Original Research Article

Analysis of The Exchange Rate of Small-scale Trammel Net Fishermen in Pangandaran District, Pangandaran Regency

ABSTRACT

Fishing activities in Pangadaran District are one of the economic sectors that have been supporting regional development and growth. One of the capture fisheries commodities that contribute to improving the economy, especially the fishing profession in Pangandaran District, is shrimp. Generally, fishermen in Pangandaran District use trammel nets to catch shrimp. This study aims to calculate the Fisherman's Exchange Rate (FER) on small-scale fishermen who use trammel nets in Pangandaran District. Fisherman's Exchange Rate is an indicator of economic welfare for fishermen published by Ministry of Marine Affairs and Fisheries. This research was conducted at the Pangandaran and Cikidang Fish Auction Places, Pangandaran District, Pangandaran Regency, West Java, Indonesia in January-August 2022. This research uses a descriptive type of research method with a quantitative approach. The sampling technique used in this research is census. The data used are primary and secondary data with the number of respondents as many as 45 small scale trammel net fishermen in Pangandaran District with interviews. The data analysis method use Fisherman's Exchange Rate (FER). The results of this research indicate that the average exchange rate for small-scale fishermen is 92. FER shows a number < 100. This indicates that small-scale fishermen who use Trammel net fishing gear in Pangandaran District have a deficit. This means that the economic welfare level of fishermen during the calculation period has decreased compared to the welfare level of fishermen in the basic calculation period.

Keywords: Fisherman's Exchange Rate, Small-scale Fishermen, Trammel net, Pangandaran District

1. INTRODUCTION

West Java Province in 2018 was the province with the third largest level of shrimp production nationally from the capture fisheries sector. West Java Province was ranked third by producing shrimp production of 20,815.65 tons. One of the largest shrimp-producing districts in West Java Province is Pangandaran Regency. The value of shrimp production from the capture fisheries sector in Pangandaran Regency in 2018 reached 537,558.10 kg (DKPKP Pangandaran Regency, 2018).

The high shrimp catch in Pangandaran Regency is inseparable from the productivity of the fishing gear used, namely the *trammel net*. The results of the analysis of catch per unit of effort and catch rate gear trammel net in the Pangandaran District resulted in 27.52 kg/trip and a catch rate of 9.13 kg/hour (6 .28 kg/hour as the main catch, namely shrimp and 2.85 kg/hour as a *bycatch*), with an average towing time of 60 minutes/trip. This catch rate value

shows that *trammel net* has a greater ability to catch shrimp than other aquatic biota (Aulia, 2020).

Pangandaran District is one of the sub-districts in the Pangandaran Regency. Pangandaran District is one of the sub-districts that has great capture fisheries potential in Pangandaran Regency. Pangandaran District basically has two locations of Fish Auction Places (TPI) which are active in fish landings and fish buying and selling transactions. The two TPI are TPI Cikidang and TPI Pangandaran (Singkawijaya & Hilman, 2021). According to data compiled from KKP Statistics in 2018, 150,142 kg or the equivalent of 26.17% of shrimp production in Pangandaran Regency was contributed by TPI in the Pangandaran District. This value is also the catch using *trammel net* with the use of fishing vessels of less than 5 GT. The production data of shrimp catches in Pangandaran District is shown in **Table 1.**

Table 1. Production Data of Shrimp Catches in Pangandaran District

No	Fish Auction Places (TPI)	Fishing vessel	Volume Produksi (kg)
1	TPI Cikidang	Fishing motorboat 1 GT	10.207
2	TPI Cikidang	Fishing boat 5 GT	121.727
3	TPI Pangandaran	Fishing boat 5 GT	17.708
Total			150.142

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 Tonnage (GT) (Law Number 7 of 2016). Overall, the characteristics of fishermen in Pangandaran Regency are dominated by small-scale fishermen who are not yet prosperous (Sartika, 2011). Small-scale fishermen generally use small vessels and not more than 5 (five) GT to carry out fishing operations (Halim, 2020). The size of fishing vessels is generally measured using units of *Gross Tonnage* (GT). *Gross tonnage* (GT) is a measure that shows the volume of vessels to accommodate the results of fishing operations (Sunardi et al., 2019).

Fisherman's Exchange Rate (FER) is a comparison between the total income received by fishermen and the total expenditure of fishermen's households during a certain period (Kusdiantoro et al., 2019). FER is an indicator that can be used to measure the ability of fishermen's families to meet their basic needs (Dessy et al., 2020). Fisherman's Exchange Rate is considered appropriate as a measuring tool to measure the welfare of fishermen because it has advantages by considering all revenues (*revenue*) and all expenditures (*expenditure*) from fishermen's families (Juliani, 2012). Fishermen's Exchange Rate is one of the Main Performance Indicators of the Ministry of Marine Affairs and Fisheries (KKP) which is claimed to be able to describe the development of fishermen's welfare economically because it is closely related to the income and expenditure of fishermen for each month. (Regulation of The Minister of Marine Affairs and Fisheries Number 35 of 2014). Fishermen's exchange rate also can be the basis for policies made by the Ministry of Marine Affairs and Fisheries to improve the welfare of fishermen.

2. METHODS

The research was conducted at the Pangandaran and Cikidang Fish Auction Places, Pangandaran District, Pangandaran Regency, West Java, Indonesia. The research was conducted in January-August 2022. The research method used is a census method to small-scale trammel net fishermen in Pangandaran District, Pangandaran Regency. The sampling technique used in this research is census. The data used are primary and secondary data

with a total number of respondents as many as 45 small-scale trammel net fishermen in Pangandaran District with interview techniques using questionnaires. The population of small-scale trammel net fishermen in Pangandaran sub-district is 45 fishermen. Primary data collected directly during the study were the characteristics of small-scale trammel net fishermen in Pangandaran District which included data on age, educational background, marital status, number of family dependents, working time, size of fishing boats, income from the fishery sector, household expenditures. fishermen, and fishermen's income. The secondary data used is data on the number and types of fishing gear and fishing productivity in the Pangandaran Regency. The data analysis method used in this study is Fisherman's Exchange Rate Analysis. The data were analyzed descriptively with a quantitative approach.

2.1 Data Analysis

Analysis of the data used in this research, including

2.1.1 Fisherman's Exchange Rate

Analysis of the welfare of small-scale trammel net fishermen can be measured using the Fisherman's Exchange Rate formula (Ramadhan et al., 2014), which is formulated as follows:

$$FER = \frac{IR}{IP} \times 100$$

$$IR = \sum_{i=1}^{n} Pt_i^1 \cdot Qt_i^1$$

$$IP = \sum_{i=1}^{n} Pf_i^1 \cdot Qf_i^1$$

Information:

FER : Fisherman's Exchange Rate (FER);
IR : Index Received by Fishermen (IR);
IP : Index Paid by Fishermen (IP);
Pt : Price of Fishery Production Commodity (Pt) in IDR;
Qt : Fishery Production Commodity Quantity (Qt) in Kg;
Pf : Prices of Food, Non-Food Consumption, and cost of Fishing Business (Pf) in IDR;
Qf : Quantity of Food, Non-Food Consumption, and Cost of Fishing Business (Qf) in IDR;
t : Time Period.

Result:

1. FER > 100 : Fishermen have a surplus. This means that the welfare level of fishermen is economically better than the level of welfare of fishermen in the basic calculation period;
2. FER = 100 : Fishermen break even. The economic welfare level of fishermen does not change with the level of welfare in the basic calculation period;

3. FER < 100 : Fishermen have a deficit. This means that the level of economic welfare of fishermen during the calculation period has decreased compared to the level of welfare of fishermen during the basic calculation period.

3. RESULTS AND DISCUSSION

3.1 PANGANDARAN DISTRICT PROFILE

Pangandaran District is one of the sub-districts in the Pangandaran Regency along with nine other sub-districts, namely Cimerak, Cijulang, Cigugur, Langkaplancar, Parigi, Sidamulih, Mangunjaya, Kalipucang, and Padaherang sub-districts. Pangandaran District is a coastal area with an average height above sea level of about 611.25 m. Pangandaran District has an area of 118.87 km2. Pangandaran District is the second largest sub-district in Pangandaran Regency after Kalipucang District with a total area of 136.78 km^2 (Ciamis District Statistical Center Agency, 2021)

Pangandaran District has a population of 58,299 people consisting of 29,311 male and 28,988 female. In 2021, the sex ratio in Pangandaran District will reach 101.10. This means that for every 100 female residents there are 101 male residents or in other words, the male population in Pangandaran District is more than the female population. The productive age group, namely the age of 15-64 years, in Pangandaran District there are 41,190 people (71%) and the non-productive age group, namely the young age (0-14 years) and the old age (> 65 years) as many as 17,109 people (29%). (Ciamis District Central Agency of Statistics, 2021)

3.2 CHARACTERISTICS OF SMALL-SCALE TRAMMEL NET FISHERMEN IN PANGANDARAN DISTRICT

Characteristics Of Small-Scale Trammel Net Fishermen In Pangandaran District aims to find out the condition of the respondents and obtain the data needed in compiling the fisherman's exchange rate. Characteristics of respondent data consist of age, educational background, marital status, number of family dependents, work experience, work time, fishing vessel size, fisherman's ousehold expenditure, fisherman's fishing expenses, and fisherman income. Characteristics of respondent data can affect FER because each fisherman has different household needs.

3.2.1 Age

Age is the length of an individual's life from birth to birthday. The more old enough, the level of maturity and strength of a person will be better at work (Lasut, 2017). Age is one of the factors that affect a person's productivity at work (Aprillyanti, 2017). The age group categorized in the age of 15-64 years while the unproductive age group is the age group under 15 years and above 65 years (Panggabean, 2020). Based on the results of the research in **Table 2**, it shows that the age of small-scale trammel net fishermen in Pangandaran District is dominated by the productive age group, which is 98% and the remaining 2% is the non-productive age group. The average age of small-scale trammel net fishermen in Pangandaran District is 40 years. Productive age of workers will affect their ability to work. Rising working age then the level of productivity of employees it will increase because workers are in a position of productive age. When the age of the worker approaches old age then the level of work productivity will decreasing due to limitations physical and health factors influence (Kumbadewi et al., 2021).

Table 2. Age of Small-Scale Trammel net Fishermen in Pangandaran District

No	Age (Years)	Frequency (Fishermen)	Percentage (%)
1	22 – 28	6	14
2	29 – 35	13	29
3	36 – 42	9	20
4	43 – 49	8	18
5	50 – 56	6	13
6	57 – 63	2	4
7	64 – 70	1	2
	Total	**45**	**100**

3.2.2 Educational Background

Education is one of the important factors in the development of human resources. The level of education is very influential on the ability to work.The higher a person's educational background, the higher the person's ability to increase work productivity (Arifin & Firmansyah, 2017). Based on the results of the research in **Table 3** , it is shown that the small-scale trammel net fishermen in Pangandaran District on average have an elementary school education background (58%). Traditional fishermen in Pangandaran District are dominated by fishermen with low educational levels, Elementary School (SD) (Nastiti et al., 2022). Generally, the paradigm and socio-culture that developed in fishing communities consider formal schooling is not something that promises to make a better life because many people who have graduated from school turn out to be unemployed. This causes them to think that it is better to work and earn money than to go to school. In fact, formal schools can improve the ability of fishermen to develop and manage their capture fisheries business and increase their knowledge to use renewable technology in catching fish (Siregar, 2016).

Table 3. Educational Background of Small-Scale Trammel net Fishermen in Pangandaran District

No	Educational Background	Frequency (Fishermen)	Percentage (%)
1	Elementary School (SD)	26	58
2	Junior High School (SMP)	13	29
3	Senior High School (SMA)	6	13
	Total	**45**	**100**

3.2.3 Marital Status

Marital status can also affect one's household welfare. A person who is bound to marital status will require more food needs than someone who is not married. Therefore, financial independence is important before starting a household (Sari, 2018). Based on the results of the research in **Table 4**, it shows that small-scale trammel net fishermen in Pangandaran

District on average are married (91%) and the rest are unmarried (4%). Fishermen in Pangandaran District are generally married with an average number of dependents of four families (Santi et al., 2020).

Table 4. Marital status of Small-Scale Trammel net Fishermen in Pangandaran District

No	Marital Status	Frequency (Fishermen)	Percentage (%)
1	Married	41	91
2	Unmarried	4	9
	Total	**45**	**100**

3.2.4 Number of Family Dependents

Number of dependents is the number of family members who are still dependents of a family. Family members categorized as family dependents are siblings or non-siblings who live in the same house but do not have a job. The bigger the number of dependent family members owned by a family will generally affect the high level of expenditure from the family (Purwanto &Taftazani, 2018).

Table 5. Number of Family Dependents of Small-Scale Trammel net Fishermen in Pangandaran District

No	Number of Family Dependents (People)	Frequency (Fishermen)	Percentage (%)
1	1	1	2
2	2	6	13
3	3	11	24
4	4	15	33
5	5	9	20
6	6	3	8
	Total	**45**	**100**

Based on the results of the research in **Table 5**, it shows that small-scale trammel net fishermen in Pangandaran District have four family dependents. The minimum number of family dependents owned by fishermen is one person and the maximum is six people. The Indonesian Central Agency of Statistics categorizes the number of dependents into three groups, namely small family dependents 1-3 people, medium family dependents 4-6 people and large family dependents are more than 6 people. Based on this, small fishermen who use trammel nets in Pangandaran District are dominated by medium family dependent groups as many as 27 fishermen (61%).

3.2.5 Work Experience

Work experience is one of the factors that can affect a person's productivity at work. The longer the working period of a worker, generally the skills and abilities in doing work are increasing (Aprilyanti, 2017). Based on the results of the research in **Table 6**, it shows that small-scale trammel net fishermen in Pangandaran District on average have 20 years of experience at work. The lowest fishing experience is 2 years and the highest fishing

experience is 40 years. Based on other studies, on average, traditional fishermen in Pangandaran Sub-district have 22 years of experience at work and the longest running time at work is 38 years (Nastiti et al., 2022).

Table 6. Work Experience of Small-Scale Trammel net Fishermen in Pangandaran District

No	Work Experience (Years)	Frequency (Fishermen)	Percentage (%)
1	2 – 7	8	18
2	8 – 13	5	11
3	14 – 19	11	24
4	20 – 25	11	24
5	26 – 31	5	11
6	32 – 37	3	8
7	> 38	2	4
	Total	**45**	**100**

3.2.6 Working Time

Working time is the amount of time allotted to carry out a series of activities that are usually carried out inside and outside the household in units of time (Unu et al., 2018). In this study, the outpouring of fisherman's working time was measured according to the number of trips to catch fish (trips) in one month. According to Juradin et al., (2019) A fishing trip is a fishing operation activity starting from leaving the base to the operating area, looking for fishing areas, making arrests until returning to the place of origin. Fishing trips can be carried out once a day (one day fishing) or do not occur in the same day. Based on the results of the study, small trammel net fishermen in Pangandaran District generally carry out fishing operations on a daily basis (One day fishing).

Table 7. Working Time of Small-Scale Trammel net Fishermen in Pangandaran District

No	Working Time (*Trip*/Month)	Frequency (Fishermen)	Percentage (%)
1	12 – 16	6	13
2	17 – 21	25	56
3	22 – 26	13	29
4	> 27	1	2
	Total	**45**	**100**

Based on the results of the research in **Table 7**, small trammel net fishermen in Pangandaran District generally carry out fishing operations on a daily basis (One day fishing) with an average number of trips 21 times in one month. The minimum number of trips is 12 times and a maximum of 30 times. In generally fishermen in Pangandaran Regency carry out one day fishing operations on a daily basis (one day fishing) as many as 20 trips in one month (Ginanjar et al., 2022). Basically, time work and work productivity positively related. The more time work, the higher the experience and skills that will support their work so that

they can increase work productivity. However, the working period must be balanced with efficiency so that the fishing effort carried out is proportional to the fish catch production obtained.

3.2.7 Fishing Vessel

The size of fishing vessels is generally measured using units of *Gross Tonnage* (GT). *Gross tonnage* (GT) is a measure that shows the volume of vessels to accommodate the results of fishing operations (Sunardi et al., 2019). In general, fishing vessels used to catch fish consist of fishing boat, fishing motorboats or boats without motors, or other floating equipment used to catch fish. Based on the results of the research in **Table 8**, it shows that small-scale trammel net fishermen in Pangandaran District use two types of boats, namely fishing boat (5 GT) and fishing motorboats (1 GT). Small *trammel net* in Pangandaran District are dominated by fishermen with fishing motorboats (1 GT) as many as 41 people (91%). As for the rest using a motor vessel (5 GT) as many as 4 people (9%). Fishing vessels that have a larger size can accommodate more fish and the speed power of the engine is faster (Yuliana & Budhi, 2019). The type of fishing vessels that is generally used by fishermen in Pangandaran Regency for capture fisheries activities is an fishing motorboats. As for fishermen who have the characteristics of being small-scale fishermen, they generally use fishing motorboats or even boats without motors (Rahim et al., 2018).

Table 8. Fishing Vessel of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fishing Vessel Size (GT)	Frequency (Fishermen)	Percentage (%)
1	Fishing Motorboats (1 GT)	41	91
2	Fishing Boat (5 GT)	4	9
	Total	**45**	**100**

3.2.8 Fishermen's Revenue

Fishermen's revenue (Total Revenue) is the multiplication of the number of fishery commodities obtained or yield (Y) with the selling price of the fishery commodity (Py) (Rafki, 2022). Basically, the income received by fishermen does not include the reduction of fixed costs and variable costs incurred by fishermen. Based on the results of the research in **Table 9**, it shows that small-scale trammel net fishermen in Pangandaran District are dominated by fishermen with revenues ranging from IDR1,000,000 – IDR3,500,000 in one month as many as 23 people (51%). The lowest income owned by small trammel net fishermen in Pangandaran District is IDR1,000,000 and the largest is IDR19,000,000 by one fisherman. On average, the income of small scale trammel net fishermen in Pangandaran District is IDR4,543,333. The average revenue of traditional fishermen in 2021 in Pangandaran District is IDR9,004,567 (Nastiti et al., 2022). There was a decrease in the average value of fishermen's revenue due to fluctuations in the fishing season. At the time of conducting the research, fishermen were entering the rainy season so that the production of fish catches was decreasing.

Table 9. Fishermen's Revenue of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fishermen's Revenue (IDR/Month)	Frequency (Fishermen)	Percentage (%)
1	1.000.000 – 3.500.000	23	51%
2	4.500.000 – 7.000.000	17	39%
3	8.000.000 – 10.500.000	1	2%
4	11.500.000 – 14.000.000	1	2%
5	15.000.000 – 17.500.000	2	4%
6	18.500.000 – 21.000.000	1	2%
	Total	**45**	**100**

3.2.9 Fisherman's household expenditure

Fisherman's household expenditure is one of the factors that can affect the welfare of fishermen (Sukmawardhana et al., 2013). In general, fishermen's household expenditures can be categorized into two groups, namely expenditure needs for food and non-food (Firdaus et al., 2015). Based on the results of the research in **Table 10**, it shows that small-scale trammel net fishermen in Pangandaran are dominated by expenditure groups of IDR 1,450,000 – IDR1,800,000 as many as 12 people (27%) in one month. The lowest fisherman household expenditure in one month is IDR800,000 for one fisherman. The largest household expenditure in one month is IDR4,750,000 for one fisherman..The average expenditure for the household is IDR2,312,222. Fishermen's household expenses can be influenced by the number of dependents of fishermen's families. The more the number of dependents of the fishermen's families, the higher the household expenditure of fishermen.

Table 10. Fishermen's Household Expenditure of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fishermen's Household Expenditure (IDR/Month)	Frequency (Fishermen)	Percentage (%)
1	800.000 – 1.150.000	5	11
2	1.450.000 – 1.800.000	12	27
3	2.100.000 – 2.450.000	11	24
4	2.750.000 – 3.100.000	8	18
5	3.400.000 – 3.750.000	3	7
6	4.050.000 – 4.400.000	5	11
7	> 4.400.000	1	2
	Total	**45**	**100**

3.2.10 Fisherman's fishing expenses

Fishermen's fishing expenses (Total Cost) are expenses incurred by fishermen in carrying out capture fisheries activities. In general, fishermen's fishing expenses consist of fixed costs and variable costs. Fixed costs, for example, are maintenance and repair costs for ships and their engines or fishing gear. Meanwhile, variable costs fishermen in fishing activities generally consist of fuel oil, equipment (ice, water, bait, food supplies, cigarettes, medicines) and labor. Based on the results of the research in **Table 11**, it shows that small scale trammel net fishermen in Pangandaran District are dominated by expenditure groups of IDR 750,000 – IDR1,750,000 as many as 26 people (58%) in one month. The lowest expenditure is IDR750,000 and the largest expenditure is IDR10,000,000. On average, fishing expenses for small-scale trammel net fishermen in Pangandaran District for one month are IDR 2,232,222. Fishermen's fishing expenses be influenced by the efficiency obtained by fishermen. The more inefficient fishing activities, the more costs incurred to catch fish. The characteristics of fishermen who do one day fishing force fishermen to always go fishing every day. In fact, when entering the rainy season, fishing activities cannot be carried out optimally. This causes the expenditure to catch fish fishermen to increase and their income to decrease.

Table 11. Fishermen's fishing expenses of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fishermen's fishing expenses (IDR/Month)	Frequency (Fishermen)	Percentage (%)
1	750.000 – 1.750.000	26	58
2	2.250.000 – 3.250.000	14	32
3	3.750.000 – 4.750.000	1	2
4	5.250.000 – 6.250.000	1	2
5	6.750.000 – 7.750.000	1	2
6	8.250.000 – 9.250.000	1	2
7	> 9.250.000	1	2
	Total	**45**	**100**

3.2.11 Fishermen's income

Fishermen's income is the substraction between *total revenue* (TR) and all costs or *total cost* (TC) incurred by fishermen to carry out their work. Based on the results of the research in **Table 12**, it shows that Small scale trammel net fishermen in Pangandaran District are dominated by the income group of IDR850,000-IDR1,850,000 as many as 20 people (44%). The lowest income was IDR850,000 and the largest income reached IDR9,000,000. On average, small-scale trammel net fishermen in Pangandaran District have an income of IDR 2,572,222 for one month. In general, the income of small-scale trammel net fishermen in Pangandaran district has exceeded the regional minimum wage of Pangandaran Regency. The regional minimum wage in Pangandaran Regency is IDR1.860.591. However, the income of small-scale trammel net fishermen still needs to be increased so that the welfare of fishermen will increase.

Table 12. Fishermen's income of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fishermen's Income (IDR/Month)	Frequency (Fishermen)	Percentage (%)
1	850.000 – 1.850.000	20	44
2	2.350.000 – 3.750.000	19	42
3	3.850.000 – 5.250.000	1	2
4	5.350.000 – 6.750.000	1	2
5	6.850.000 – 8.250.000	3	8
6	> 8.250.000	1	2
	Total	**45**	**100**

3.3 FISHERMAN'S EXCHANGE RATE

Fisherman's Exchange Rate (FER) is a comparison between the price index received (It) by fishermen and the price index paid (Ib) by fishermen. FER has a function to measure the ability and purchasing power of fishermen in financing their household life. Conceptually, the fisherman's exchange rate describes all revenues from the capture fishery business then traded for the non-capture fisheries sector.

Table 13. Fishermen's exchange rate of Small-Scale Trammel net Fishermen in Pangandaran District

No	Fisherman's Exchange Rate (FER)	Frequency (Fishermen)	Percentage (%)
1	50 – 59	3	7
2	60 – 69	4	9
3	70 – 79	5	11
4	80 – 89	15	33
5	90 – 99	3	7
6	100 – 109	3	7
7	110 – 119	3	7
8	120 – 129	4	9
9	130 – 139	3	7
10	> 140	2	3
	Total	**45**	**100**

Based on the results of the research in **Table 13**, it shows that small scale trammel net fishermen in Pangandaran District are dominated by fishermen with FER < 100 as many as 30 fishermen. There are two fishermen with FER = 100 and the rest with FER > 100 as many as 13 fishermen. The overall average FER result for small-scale trammel net fishermen in Pangandaran District is 92. This figure shows that fishermen experience a deficit and the level of economic welfare of fishermen during the calculation period has decreased compared to the welfare level of fishermen during the previous calculation period. The results of FER are obtained from all fishermen's income from capture fisheries activities

then divided by fishermen's household expenditures and fishing expenses. This result is then multiplied by 100 and avergaed by 45 fishermen. Research conducted in 2021 in Pangandaran District on traditional fishermen showed that the overall average FER yield was 99 (Nastiti et al., 2022). The FER results that are less than 100 may indicate that the production of fish catches has decreased and the household expenditure of fishermen have increased. The decrease in FER is also caused by the inefficient fishing activities of fishermen because at the time of the research the Pangandaran district entered the rainy season so that the catch production decreased.

4. CONCLUSION

The average exchange rate (FER) for small-scale trammel net fishermen in Pangandaran District is 92 or less than 100 (<100) This shows that the economic welfare of small-scale trammel net fishermen in Pangandaran District is deficit. This means that the level of economic welfare of fishermen during the calculation period has decreased compared to the level of welfare of fishermen during the basic calculation period. The low fisherman exchange rate can indicate the amount of fisherman's expenditure is bigger than the amount of fisherman's income. To increase FER yields, fishermen are expected to increase their efficiency in catching fish and not to behave consumptively when earning large incomes.

REFERENCES

Aprilyanti, S. Effect of Age and Working Period on Work Productivity (Case Study: PT. OASIS Water International Palembang Branch). *Journal of Industrial Systems and Management*. 2017; 1(2): 78-68

Arifin, S., & Firmansyah. The Effect of Education Level and Employment Opportunities on Unemployment in Banten Province. *Journal of Economics-Qu*. 2017; 7(2): 1 – 9.

Aulia, A. N., Supriadi, D., Dewanti, L. P., & Mahdiana, I. Captures Per Trammel Net Business Unit in the East. *International Journal of Research and Review*. 2020; 7 (8): 319 – 313.

Ciamis District Statistical Center Agency (BPS). 2021. Pangandaran Regency in Figures 2021. Pangandaran District.

Department of Marine Affairs, Fisheries, and Food Security Pangandaran Regency. 2019. Pangandaran Regency Fisheries Statistics. Annual report. Pangandaran.

Firdaus, M., Apriliani, T., and Wijaya, R. A. Fisherman's Household Expenditure and Its Relationship with Poverty: A Case in Ketapang Barat Village, Sampang Regency, East Java. *Journal of Socio-Economic Maritime Affairs and Fisheries*. 2015; 8(1): 56-49.

Halim, A., Wiryawan, B., Loneragan, N. R., Hordyk, A., Sondita, M. F. A., White, A. T. Yuni, C. Formulating the Definition of Small-Scale Fisheries to Support Indonesian Capture Fisheries Management. *Journal of Fisheries and Marine Research*. 2020; 4(2): 262-239.

Juliani. Trend of Welfare Fishermen at Coastal Area of Kutai Kartanegara Regency. Marine Fisheries: *Journal of Marine Fisheries Technology and Management*. 2012; 3(2): 183-177.

Juradin, A., Tadjudah, M., & Lawelle, S. The Effect of Arrest on Purse Seine Fishing Equipment Income in Petoaha and Bungkutoko Villages, Kendari City. *PekaBuana*. 2019; 1(1): 1 – 8.

Kumbadewi, L.S., Suwendra, I.W., & Susila, G. P. A. Effect of Age, Work Experience, Wages, Technology and Work Environment on Employee Productivity. *e-Journal Ganesha University of Education*. 2021; 9(1): 1 – 9.

Kusdiantoro, Fahrudin, A., Juanda, Wisudo, S. H., and Juanda, B. The Performance of Capture Fisheries Development in Indonesia. *Marina Socio-Economic Marine and fisheries Scientific Bulletin*. 2019; 5(3): 84-69.

Lasut, E. E. Analysis of Differences in Employee Performance Based on Gender, Age and Period of Work (Study at the Sitaro Education Office). *Journal of Research in Economics, Management. 2017; Business and Accounting*, 5(3).

Nastiti, A. S. R., Rizal, A., Apriliani, I. M., & Suryana, Asep Agus Handaka. Comparison of Exchange Rates of Tourism Small Enterprises and Traditional Fishermen in Pangandaran District, Indonesia. *Asian Journal of Fisheries and Aquatic Research*. 2022; 17(4): 45-29.

Panggabean, M. Factors Affecting Dependency Ratio in Indonesia. *Proceedings of the 2020 Annual Academic Seminar of Economics and Development Studies*. 2020.

Purwanto, A., and Taftazani, B. M. The Effect of Number of Dependents on the Level of Economic Welfare of K3L Workers' Families, Padjadjaran University. *Focus: Journal of Social Work*. 2018; 1(2): 43-33.

Rafki. Introduction to Microeconomics: Maritime and Ocean Perspectives. Tanjung Pinang: UMRAH Press; 2022.

Rahim, A., Hastuti, D. R. D., Syahma, A., & Firmansyah. Effect of length of time at sea, power of outboard engines, and respondent's characteristics on the income of traditional fishing fishermen in Takalar Regency. *Agricultural socio-economic*. 2018; 2(1): 50 – 57.

Ramadhan, A., Firdaus, M., Wijaya, R.A. Term of Trade Analysis of Traditional Fishers of Big Pelagic. *Journal of Socioeconomics Marine Fisheries*. 2014; 9(1): 11-1.

Regulation of The Minister of Marine Affairs and Fisheries Number 35. 2014. General Guidelines for Marine and Fishery Data Architecture in the Ministry of Marine Affairs and Fisheries). Jakarta.

Santi., Nurhayati, A., Apriliani, I. M., Rizal, A. 2020. Analysis of the Educational Participation of Fishermen's Children in Pangandaran District, Pangandaran Regency. *Syntax Idea*. 2020; 2(9): 662 – 675.

Singkawijaya, E.B., Hilman, I. Economic Spatial Activities of Fishermen at the Cikidang Pangandaran Fish Landing Base (PPI). *Journal of Geography Education*, University of Siliwangi (GEODUCATION). 2021; 2(2): 11-1.

Siregar, N. S. S. Fishermen Community Awareness of Children's Education. *Journal of Government and Socio-Political Sciences.* 2016; 4(1): 1 – 10.

Sukmawardhana, N., Bambang, A. N., and Rosyid, A. Analysis of the Welfare Level of Gill Net Fishermen in Asinan Village, Bawen District, Semarang Regency. *Journal of Fisheries Resources Utilization Management and Technology*. 2013; 2(4): 49-40.

Sunardi, S., Baidowi, A., & Yulianto, E. S. Calculation of Gt of Fishing Vessels Based on Indonesian Regulations and Computer Assisted Ship Modeling (Case Study of Muncar and Prigi Fishing Vessels). *Marine Fisheries: Journal of Marine Fisheries Technology and Management.* 2019; 10(2): 152-141.

The Laws of The Republic of Indonesia Number 7. 2016. Protection and Empowerment of Fishermen, Fish Cultivators, and Salt Farmers. Jakarta.

Unu, A., Sendow, M. M., & Wangke, W. M. The Outpouring of Women's Working Time in Rice Field Farming Activities in Rasi Satu Village, Ratahan District, Southeast Minahasa Regency. *Agri-Sosioeconomic*. 2018; 14(3): 105-115.