

Analysis of the Welfare Level of Fisherman Households Based on the Fisherman Exchange Rate (NTN)

Muhammad Hawlaa Abdussalam Shadra^{1*}, Yeni Sari Wulandari¹, Ali Fahmi Syahputra¹

¹ Agribusiness Study Program, Faculty of Agriculture, Singaperbangsa University of Karawang, Indonesia

*Correspondence Author: 2010631200057@unsika.ac.id

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ABSTRACT

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Ciparagejaya Village is one of the villages in Karawang Regency that is directly adjacent to the Java Sea waters and is dominated by fisheries activities such as capture fisheries, sea product auctions, and processing of fish caught in the sea. The existence of weather factors and moon phases can affect fishing catches which have an impact on fishermen's income, purchasing power of fishermen's households, and the level of welfare of fishermen's households. The purpose of this study is to analyze the amount of fishermen's household income from the fisheries sector which includes capture fisheries and non-fisheries and analyze the expenditure of fishermen's households which includes food and non-food expenditures, and analyze the level of welfare of fishermen's households based on the Exchange Rate of fishermen (NTN) in May 2024 in Ciparagejaya Village, Tempuran District, Karawang Regency. The method used in this research is the survey method and this research was conducted with a quantitative descriptive approach. Sampling was done purposively by involving 96 boat-owning fishermen residing in Ciparagejaya Village, Tempuran Subdistrict, Karawang Regency. This study used primary data and secondary data. Primary data was obtained through interviews using a questionnaire and secondary data was obtained through relevant agencies. The results showed that the average income from capture fisheries and non-fisheries in May 2024 amounted to Rp 2,832,158 and Rp 1,620,000. The average food and non-food expenditure of fisher households in May 2024 amounted to Rp 973,281 and Rp 713,135. The average welfare level based on the Fisherman Exchange Rate (NTN) indicator in May 2024 was 1.89. This shows that fisher households can fulfill their primary and non-primary needs.

INTRODUCTION

Fishing communities are categorized as poor because of their low level of social welfare and low income, making it difficult to meet their daily needs (Supriadi

et al., 2020). Kasryno in Wulandari *et al.* (2023) explained that a common characteristic inherent in Indonesian coastal communities is weak access to capital. Capital is the main element in supporting the increase in production and the standard of living of coastal communities themselves.

According to Ramdayanti *et al.* (2021), one of the regions in Indonesia that has considerable potential for fisheries and marine resources is Karawang Regency. Fisheries production in Karawang Regency in 2022 was 9,198 tons (BPS Provinsi Jawa Barat, 2022) Tempuran sub-district is the largest area in contributing to marine capture fisheries production of 2,513.66 tons in 2023 (BPS Kabupaten Karawang, 2022).

Ciparagejaya Village is one of the villages in Tempuran Sub-district, Karawang Regency. The potential of Ciparagejaya Village is in the field of fisheries. According to data from the Ministry of Home Affairs of the Republic of Indonesia (2022), Ciparagejaya Village is the center of fisheries activities in the Tempuran Subdistrict area of Karawang Regency with a total of 2,250 fishermen out of a total population of 5,461 and has supporting facilities for fisheries activities, namely the Fish Auction Place (TPI). However, capture fisheries activities in Ciparagejaya Village still face various problems caused by various factors, especially weather factors and moon phases that cause fishermen's catches to fluctuate.

According to Pangauan *et al.* (2020) The influence of the moon phase in the sky is one of the factors closely related to fish behavior, one of which is the attraction of fish to light. In addition, the brightness of moonlight will affect the efficiency of fishing. Previous research related to the welfare level of fishermen households by Wahyuni (2022) said that weather factors also affect the catch of fishermen to fluctuate, resulting in a decrease in the income of fishermen.

From the description above, measuring the welfare level of fishermen has important implications in understanding the economic conditions of coastal communities. According to Wahyuni (2022) the measurement of fishermen's welfare level can be done by using the Fishermen's Exchange Rate (NTN) indicator. NTN is relevant because it covers aspects of fishermen's economic life holistically. Therefore, this study aims to measure the welfare of fishermen using NTN as the main indicator, with the hope that the results of the study can provide better insight into the living conditions of fishermen and support the development of more effective policies in the fisheries sector.

LITERATURE REVIEW

According to Law of the Republic of Indonesia Number 7 Year (2016), small-scale fishermen are fishermen who catch fish to meet their daily needs, both those who do not use fishing vessels and those who use fishing vessels with a maximum size of 10 (ten) gross tons (GT). Small fishermen families have a much greater level

of economic vulnerability if the fishing catch is small and can affect the low purchasing power of fishermen households.

Fishing catches are generally affected by bad weather and moon phases. Bad weather accompanied by large waves is one of the things that can jeopardize the process of fishing at sea, so when these events occur fishermen often fail to go to sea. The moon phase is also a factor that can have a significant impact on fishing catches due to phototaxis. According to Pangauan *et al.* (2020) The brightness of moonlight will affect fishing efficiency.

According to (Nugroho, 2017) the catch of fishermen affects the level of fishermen's welfare. The amount of income earned by fishermen is determined by the catch, then the income earned will be used to buy the needs of their families. Supriadi *et al.* (2020) argued that efforts to measure the level of fishermen's welfare by using indicators of changes in fishermen's income are not appropriate to describe the level of fishermen's welfare, because they have not compared with fishermen's expenses for their household needs. The Fishermen's Exchange Rate (NTN) is a more appropriate indicator to measure the welfare level of fishermen, because it considers all income and expenses in the fishermen's household.

METHOD

This research was conducted in May 2024 in Ciparagejaya Village, Tempuran District, Karawang Regency. This research uses a quantitative descriptive research method that aims to describe the quantitative data obtained in accordance with the actual situation. The sampling method in this study used purposive sampling, where the sample was not randomly selected but based on certain criteria. The sample criteria are small fishermen who have boats with a maximum size of 10 Gross Tonnage (GT) in Ciparagejaya Village, Tempuran District, Karawang Regency with a total of 96 respondents determined by the Slovin formula.

The data collection technique of this research is using primary data and secondary data. Primary data was obtained directly through interviews using questionnaires with fishermen as respondents in Ciparagejaya Village, Tempuran District, Karawang Regency. Meanwhile, secondary data was collected from various sources such as library books, as well as publications from institutions related to the research, including the Central Bureau of Statistics (BPS), Village and Village Information System of the Directorate General of Village Governance of the Ministry of Home Affairs, and Ciparagejaya Village Profile, Tempuran District, Karawang Regency.

According to Basuki in Supriadi *et al.* (2020), NTN is the ratio of total income to total expenditure of fishing households during a certain period of time. The analysis method used is the Fisherman Exchange Rate method. calculation of Fisherman Exchange Rate (NTN) as follows:

$$Et = Eft + EKt$$

$$Y_t = Y_{Ft} + Y_{NKt}$$

$$NTN = Y_t / E_t$$

Information:

NTN = Fisherman Exchange Rate

Y_t = Total Income of Fishermen

E_t = Total Expenses of Fishermen

Y_{Ft} = Total income of fishermen from fishing business

Y_{NFt} = Total income of fishermen from non-fisheries

E_{Ft} = Total expenditure of fishermen for fishing business

E_{Kt} = Total fishermen's expenditure for fishermen's family consumption

T = Time period (month, year, etc.)

There are three NTN criteria used to determine the welfare level of fisher households, namely:

- If $NTN < 1$, it means that the purchasing power of the fisher families is low and there is a household budget deficit.
- - If $NTN = 1$, it means that the fisher families are only able to fulfill their primary needs.
- - If $NTN > 1$, it means that the fisher families have a good level of welfare to fulfill their primary needs, have the ability to fulfill their secondary needs, have the potential to fulfill their tertiary needs, and can also save money.

RESULT AND DISCUSSION

Description of Research Location

Ciparagejaya Village consists of five (5) hamlets, namely Muara 01 Hamlet, Muara 02 Hamlet, Cibancar Hamlet, Mangun Karya Hamlet, Pulomulya Hamlet. Based on its geographical position, Ciparagejaya Village borders the Java Sea to the north, Tempuran Village to the south, Pasirjaya Village to the east, and Cikuntul Village to the west.

The total population in Ciparagejaya Village is 5,461 people, of which 2,250 people work as fishermen. The largest population in Ciparagejaya Village is male with 2,753 people and female with 2,708 people, and the number of family heads in Ciparagejaya Village is 1,992 people.

Analysis of the Welfare Level of Fishermen Households

1. Capture Fisheries Revenue

The marine catches obtained by respondent fishermen varied, such as shrimp, squid, skipjack fish, anchovies, tembang fish, pomfret, layur fish, and tuna. Capture fisheries revenue in this study is the gross income earned by respondent fishermen and has not been reduced by the total costs incurred to support the sustainability of the capture fisheries business.

Table 1. Average capture fisheries revenue in May 2024

No.	Description	Value (Rp)
1.	Capture Fisheries Revenue/Trip	364.648
2.	Capture Fisheries Revenue/May	9.116.210

Table 1 above shows the average capture fisheries revenue per trip is Rp 364,648. The average respondent fishermen went to sea as many as 25 trips in May 2024. The average capture fisheries revenue per month in May 2024 is Rp 9,116,210. which is obtained from capture fisheries per trip multiplied by the number of trips of each respondent fisherman.

2. Total Capture Fisheries Costs

The total cost of capture fisheries in this study is the total cost incurred by fishermen to support the success of capture fisheries businesses consisting of fixed costs and variable costs.

Table 2. Average total cost of capture fisheries in May 2024

No.	Description	Value (Rp)
1.	Fixed Cost	143.687
	Boat Depreciation Cost	87.298
	Engine Depreciation Cost	27.569
	Fishing Gear Depreciation Cost	18.620
	Cool Box Depreciation Cost	10.200
2.	Variable Cost	6.140.365
	Working Capital/May	5.967.188
	Boat Maintenance Cost	173.177
Total Capture Fisheries Costs		6.284.052

Table 2 above shows that the average total cost of capture fisheries in May 2024 is Rp 6,284,052. The total cost of capture fisheries consists of accumulated fixed costs of Rp 143,687 which includes the cost of depreciation of boats, engines, fishing gear, and cool boxes and accumulated variable costs of Rp 6,140,365 which includes working capital and boat maintenance costs in May 2024.

3. Capture Fisheries Income

Income in this study was calculated by reducing the total revenue from capture fisheries with the total costs incurred for capture fisheries activities.

Table 3. Average capture fisheries revenue in May 2024

No.	Uraian	Nilai (Rp)
1.	Capture Fisheries Revenue	9.116.210
2.	Total Capture Fisheries Cost	6.284.052
3.	Capture Fisheries Income	2.832.158

Table 3 above informs that the average income of capture fisheries in May 2024 is 2,832,158. This average capture fisheries income is obtained from capture

fisheries revenue of Rp 9,116,210 which is reduced by the total capture fisheries costs of Rp 6,284,052.

4. Non-fishery Income

Non-fishery income in this study is the income earned by household members who work outside capture fisheries.

Table 4. Non-fishery income

No.	Occupation	Income (Rp)	Number (person)
1.	Labor	1.650.000	14
2.	Trade	1.000.000 – 2.500.000	6
Total			20

Table 4 above informs us that there are 20 members of respondents' fishing families who work outside the capture fisheries business such as laborers in rice and salt farming, trading in grocery stores and cooked side dishes. The average income of laborers is Rp 1,650,000 per month and trading income is Rp 1,000,000 - 2,500,000 per month in May 2024.

5. Total Income of Fishermen's Households

Fishermen's household income is obtained from the accumulation of family income from the fisheries sector and family income from the non-fisheries sector.

Table 5. Average income of fisher households in May 2024

No.	Type of Income	Income/Month (Rp)
1.	Capture Fishery	2.832.158
2.	Non-fishery	1.620.000
Pendapatan Rumah Tangga		3.169.658

Table 5 above informs that the average income of respondent fishermen from capture fisheries is Rp 2,832,158 and the average income from non-fisheries is Rp 1,620,000, so the average household income of respondent fishermen is Rp 3,169,658.

6. Total Expenditure of Fisher Households

Fisher household expenditure in this study includes food expenditure and non-food expenditure. Food expenditure consists of rice, meat, fish, eggs, tofu/tempeh, milk, vegetables, fruits, cooking oil, sugar, tea, coffee, spices, and processed food.

Table 6. Average expenditure of fisher households in May 2024

No.	Food Expenditure	Expenditure/Month (Rp)	Percentage (%)
1.	Rice	148.500	11,41%
2.	Meat	121.667	9,35%
3.	Fish	290.789	22,35%
4.	Eggs	33.609	2,58%
5.	Tofu/Tempeh	60.000	4,61%

No.	Food Expenditure	Expenditure/Month (Rp)	Percentage (%)
6.	Milk	50.583	3,89%
7.	Vegetables	110.823	8,52%
8.	Fruits	39.340	3,02%
9.	Cooking Oil	101.146	7,77%
10.	Sugar	11.016	0,85%
11.	Tea	17.578	1,35%
12.	Coffe	85.361	6,56%
13.	Kitchen Spices	107.813	8,29%
14.	Fast Food	123.077	9,46%
Total		1.301.302	100%

Table 6 above informs that the average food expenditure of respondent fishermen households in May 2024 was IDR 1,301,302. The largest food expenditure is fish with a percentage of 22.35% and rice 11.41%. The expenditure on processed food was 9.46%, meat 9.35%, vegetables 8.52%, kitchen spices 8.29%, cooking oil 7.77%, coffee 6.56%, tofu/tempe 4.61%, milk 3.89%, fruits 3.02%, eggs 2.58%. The lowest percentage of food expenditure is tea 1.35% and sugar 0.85%. This suggests that respondent fishermen households tend to prefer coffee over tea when viewed from the average food consumption expenditure in one month.

Non-food expenditure includes education, care and health, housing and facilities, clothing, communication/telecommunication, transportation fuel, kerosene and LPG, recreation, and credit. The following non-food expenditures of fisher households can be seen in the table 7 below.

Table 7. Average monthly non-food expenditure of fisher households

No.	Non-Food Expenditure	Expenditure/Month (Rp)	Percentage (%)
1.	Education	50.000	4,50
2.	Care and Health	174.323	15,69
3.	Housing and Household Facilities	301.823	27,17
4.	Clothing	74.167	6,68
5.	Communication/Telecommunication	75.521	6,80
6.	Transportation Fuel	200.000	18,01
7.	Kerosene/LPG	47.198	4,25
8.	Recreation	-	-
9.	Credit	-	-
10	Others	187.692	16,90
Total		1.110.724	100

Table 7 above informs that the average non-food expenditure of respondent fishermen households in May 2024 was IDR 1,110,724. The largest non-food expenditure is the cost of housing and household facilities amounting to IDR 301,823 with a percentage of 27.17%, then the average expenditure on fuel for transportation commonly used for the mobility of respondent fishermen households for IDR 200,000 with a percentage of 18.01%. Then other average

expenses include additional spending money for family members amounting to Rp 187,692 with a percentage of 16.90%. This shows that the average non-food expenditure of respondent fishermen households is dominated by housing expenses and household facilities which include water and electricity costs.

7. Fishermen Household Welfare Level

Fishermen's Exchange Rate is a comparison between the total income and total expenditure of fishing households. This indicator is used to measure the welfare of fishing households. This concept is based on the understanding that each household has a different level of income and expenditure, which is influenced by their respective lifestyles. The Fisherman Exchange Rate can provide an overview of the welfare of fishermen at this time. The results of the Fishermen's Exchange Rate (NTN) analysis for fishing households in Ciparagejaya Village, Tempuran District, Karawang Regency are as follows.

Table 8. Average Nilai Tukar Nelayan (NTN) in May 2024

No.	Description	Value (Rp)
1.	Total Income of Fishermen's Household	3.184.762
2.	Total Expenditure of Fishermen's Household	1.686.417
Nilai Tukar Nelayan (NTN)		1,89

Table 8 above informs that the average total income of respondent fishermen households in May 2024 was Rp 3,184,762, while the average total expenditure of respondent fishermen households in May 2024 was Rp 1,686,417. The results of the calculation of the overall average income of respondent fishermen households divided by the overall expenditure of respondent fishermen households resulted in a Fisherman Exchange Rate (NTN) > 1, which amounted to 1.89. This confirms that on average, fishermen households can fulfill the primary and non-primary needs of their households.

The percentage of Nilai Tukar Nelayan (NTN) consists of three criteria, namely NTN < 1, NTN = 1, NTN > 1. The percentage of Nilai Tukar Nelayan presents the total NTN data of respondent fishermen in Ciparagejaya Village, Tempuran District, Karawang Regency. The percentage of Fisherman Exchange Rate can be seen in the table 9 below.

Table 9. Percentage of Nilai Tukar Nelayan (NTN) in May 2024

No.	Fisherman Exchange Rate (NTN)	Jumlah Nelayan	Percentage (%)
1.	NTN < 1	5	5,21
2.	NTN = 1	3	3,13
3.	NTN > 1	88	91,67
Total		96	100

Based on Table 9 above, the results of the calculation of the Nilai Tukar Nelayan (NTN) are mostly in the criteria that are worth $NTN > 1$ as many as 88 fishermen with a percentage of 91.67%, 3 respondent fishermen's households with $NTN = 1$, and 5 fishermen's households with $NTN < 1$. If $NTN < 1$ is obtained, it means that the welfare level of the fishermen's family is low and cannot meet their primary needs. If $NTN = 1$, it means that the fishermen's family is only able to meet their primary needs, and if $NTN > 1$, it means that the fishermen's family has a level of welfare that is good enough to meet their primary and non-primary needs.

Previous research by Wahyuni (2022) showed that the average exchange rate of boat-owning fishermen in Cilincing Subdistrict, North Jakarta was at the NTN level of 1.25. In this study, the results obtained show harmony or consistency with these findings, especially in terms of the average Nilai Tukar Nelayan which is in the $NTN > 1$ criteria. Thus, this study strengthens and expands the understanding of the Analysis of the Welfare Level of Fishermen's Households with certain criteria, namely small boat owners with a maximum size of 10 GT and makes a new contribution in the form of the discovery of other factors that can determine the catch of fishermen, namely the moon phase factor, which if during the light phase of the moon the catch of fishermen tends to be less while in the dark phase of the moon the catch tends to be abundant.

CONCLUSION

Based on the results of the research and discussion above, the conclusions are obtained:

- The average household income of fishermen in Ciparagejaya Village, Tempuran Subdistrict, Karawang Regency in May 2024 was Rp 3,184,762. Capture fisheries income amounted to Rp 2,832,158. and non-fisheries amounted to Rp 1,620,000. The average expenditure of fishermen households in Ciparagejaya Village, Tempuran Subdistrict, Karawang Regency in May 2024 amounted to Rp 1,686,417. Food expenditure of fisher households amounted to Rp 973,281. and non-food expenditure amounted to Rp 713,135.
- The welfare level of fishermen households in Ciparagejaya Village, Tempuran Subdistrict, Karawang Regency based on the Fisherman Exchange Rate (NTN) indicator in May 2024 averaged 1.89. The results of the calculation of $NTN < 1$ were 5 fishermen, $NTN = 1$ were 3 people, and $NTN > 1$ were 88 fishermen respondents. This shows that there are 5 fishermen respondents who cannot meet their primary needs, then there are 3 fishermen respondents who are only able to meet their primary needs, while there are 88 fishermen respondents who can meet their primary needs and enough for their non-primary needs.

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REFERENCES

- BPS Kabupaten Karawang. (2022). Kecamatan Tempuran Dalam Angka 2023. <https://karawangkab.bps.go.id/>
- BPS Provinsi Jawa Barat. (2022). Provinsi Jawa Barat Dalam Angka 2024. <https://jabar.bps.go.id/>
- Dirjen Bina Pemerintahan Desa. (2022). *Data Pokok Desa*. https://prodeskel.binapemdes.kemendagri.go.id/dpokok_grid_t01/
- Nugroho, V. R. (2017). Analisis Faktor-faktor Yang Mempengaruhi Hasil Pendapatan Nelayan Di Desa Bendar Kecamatan Juwana Kabupaten Pati. Universitas Islam Indonesia Yogyakarta.
- Pangauan, D., Manoppo, L., Kayadoe, M. E., & Manu, L. (2020). Pengaruh Fase Bulan Terhadap Hasil Tangkapan Dengan Jaring Insang Hanyut (Soma Landra) (Effect of moon phase on catches of drift gill net (Soma Landra)). *Jurnal Ilmu Dan Teknologi Perikanan Tangkap*, 5(1), 18–22. <https://doi.org/10.35800/jitpt.5.1.2020.27449>
- Ramdayanti, E., Argenti, G., & Marsingga, P. (2021). Peran Pemerintah Dalam Pemberdayaan Masyarakat Nelayan Di Desa Ciparagejaya Kabupaten karawang. *Ilmu Pemerintahan Suara Khatulistiwa*, 6(02).
- Supriadi, D., Widayaka, R., & Gumilang, A. P. (2020). *Dinamika Nilai Tukar Nelayan*. Lakeisha. Klaten.
- Undang-Undang Republik Indonesia Nomor 7 Tahun 2016 Tentang Perlindungan Dan Pemberdayaan Nelayan, Pembudi Daya Ikan, Dan Petambak Garam, Pub. L. No. 7 (2016). <https://peraturan.bpk.go.id/Details/37237/uu-no-7-tahun-2016>
- Wahyuni, D. (2022). *Analisis Tingkat Kesejahteraan Rumah Tangga Nelayan Berdasarkan Nilai Tukar Nelayan (NTN) Di Kecamatan Cilincing Jakarta Utara*. Universitas Negeri Singaperbangsa Karawang.
- Wulandari, Y. S., Abadi, S., Zahra, F. A., & Syahputra, A. F. (2023). Peningkatan

pengetahuan dan keterampilan pelaku UMKM perikanan melalui sosialisasi manajemen dan pemasaran. *Jurnal Inovasi Hasil Pengabdian Masyarakat (JIPEMAS)*, 6(2), 257-268. <https://doi.org/10.33474/jipemas.v6i2.19385>