Level of Compliance and Perception of Beach Seine Fishers in Pasir Putih Beach, Padang City, West Sumatra Province towards Sustainable Capture Fisheries

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Abstract

Research has been conducted at Pasir Putih Beach, Padang City, West Sumatra Province, which aims to describe the socioeconomic characteristics of beach trawl fishers, determine the level of compliance of beach seine fishers, determine the perceptions of beach seine fishers towards environmentally friendly fishing gear, and fishers' perceptions of the existence of fish resources. This type of research is descriptive, using a survey method. The sample consisted of 10 respondents, using a purposive sampling technique. Data collection techniques included observation and interviews, with questionnaires for respondents. The analyses used were descriptive, proportion distribution, and Spearman's rank correlation. The results of this study indicate that the socioeconomic characteristics of fishermen at Pasir Putih Beach, Padang City, West Sumatra Province, show that the majority are 46-65 years old and have low education, namely elementary school education. Experience as a fisherman exceeds 15 years. Then, in the income section, the dominant fishermen earn below UMP, with 8 people. Regarding the Number of dependents, most fishermen have 3-4 dependents, up to 5 people, with a 50% share. Beach seine fishers have a very low level of compliance, as they use prohibited gear, violate fishing line regulations, and lack documents.

1. Introduction

Fisheries is one of the most important activities for utilizing aquatic biological resources to meet animal and economic needs. There are two main components in fisheries, namely, capture fisheries, which involve fishing from fresh, brackish, and marine waters, and aquaculture, which includes the cultivation of fish and other aquatic organisms. Both are interrelated and important for maintaining the balance of aquatic ecosystems and supporting the sustainability of fisheries production. Marketing and processing of fishery products are also important steps in providing fishery products to consumers. The development of capture fisheries is strongly influenced by the construction and design of fishing gear. The more advanced the technology used in fishing, the more efficient and sustainable the fishing business becomes. Good construction of fishing gear is very important because it can affect catch rates and environmental impacts. By understanding the design of effective fishing gear, we can increase the efficiency and sustainability of capture fisheries (Syaputra, 2009).

The fishing gear operated by fishermen at Pasir Putih Beach, Bungus Selatan Village, varies in both type and size. Beach seine is indeed one of the common fishing gears used in nearshore waters to catch fish and other marine biota. The use of these different types of fishing gear can affect fishermen's catches and also impact the conservation of marine resources. It is important to ensure sustainable fisheries

management to safeguard marine ecosystems and fishers' livelihoods.

Beach seine has become a common fishing gear used by fishermen in Indonesia. Its presence is widespread across almost all provinces, and in some places, beach seine is considered a traditional fishing tool still in use. Because a beach seine can be the best choice for fishermen with limited capital, its advantages lie in its simple construction and low operational and maintenance costs. This makes it an efficient tool for many fishing groups in Indonesia (Suherman, 2015).

The ban on the use of beach seines is stipulated in PERMEN-KP Number 2 of 2015. The ban appears to be intended to maintain the sustainability of fish resources and protect the aquatic ecosystem of Pasir Putih Beach. It is important to comply with these regulations to preserve the marine environment and sustain fisheries in the area. The government often issues such regulations to maintain ecosystem balance and support fishermen who use more sustainable fishing methods.

Based on this, it is necessary to evaluate the knowledge and perceptions of beach trawl fishermen in Pasir Putih Beach Waters, Bungus Selatan Village, to increase their compliance with government regulations and realize sustainable fisheries management. The perceptions in question are the criteria for environmentally friendly fishing gear and the existence of fisheries resources in the waters.

2. Methodology

2.1. Time, Place, and Materials

This research was conducted from May 2023 to completion in the waters of Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province.

2.2. Method

The method used in this research is the survey method. This research was conducted to collect primary data through interviews using a questionnaire. A sampling technique determined the selection of respondents interviewed. Respondents were beach trawl fishermen who agreed to be interviewed using a questionnaire.

2.3. Procedures

This research begins by identifying the existing problem: the ineffectiveness of fisheries management due to fishermen's noncompliance with applicable regulations. The government has directed fishermen to carry out fishing activities in accordance with several regulations, but there is still resistance. The perception of the fishing community regarding compliance with the fishing process is very helpful to the government in achieving proper fisheries management. If you want to know about a person's perception, it cannot be separated from their socioeconomic characteristics, because different people have different characteristics. After identifying the research problem, a literature review is conducted to identify relevant references and prior research.

2.4. Data Analysis

Data The data was processed with Microsoft Excel software. The first data processing stage is descriptive analysis. Furthermore, the measurement of correlation analysis. First, descriptive analysis is conducted, which uses the collected data to describe the object under study. Descriptive analysis consists of three stages: data reduction, data display, and conclusion drawing.

Furthermore, the proportional distribution analysis is conducted to determine the distribution of fishermen at Pasir Putih Beach, Padang City, West Sumatra Province, based on socioeconomic characteristics. The formula used is as follows (Hasan, 2012):

$$P_{ij} = \frac{f_{ij}}{n} \; x \; 100\%$$

Description:

P_{ij} = Proportion of the i-th variable and j-th data group
F_{ij} = Frequency of the i-th variable and the j-th data group
N = Number of respondents
I = Variable
J = Data groups on each variable

Second, a comparative analysis is carried out. A comparative analysis or comparison is an analysis that uses techniques to compare an object with other objects. Objects that are compared can take the form of figures, institutions, management, or application development (Suprantro, 2016)

3. Result and Discussion

Socioeconomic Characteristics of Fishermen

The results of the proportion distribution analysis regarding socioeconomic characteristics at Pasir Putih Beach, Padang

City, West Sumatra Province are as follows Table 1.

Table 1. Socioeconomic characteristics of fishermen at Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province

No.	Respondent Characteristics	Total	%
1.	Umur a. Early adolescence:	0	-
	12-20 years old	1	10
	b. Early Adulthood:21-35 years old		
	c. Mid-adulthood: 36-45 years old	1	10
	d. Late Adults 45-65 years	8	80
2.	Education: a.Not graduated from elementary school	0	-
	b. Elementary school	3	30
	c. Junior high school	4	40
	d. Senior high school	3	30
3.	Experience a. 0-5 years	1	10
	b.6-10 years of fishing	1	10
	c.11-15 years	2	20
	d. ≥ 15 years	6	60
4.	Organization a. Exists	0	-
	b. None	0	-
5.	Socialization a.Existing	0	-
	b.None	0	-
6.	Income a. Above UMP	2	20
	b. Below UMP	8	80
7.	Dependent a. 1-2 people	3	30
	b. 3-4 people	5	50
	c. 5-6 people	2	20
	d. 7-8 people	0	-

The socioeconomic characteristics of fishermen at Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province, vary from person to person. In the age category, the most dominant is the 46-65-year-old fishermen, at 80%, while the early adult category, aged 21-35 years, is the least, at 10%. Furthermore, for the education level category, the majority are junior high school graduates (40%), fishermen with a high school education (30%), and fishermen with an education level not graduating from elementary school (0%).

The length of experience of fishermen as fishermen is also considered. Fishermen on Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province, are predominantly experienced, with 60% having more than 15 years of experience. Fishermen with 0-15 years of experience are the same, with a presentation of 20%. Furthermore, in the category of organization and socialization at Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province, there is none.

Then, for the characteristics of fishermen in the income section, the dominant group earns above UMP (Minimum Wage), with 20% and 80% earning below UMP. Finally, for the dependents of fishermen, the largest Number is 3-4 people, as much as 50%. Brief data on the socioeconomic characteristics of fishermen at Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province, are shown in Figure 1.

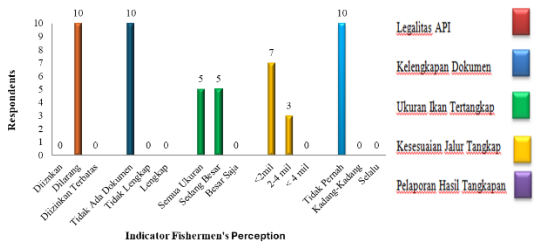

Figure 1. Fishermen's compliance with sustainable capture fisheries management

The assessment of compliance with sustainable capture fisheries management carried out among fishermen in Pasir Putih

Beach, Bungus Selatan Village, West Sumatra Province yielded low results. The level of fishermen's compliance is low because fishermen use prohibited fishing gear, do not have documents, the fishing gear used c a t c h e s all sizes of fish, never reports catches to local agencies, and catches fish outside the designated catch line. The data obtained show that the compliance of the 10 fishermen respondents varies. According to the fishing gear legality indicator, 10 fishermen use fishing gear that is not permitted by the government, namely beach seine, in accordance with PERMEN-KP Number 2 of 2015. Then, for the document completeness indicator, not all fishermen have documents to catch fish. The indicator of the size of fish caught is that as many as 5 fishermen catch fish of all sizes, and 5 fishermen catch medium-large sizes. The percentage distribution of fishermen by compliance status is shown in Figure 2.

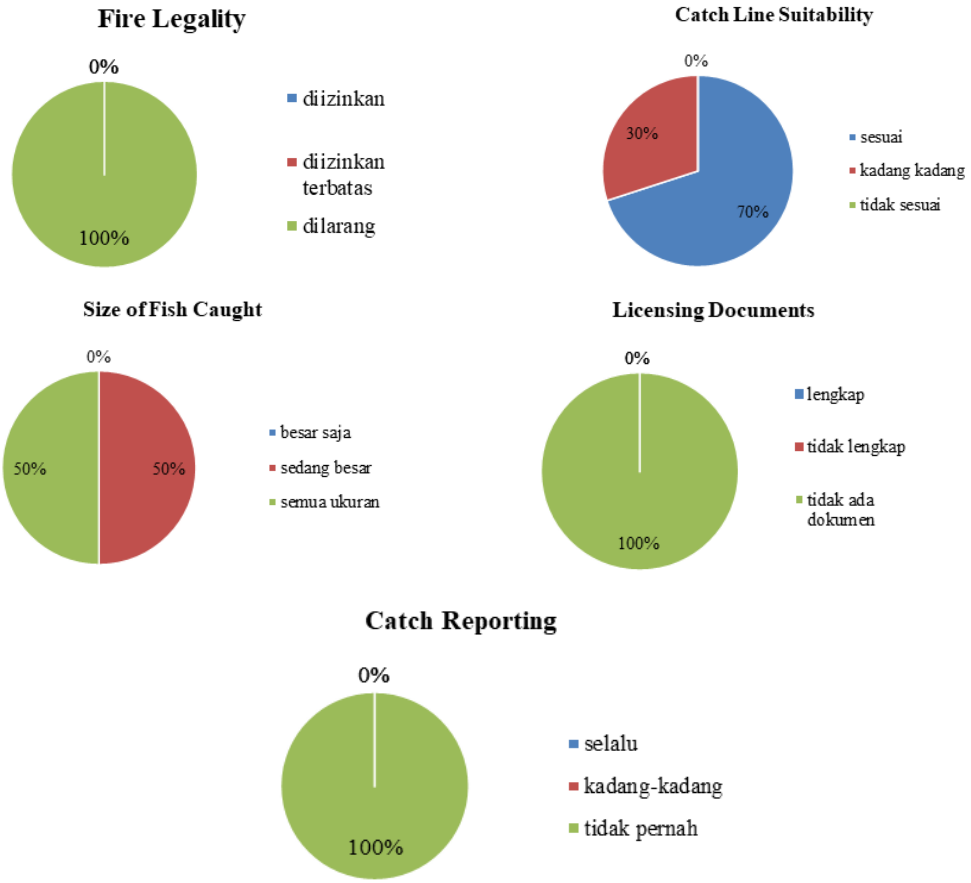

Figure 2. Fishermen's compliance with fisheries management

Fishermen's Perceptions of Environmentally Friendly Fishing Gear

Measurement of perceptions of environmentally friendly fishing gear used 10 fishermen as respondents. This assessment uses 9 indicators of environmentally friendly fishing gear. To the researcher's knowledge, this fishing gear is not environmentally friendly because all sizes of fish are caught, from the largest to the smallest.

All fishermen rated the nine criteria question as very good. In the opinion of local fishermen, this beach seine gear is environmentally friendly, does not damage the bottom of the water, and has been passed down from their ancestors, so they still operate it today. A total of 6 fishermen considered that the fishing gear used had good selectivity, 8 fishermen considered that the fishing gear used did not damage the habitat, 8 fishermen considered that the fish caught were of high quality, all fishermen considered that the fishing gear used did not endanger themselves or fishermen, 7 out of 10 fishermen considered that the fishing gear used did not endanger consumers, 2 fishers rated the by catch as poor, 8 fisher rated it a s excellent for fishing gear that has low biodiversity impact, 7 fishers rated it as excellent for fishing gear that does not catch

protected fish and 9 fishers rated it as excellent that the fishing gear used is socially acceptable.

From this result, it can be concluded that fishermen already understand environmentally friendly fishing gear. The distribution of fishermen's perceptions of environmentally friendly fishing gear is shown in Figure 3.

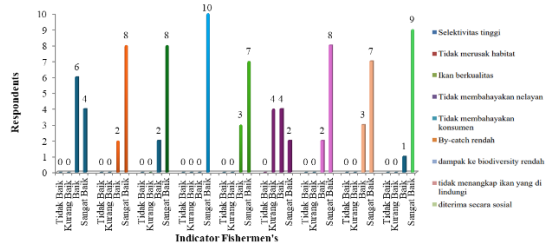

Figure 3. Fishermen's perceptions of environmentally friendly fishing gear

Fishermen's Perception of the Existence of Fish Resources

The results of the comparative analysis of fishermen's perceptions of the presence of fish resources are shown in Figure 4.

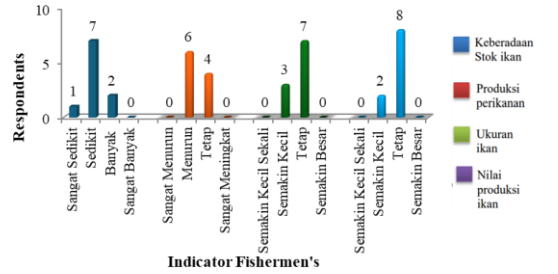

Figure 4. Fishermen's perception of the existence of fish resources

The assessment of fishermen's perceptions of the existence of fish resources yielded quite good results. This assessment was answered by 10 fishermen using different fishing gear questionnaires, and different results were obtained. The questions were: the Number of fish stocks in the waters, the Number of catches, the size of the fish caught, and the selling value of the fish. 7 fishermen who assessed the existence of fish stocks in the waters were few; 6 fishermen who assessed fisheries production increased; 7 fishermen who assessed the size of fish obtained remained; and 8 fishermen who assessed the value of fish production remained. This means that the catch is decreasing, which is certainly in line with the previous question about fish stocks. For the size of fish caught, fishermen assessed that it did not change much; namely, the size caught remained, as did the dominant production value, which they assessed as decreasing in category 2 and fixed in category 3.

The results of the correlation analysis show that the relationships between fishermen's perceptions of environmentally friendly fishing gear criteria, the existence of fishery resources, and compliance with applicable regulations are examined using Spearman's rank correlation analysis. There is a significant correlation between fishermen's perceptions of environmentally friendly criteria for fishing gear and their compliance with applicable regulations. The correlation coefficient of 0.4061 indicates that the strength of the correlation falls into the "weak" category. A positive correlation coefficient indicates that the relationship between the two variables is unidirectional.

The correlation between fishermen's perception of the availability of fisheries resources and compliance with applicable regulations is -0.3091. The strength of the correlation falls into the "weak" negative category. The negative correlation coefficient indicates that the higher the respondents' assessments of the presence of fisheries resources, the lower the fishermen's compliance with applicable regulations.

The relationship (correlation) indicates that a person's perception does not fully influence their actions. The action in question in this case is considered compliant with the rules. Fishermen's perception of environmentally friendly fishing gear criteria with compliance. Fishermen who assess better criteria for environmentally friendly fishing gear also show slightly better compliance. Therefore, efforts are needed to increase the selectivity of fishing gear, especially for those currently not selective. Coaching for fishers is needed to help them understand the importance of operating fishing gear in accordance with environmentally friendly criteria.

Perception of the existence of fisheries resources is negatively correlated with compliance. Therefore, the government needs to provide information and counseling on the current condition of fisheries resources. The information provided is expected to be accurate in accordance with the actual conditions. If indeed fisheries resources have decreased and fishermen fully understand this, it will be more in line with regulations in sustainable fisheries management. Different perceptions among fishermen are usually an obstacle to fisheries

management because government programs are still understood differently by them. Therefore, it is necessary to make effective coaching and counseling efforts through socialization and technical training to improve fishermen's skills and increase their understanding of the importance of preserving fisheries resources.

4. Conclusion

Based on data processing and analysis carried out related to the level of compliance and perceptions of beach trawl fishermen on Pasir Putih Beach, Padang City, West Sumatra Province towards Sustainable Capture Fisheries, it shows that: Fishermen on Pasir Putih Beach, Bungus Selatan Village, West Sumatra Province, the majority of fishermen aged 45-65 years with low education, namely elementary school and high school education. The experience of being a fisherman is more than 15 years. Then, in the income section, the dominant fishermen earn less than UMP, with 8 people. Finally, the most frequent Number of dependents is 3-4 people, followed by 5 people, with a percentage of 50%. Fishermen's compliance with sustainable fisheries management remains low, as evidenced by the presence of fishermen using prohibited gear, violating fishing lines, and lacking documents due to a lack of awareness of the importance of complying with applicable regulations.

References

Cundaningrum, L., Rengi, P., & Zain, J. (2022). Level of Compliance and Fishermen's Perceptions on Sustainable Fishery at UPT Fish Port, Dumai City, Riau Province. *Journal of Coastal and Ocean Sciences,* 3(3):: 215-223

Darmawanto, A. T., Hatta, D., & Rahmawati, M. (2020). Analisis Faktor-Faktor yang Mempengaruhi Pendapatan Nelayan Perikanan Tangkap di Kecamatan Tarakan Tengah. *Jurnal Borneo Humaniora*, *3*(1): 09-17.

Direktorat Jendral Perikanan Tangkap. (2015). Statistik Perikanan Tangkap di Laut Menurut Wilayah Pengelolaan Perikanan Negara Republik Indonesia (WPP-NRI). Jakarta (ID).

FAO. (1995). *CCRF (Code of Conduct for Responsible Fisheries)*. Rome (IT).

Kuantitatif, P.P. (2016). *Metode Penelitian Kuantitatif Kualitatif dan R&D.* Alfabeta, Bandung.

Mussadun, M., Fahrudin, A., Kusumastanto, T., & Kamal, M.M. (2016). Analisis Persepsi Nelayan dalam Pengelolaan Sumberdaya Perikanan Berkelanjutan di Taman Nasional Karimunjawa. *Tataloka*, 13(2): 70-81.

Nababan, B.O., Sari, Y.D., & Hermawan, M. (2017). Analisis keberlanjutan Perikanan Tangkap Skala Kecil di Kabupaten Tegal Jawa Tengah (Teknik Pendekatan Rapfish). *Jurnal Sosial Ekonomi Kelautan dan Perikanan*, 2(2): 137-158.

Suherman, S., Brown, A., & Usman, U. *Analysis Composition Weight and Type of Catches of Beach Seine Which Operated at Morning and Afternoon in Bungus Selatan Village Bungus Teluk Kabung District Padang City Province of West Sumatera*. Universitas Riau.

Syahputra, A. (2009*). Studi Konstruksi Alat Penangkapan Ikan di Kelurahan Teluk Meranti Kecamatan Teluk Meranti Kabupaten Pelalawan Provinsi Riau.* Fakultas Perikanan dan Ilmu Kelautan Universitas Riau. Pekanbaru. 90pp.

Tzanatos, E., Dimitriou, E., Papaharisis, L., Roussi, A., Somarakis, S., & Koutsikopoulos, C. (2006). Principal Socioeconomic Characteristics of the Greek Small-Scale Coastal Fishermen. *Ocean & Coastal Management*, 49(7-8): 511-527.

Usman, M., & Rifqi, N. (2018). The Composition and the Maturity Level of the Beach Seine's Catches Based on the Construction's Aspect at the Pasir Putih Beach, District of South Bungus, Teluk Kabung, Padang, West Sumatra. *JOM FPK UNRI; 1–11*.