

TREND OF PRODUCTION AND INCOME OF HAND LINE FISHERMEN IN TULEHU VILLAGE, CENTRAL MALUKU DISTRICT

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ABSTRACT

Hand line fishing business can contribute to fishermen's income. Still, this business is faced with risks and uncertainties in the amount of production, one of the factors causing it is the seasonal factor. The uncertainty of the amount of production will affect the amount of income fishermen receive. This study aimed to determine the production and income trends of hand-line fishermen in Tulehu Village, Central Maluku Regency, from September to December 2022. Primary data were collected through interviews with ten fishermen and analyzed using the business income equation. The results showed that the highest level of tuna (*Thunnus sp.*) production in December was 690kg and the lowest in September was 299kg, while the highest income was IDR26.682.084 in December and the lowest was IDR11.850.084 in September.

Keywords: Hand line, Income, Production, Tuna, Trend

INTRODUCTION

Central Maluku Regency is one of the regency in Maluku Province with a total area of approximately 275,907 km, consisting of a sea area of 264,311.43 km (95.80%) and a land area of 11,595.57 km (4.20%). This large water area certainly has considerable fishery resources (Dinas Perikanan dan Kelautan Maluku Tengah, 2018 in Ruban et al., 2021). These fishery resources are utilized by some communities, especially in coastal areas, as the main source of income.

Tulehu Village is one of the villages located in Salahutu Sub-district, Central Maluku Regency, where some of the people make a

living as fishermen. In general, fishermen in Tulehu Village catch fish using hand line fishing gear. Hand line is a passive fishing tool and is also environmentally friendly. The operation of the tool is relatively simple, not using much auxiliary equipment. In principle, fishing rods consist of two main components, namely line and hook (Subani and Barus, 1989 in Pattiasina et al., 2020).

The main objective of any fishing business is to obtain as much fish catch as possible. This catch is expected to cover all costs sacrificed and make a profit (Yulianti et al., 2020). Likewise, in the hand line fishery in Tulehu Village, the main source of fishermen's income is obtained from

running this business. However, the reality in the field shows that the fishing business faces many obstacles and is faced with risks and uncertainties. Yulianti et al (2020) revealed that in terms of production, the uncertainty faced by fishermen is that the catch is highly variable and sometimes not as expected.

One of the factors that cause such uncertainty is the seasonal factor related to weather changes. Weather is a phenomenon or change that occurs in certain areas that shows changes in natural activities such as rain, sun heat, or cloudy (Saefudin, 2003 in Khalfianur et al., 2017).

The effect of weather change on capture fisheries activities is the creation of an increase in the frequency of large waves and high rainfall, which become obstacles for fishermen to reach the catch area (Bachtiar et al., 2012., Purnomo et al., 2015., Zulkhasyni, 2015). The situation makes fishermen will stall or not be able to conduct fishing operations, resulting in a decrease in the amount of production and income.

The amount of fish production is one of the determinants of income received by hand line

fishermen in Tulehu Village, according to Syahma (2016) in Putra (2019), the income of a fishing community is through fish catch.

Based on this description, this research was conducted to determine the production and income trends of hand line fishermen in Tulehu Village, Central Maluku Regency.

MATERIAL AND METHOD

This research was conducted from September to December 2022 in Tulehu Village, Central Maluku Regency, Maluku Province using survey method. The survey was conducted through direct observation and interviews with resource persons, namely hand line fishermen.

The data collected in this study consisted of primary and secondary data. Primary data were collected through interviews with respondents in the form of costs, production per trip for 4 (four) months, types of fish production, and marketing. Secondary data in the form of previous research results, potential fishery resources and other types of data related to the research objectives.

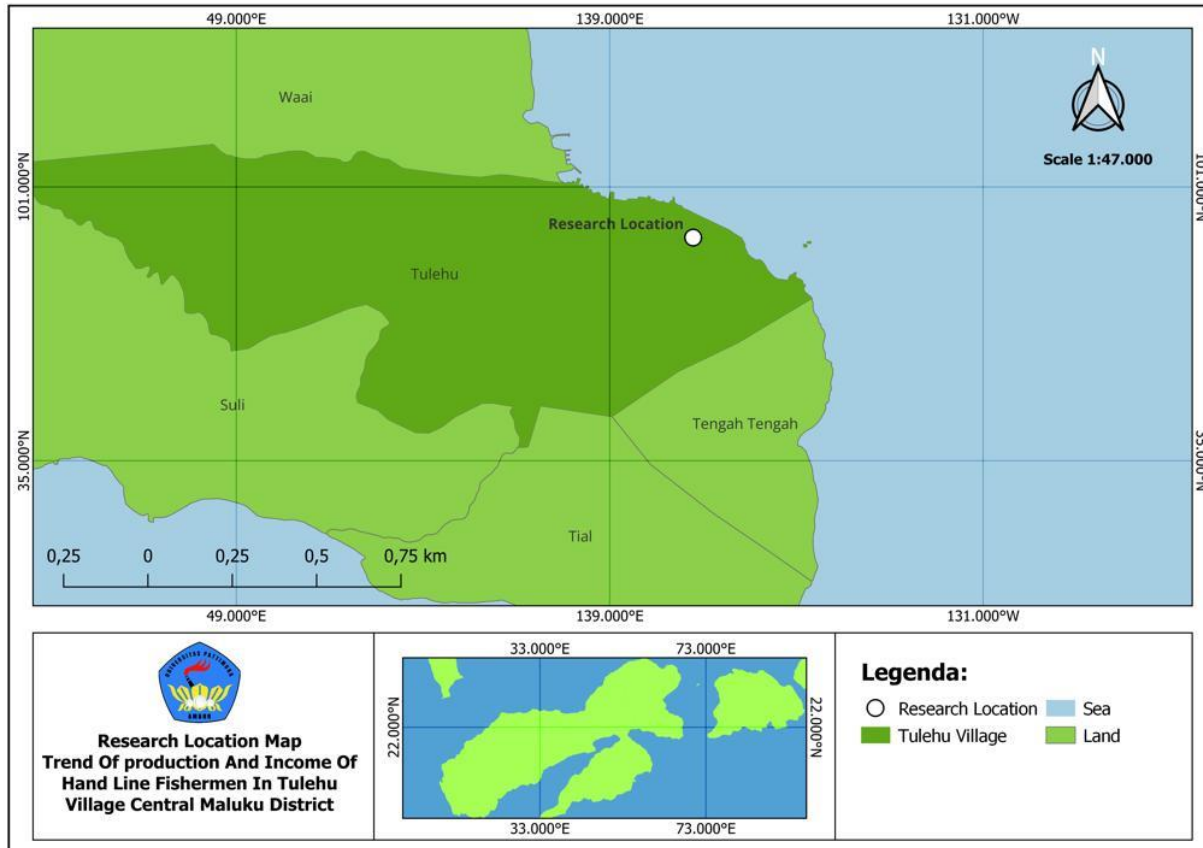


Figure 1. Location of research data collection

The sample of this research was 10 fishermen, the sample selection used purposive sampling technique with the consideration that the fishermen knew the necessary information such as cost data, production, and selling prices. The data analysis used in this research is quantitative analysis. Quantitative analysis to determine the trend of production and income received by hand line fishermen in Tulehu Village, Central Maluku Regency. The calculation of income follows the following equation:

1. Total cost

According to Mulyadi (2012) in Saiful and Ruban (2022) systematically the total cost can be calculated with the following formula:

$$TC = TFC + TVC$$

Where:

- TC = Total cost (IDR/month)
- TFC = Fixed Costs (IDR/month)
- TVC = Variable Cost (IDR/month)

2. Revenue

The amount of revenue is calculated using The amount of revenue is calculated using the formula (Andiny, 2017) in Saiful and Ruban, 2022):

$$TR = P \times Q$$

Where:

- TR = Total Revenue (IDR/month)
- P = Price per unit (IDR/kg)
- Q = Number of products sold

3. Income

Income is calculated using the formula (Septianita, 2014 in Saiful and Ruban, 2022):

$$\pi = TR - TC$$

Where:

- π = Income (IDR/month)
- TR = Total Income (IDR/month)
- TC = Total Cost (IDR/month)

RESULTS AND DISCUSSION

Characteristics of Respondents

The characteristics of respondents referred to in this study are the character or characteristics of a person such as age, education level, business experience, and number of family dependents.

Age

Respondents were grouped into 3 (three) age groups based on the age category of Departemen Kesehatan RI (2009) in Saiful and Ruban (2022), namely teenagers (12-25 years), adults (26-45 years), and elderly (≥ 46 years).

Table 1. Age of Respondents

No.	Age Category	Number of people	%
1.	Teenager	0	0
2.	Adults	7	70
3.	Elderly	3	30
Total		10	100

Source: primary data processed, 2022

Most respondents were in the adult age category with an age range of 26-45 years as many as 7 people or 70%. According to Undang-Undang No.13 Tahun 2003 Tentang Ketenagakerjaan in Saiful and Ruban (2022), ages 46-65 years are the age range included in the productive age category, so that respondents are able to carry out fishing operations properly.

Level of Education

Education is an activity of a person in developing his abilities, attitudes, and forms of behavior, both for future life where through school (Wirawan, 2015 in Nendissa et al., 2022). Educational characteristics in the study are formal education that has been taken by respondents, which is grouped into 3 (three) levels of education, namely elementary school, junior high school, and senior high school

Table 2. Respondent Education

No.	Educational Level	Number of people	%
1.	Elementary School	2	20
2.	Junior High School	6	60
3.	Senior High School	2	20
Total		10	100

Source: primary data processed, 2022

The junior high school education level is the last formal education most taken by respondents, namely 6 people or 60%. This indicates that respondents generally have a formal education background that is sufficient to understand the utilization of fishing technology and manage their business properly.

Number of Family Dependents

The number of family dependents is the number of family members who are still

dependent on the family, both siblings and non-siblings who live in one house but have not worked (Purwanto and Taftazani, 2018).

The number of family dependents of respondents is divided into 3 (three) groups, namely the number of dependents <3 people (small), 3-5 people (medium), and >5 people (large). According to Saiful and Ruban, 2022, the number of family dependents affects the size of the living needs that must be met.

Table 3. Number of Family Dependents

No.	Number of Dependents (people)	Number of People	%
1.	<3	0	0
2.	3-5	6	60
3.	>5	4	40
Total		10	100

Source: primary data processed, 2022

Respondents generally have a medium number of family dependents, namely 3-5 people as many as 6 respondents or 60%. The number of dependents indicates that a considerable allocation of income is needed to meet their needs.

Length of Business

Length of business is related to experience and skills in running a business, which is an important capital to achieve business success (Saiful and Ruban, 2022). Respondent characteristics based on length of business are grouped into 3 (three), namely <10 years, 10-20 years, and >20 years.

Table 4.Length of Business

No.	Length of Business (Year)	Number of people	%
1.	<10	1	10
2.	10-20	5	50
3.	>20	4	40
Total		10	100

Source: primary data processed, 2022

Generally, respondents have a length of business of 10-20 years, namely 5 people or 50%, so it can be said that respondents have high business experience along with the length of their business.

According to Mandala and Raharja (2012) in Nisa et al (2020), the higher the experience of an entrepreneur, the less production defects, so that it will greatly affect the level of work effectiveness and work efficiency which will ultimately greatly affect the productivity of the business being run.

Overview of Hand Line Fishing Business in Tulehu Village

The average cost of running a hand line business in Tulehu Village is IDR80.500.000, the cost is needed to buy a boat and engine. The type of engine used is Yamaha with a capacity of 40PK which costs IDR27.000.000, a boat with a size of 10m long and 1,35m wide is around IDR50.000.000, a hand line is IDR3.500.000, these costs are generally obtained from bank loans.

Fishing ground is in the waters of Latuhalat Village and Banda Sea, depending on

weather conditions. The frequency of fishing is generally 5 to 6 days a week, starting at 03.00 a.m until 18.00 p.m. The hand line operated is made of nylon rope with a length of 500 - 750m. Preparation activities carried out in the form of checking sea conditions (wind and waves, etc.), supplies, fresh water and ice cubes. After the preparation is done, fishermen take squid bait, for the type of bait can be adjusted to the season, in the west season the bait used is flying fish, while in the east season it is squid.

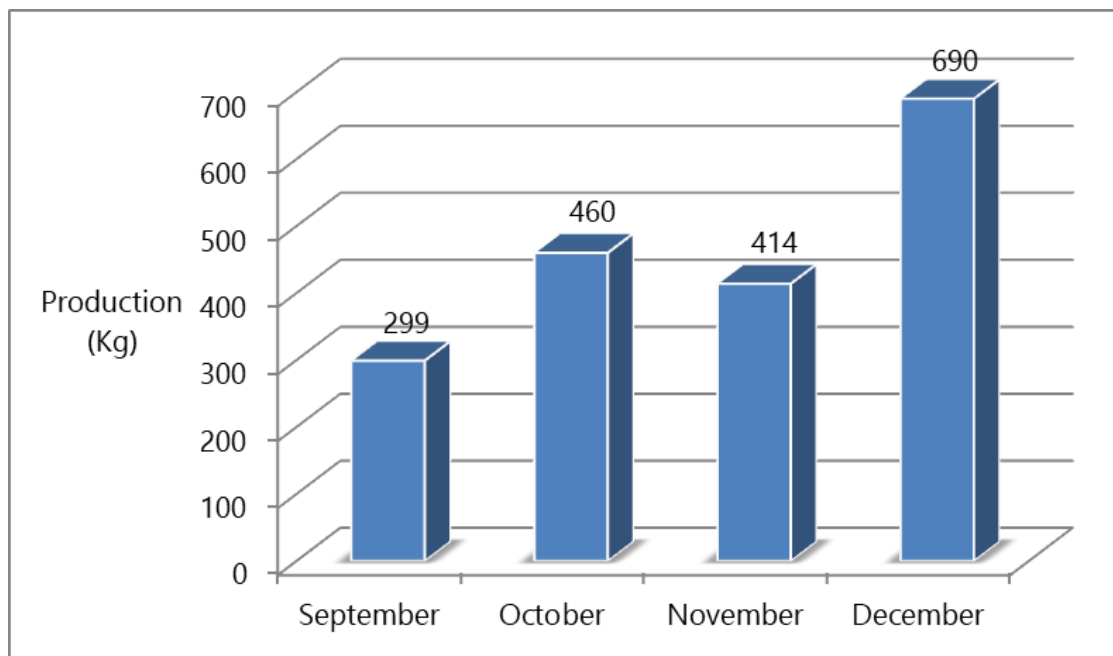
Based on the interview results, it is known that fishing in the afternoon is very effective because it is the time when fish are looking for food. The type of fish caught is tuna (*Thunus* sp.), the dominant type of bluefin tuna (*thunnus thynnus*). Fishing starts with hooking the bait after it is thrown away from the boat, when the fish grabs and eats the bait then the rope is jerked then the buoy reel is thrown to the surface of the sea, this can be done 3 to 4 times by 1 to 2 fishermen on 1 boat.

Production Trend of Hand Line Fishermen in Tulehu Village

A trend is a long-term upward or downward movement (tendency), which is

derived from the average change over time. The average change may increase or decrease. If the average change increases, it is called a positive trend or an upward trend. Conversely, if the average change decreases, it is called a negative trend or a trend that has a downward trend (Maryati, 2010 in Fikri et al., 2020). The production trend from September to December in fish units, which is the average production of all respondents.

The production of hand line fishermen in Tulehu Village from September to December fluctuated, production in September was 13 fish, October 20 fish, November 18 fish and December 30 fish. The average weight of one tuna is 23kg (Saiful and Ruban, 2022), the conversion results into kilogram units are shown in Figure 2.



Source: primary data processed, 2022

Figure 2. Production Trend (kg)

The difference in the number of catches in these months is influenced by the season, which is related to weather changes. The average number of catches was high in December because it was in the west season, while the other three months were in the transitional season. In Indonesian waters, the season that runs from June to August is the east season

where east winds blow with the direction of surface currents moving from east to west. In December to February the west season takes place, where west winds blow with the direction of surface currents moving from west to east. In March to May and September to November the transitional season takes place, where in this

season the surface current movement is irregular (Wyrcki, 1961 in Rahman et al., 2019).

In the west season, weather conditions are normal and the waters tend to be calm so that fishermen can carry out fishing well. On the other hand, water conditions in the east and transition seasons make it difficult for fishermen to reach the fishing ground, due to high sea waves and strong winds accompanied by high rainfall. September to November is the transitional season, so fishermen will generally delay or not conduct fishing operations.

Income Trend of Hand Line Fishermen in Tulehu Village

Cost

To determine the income of the hand line fishery business in Tulehu Village, it is necessary to know the fixed costs and operating costs. Fixed costs are a type of cost that is static (unchanging), which is not affected by the size of the business volume or business processes that occur in that period in a certain size (Assegaf, 2019). The average fixed costs incurred consist of depreciation and maintenance costs.

Table 5. Fixed cost

No.	Type	Average Cost (IDR/year)	Average Cost (IDR/month)
A. Depreciation			
1.	Boat	875.000	72.917
2.	Machine	600.000	50.000
3.	Fishing rod	260.000	21.667
Total		1.735.000	144.583
B. Maintenance			
1.	Boat	600.000	50.000
2.	Machine	500.000	41.667
3.	Fishing rod	500.000	41.667
Total		1.600.000	133.333
Totals (A+B)		3.335.000	277.916

Source: primary data processed, 2022

The results of depreciation calculations using the straight-line method according to Hidayat et al., 2011 with an estimated economic life of 20 years for boats, 5 years for engines and 5 years for fishing rods resulted in the largest depreciation cost being the boat at IDR875.000 per year or IDR72.917 per month, while the highest maintenance cost was the boat at IDR600.000 per year or IDR50.000 per month.

Operating costs are costs whose total amount can change in proportion to changes in the volume of activities or activities. The higher the volume of activities or activities, the higher the variable costs (Assegaf, 2019). The average operational costs per trip incurred by hand line fishermen in Tulehu Village are shown in the following table.

Table 6. Operational Cost per Trip

No.	Type	Average Cost (IDR/trip)
1.	Fuel oil	398.000
2.	Consumption	120.000
3.	Ice	50.000
4.	Cigarette	100.000
Total		668.000

Source: primary data processed, 2022

Based on the operational cost data per trip, the operational costs for September to

December are calculated based on the number of trips per month shown in Table 7.

Table 7. Operational Cost per Month

No.	Sept. (IDR)	Oct. and Nov. (IDR)	Dec.(IDR)
1.	3.184.000	4.776.000	7.960.000
2.	960.000	1.440.000	2.400.000
3.	400.000	600.000	1.000.000
4.	800.000	1.200.000	2.000.000
5.344.000		8.016.000	13.360.000

Source: primary data processed, 2022

Total trips in September were 8 days, October and November were 12 days, and December was 20 days. The result of multiplying the average operational cost per trip by the total trips per month, it is known that the highest operational cost is fuel and the lowest is ice.

After knowing the fixed and operational costs per month, the total cost per month can be known, which is the result of the sum of fixed costs and operational costs (Hutauruk et al., 2021).

Table 8. Total Cost per Month

Cost	Sept. (IDR)	Oct. and Nov. (IDR)	Dec. (IDR)
Fixed	277.916	277.916	277.916
Operational	5.344.000	8.016.000	13.360.000
Total	5.621.916	8.293.916	13.637.916

Source: primary data processed, 2022

Revenue

Generally, tuna fish caught by fishermen are marketed to PT Aneka Sumber Tata Bahari in the form of loins at a price of IDR80.000 per kg, where one tuna fish usually produces 4 (four)

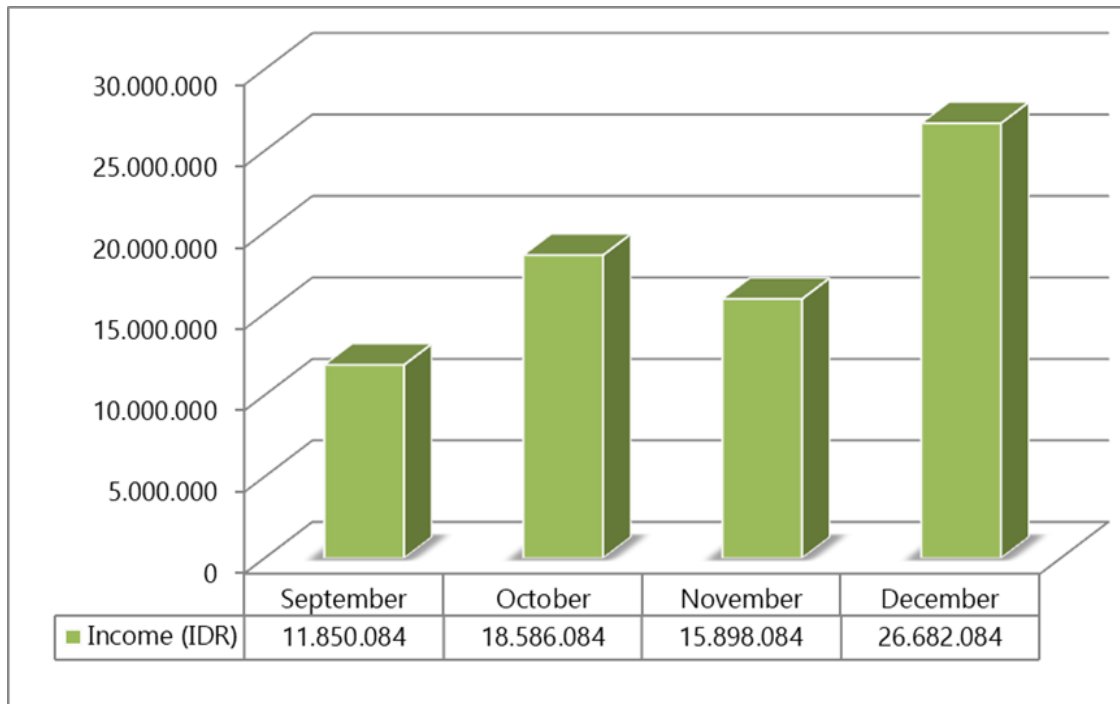
loins with the weight per loin is 4,2kg. In the fisheries business, the revenue obtained by fishermen is determined by the production produced, so based on the production trend in Figures 2 and 3, it is known that the fishermen's revenue from September to December is

IDR17.472.000, IDR26.880.000, IDR24.192.000, and IDR40.320.000.

Income

The income of hand line fishermen is obtained from the difference between revenue per month

and total costs per month. Based on Figure 4, the highest income in December is IDR26.682.084 and the lowest in September is IDR11.850.084.



Source: primary data processed, 2022

Figure 3. Income Trend

For owner fishermen who run their own business without the help of crew, the income is their personal income. Fishermen who are not owners or have crew, the income will be divided according to the agreed portion or share.

CONCLUSION

Conclusions based on research results are:

1. The highest production of tuna (*Thunus sp*) in Tulehu Village is in December as many as 690kg, while the lowest in September is 299kg.

2. In line with production, the highest income received by fishermen was in December at IDR26.682.084, while the lowest was in September at IDR11.850.084.

Suggestions related to the results of the study are the need for planning and strategies for fishermen in fishing operations by considering the season in order to obtain maximum production and income.

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