

Productivity of The Gillnetter That Landed at The Karangsong Fish Landing Base, Indramayu

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ABSTRACT

The Karangsong Fish Landing Base (PPI Karangsong) is one of the largest and most active ports in the Indramayu Regency. Most fishermen in PPI Karangsong use gillnet fishing units with various GT vessel sizes that vary in the use of marine resources. The size of the ship's GT can affect the yield of fish production. This research aims to determine the productivity of gillnetter at PPI Karangsong, Indramayu Regency. This research was carried out in August 2021, at PPI Karangsong, Indramayu Regency. Sampling was carried out with research objects gillnet ships which have intervals between <5 GT, 5-10 GT, > 10-20 GT, > 20-30 GT, and > 30 GT. The data taken is in the form of gillnet ship production in one trip. The research method used is a survey. The data were analyzed by comparative description by comparing the productivity of gillnet vessels in one month. Of the five intervals, the GT of gillnet vessels with the highest productivity is in the 20-30 GT interval of 0.556 - 0.584 tons/trip/GT. Meanwhile, the GT of gillnet ships with the lowest productivity is in the 5-10 GT interval of 0.006 - 0.007 tons/trip/GT.

Keyword : *Gillnet, Gross Tonnage, Karangsong, Production, Productivity.*

1. INTRODUCTION

Indramayu Regency is an area with the largest contribution level to fisheries production among other areas in the coastal area of the northern part of West Java Province. One of the fishing ports in Indramayu is PPI Karangsong with fish auction activities and the busiest fishing port activities in Indramayu Regency. Based on fish production data 2016 issued by the Department of Marine Affairs and Fisheries of Indramayu in 2017, Karangsong Fish Landing Base has the highest fish production compared to other fishing ports in Indramayu. Total production at PPI Karangsong reached 15622,736 tons with a production value of Rp. 336,261,186,000.00 which are mostly dominated by fish such as ponyfishes, catfish, black pomfret, scad, herrings, sardinella, red snapper, mackerel, mackerel, tuna, and squid [1]. In addition, PPI Karangsong is famous for its large fleet of vessels and the range of fishing operations up to the Kalimantan area, and small fleets that reach around the North Coast of Java or the Indramayu area [2].

Fishing vessels are part of fishing units that have an important role to support the success of fishing operations, both as a means of transportation from the fishing base to the fishing ground and vice versa as well as as a tool to accommodate and store the caught fish [3][1]. Most fishermen in PPI Karangsong use gillnet fishing units in the utilization of marine resources. Gillnet vessels that are widely used at PPI Indramayu range from 3 GT to 80 GT and are dominated by ships with a size of 10 GT. Fishing activities in Indramayu Regency are dominated by gillnet fishing gear as much as 71.4% of the total fishing units in PPI Karangsong [5]. In general, what is called a gillnet is a rectangular net, having the same mesh size throughout the net, the width is shorter than the length, in other words, the number of mesh sizes in the direction of the length of the net [2]. A gillnet is one type of fishing gear that is widely used by fishermen, ranging from circular gillnets, basic gillnets, and surface gillnets which are operated at night [7].

Fishing activities using gill net vessels have an impact on the catches of local fishermen which are closely related to productivity. The productivity of gill net vessels is an important review to determine the ability of gill net vessels located at the Karangsong Fish Landing Base, Indramayu in producing catches. The productivity of fishing gear is the ratio of the catch obtained to the resources used [8].

2. RESEARCH METHODS

The research was conducted in August 2021 at the Karangsong Fish Landing Base (PPI), Indramayu Regency, West Java. The research location has fishery potential originating from the northern part of the Java Sea. The research object used is a gillnet ship operating at PPI Karangsong. The research object has an interval between <5 GT, 5-10 GT, >10-20 GT, >20-30 GT, and >30 GT. The research method uses a survey method using primary data. Primary data is information obtained from primary sources, namely information from sources. Primary data was obtained by interviewing the crew to obtain information about the size of the ship's GT and data on the catch of gillnet vessels in July 2021.

The data that has been obtained were analyzed descriptively. The form of description is to analyze the data by describing or describing the productivity of each ship's catch in one month. The calculation of the productivity of fishing vessels is determined per Gross Tonnage (GT) per year based on the calculation of the number of fish caught per vessel for a year divided by the GT of the vessel concerned based on the Decree of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 86/KEPMEN-KP/2016. However, the formula was modified by calculating one trip, so the formula used is as follows:

$$\text{Productivity in GT} = \frac{\text{average production in 1 trip (ton)}}{\text{average fishing vessel size (GT)}}$$

3. RESULTS AND DISCUSSION

3.1. Gillnet at PPI Karangsong

A gillnet is a fishing gear that has a rectangular construction consisting of an upper ris line, a lower ris line, a net body, buoys, ballast, sign buoys. Gillnet is a fishing gear that catches fish by being entangled or spun by the body of the net.

The ship construction at PPI Karangsong is designed in such a way and has been adapted to the needs of the operation to find fish in the sea so that fishermen can get maximum catches. Based on data from fishing units from the Indramayu Marine and Fisheries Service in 2010, the majority of about 80% is gillnet fishing units of the total fishing units in PPI Karangsong [3]. Based on the results of the study, it was found that the gillnet vessels at PPI Karangsong had ship sizes ranging from 3 - 80 GT. The size of the ship's GT can affect the duration for 1 set, the number of settings per trip, and the fishing area. The larger the size of the ship, the longer the duration for 1 setting, the more settings per trip, and the longer the fishing area that needs to be covered [8]. The results showed that a 6 GT gillnet ship required 3 hours of setting time and 6 times of tool setting per trip, while a 30 GT gillnet ship required 6 hours of setting time and 45 tool settings per trip.

The gillnets in Indramayu Regency are known as "millennium nets". Millennium gillnet is a fishing gear modified from gill nets commonly used in PPI Karangsong. Millennium nets are classified as rectangular drift gill nets. This net material is made of monofilament or multifilament which is shaped into a rectangle, at the top it is equipped with several floats and at the bottom, it is equipped with several sinkers. The millennium gillnet used by Karangsong fishermen has a net body made of polyamide monofilament. Monofilament netting material is a type of net that consists of only one strand of yarn, with the yarn number symbolized in diameter [4]. The buoy serves to lift the top rope so that the body of the net can stand upright (vertical) in the water. The buoys used are usually made of styrofoam, polyvinyl chloride, plastic, rubber, or other objects that have buoyancy [5]. The ballast serves to sink the net body into the water column. The millennium gillnet used by Karangsong fishermen has a transparent white

thread with the intention that the net installed in the water will emit light to attract the attention of the fish. Millennium gillnet nets located at PPI Karangsang use an average of 12 ply twisted fiber.

The fishing ground for gillnet vessels with <10 GT vessels performs fishing operations in the Tegal waters, while the gillnet fleets using 29 and 30 GT vessels carry out fishing operations in the Java Sea waters. The gillnet fleet with a size of >30 GT has two fishing ground areas, namely Fishery Management Area (WPP) 711 and Fishery Management Area (WPP) 718. WPP 711 covers the waters of the Karimata Strait, Natuna Sea, and the South China Sea, while WPP 718 covers the waters of the Sea. Aru, Arafura Sea, and East Timor Sea. The distance required by the ship from the fishing base to the fishing ground (WPP 711) is 7 days, while the travel time required by the ship to the fishing ground (WPP 718) is about 15 days to reach the location. Each fishing area has an abundance of natural resources or different fish and will affect the catch.

The quantity of fish production is closely related to fishing activities carried out by fishermen. Fishing activities will be influenced by seasonal conditions. The fishing season is usually classified into three seasons, namely the peak season, the middle season, and the famine season [12]. The condition of the western season is a term for Karangsang fishermen who usually find it difficult to get fish catches at sea. This season can affect the value of fishermen's income which tends to decrease due to natural and weather factors. Climate change is expected to severely impact many tropical coastal communities [13]. Rising sea level temperatures will alter the productivity and distribution of marine ecosystems, with the potential to impact people whose livelihoods depend on fisheries [6].

Generally, fishermen who do not go to the sea because of the weather will use their time to repair fishing units such as repairing motor boats and repairing nets. The peak season for 25 GT gillnet vessels occurs from February to June. The moderate season occurs from July to November, while the low season for 25 GT gillnet vessels occurs from December to January [6].

The catches of fishermen who landed at PPI Karangsang consisted of large fish and small fish, among these types of fish there were export commodities. Types of fish that are generally caught for consumption, both in the form of fresh and processed fish, are pelagic fish. According to information data from the Marine Fisheries Service of Indramayu Regency in 2017, the continuity of fishermen's catches at TPI Karangsang every month is quite stable [12]. Marketing of the products in the form of fresh fish and processed fish are marketed to several regions, consisting of 20% distributed to the Indramayu area and its surroundings, and 80% distributed outside the Indramayu area, including Jakarta, Bandung, Subang, Cirebon, Kuningan, and Majalengka.

The catches of the gillnet fleet are squid, dim, squid, and are dominated by cob. The catches of fishermen who landed at PPI Karangsang included black pomfret, tuna, mackerel, giant catfish, shark, stingray, giant featherback, and red snapper [12]. The composition of the fish caught was dominated by tuna (*Euthynnus affinis*) as much as 54% or 1,177 tons of the total catch of 2,166 tons.

3.2. Gillnetter Productivity at PPI Karangsang

Productivity per GT in this study was carried out by calculating the average catch obtained by gillnet vessels per fishing effort (fishing trip) and the size of the vessel used. Fishing effort is the entire capability that is deployed by various types of fishing units that are incorporated as a fishing fleet to obtain catches [7]. Based on the production results obtained, the largest amount of production is found on ships with 97 GT with a total production of 65 tons in one trip. The lowest production results are on ships with a size of 5 GT, which is 0.02 tons. The calculation of ship productivity based on GT can be seen in Table 1.

Table 1. Gillnetter Productivity Based on GT

No.	Size category	Production (ton/trip)	GT Sign			GT Calculation		
			Ship size (GT)	Productivity (ton/trip/GT)	Avg.	Ship size (GT)	Productivity (ton/trip/GT)	Avg.
		(a)	(b)	(a/b)		(b)	(a/b)	
1	< 5 GT	0,05	3	0,017	0,013	3	0,017	0,013
2		0,03	3	0,008		3	0,008	
3		0,04	3	0,013		3	0,013	
4	5 - 10 GT	0,05	5	0,010	0,007	5	0,010	0,006
5		0,03	5	0,006		6	0,005	
6		0,02	5	0,004		6	0,003	
7	>10-20 GT	4,00	12	0,333	0,359	9	0,444	0,446
8		2,00	17	0,118		14	0,143	
9		7,50	12	0,625		10	0,750	
10	>20-30 GT	22,00	28	0,786	0,584	30	0,733	0,556
11		10,00	29	0,345		30	0,333	
12		18,00	29	0,625		30	0,600	
13	> 30 GT	65,00	80	0,813	0,518	97	0,670	0,412
14		20,00	40	0,500		70	0,286	
15		12,00	50	0,240		43	0,279	
Rata-rata		10,71	21,40	0,296	0,296	23,93	0,29	0,286

When viewed from the size of the ship (GT) according to the string sign, the productivity of the ship is obtained sequentially from the highest to the lowest, namely ship No. 13 with a size of 80 GT. The productivity value is 0.813 tons/trip/GT, then vessel number 10 is 28 GT with a productivity value of 0.786 tons/trip/GT and ships no. 9 and 12 are 12 and 29 GT with a productivity value of 0.65 tons/trip/GT. . Meanwhile, when viewed from the ship size (GT) calculation results, the productivity of the ship is obtained sequentially from the highest to the lowest, namely ship No. 9 measuring 10 GT with a productivity value of 0.750 tons/trip/GT, then ship No. 10 measuring 30 GT with a value of productivity of 0.733 tons/trip/GT and ship No. 13 measuring 97 GT with a productivity value of 0.67 tons/trip/GT. Overall, the lowest productivity value is found in ship No. 5 with a size of 5 GT. This is because the size of the ship's GT can be used as a benchmark in determining catch productivity [17].

The productivity value per GT size interval according to the strings sequentially from the highest, we get ships measuring >20-30 GT with a productivity value of 0.584 tons/trip/GT, ships measuring >30 GT with an average value of 0.518 tons/trip/year and ships measuring >10-20 GT with an average value of 0.359 tons/trip/year. Based on the calculated ship size, the productivity is obtained from the highest sequentially, namely, ships measuring >20-30 GT with an average value of 0.556 tons/trip/GT, then ships measuring >10-20 GT with an average value of 0.446 tons/trip/ GT and ships measuring >30 GT with an average value of 0.412 tons/trip/GT. Overall, the lowest productivity value with an average value of 0.007 tons/trip/GT is found in ships measuring 5-10 GT.

Based on the exposure of the data above, both using the GT listed on the ship and the calculated GT, it turns out that the highest productivity value is on ships with a size > 20-30 GT, namely with a value of 0.584 and 0.556 tons/trip/year. This is because the shape and size of a ship will affect the strength of the ship on the sea [8]. The larger the dimensions of the ship, the greater the ability of the ship to carry fishing aids and fishing nets, thus the wider the range of fishing ground.

Besides ship size, there are other factors that affect productivity. including the PK of the machine, the length of the net, the size of the vessel, the number of crew members, and the fishing grounds usually affect the fish catch. The length of the net affects the catch, the longer the net, the wider the range of the fishing gear so that the catch is also increasing. In addition, other factors that affect ship productivity are the skills of fishermen, natural resources, and the economy.

Gillnet productivity itself is strongly influenced by the way the gillnet operates and the fishing ground. Two ways of operating gillnets that greatly affect the acquisition of fish catches include the application of time for each setting and the number of settings/trips [8]. The fishing operation area also contributes to the acquisition of the catch. The

increase in productivity is closely related to the ability of the fishing fleet, the type of fishing gear used, the fishing area, and the components that support fishing operations [9].

4. CONCLUSIONS

Based on 5 GT intervals, the ship with the highest productivity is in the >20-30 GT interval with a productivity value of 0,556 - 0,584 ton/trip/GT and the lowest productivity is on ships with an interval >5-10 GT with a productivity value of 0,006 -0,007 tons/trip/GT.

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