

Exchange Rate of Fishermen Business Light Boat in Papusungan Subdistrict Lembeh Selatankota Bitung North Sulawesi Province

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Abstract— Lembeh Island is included in the administrative area of Bitung City, North Sulawesi Province, Indonesia. Lembeh Island is administratively divided into two sub-districts namely North Lembeh and South Lembeh. The island is famous for being a dive site for foreign and local tourists in North Sulawesi in addition to Bunaken. The number of residents in Papusungan Subdistrict Lembeh Selatan Bitung City in July 2019 recorded 3,129 people and who worked as fishermen recorded as many as 388 fishermen consisting of fishing rods 140 people, fishermen trawler ring 120 people, sea transportation 110 people and boat business lights 10 people. Fishermen light boats with the smallest number but still exist and never disappear from activity in the coast region of Lembeh island. The purpose of research, to know and analyze how the business profile of the light boat and to know, analyze and explain the financial state of the business of the light boat. The analysis used in this study is the analysis of Fishermen's Exchange Rate (FER) which is further described and explained through quantitative descriptive analysis and descriptive qualitative. FER result calculation for the business of fishermen's light boats on total revenue of 211.83. FER value is greater than 100, which indicates that income only from the business of light boats can cover the needs of subsistence (basic needs) of the family of fishermen light boats in Papusungan village, South Lembeh subdistrict. FER for fishing boat business lights on revenue. boat lights of 228.16. The value of FER is greater than 100, which indicates that the revenue from the business of fishermen can cover the costs incurred from the business of fishermen's light boats in Papusungan village, South Lembeh subdistrict.

Keywords— Fishermen Exchange Rate, Lamp Boat Business, Papusungan Village.

I. INTRODUCTION

The development of coastal and marine areas is an issue and discussion that is a necessity that is done now, before (during the new order), the development of coastal areas and the oceans did not get enough attention due to the interaction of political decisions based on agrarian interests alone. However, in recent years it has been realized that coastal and ocean assets and resources have too great an

opportunity to be abandoned. Development and management of coastal areas is an integral part and interrelated and supports the interests of the development of the surrounding area (Integrated Conservation and development program), to ensure the conservation efforts of biological natural resources and can improve the welfare of the surrounding community either directly or indirectly. To increase the care and participation of the community in supporting the interests of development and management

of coastal areas, one of which is booked through efforts; counseling to the community and fostering the participation of the community around the national park area and the development and management of the buffer area of the national park.

The fishing business is a fishing activity to meet their daily needs. This effort can improve the economy and utilize marine biological resources to benefit. Fishing activities require costs incurred, with the receipt obtained to benefit by conducting financial analysis to know the development of the business from time to time. Lembah Island is an island in the administrative area of Bitung City in North Sulawesi Province, Indonesia. Lembah Island is currently administratively divided into two sub-districts namely North Lembah and South Lembah Subdistricts. This island is famous for being a dive site for foreign tourists in North Sulawesi besides Bunaken. The number of residents in Papusungan Subdistrict Lembah Selatan Bitung City in July 2019 recorded 3,129 people and who worked as fishermen recorded as many as 380 fishermen consisting of fishing rods 140 people, fishermen trawler ring 120 people, sea transportation 110 people and light boats 10 people.

Work on the light boat business was the purpose of this research. Their livelihood is not yet known if their income can meet the needs of fishermen and their families. Based on observations in the field and the results of the discussions team that the problems faced by them are sometimes the operational expenditure of this business and family expenses are insufficient or unbalanced but have not disrupted their economy. It's possible that in the pandemic there is a lack of inclusion. What is the Exchange Rate of Fishermen's light boat business in Papusungan Subdistrict Lembah Selatan Bitung City, North Sulawesi Province becomes the next calculation and discussion.

II. LITERATURE REVIEW

Light Boat

Light Boat is one of the aids in *the mini purse seine* fishery (Soma Pajeko) in the form of a boat using lights to lure fish. To collect target fish in the catchment area, a fish collecting tool in the form of lights is required.

Development of Catch Fisheries Business

According to the location of its activities, fishing in Indonesia is grouped into 3 groups, namely: 1) offshore fisheries(*offshore Fisheries*); 2) coastal fisheries (*Coastal Fisheries*); and 3) land fisheries(*Inland Fisheries*). Coastal fisheries and land fisheries activities are closely related to coastal environmental management (Satria 2002).

Fishermen and Income

Indonesian Fishermen's Center is defined as a person whose main livelihood is fishing in the sea. The profession as a fisherman becomes the choice of coastal communities because of the absence of job opportunities on the mainland. Usually, this profession is carried out by fishermen hereditary from their ancestors. The complexity of the problem of poverty of the fishing community is caused because they live in a harsh natural atmosphere that is always covered by uncertainty in running their business (Fahrudin 2004).

Directorate General of Fisheries *in* Satria (2002) stated that fishermen are people who actively conduct professions in fishing operations / other aquatic animals / aquatic plants. Fishermen are defined as people who do fishing in the general water area (Mantjoroand Otniel, P., 2003). Directorate General of Fisheries referred *to in* Satria (2002) classifies fishermen based on the time used to perform the profession of catching/maintenance operations, namely: Fishermen/fish farmers are full-time people who are all the time used to perform the profession of fishing operations/maintenance of fish / other aquatic animals / aquatic plants.

Fishermen/farmers of the main part-time fish are people who most of the time are used to perform the profession of fishing operations/maintenance of fish / other aquatic animals / aquatic plants. In addition to doing the profession of catching/maintaining, fishermen of this category can have other professions.

Fishermen/farmers of additional part-time fish are people who are a small part of their working time used to perform the profession of catching/maintaining fish / other animals / aquatic plants.

The household income of fishermen is the summation of income in the fishery sector and not the fishery sector. Revenue from the fishery sector is derived from the ownership of fishery assets such as fishing equipment, boats, and machinery; or the ownership or rights to fish resources. Non-fishery income can be based on productive land ownership, ownership of non-fishery assets such as buildings, transportation equipment; working family labor on their land, other people's land, industrial sector, community service sector (Panayotou, 1985).

Fishermen's Exchange Rate (FER)

FER is the ratio between the price index received by fishermen and the price index paid by fishermen expressed in percentage. The exchange rate of fishermen is one of the indicators in determining the level of welfare of fishermen. Data collection and calculation of FER in Indonesia is conducted by the Central Bureau of Statistics.

The price index received by fishermen (IT) is a price index that shows the development of producer prices on fishermen's production. From the value of IT, can be seen fluctuations in the price of goods produced by fishermen. This index is also used as supporting data in the calculation of agricultural sector revenues.

IT is calculated based on the selling value of agricultural products produced by fishermen, including the rice sector, crops, livestock products, people's plantations, vegetables, fruit, and the results of light boats (fishing and winding boats).

The price index paid by fishermen (IB) is a price index that shows the development of the price of fishermen's household needs, both the need for household consumption and the need for agricultural production processes. From the IB can be seen fluctuations in the price of goods consumed by fishermen who are the largest part of the community in the countryside, as well as fluctuations in the price of goods needed to produce agricultural products. IB developments can also reflect the development of inflation in rural areas.

The IB is calculated based on the price index to be paid by the fisherman in meeting his life needs and the addition of capital goods and production costs, which are further divided into the food and non-food goods and services sector.

III. METHODOLOGY

Research Methods

The method used in this study was used census method. Census definition is a way of collecting data when all elements of the population are investigated one by one (Supranto, 2008). This census is intended where all Papusungan fishermen get the same opportunity to be respondents where questionnaires will be conducted as guides and systematically structured interviews.

Data Collection Techniques

Data were collected through two sources, namely primary data and secondary data. Primary data is data obtained through observation, live interviews, and questionnaire filling out.

Secondary data is data obtained through data in Papusungan Village, South Lembeh, Bitung City

Data Analysis Methods

Data analysis of research results is distinguished in two kinds, namely quantitative analysis and qualitative analysis (Fathoni, 2006).

To measure FER is spelled out with the following formula:

$$FER = (It/Ib) \times 100$$

Where: FER = Fishermen's Exchange Rate

It = Price index received by fishermen

Ib = Index of prices paid by fishermen

FER > 100, means fishermen experience increased purchasing power because the production price is greater than the input price of production and household consumption.

FER = 100, meaning fishermen are break-even. The decrease in production price is equal to the percentage decrease in the price of production inputs and household consumer goods.

FER < 100, means fishermen have a deficit/decrease in purchasing power because the price of production lights is relatively smaller compared to the price of production inputs and household consumer goods.

IV. RESULTS AND DISCUSSION

Papusungan Village Overview

Papusungan is one of the villages in South Lembeh Subdistrict, Bitung City, North Sulawesi Indonesia, Papusungan Village is one of 7 subdistricts in South Lembeh Subdistrict. Papusungan village in daily activities led by a chief. The livelihoods of the people in Papusungan Village vary. One of the many jobs in Pasungan village is as a fisherman. The village received IFAD (International Fund For Agricultural Development) funding in 2014.

This village is located facing the docking dock of ships originating from Bitung City, Kema, Amurang, etc. who come to Lembeh island that is active in the field of fisheries, culinary tourism, or other business.

Generally, the fishing community in Papusungan Village is active in doing activities both in groups and individually. They need a group for the work to be light. Through IFAD (International Fund For Agricultural Development) which is a meeting of business groups that qualify formed in every village location, including Papusungan Village.

Their activities include; structured organization, making signs of DPL assistance, holding supporting facilities for all fishery activities, there are also activities to develop a network of Partners that have the potential to help or accompany processing activities. Most of the people in Papusungan Village also actively create and participate in village meetings for the strengthening of groups to improve the economy. Other activities are receiving or carrying out socialization about fishery regulations either from the Government of North Sulawesi Province, Bitung City Government or South Lembeh Sub-District Government

and related agencies such as; Provincial Fisheries and Marine Service, Fisheries and Marine Service of Bitung city.

In addition to the above, Papusungan village has also conducted activities such as; training in making fish meatballs, procurement of processing production facilities and infrastructure although simple, entrepreneurial training, and forming microfinance institutions, simple cooperatives. Not only have the activities been delivered, but they have also created ecotourism information centers, trainers, or small industrial developments such as wood fish processing, making marketing strategies both local and international, as well as fostering a network of timber fish businesses with stakeholders and investors both local and foreign.

Financial Analysis

1. Investment

Investment is several funds needed to meet/finance the tools and materials of a light boat business. Here is a list of investment costs can be seen in Table 1.

Table 1. Lamp Boat Investment in Papusungan Village

No	Description	Price
1	Boat	IDR 11.900.000
2	Machine	IDR 26.000.000
3	Genset	IDR 1,100,000
4	Lamp	IDR 1.302.000
5	Center	IDR 40,000
6	Coolbox	IDR 89,000
Total		IDR 40.431.000

Source: Data Results and Processed, 2021

In table 1, shows that the investment capital for the light boat business in Papusungan village rata-average IDR. 40,431,000, -. The largest amount of investment in machinery is IDR. 26,000,000, -

2. Fixed Costs

This fixed fee is required even if the business of the light boat is not active. Fixed Cost is a cost that does not change during the production process, is a type of cost that is static (unchanged) in a certain size.

Table 2. Average Fixed Cost of Boat Lamp Business/Year

No	Fixed Cost	Price	Economic Age (Years)	Depreciation Cost (IDR/Year)	Maintenance (IDR/Year)	Amount (IDR/Year)
1	boat	11.900.000	20	595.000	400.000	995.000
2	Machine	26.000.000	10	2.600.000	3.000.000	5.600.000
3	Gengset	1.100.000	3	700.000	1.000.000	1.700.000
4	Lamp	1.302.000	3	651.000	300.000	951.000
5	center	40.000	4	10.000	20.000	30.000
6	coolbox	89.000	2	44.500	10.000	54.500
Total						9.276.500

Source: Results and Processed Data, 2021

Table 2, showing that the boat business has a fixed cost in a year amounting to IDR. 9,276,500, -

3. Fixed Costs

Non-fixed costs are fees incurred by a company on a fickle basis based on changes in the number of products

produced. The greater the amount of product produced by a company, the greater the cost to produce the product. Similarly, if the volume of products produced is small then the cost is also small.

Table 3. Average Fixed Cost of Boat Business Lights/Year

Variable Costs	Number/ Trip	Unit	Price	1 Trip/IDR	15 Times Per Month/IDR	150 Times Per Year/IDR
Petrol	15	Litre	8.000	120.000	1.800.000	18.000.000
Had	1	Litre	37.000	37.000	555.000	5.550.000
Ice	17	Wrap	2.000	36.000	540.000	5.400.000

Such	1	Roll	10.000	10.000	150.000	1.500.000
Food Calculations	1		50.000	50.000	750.000	7.500.000
Wages	1		1.000.000	1.000.000	15.000.000	150.000.000
Sum				1.253.000	18.795.000	187.950.000

Source: Data Results and Processed, 2021

Table 3, shows that the irregular costs or operational costs incurred in the business of light boats in Papusungan Village in 1 year are an average of IDR. 187.950.000, -. Indeed, this cost is a bit high but it is because the value is what is needed for a light boat business at the time of operation.

Gasoline also greatly affects the income if the price of fuel is increasing then the income will be doubled g and if gasoline is running out at the place of purchase, then sea activities cannot be done so as not to earn income/income.

4. Total costs

Total Cost is the total fixed cost and variable cost incurred by the company to produce several products in a certain period, based on that understanding the total cost can be formulated as follows:

$$TC = FC + VC$$

Description: TC = Total Cost

FC = Fixed Cost

Vc = Variable Cost

Table 4. Total Cost of Lamp Boat Business in a year

No	Description	Cost/IDR	Percentage
1	Fixed Cost	9.276.500	5%
2	Fixed Fee	187.950.000	95%
Total Cost		197.226.500	100%

Source: Results and Processed Data, 2021

Based on Table 4, it is known that the fixed cost incurred per-know is 95% greater than the fixed cost incurred by 5%. Indeed, the cost does not remain greater than the fixed cost because this non-fixed cost is needed at the time of conducting activities/operations.

5. Household Expenses

Household expenses are the expenses of each household business boat lamp against basic needs adjusted to the number of family members. The ability to meet the basic needs of one household is influenced by income and limited by the number of members so that the larger the number of family members, the greater the expenditure on

basic needs. Baiki, et al (2020) writes that household cost is the cost of spending on each family on basic needs, and adjusted to the number of family members. Because the ability to meet the basic needs of the household is influenced by income and limited by the number of members so, the larger the number of family members, the greater the expenditure on basic needs. The family count factor is a variable that determines the small cost of the family. The larger the family size, the greater the family expenses. In the results of this study, the variation in family costs is as large as due to family size, although not all family costs are characteristic as well depending on family needs (Mumu, 2019)

The details of household costs on the lamp boat business in Papusungan Subdistrict, South Lembe can be seen in Table 5.

Table 5. Household Costs in a Year

No	Information	Amount (IDR)
1	Eat	8.850.000
2	Electricity	2.500.000
3	Drinking-Water	1.500.000
4	Transportation	1.250.000
5	Shirt	1.000.000
Total/Year		15.100.000

Source: Results and Processed Data, 2021.

Table 5 shows the household costs of families trying in the field of light boats the largest number is for family meals. This is indeed the usual state of affairs in every household. However, it can be said that the income earned from this business has not been able to guarantee the family buys other needs.

6. Revenue

What is meant by the income in this study is the money received by the light boat entrepreneur in an operation.

Table 6. Total Revenue of Light Boat Business in a Year

Information	Number of Trips	Revenue/IDR
Revenue/Trip	1 trip	3.000.000.
Revenue/Week	5 trips	15.000.000
Revenue/Month	15 trips	45.000.000
Revenue/Year	150 trips	450.000.000

Source: Result and Processed Data, 2021

Based on Table 6, it is known that the gross income per year of boat fishermen averages IDR 450,000. 000, - with an average annual trip of 150 times. The more the number of trips, the higher the income of the light boat fishermen.

7. Operating Profit (OP)/Year

Operating Profit (OP) is the profit of the light boat business which is the difference between all gross income and non-fixed costs in a year.

OP = TR-VC where

TR = Total Receipts

VC = Variable Cost

Table 7. Lamp Boat Business Acceptance in a Year

No	Description	Total Cost/IDR
1	Gross Income	450.000.000
2	Variable Costs	187.950.000 (-)
Operating Profit (OP)		263.950.000

Source: Results and Processed Data, 2019.

By Table. 7, Operating Profit IDR.263.950.000, -is a profit earned in a year and can be used for the following production costs are greater.

8. Total Profit /Net Profit

The advantages of the light boat business in Papusungan Village can be formulated as follows:

$$\pi = TR - TC$$

Table 8. Total Profit of Light Boat Business in a Year

No	Description	Amount (IDR)
1	Total Receipts	450.000.000
2	Total Cost	197.226.500 (-)
Total Profit		252.773.500

Source: Results and Processed Data, 2019.

Net Profit or total profit obtained in the light boat business in Papusungan Village amounted to IDR. 252,773,500, -. With such a profit, the light boat entrepreneur can develop his business or save as the next business investment capital and build a more decent house as well as for the cost of education.

9. Benefit-Cost Ratio (BCR)

Benefit-Cost Ratio (BCR) is an estimate of the expected benefits in the future or the ratio of receipts with all expenses. If $BCR > 1$ then the business is feasible to run.

$$BCR = \frac{TR}{TC}$$

$$= \text{IDR. } 450.000.000, - / \text{IDR. } 197.226.500, - = 2.28$$

Calculation of B/C Ratio of the lamp boat business can be continued / feasible if the results of the analysis, namely:

B/C Ratio < 1 investment proposal rejected

B/C Ratio > 1 investment proposal considered or accepted

Based on the feasibility of the business feasibility of the light boat in Papusungan Village obtained a value of B / C 2.28. This ratio indicates that the business of light boats in Papusungan Subdistrict South Lembeh, Bitung City is feasible to run because the benefits of light boat activities outweigh the cost.

10. Payback Period (PP)

Analysis of the period of return /payback period (PP) aims to determine the rate of return on investment that has been invested in a business. If the value of the Payback Period is less than 3 years means the rate of return of capital in the business falls into the fast category, if the Payback Period is more than 3 years and less than 5 years means the return rate of capital falls into the medium category and if the Payback Period is above 5 years, then the rate of return of capital falls into the slow category.

Table 9. Return Time of Investment of Lamp Boat Business

No	Description	Cost
1	Investment Costs	IDR 43,431,500
2	Total Profit	IDR 252,773,500
Return Time		0,17

Source: Results and Processed Data, 2021.

Based on Table 9 assessment criteria for return on investment (payback Period) above, it is known that the period of return of business of light boats in Papusungan Village is relatively fast because the period of return of capital is less than 3 years which is 0.17 or 2 months 12 days. Quite small investments and very large profits make the return on investment very fast. Thus, the business of light boats in Papusungan Village can be developed and relied on as a source of income for the fishing community in the field of fisheries.

Fishermen's Exchange Rate Boat Lights

The concept of fishermen's exchange rate of light boats used in this study is the concept of Fishermen's Exchange Rate Value (FER) which is an indicator to measure the

level of welfare of the fishermen of light boats relatively. Because the indicator is also a measure of the ability of the fishing boat family to meet the needs of its subsistence, FER is also referred to as *subsistence Terms of Trade*. FER is the ratio of total income to the total household expenditure of fishermen's light boats over a certain period. In this case, the income in question is gross income or can be referred to as household receipts of fishermen's light boats.

Results of the analysis on the effort. light boat in Papusungan Subdistrict Lembah Selatan obtained FER value, as follows:

Table 10. Average Income, Expenditure, FER Nelayan Boat lights in Papusungan Subdistrict Lembah Selatan

	Description	Amount (IDR)
A	Fishermen's Income Boat lights	
1.	Business Boat lights (a)	450.000.000
2.	Non-Boatlights (b)	0
	Total (c)	450.000.000
B.	Fishermen's Spending Boat Lights	
	Business Boat lights (d)	197.226.500
	Family Consumption (e)	15.204.000
	Total (f)	212. 430. 500
C.	Fishermen Exchange Rate (FER)	
1.	Against Total Expenses (g) = $c/f \times 100$	211,83
2.	Against Fishery Expenditure. (h) = $a/d \times 100$	228,16

Source: Primary Data Processing (2021)

FER in this calculation is spelled out on total revenue and revenue. boat lights, along with the dividing factor of the total expenditure of fishermen's boat lights and expenditure on the business of light boats. Similarly, on FER, the calculations are based on observations of October and November 2020. Explanations on the types of FER can be seen in the following discussion.

1. Exchange Rate of Fishermen Boat Lights on Total Revenue

The exchange rate of fishermen's light boats on total income is calculated based on a comparison between the total income of light boat fishermen, both from fishing and non-fishing businesses compared to the expenditure of boat light fishermen and family consumption. Based on the

calculation of FER for the business of fishermen's light boats on a total expenditure of 211.83.

This value when compared to FER Sulut in 2020 amounted to 98.85, FER Indonesia 103.25, then the achievement of FER for light boat fishermen in Papusungan Village is quite good. FER value is greater than 100, which indicates that the income from the business of light boat fishermen can cover the needs of subsistence (basic needs) of the family of light boat fishermen in Papusungan Village, South Lembah District. Total Expenditure of the family of fishermen light boats averaged 197,226,500, - per year can be covered by the total income of the business income of the fishermen's business light boats averaged IDR. 450.000.000.-

2. FER on Fishermen's Income Boat Lights

The exchange rate of Fisherman's boat lights on the income of the Fisherman's boat lamp is calculated based on the comparison between the amount of business income. boat lights compared to the expenditure of the business. boat lights. Based on the results of FER calculation for fishermen's business of light boats on revenue. boat lights of 228.16. The value of FER is greater than 100, which indicates that the revenue from the business of fishermen can cover the costs incurred from the business of fishermen's light boats in Papusungan village, South Lembah subdistrict. The total expenditure of fishermen's business of light boats averages IDR. 212. 430. 500 per year can be covered by the business income of fishermen's light boats, which is IDR. 450,000,000 per year.

V. CONCLUSION

Based on the results and discussion of this study, it can be concluded:

1. The results of FER calculation for the business of fishermen's light boats on total revenue of 211.83. FER value is greater than 100, which indicates that income only from the business of light boats can cover the needs of subsistence (basic needs) of the family of fishermen light boats in Papusungan village, South Lembah subdistrict.
2. FER for fishing boat business lights on revenue. boat lights of 228.16. The value of FER is greater than 100, which indicates that the revenue from the business of fishermen can cover the costs incurred from the business of fishermen's light boats in Papusungan village, South Lembah subdistrict.

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