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Performance analysis of catch fisheries in Sabang Waters

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ABSTRACT

Sabang waters is one of the centers of capture fisheries production at the tip of the Sumatera Island which has a large potential of fish resources. However, information related to the performance of capture fisheries including fish production, fishing gear, fishing fleet, number of fishermen and fishing areas is still limited. This study aims to analyse and describe information related to capture fisheries performances in the waters of Sabang. Performance data were analysed descriptive quantitatively and obtained by survey method. The results showed that the trend of capture fisheries production tends to increase by 15% annually and catches are dominated by large pelagic fish, namely tuna (*Thunnus* sp). The type of fishery business is dominated by fishermen who operate vessels measuring 0 - 5 GT (57.9%) with fishing areas between the coast to 2 nautical miles. Fishermen in Sabang Waters are categorized as small businesses. because use small boats and using handlines as fishing gear that aim to meet daily needs, not for business scale.

Introduction

Sabang City located is on the top of Sumatra Island, which has potential in the marine and fisheries sector also one of the main tourist destinations in Aceh Province. The marine and fisheries sector hands an important role in the economic structure of Sabang city. Furthermore, the fisheries sector was also one of the largest sectors that contribute to Gross Domestic Product in Sabang city in addition to the agricultural and forestry sectors (Central Statistics Agency, BPS of Sabang City, 2016). The workforces in The Sabang city around 25.5% works as fishermen and cultivators. Thus, the fisheries sector in Sabang city has good prospects in the future, both for improving the welfare and standard of living in the community as well as regional income so that fisheries management in Sabang city should be implemented properly. It is also supported by Zulbainarni (2012), the utilization and good management of fisheries resources can be a great benefit to local communities in Indonesia and can promote economic growth and the investment rate in fisheries.

The sustainability of fish resources can be maintained by good fisheries management (Rahmah at al., 2021). Fisheries management in practice must observe the dynamics in fishing activity, such as adjusting fishing boat number, fishing areas, fishing gears number, and technology used by fishermen. The efforts to utilize fish resources always dynamically changing, so that it affects the sustainability of the capture fisheries system (Limbong, 2021). On this basis, the first step is to understand the existence of the diversity of capture fisheries. It hoped that fisheries management should be carried out with available accurate and adequate data and information so that the output produced is excellent and on target. On the other hand,

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information related to capture fisheries performance can be used as a rationale for stakeholders in the marine and fisheries sector to determine development achievements, both at the regional and national levels (Abdullah *et al*., 2011).

The data and information needed for the application of management can be through by analyzing the performance of capture fisheries similar to the size and number of fishing boat, the number of fishermen, the type of fishing gear, and the area of fishing grounds. So far, data and information related to capture fisheries and its management in Sabang City are still supported out spatially (Kurniawan, 2008; Yulianto *et al*., 2011; Pakusadewo *et al*., 2017; Carnegie *et al*., 2018; Kurniasari *et al*., 2018; Shodikin *et al*., 2019; 'Akla *et al*., 2021; Chaliluddin *et al*., 2021). with the performance of capture fisheries in Sabang City, it is very required to do. This study aims to identify and analyze the performance of capture fisheries in Sabang City. The capture fisheries show includes the development of fish catch production, the number of fishermen, the number and size of the fishing fleet, the type and number of fishing gear, and the fishing area. The benefits of this research are to be a scientific database in the development of capture fisheries, especially in Sabang City.

Materials and Methods

Location and time of research

This research was conducted from May to June 2021 in Sabang City, Aceh Province. Location of study is described in Figure 1.

Data collection methods

Efforts to collect data in this research were conducted by survey method. The descriptive survey method is an investigation conducted to obtain facts from existing issues and seek factual information (Masyhuri and Zainuddin, 2008). The data collected includes the development of the number of fishermen, type and sizes of fishing boat, types of fishing gear, annual production of capture fisheries obtained from the Marine and Fisheries Service of Sabang City. All of the data obtained were analyzed descriptively quantitatively, meaning that the quantity data will interpret with easy-to-understand descriptions. Then the results are visualized in the form of images, tables, and graphs. Furthermore, Data on fishing areas were obtained through direct observations in the field and interviews with fishery actors as many as 20 people. The number of samples selected based on the population of fishermen in the sabang city by 25%.

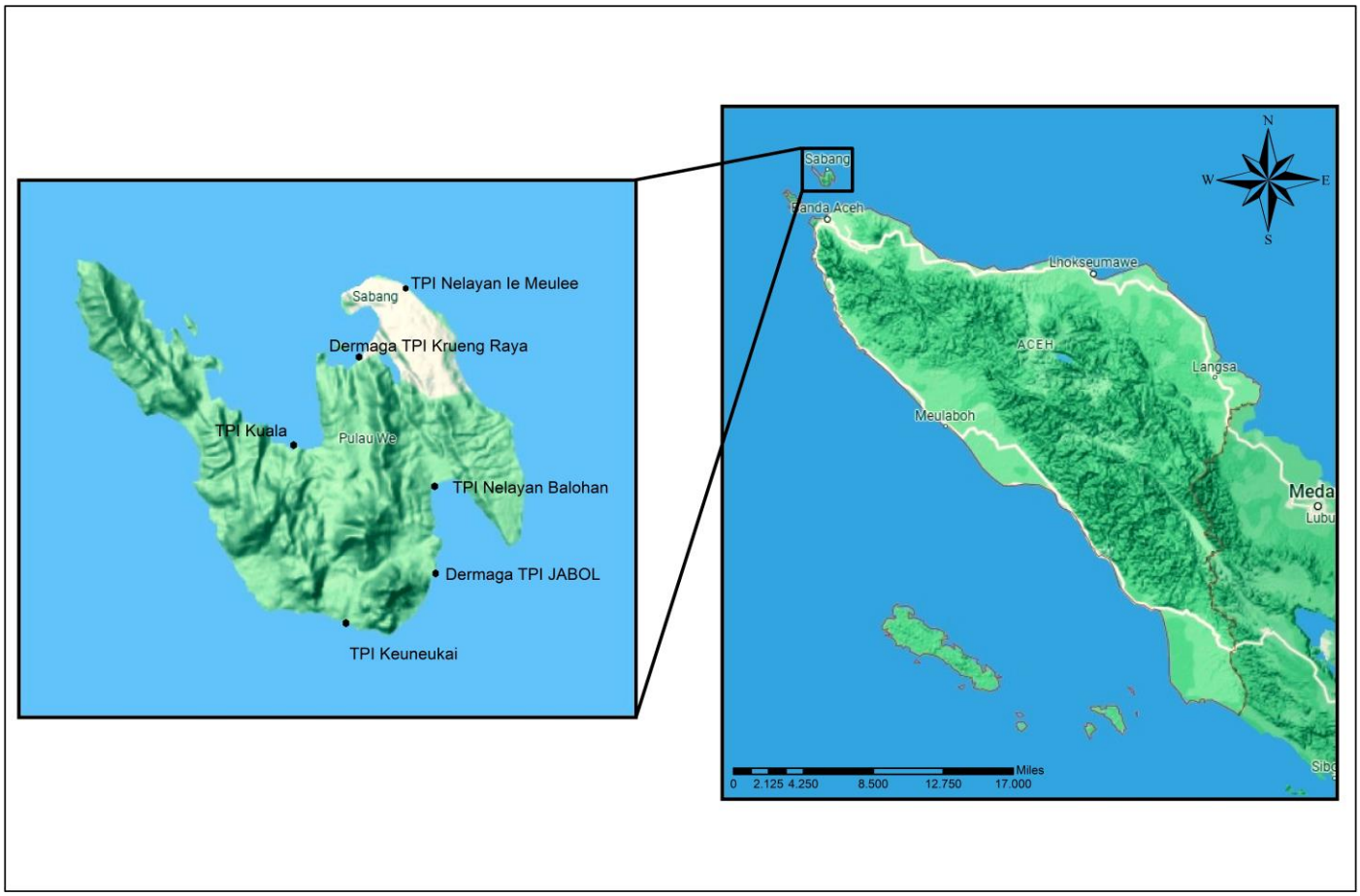

Figure 1. Study Location in Sabang city (Sources: Google Map, 2021).

Tabel 1. Distribution of fishing gear operating in Sabang waters in 2016-2020

No	Types of fishing gear	Year (unit)				
		2016	2017	2018	2019	2020
1	Beach seine	4	4	7	7	7
2	Purse seine	19	11	8	8	8
3	Drift gillnet	9	1	5	-	5
4	Set gillnet	12	12	25	25	25
5	Longline	13	11	45	46	45
7	Troll line	176	221	196	45	214
8	Hand line	440	403	686	196	686
9	Speargun	-	-	133	-	133
10	Muroami	-	-	-	846	-
	Total	673	663	1105	1153	1123

Sources: DKP, 2021.

Table 2. Development of fishing boats in Sabang waters in 2016-2020

No	Types of fishing boat	Year (unit)				
		2016	2017	2018	2019	2020
1	0 - 5 GT	514	438	337	370	385
2	5 - 10 GT	1	10	37	58	49
3	10 - 20 GT	11	6	4	19	6
4	20 - 30 GT	3	1	1	9	3
5	Outboard motors	78	99	156	156	158
6	Boat without motors	66	128	54	64	64
	Total	673	682	589	676	665

Sources: DKP, 2021.

Data analysis

The data of catch fisheries performances were analyzed descriptively and presented in form of picture and narrative.

Results

Capture fisheries production

The capture fisheries production in Sabang waters is dominated by Tuna (Thunnus sp) as much as 1949.5 tons, Skipjack (*Katsuwonus pelamis*) 1025.6 tons, tuna (*Auxis thazard)* 709.3 tons, and followed by Kuwe fish (*Caranx* sp) as much as 338.1 tons, Octopus (*Octuvis Vulgaris*) 253 tons, Grouper (*Epinephelus* sp) 246 tons, Marlin (*Istiophoridae*) 178.1 tons, Bloated (*Rastrelliger* sp) 142.4 tons, kite (*Decapterus* sp) 157.5 tons and other fish (DKP, 2021). The development of capture fisheries production in the Sabang waters for the period 2011-2020 has fluctuated and tends to increase. Fish production from 2011 to 2112 tons increased by 55% to 3268 tons in 2012. Then decreased in 2013 by 3% to 3159 tons and increased again until 2016. Furthermore, in 2016 to 2018 there was a slight decrease in fish production while 2019 increased by 2% to 4322 tons and in 2020 experienced a significant increase of 49% to 6452 tons. The development of capture fisheries production from 2011 to 2020 are presented in figures 2.

Fishing gear

The types of fishing gear used by fishermen in Sabang waters vary widely, namely beach trawls, purse seine, drift gillnets, set gillnets, longlines, trolling lines, handlines, arrows, and Muroami. In 2020, The Fishing gears are numbered 1123 units and dominated by handlines of 686 units. The Fishing gear number in 2019 was around 1153 units. When compared to the data in 2020, there was a decrease of about 30 units to 1123 units. The development of the number of fishing gear based in Sabang City has fluctuated. The number of fishing gear from 2016 to 2017 tends to decrease except for beach trawls and set gillnets, which have a constant number of units, and trolling lines which have increased. In 2018, the fishing gear increase except for purse seine and trolling lines which decreased from the previous year. Furthermore, the number of fishing gear from 2019 to 2020 tends to remain the same and does not change except for trolling lines, handline, arrow, and Muroami. Distribution of fishing gear in Sabang waters are presented in the following Table 1.

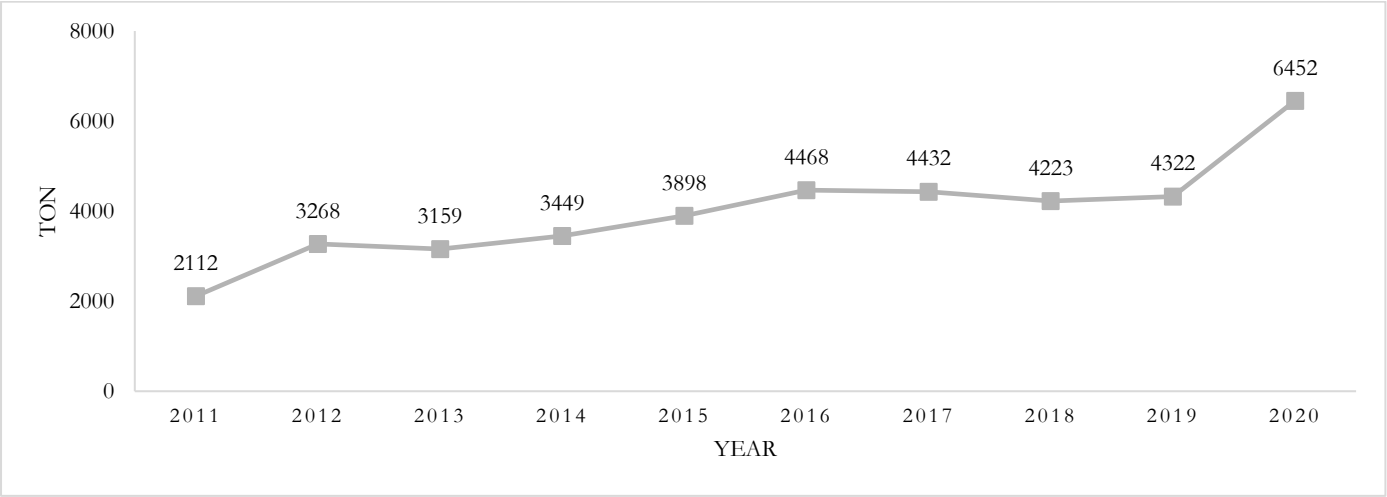

Figure 2. The development of capture fisheries production in Sabang waters from 2011 to 2020. (Sources: DKP, 2021).

Fishing Boats

The number of fishing boat scattered in Sabang waters in 2020 is around 665 boats. The size of fishing boat dominated by boats measuring 0-5 GT, namely 385 units (57.9%), followed by boat with outboard motors as many as 158 units (23.8%), boats without motors by 64 units (9.6%), 49 units of 5-10 GT ships (7.4%), ships of 10-20 GT is 6 units (0.9%) and 3 units ships of 20-30 GT (0.5%). A high percentage of 0-5 GT boat number is becaused by fishermen in Sabang waters dominantly using hand line and thus no longer requiring a large boat. Based on these data, fishing activities in Sabang waters are classified into small-scale (traditional) capture fisheries in 2016-2020 (Table 2).

Fisherman

Fishermen are classified into 3 categories, namely native fisher, main subsistence fisher, and additional subsistence fishers. The number of fishermen accumulated in Sabang waters in 2020 is 1267 people. The trend of fishermen in 2016-2020 shows that the number of fishermen tends to decrease. One factor is the fluctuation of fishermen number due to the Covid-19 pandemic. So that, fishermen had to looking for an alternative job. Development of fisheries number in Sabang waters shown in Figure 3.

Fishing ground

Fishing areas are locations targeted for fishing activities (Rizki et al., 2018). Fishing ground is determined based on the experience of previous fishermen or information from fellow fishermen who have carried out fishing operations in the area. Information related to the distribution of fishing grounds needs to be explored so that fishing can run optimally (Selvika et al., 2018). Fishing activities based in Sabang City are daily or one-day fishing so that the fishing area is not too far from the fishing base. Small fishermen (<5 GT) carried out fishing activities in the waters about 2 miles from the coast. The fishermen use Handline. Meanwhile, boats above 5 GT usually make arrests in waters farther up to Nasi Island and Aceh Island.

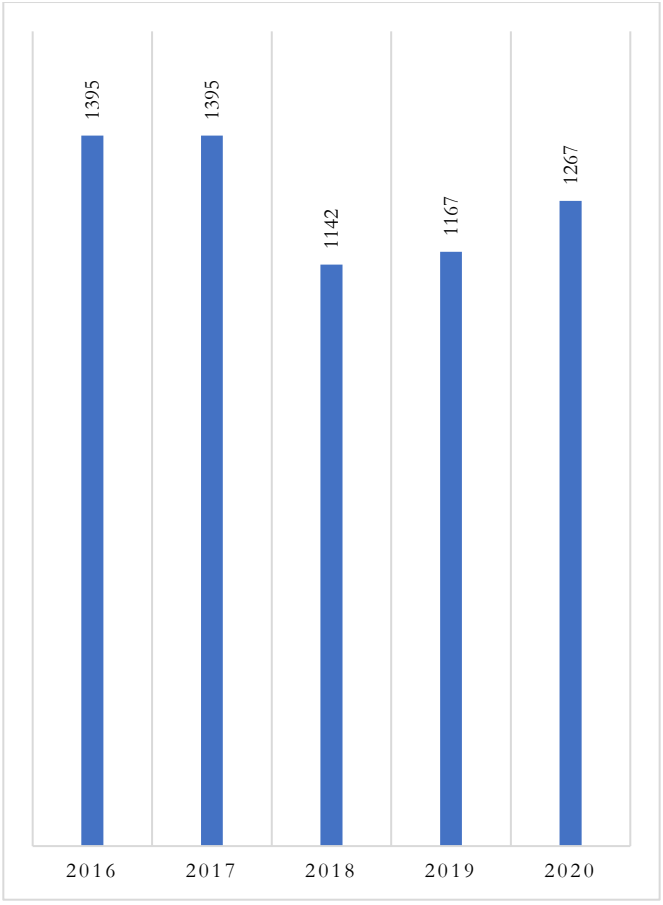

Figure 3. Development of fishermen number period 2016-2020 in Sabang waters (Sources: DKP, 2020).

Discussion

The capture fisheries sector in Sabang waters is very interesting to be discussed deeply. This is supported by the large number of people who work as fishermen. However, there are still many fishermen who use small boats and fishermen catch in Sabang waters only looking for their daily needs so that they can be categorized into small-scale fishermen. The performance of capture fisheries in the waters of Sabang has fluctuated, seen from the development of fishermen number, fishing fleets, fishing grounds and the consistency of the use of fishing gear.

The information about catch production can provide knowledge to fishermen about the ability level of fishing gear to obtain catches (Imron et al., 2021). Based on study result, capture fish production has fluctuated and tends to increase. It can be caused by several factors such as the number of fishing boat and fishing trips made by fishermen. Sholihin et al., (2011), stated that the increase in catch could be due to a lack of fishing trips. The lack of fishing trips can be caused by a lack of fishing boat, otherwise if the fishing boat increases, the fishing trips also increase. It is supported by Salmarika et al., (2018), increasing fishing fleets encourage fishermen to increase fishing intensity and expand fishing areas. Changing of the catch can be caused by the fishing season, fishing pressure and physical changes of aquatic habitat (Kasim et al. 2017).

Based on the results, fishing gear and fishing boat in Sabang City tend to decrease, so that it also affects the fishing trip. The decrease in the number of fishing gear and fishing fleets in Sabang waters was due to several fishing gears that could no longer operated or damaged. The dominant fishing fleet used by fishermen in Sabang waters is by boats measuring 0-5 GT. The reason is the lack of capital owned by fishermen, resulting in the ability to invest in larger vessels. The limited number of large vessels has an effect on the area of fishing grounds reached by fishermen. The bigger of fleet size then it would make the longer the fishing area can be. On the other hand, if the fleet is small, the fishing area will be closer to the fishing base or not far from the coast. In general, the time required for fishermen from the fishing base to the fishing ground is around 1-3 hours. The lack of time that fishermen have, often makes the catches obtained are not optimal, as a result the income earned by fishermen is also not less than optimal.

The income of fishermen who do not meet their daily needs can trigger fishermen to look for other jobs, so that the decline in the number of fishermen cannot be avoided, as in Sabang waters. Decreasing of fishermen number was caused by fishermen in the category of additional odd jobs shifting their work to other workers such as gardening, construction workers and so on. Malcolm et al., (2021), stated that fishermen in rural areas are more likely to have a second source of income because fishing does not provide sufficient income.

The condition of capture fisheries in Sabang waters currently only utilizes a small fishing area or close to the coast so that the production of the catch is still less than optimal. The reason is the limitations of fishing gear, fishermen and the ability of the fleet to reach further areas. Although, fisheries management ideally is not easy thing to do because the variety of fishing gear and fish resource character (Suman et al. 2016). But, the availability of data is required to minimize errors in the analysis of the chosen police (Hartati et al, 2021). Based on information about existing condition of capture fisheries in Sabang waters, so that the plan of well fisheries management as soon as realizing.

Conclusion

The performance of capture fisheries in the waters of Sabang has well but fluctuated, seen from the development of fishermen number, fishing fleets, fishing grounds and the consistency of the use of fishing gear. The production of capture fisheries in Sabang city is dominanted by large pelagic such as Tuna, Skipjack and Bullet Tuna. The total of fishing gears are 1123 units, then the dominant fishing gear is handlines 868 units. The total number of fishing boat is 665 units and is dominanted by boat measuring 0-5 GT, totaling 385 units. Fishermen carry out catching activities usually around the coast or as far as 2 nautical miles from fishing base to Breuh Island and Aceh Island.

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