyaging to sea (Rp.000)

*Labor :*

Is the quantity of fishermen a significant factor (per person). Typically, 1-2 fishermen utilize non-motorized boats. The number of non-family members employed by fishermen who utilize boats powered by outboard motors ranges from 1-5.

*time used :*

Is the amount of time fisherman use to go to sea/catch fish (hours) ?

*season :*

It is the west season and the east season.

### **Data analysis method**

To explain the research aims and evaluate the hypothesis, the following analytical tools were used in this research.

#### *a. Gini Ratio Analysis*

The Gini Ratio model is used to determine/observe the income distribution of fisherman in the Medan Belawan District, which has a Lorenz curve with the following formula :

$$GR = 1 - f_i (Y_i + Y_{i-1})$$

Information :

GR = Gini Ratio Coefficient

$f_i$  = Percentage (%) of fishermen receiving income

$Y_i$  = Cumulative amount of income received in %

$Y_{i-1}$  = The cumulative sum to I minus the previous  $Y_i$

#### **b. factors influencing the income and welfare of fisherman**

In this instance, a multiple linear regression model is employed with the following determination of independent and dependent variables :

$$\text{Function} \rightarrow Y = f(X_1, X_2, X_3, X_4, X_5) \dots (1)$$

From this function, the model is created as follows:

Model I, for boats without motors

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 D + \mu \quad (2)$$

Model II, designed for boats with outboard engines

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 D + \mu \quad (3)$$

Information:

Y = fishermen's income (Rp.000) which is a non-free changer

bo	= intercept
b1,b2,b3,b4	= parameter
x1	= number of catches (kg)
x2	= cost of going to sea (Rp 000)
x3	= the amount of labor used to go to sea (people)
x4	= length of time spent at sea (hours)
D	= western season → 0
D	= eastern season → 1
M	= term error

For the purpose of determining whether the hypothesis is accepted or rejected, a simultaneous and partial test will be conducted.

## **RESULTS AND DISCUSSION**

### **Respondent Identity**

Medan Belawan is one of 21 subdistricts of the Indonesian city of Medan, North Sumatra Province. In this research, the units of analysis were the heads of families using boats without motors and the heads of households using boats with outboard motors, with 35 households and 75 households as respondents, respectively. The respondent's identification will contain the following:

#### **a. Age**

The age of fishermen (KK) in the MPTM fishermen group aged 41-50 years was 12 people or 34.29%, aged 51-60 years were 11 people or 31.43%, ages between 31-40 years were 8 people or 22.86% , aged > 60 years only 3 people or 8.57% for ages 20-30 years only 1 person or 2.86%.

MPDMT fisherman aged 51-60 years were 27 people or 36.48%, 31-40 years and 41-50 years were 19 people or 25.68%, >60 years were only 6 people or 8.11%, and 20-30 years were as many as 3 people 4.05%.

#### **b. Level of education**

In the group of MPTM fisherman, 23 people (65.71%) had completed elementary school, 10 people (28.57%) had completed junior high school, and 2 people (5.71%) had completed high school.

There are as many as 56 MPDMT fisherman with elementary education or 75.68 % educated as many as 17 MPDMT fishermen. 22.97% with a high school diploma, or 1.35 % of the population.

#### **c. The number of dependents**

In the nemalayn MPTM group, the number of dependents for the family head (KK) ranged from 2 - 3 (9 people or 25.72%), 4 - 5 (20 people or 57.14%), and 5 - 7 (17.14%).

In the MPDMT fisherman group, the number of dependents per family head (KK) ranges from 2 to 3 people, or 20 people, or 27.03 % , to 4 to 5 people, or 35 people, or 47.30 % , to 6 to 7 people, or 19 people, or 25.67 %.

#### **d. Place of Origin**

In the group of MPTM fisherman, there were 16 people from the Medan Belawan District (45.72%), 2 people from the Medan Labuhan District (5.71%), and 3 people from the Medan

Marelan District (8.52%). Fishermen came from outside the city of Medan as many as 4 people or 11.43% and fishermen from outside North Sumatra totaled 7 people 20%.

In the MPDMT group of fisherman, there were 42 individuals, or 57.76%, from the Medan Belawan District, 5 people from the Medan Labuhan District, 8 individuals from the Medan Marelan District, or 10.81%, and individuals from outside of Medan City. As many as 6 persons, or 8.11 %, and as many as 3 fisherman from beyond North Sumatra, or 4.05%.

e. Ethnic group

The Batak tribe comprised 27 people, or 77.14 %, of the MPTM fisherman population. Then came the Minang tribe with 3 people, or 8.57 %, the Javanese with 2 people, or 5.71 %, and the Malay with 3 people, or 8.57 %.

MPDMT fisherman are dominated by the Batak ethnic group with 54 people, or 72.97 %, the Minang ethnic group with 7 people, or 9.46 %, the Javanese ethnic group with 3 people, or 4.06 %, and the Malay ethnic group with 10 people, or 13.51 %.

### **Conditions of Fishermen's Activities/Business**

a. Length of Activity/Business

The period of the MPTM fishermen's business operations ranges from 6 to 10 years, with as many as 20 individuals, or 57.14 percent, having been involved for 1 to 5 years, along with as many as 6 individuals, or 17.14 %. In the MPDMT fisherman group, it can be observed that 43 individuals, or 58.11%, have been in business for 6–10 years, 22 people, or 29.73%, have been in company for more than 10 years, and 9 people, or 12.16%, have been in business for 1–5 years.

b. Labor Used

Even though the majority of MPTM fisherman only work by themselves, without the assistance of other family members, they nevertheless rely on labor from within their own families. Up to 22 individuals, or 62.86%, work alone without the assistance of their families. Fish processing after it has been caught (post-harvest), such as: salting, boiling, drying, selling, and so on, is often handled with labor support from within the family.

The majority of MPDMT fisherman rely on non-family work. In this group of fishermen, up to 57 individuals, or 77.03%, rely on labor from outside sources, while up to 17 individuals, or 22.97%, combine labor from both inside and outside the family. These individuals work unassisted (alone) at the fishing grounds for eight hours every day. There isn't a fishing crew like this.

c. Monthly Fishing Activities (Trip)

Due to the fact that the MPTM relies solely on human strength and wind direction, the fishing area is relatively limited. This will have an effect on fishing activity as the MDMT fishing region is substantially larger.

d. Catch

The majority of fish captured by MPTM are lumuru fish and swollen fish, whereas the most of fish caught by MPDMT are snapper, grouper, bloated fish, squid, pomfret, and shrimp.

e. Sea Fees

MPTM fisherman groups incur expenses of between Rp200,000 - Rp500,000 every voyage. The cost of going to sea per trip varies between Rp.200,000-Rp.300,000 as many as 17 people or 48.57% between Rp.3,100,000-Rp.4,100,000 as many as 11 people or 31.4% between Rp. 4,200,000-Rp.5,200,000 as many as 6 people or 17.14% and above Rp.5,200,000 only 1 person or 2.86%.

The cost of going to sea per trip at MPDMT is between IDR 5,500,000-IDR 25,000,000 for 33 people or 44.60%, the cost is between IDR 26,000,000-IDR 50,000,000 for 31 people as much as 55.4%.

f. Sources of Business Capital

As many as 28 persons, or 80%, in the MPTM fisherman group use their own money, while as many as 7 people, or 20%, utilize loan capital from toke/entrepreneurs. As many as 20 MPDMT fisherman, or 27.03%, utilize loan money, compared to up to 54, or 72.97%, who use their own funds.

Fishermen who get loans from the toke or the entrepreneur are subject to a number of conditions, such as a requirement that they sell the toke or the entrepreneur a portion of their catch or pay a hefty interest rate.

g. Fisherman Basic Income Per Month

The MPTM fishermen's collective revenue ranges from IDR 1,100,000 - IDR 2,880,000. Between IDR 1,080,000 - IDR 26,250,000 are the fishermen's group in the MPDMT.

h. Side Livelihoods

Generally speaking, few fisherman have supplementary incomes. Due to the fact that fishing is the primary occupation that is passed down from generation to generation, fishermen feel unqualified in other industries. Particularly for MPTM fisherman, the restricted revenue makes it difficult to deploy funds to other sectors, notably as business capital. Three MPTM fisherman, or 8.57% of all fishermen, make a living off of selling and gardening. 12 individuals, or 16.22% of the MPDMT fishermen, have other sources of income.

i. Average Spending Per Month

According to interviews with numerous key informants, fishing villages have a reputation for leading consumptive lifestyles. They claimed that if they have extra money, they tend to spend it on luxuries such : When purchasing domestic furnishings, the demand for basic dietary fiber pays little heed to thrifty practices.

### **Income Inequality Analysis**

According to statistics on fishermen's earnings from groups utilizing boats without motors, then the calculation of the Gini Ratio Index is carried out based on the formula  $GR=1-\frac{\sum f_i(Y_i+Y_{i-1})}{\sum Y_i}$ . After doing the calculations, it is discovered that the Gini Ratio Index for the group of people who use boats without engines is  $GR=0.204082$ .. Comparing the Gini Ratio Index to the current categorization,  $GR= 0.204082$  falls inside the category of little inequality. This is a helpful indication, since it can be seen that the average income of the group of fishermen who use boats without motors is relatively low when compared to those who use boats without outboard engines.

### **Gini Ratio and Lorenz Curve Analysis for Fishing Groups using boats with outboard motors (MPDMT)**

based on information on the revenue of fishermen from groups utilizing outboard motor boats, then the calculation of the Gini Ratio Index is carried out based on the formula  $GR=1-\frac{\sum f_i(Y_i+Y_{i-1})}{\sum Y_i}$ . After the calculation results were carried out, the Gini Ratio Index results were obtained from the group using outboard motor boats of  $GR=0.452678$  and included moderate inequality.

### **5.3.3. Gini Ratio and Lorenz Curve Analysis for Fishermen Groups (MPTM) and (MPDMT) Combined**

After the Gini ratio analysis has been carried out for the two groups of fishermen who are the object of research, the Gini Ratio Index calculation will be carried out for the two groups of fishermen by combining MPTM fishermen and MPDMT fishermen. On this basis, the income distribution of fishermen in the district of Medan Belawan will be determined.

On the basis of the combined income statistics for fishermen (MPTM and MPDMT), the Gini Ratio Index is calculated as GR=0.495 or GR=0.50. If the Gini Ratio Index is compared with the two Gini Ratio Indexes from the two groups of fisherman who utilize outboard motors, it can be observed that the combined Gini Ratio Index is greater than the two individual indices. This demonstrates that the revenue of fishermen in the Medan Belawan District is not allocated equitably.

### **Analysis of Factors Affecting Fishermen's Basic Income in Medan Belawan District**

#### **Factors Affecting the Basic Income of Fishermen Who Use Boats Without Motorbikes (MPTM)**

A multiple linear regression model is performed with the following arrangement of independent and dependent variables to determine the factors that influence the basic income of fishermen who utilize boats without fishing motors :

$$Y=b_0+b_1X_1+b_2X_2+b_3X_3+ \mu \dots\dots(1)$$

Information:

- Y = fisherman's income (Rp.000)
- X1= catch (kg)
- X2 = cost of going to sea (Rp. 000)
- X3 = time spent (hours)
- X4 = Season where
  - D= 0 West Season
  - D = 1 Eastern Season

After the computations are performed, the regression results for the variables X1, X2, X3, and X4 on the variable Y are produced. The outcomes of the estimate formula :

$$\begin{aligned} (= & -3667,38+775,29 X_1 - 0,50X_2 + \\ & (4,636)^{***} \quad (-1,309)^* \\ & 488,51X_3 + 836,85X_4) \\ & (2,329)^{**} \quad (2,060)^{***} \end{aligned}$$

Information

- : Significance at  $\alpha$  1%
- \*\* : Significance at  $\alpha$  5%
- \* : Significance at  $\alpha$  10%

#### **Factors Affecting Fishermen's Basic Income Who Use Outboard Motor Boats**

To determine the factors that influence the basic income of fishermen who utilize boats with outboard motors, the independent and dependent variables are arranged as follows in a multiple linear regression model :

$$Y=b_0+b_1X_1+b_2X_2+b_3X_3+b_4X_4+b_5X_5+ \mu \dots\dots(2)$$



Information:

- Y = fisherman's income (Rp.000)
- X1= catch (kg)
- X2 = cost of going to sea (Rp. 000)
- X3 = time spent (hours)
- X4 = Season where
  - D= 0 West Season
  - D = 1 Eastern Season

After doing the calculations, the regression results for the variables X1, X2, X3, X4, and X5 on the variable Y are produced. The estimate equation's findings :

$$Y=167646,32+1843,63X1+0,36X2 \\ \quad \quad \quad (4,46)^{***} \quad (1,75)^* \\ -12706,95X3-322,73X4-167537,26X5 \\ (-0,75) \quad (-0,38) \quad (-4,13)^{***}$$

Information

- \*\*\* : Significance on  $\alpha$  1%
- \*\* : Significance on  $\alpha$  5%
- \* : Significance on  $\alpha$  10%

**CLOSING**

The catch, the expense of traveling to sea, the amount of time spent, and the season all have a beneficial impact on the fishermen's revenue. The productivity of fishing operations influences the income of fishermen. This occurs because the fish collectors choose the income (juragan). There must be a role for or collaboration between fishermen and government programs' fish management divisions. And the necessity for insurance funds and social and health guarantees, particularly for elderly fisherman in the district of Medan Belawan.

**DAFTAR PUSTAKA**

Harahap, A.S. (2003). *Analisis Masalah Kemiskinan dan Tingkat Pendapatan Nelayan Tradisional di Kelurahan Nelayan Indah Kecamatan Medan Labuan Kota Medan*, Tesis S-2 Program Pascasarjana. Universitas Sumatera Utara (tidak dipublikasikan).

Lumbanraja, Prihatin. (1997). *Analisis Distribusi Pendapatan Nelayan dan Faktor-Faktor Yang Mempengaruhinya Di Kotamadya Sibolga*, Tesis S-2 Program Pascasarjana. Universitas Sumatera Utara

Pratomo, Wahyu Ario. (2007). *Penggunaan Eviews Dalam Ekonometrika*. USU Press. Sumatera Utara

Tanjung, Ahmad Albar. (2021). *Metodologi Penelitian : Sederhana, Ringkas, Padat dan Mudah Dipahami*. Scopindo. Surabaya

Rahim, Abdul. (2011). *Analisis Pendapatan Usaha Tangkap Nelayan Dan Faktor-Faktor Yang Mempengaruhinya Di Wilayah Pesisir Pantai Sulawesi Selatan*. Makassar. Sulawesi Selatan

- Dahen, Dwindi Lovelly. (2016). *Analisis Pendapatan Nelayan Pemilik Payang Di Kecamatan Koto Tangah Kota Padang*. Sumatera Barat
- Pratama, Danies Sadya. (2012). *Analisis Pendapatan Nelayan Tradisional Pancing Ulur Di Kecamatan Manggar, Kabupaten Belitung Timur*. Jawa Barat
- Gemilang, Satria Cahya. (2002) *Analisis Kontribusi Subsektor Perikanan Terhadap PDRB dan Penyerapan Tenaga Kerja Di Kabupaten Temanggung Tahun 2015-2020*. Jawa Tengah
- Abdullah, Rudi. (2002). *Analisis Karakteristik Penyerapan Tenaga Kerja Pada Perhotelan Di Kota Baubau Studi Kasus Hotel Berbintang*. Sulawesi Tenggara
- Ribek, Pande Ketut. (2022). *Upaya Peningkatan Kualitas Pelayanan Dan Penyerapan Tenaga Kerja Pada Toko Putra Aditya Di Denpasar*. Bali
- Susanti, Endah. (2005). *Pengaruh Penanaman Modal Asing Dan Penanaman Modal Dalam Negeri Terhadap Penyerapan Tenaga Kerja Di Kabupaten Berau 2005-2019*. Kalimantan Timur