



Marketing Analysis of Wedgefish (*Rhynchobatus* sp.) and Giant Guitarfish (*Glaucostegus* sp.) by Catch of Danish Seine at Tasik Agung Fishing Port

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ABSTRACT

Wedgefish and Giant Guitarfish are by-catch from the danish seine used by fishermen at PPP Tasik Agung, Rembang Regency, which has economic value. However, both types of fish are threatened with extinction in The International Union for Conservation of Nature (IUCN) due to their declining population and habitat destruction that threatens their population, so proper management is needed. One aspect of this management is the marketing aspect that can be used as input for management, because marketing involves many parties who have a big impact on achieving the goals of management, it is necessary to conduct research that aims to determine channels, margins, fisherman's share and profits. This research is descriptive quantitative, the research method was conducted by interviewing 5 traders and 32 fishermen, respondents obtained by accidental sampling method. Analysis of the data used is the analysis of marketing channels, marketing margins, fisherman's share, and profits. The results showed that there was only one marketing channel for Wedgefish and Giant Guitarfish. The marketing margin of Wedgefish is 33.75% and that of Giant Guitarfish is 34.42%. Fisherman's share of Wedgefish is 66.25% and Giant Guitarfish is 65.81%. The annual profit earned by fishermen in selling Wedgefish and Giant Guitarfish is Rp. 43,687,847, for traders of Wedgefish as much as Rp. 2,091,566,009 and Giant Guitarfish are Rp. 946,094,836.

Keywords: Giant Guitarfish, Marketing, Tasik Agung Fishing Port, Wedgefish

1. Introduction

Tasik Agung Coastal Fishing Port is the only port located in Rembang Regency where Rembang Regency is a district located on the North Coast of Java Island. Tasik Agung Fishing Port functions as a means or as a meeting point between economic activities at sea and the economy on land. Wedgefish and Giant Guitarfish are often landed in Tasik Agung Fishing Port where both groups of rays are often found in WPP 711, 712 and 713. Wedgefish (*Rhynchobatus* sp.) and Giant Guitarfish (*Glaucostegus* ssp.) lives at the bottom of the waters close to the coast so that the impacts will be easier to catch. These two groups of rays are by-catch from danish seine used by fishermen at Tasik Agung Fishing Port. These two groups of rays have economic value because their fins have a high selling value and also their meat can be consumed as smoked fish.

The International Union for Conservation of Nature (IUCN) categorizes the Wedgefish and Giant Guitarfish as an endangered fish species because their population continues to decline and habitat damage threatens their population, so proper management is needed. One aspect of management is the marketing aspect which can be used as input for management. This is because marketing involves many parties who have a big impact on achieving management targets.

The fisheries sector in Tasik Agung Fishing Port is increasing, this can be seen from the condition of the port which is always busy and active in marketing activities for fishery products such as auction activities. Marketing is a very important activity in the fisheries sector. Marketing plays an important role in supporting fisheries development, if managed by paying attention to environmentally sound management aspects. This research uses marketing as an aspect to see or describe a situation, analyze it and become a consideration for related parties in managing it. Fisheries management is carried out to maintain balance in the use of fisheries resources and also to preserve the environment of fish resources so that it is hoped that they can provide continuous benefits.

The aim of this research is to determine the marketing channels for Wedgefish and Giant Guitarfish in Tasik Agung Fishing Port, marketing margins, fisherman's share, and profits for each business person.

2. Research Method

The research method used is descriptive research method to obtain an overview of the marketing chain of Wedgefish and Giant Guitarfish in Tasik Agung Fishing Port.

2.1 Sampling Method

The sampling method used was the accidental sampling technique. The sample was determined using the criteria of respondents who had caught and marketed Wedgefish and Giant Guitarfish at Tasik Agung Fishing Port. The number of respondents was determined using the Slovin formula quoted by Teti et al. (2019), as follows:

$$n = \frac{N}{1+N(\alpha^2)} \quad (1)$$

Where:

N : population size

n : sample size

α : percentage of allowance for inaccuracy in sampling errors that can still be tolerated (0.15 or 15%)

The number of respondents determined was 31 respondents. The population was obtained based on secondary data from Tasik Agung Fishing Port and Fish Auction II Tasik Agung, that there were 101 vessels with danish seine. Then determining the respondent fish sellers who market Wedgefish and Giant Guitarfish using the snowball sampling method. Where the sample of selected fish sellers starts from fishermen who sell or auction fish and then buy them through an auction process by fish sellers. The marketing agent stops at the fish seller, this is because the next marketing agent or processor is outside the city of Rembang. The number of fish sellers obtained was 5 respondents.

2.2 Method of collecting data

The types of data used in this research include primary and secondary data. Primary data was collected using observation, interviews and documentation, and secondary data included data on the general condition of the research location, respondent population, and catches of Wedgefish and Giant Guitarfish during 2014 – 2019 using literature study techniques.

2.3 Data analysis method

The analysis approach used in this research is as follows:

a. Marketing Channel Analysis

The method used to analyze marketing channels is to identify marketing actors for Wedgefish and Giant Guitarfish in Tasik Agung Fishing Port from the level of fishermen, intermediary actors, to consumers. Then describe the channel pattern.

b. Marketing Margin Analysis

The marketing margin analysis method is carried out by determining marketing channels after which the percentage share of margin or several margins from various marketing institutions can be calculated. According to Nurasa and Valerina (2007), marketing margin is formulated mathematically as follows:

$$Mm = Pe - Pf \quad (2)$$

Where:

Mm = marketing margin at the fisherman level

Pe = price at the marketing agency level for marketing objectives of fishermen

Pf = price at the fisherman level

The margin at each level of marketing institution can be calculated by calculating the difference between the selling price and the purchasing price at each level of marketing institution, formulated as follows:

$$Mmi = Ps - Pb \quad (3)$$

Where:

Mmi = marketing margin at each level of marketing agency

Ps = selling price at each marketing agency level

Pb = purchase price at each level of marketing institution

d. Fisherman's share analysis

Fisherman's share serves to measure the size of the share received by fishermen when marketing fishery products. Fisherman's share is formulated as follows (Pangastuti et al., 2017):

$$FS = \frac{Hp}{Hk} \times 100\% \quad (4)$$

Where:

FS = Fisherman's share

Mobile phone = Price received by fishermen

Hk = Price at the final consumer level

Criteria:

>50% = Efficient

<50% = Inefficient

e. Profit

One indicator to find out if marketing is running efficiently is to look at the profits that are evenly distributed to each marketing institution. According to Septiara et al. (2012), to determine the amount of profit obtained by each marketing institution, the following formula is used:

$$\pi = TR - TC \quad (5)$$

Where:

π = profits of each marketing agency

TR = total revenue of each marketing institution

T.C = total expenditure on marketing

With the following business criteria:

Total revenue > total cost = profitable business

Total revenue = total cost = break-even business

Total revenue < total cost = detrimental business

3. Result and Discussion

Rembang Regency is an area that is part of Central Java Province. Rembang Regency is located on the coordinate line 1110 00' – 1110 30' East Longitude and 60 30' – 70 6' South Latitude. Based on BPS Rembang Regency (2019), Rembang Regency has an area of 1,035.70 km² with 14 sub-districts and 6 of them are located in coastal areas, namely Kaliori District, Rembang District, Lasem District, Sluke District, Kragan District and Sarang District. Rembang Regency directly borders East Java Province with the area directly bordering namely Sarang District. The following are the administrative area boundaries of Rembang Regency:

North : Java Sea.

East : Tuban Regency, East Java Province.

West Side : Pati Regency.

South side : Blora Regency.

Tasik Agung Fishing Port is the only coastal fishing port in Rembang Regency. Tasik Agung Fishing Port has 2 Fish Auction Places that market fish of different types and fishing gear. Fish Auction I is specifically for demersal fish using mini purse seine fishing gear, while Fish Auction II is specifically for pelagic fish using danish seine.

3.1 Marketing Aspect

A. Technical Aspects

The boats used by fishermen at Tasik Agung are boats with danish seine measuring 29 - 90 GT. This ship is operated by 10 - 18 crew members with trips ranging from 7 - 18 for one year with a trip length of between 15 to 30 days. Danish seine fishermen's fishing areas include Bawean Island to Matasiri Island, Java Sea, Bali Sea, Makassar Strait to Natuna Sea. The main catch of the danish seine operated by Rembang fishermen is demang fish (*Priacanthus tayenus*) or by the local name swanggi fish or big eye fish.

B. Economic Aspects of Fishermen

Producers in the marketing aspect of Wedgefish and Giant Guitarfish are fishermen who produce products in the form of Wedgefish and Giant Guitarfish. The fishermen who land fish at Fish Auction II Tasik Agung are fishermen who use danish seine. Wedgefish and Giant Guitarfish or by the local name nunan caught by fishermen are by-catch fish. The profit sharing system implemented by danish seine fishermen and skippers at Fish Auction II Tasik Agung is in a 50:50 ratio of the profits obtained. Details of the costs incurred and obtained by danish seine fishermen can be seen in table 1.

Table 1 - Fishermen's Costs, Income and Profits.

No	Information	Amount (Rp/yr)	
		Average	Stingray Proportions
	Percentage of Catches of Wedgefish and Giant Guitarfish		1.06%
	Proportional Production Amount (Kg/yr)		1,155
	Selling Price (Rp)		53,662
1	Expenditure		
	Fixed cost		
	a. Shrinkage	217.603.125	2,303,499
	b. Maintenance	203,717,500	2,156,509
	c. Licensing	14,212,500	150,450
	Variable Costs		
	a. Retribution	9,907,857	104,882
	b. Marine Alms Contribution	10,000,000	105,858
	c. Transport Services	7,430,893	78,662
	d. Supplies	1.104.203.125	11,688,854
	Amount	1,567,075,000	16,588,715
2	Income	2,125,324,172	60,276,563
3	Profit	558.249.172	43,687,847
4	Profit sharing	496,891,148	24,149,153
	a. Boss 50%	61,358,023*	19,538,694*
	b. ABK 50%	31,055,697	1,509,322

Information: * After deducting fixed costs.

Based on table 1, it can be seen that the profit from fishing efforts in 1 year is IDR 558,249,172 with the profit from catching Wedgefish and Giant Guitarfish which has been proportionally amounted to IDR 43,687,847. The division of profits between the skipper and fishermen was agreed to be 50:50, so that the proceeds received by the skipper from the catch of the two rays amounted to Rp. 19,538,694 and each fisherman amounted to Rp. 1,509,322 with an average number of fishermen of 16 people. The profits obtained by fishermen are greatly influenced by the production volume of the two rays, the selling price and the total costs incurred. The selling price for Wedgefish and Giant Guitarfish set by fishermen is an average of IDR 53,662/kg.

Fish sellers around Fish Auction II Tasik Agung get raw materials from Fish Auction I and II. However, the Wedgefish and Giant Guitarfish can only be found at Fish Auction II by following the auction process. This is because Fish Auction II Tasik Agung is intended for landing ships with the type of catch being demersal fish. The following details of the costs incurred and obtained by fish sellers can be seen in table 2.

Table 2 - Merchant Costs, Revenues, and Profits

No	Information	Amount (Rp/yr)		
		Average	Wedgefish	Giant Guitarfish
1	Proportional Percentage		3.73%	1.68%
2	Volume (Kg)	1,938,960	76,279	34,320
3	Purchase price		53,481	53,481
4	Selling price			
	a. Meat		14,377	14,563
	b. Fin		680,647	684,375
5	Expenditure			
	a. Shrinkage	13,802,667	514,558	231,514
	b. Miscellaneous expense	4,766,667	177,699	79,952
	c. Variable Costs	858,377,657	31,979,974	14,397,698
	d. Fish Buying Capital	48,640,321,600	4,039,776,000	1,827,800,000
	Amount	49,517,268,590	14,029,898	1,842,509,164
6	Income			
	a. Meat		981,246,240	446,004,000
	b. Fin		5,182,788,000	2,342,600,000
	Amount	55,030,987,440	6,164,034,240	2,788,604,000
7	Profit	5,513,718,850	2,091,566,009	946,094.836

Based on table 2, it can be seen that the profits received by fish sellers in selling Wedgefish and Giant Guitarfish are obtained from the high selling price of the fins. The selling price reaches almost IDR 700,000/kg. Fish sellers' profits from selling ray fins reach 5 billion in 1 year. The ray fins sold by fish sellers are distributed directly to exporters. Fish sellers think that selling stingray meat is very unprofitable, this is because stingray meat smells very fishy, so no consumers buy fresh stingray meat. Fish sellers sell fresh stingray meat only to smoker/grill processors. This is confirmed by Succession et al. (2010), who stated that the very fishy smell of stingray fish is caused by the presence of quite high levels of urea. This is because the urea substance breaks down into ammonia.

3.2 Marketing Channel

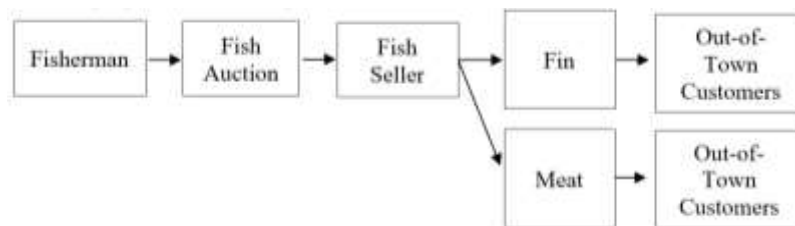


Fig. 1 - Marketing Channel of Wedgefish and Giant Guitarfish at Fish Auction Tasik Agung.

There is only 1 distribution channel for marketing of Wedgefish and Giant Guitarfish at Fish Auction II Tasik Agung. Fishermen as producers market the Wedgefish and Giant Guitarfish using an auction system held at Fish Auction II Tasik Agung. After the fish seller buys the raw materials from Fish Auction, the fish seller separates the stingray meat and fins. The meat of the Wedgefish and Giant Guitarfish which have been separated from their fins is marketed to consumers outside the city of Rembang. Meanwhile, the fins of the Wedgefish and Giant Guitarfish are marketed to exporters in Semarang and Surabaya. The process of distributing products from producers to consumers usually goes through several marketing actors. The distribution channel for Wedgefish and Giant Guitarfish can be said to be very short or simple because only a few marketing actors are involved, namely fish sellers. This is the same as research conducted by Nuriati (2018), that the marketing channel is short because it only goes through one fish seller and is distributed directly to consumers.

3.3 Marketing Margin and Fisherman's share

Marketing margin is an indicator to determine the level of efficiency of a marketing channel. The following is the marketing margin for Wedgefish and Giant Guitarfish, which can be seen in table 3.

Table 3 - Wedgefish Marketing Margin

Wedgefish							
Marketing Actors	COGS or Purchase Price (Rp/kg)	Selling Price (Rp/Kg)	Profit Margin (Rp/Kg)	Marketing Margin (Rp/Kg)	Total Marketing Margin	Marketing Margin Percentage	
Fisherman	COGS: 14,361	53,662	39,302	-	IDR 27,342	33.75%	
Fresh fish seller	Purchase price: 53,662	Meat: 14,377	27,187 (=81,004-53,818)	27,342 (=81,004-53,662)			
	Marketing costs: 429	Fin: 680,647					
	COGS: 53,818	Proportional price: 81,004 (90% Meat and 10% Fin)					
Meat consumers	Purchase price: 14,377						
Collectors/Exporters of Processed Fins	Purchase price: 680,647						

Information: Cost of Production (HPP) = proportional total cost/ production volume.

Based on table 3, the marketing margin for Wedgefish is obtained by reducing the proportional price of pari with the purchase price for fish sellers and the cost of production for fishermen. HPP is obtained from dividing total costs proportional to Wedgefish with the production volume, while fishermen's selling prices and fish sellers' buying prices are obtained from prices that have been proportional to prices during the peak season, normal season and lean season. The marketing margin for Wedgefish is IDR 27,342 or the percentage margin value for Wedgefish is 33.75%. This means that the margin percentage value reaches 33.75% of the price at the consumer level. Meanwhile, the marketing margin value of Giant Guitarfish is shown in table 4.

Table 4 - Giant Guitarfish 's Marketing Margin

Giant Guitarfish							
Marketing Actors	COGS or Purchase Price (Rp/kg)	Selling Price (Rp/Kg)	Profit Margin (Rp/Kg)	Marketing Margin (Rp/Kg)	Total Marketing Margin	Marketing Margin Percentage	
Fisherman	COGS: 14,361	53,662	39,302	-	IDR 27,881	34.42%	
Fresh fish seller	Purchase price: 53,662	Meat: 14,563	27,429 (=81,544-54,115)	27,881 (=81,544-53,662)			
	Marketing costs: 429	Fin: 684,544					
	COGS: 54,115	Proportional price: 81,544 (90% Meat and 10% Fin)					
Meat consumers	Purchase price: 14,563						
Collectors/Exporters of Processed Fins	Purchase price: 684,375						

Information: Cost of Production (HPP) = proportional total cost/ production volume.

Based on table 4, the marketing margin for pari miser is IDR 27,881 or as a percentage it is 34.42%. This means that the margin percentage value reaches 34.42% of the price at the consumer level. The size of the marketing margin can be influenced by selling price, production volume and marketing costs. In this study, the marketing margin for the Wedgefish was smaller than the marketing margin for the Giant Guitarfish. This is caused by the difference in selling prices. The selling price for Wedgefish is IDR 81,004 while the Giant Guitarfish is IDR 81,544. This will also have an impact on the size of the share received by fishermen or fisherman's share.

Table 5 - Fisherman's share

Types of Stingrays	Mobile phone (Rp/Kg)	HK (Rp/Kg)	Fisherman's share	Marketing Margin
Wedgefish	53,662	81,004*	66.25%	33.75%
Giant Guitarfish	53,662	81,544*	65.81%	34.42%

Information: Hp = price received by fishermen (sales price), Hk = price at the final consumer level (purchase price), *purchase price has been proportioned.

Based on table 5, the percentage of fisherman's share obtained was 66.25% for Wedgefish and 65.81% for the Giant Guitarfish. This can be interpreted as meaning that fishermen get an average profit of 66.03% in selling Wedgefish and Giant Guitarfish. The percentage value can be influenced by the length of the marketing channel and the selling price set by fishermen to s. The difference in the value of the fisherman's share of the Wedgefish and Giant Guitarfish is caused by the price paid by consumers. These prices may differ because they are influenced by production volume. the margin percentage obtained is smaller than the fisherman's share percentage. This means that the marketing channels that are running are efficient. This is reinforced by Azzaino (1982) in Safitri et al. (2019), that a marketing can be said to be efficient if it has a low marketing margin and a high fisherman's share compared to other marketing for the same commodity, capable of providing a fair distribution of the overall price paid by final consumers.

3.4 Profit

Profit analysis is used to find out how much profit fishermen and fish sellers get from selling Wedgefish and Giant Guitarfish and to find out whether the business is profitable for business actors. The following shows the proportional profits obtained by danish seine fishermen from selling Wedgefish and stingy stingrays as shown in table 6.

Table 6 - Proportional Profits of Fishermen.

Information	Amount (Rp/yr)
Reception	60,276,563
Total Cost	16,588,715
R/C Ratio	3.63
Profit	43,687,847

Fishermen gain profits by selling Wedgefish and Giant Guitarfish intact at a price of IDR 53,662 per kilogram. The business carried out by fishermen is profitable because fishermen's income from selling Wedgefish and Giant Guitarfish is greater than the proportional total costs incurred. Meanwhile, the profits obtained by fish sellers from selling the meat and fins of Wedgefish and Giant Guitarfish are shown in table 7.

Table 7 - Proportional Profits of Fish sellers.

Information	Amount (Rp/yr)	
	Wedgefish	Giant Guitarfish
Reception		
Meat	981.246.240	446,004,000
Fin	5,182,788,000	2,342,600,000
Total Receipts	6,164,034,240	2,788,604,000
Total Cost	4,072,468,231	1,842,509,164
R/C Ratio	1.51	1.51
Profit	2,091,566,009	946.094.836

The profits received by fish sellers in selling Wedgefish are greater than Giant Guitarfish, this is because the production volume for Wedgefish is greater than Giant Guitarfish, in 1 year fish sellers can sell 68,652 kg of meat and 7,626 kg of fins of Wedgefish, and 30,888 kg of meat and 3,432 kg of Giant Guitarfish. Even though the volume of fin production from both groups of rays is smaller than the volume of meat production, the profits received are greater. This is because the selling price of ray fins is greater than the selling price of the meat. The prices set by fish sellers for the meat and fins of Wedgefish and Giant Guitarfish are IDR 14,377 and IDR 14,563 respectively for meat and IDR 680,647 and IDR 684,544 for fins. Wedgefish and Giant Guitarfish have a higher selling price compared to other types of stingrays sold at Fish Auction II Tasik Agung. This is because the fins of Wedgefish and Giant Guitarfish are very popular with foreign consumers.

The R/C ratio calculation is carried out to find out whether the efforts made by fish sellers in selling Wedgefish and Giant Guitarfish are profitable or unprofitable. The R/C ratio values of fishermen and fish sellers who sell Wedgefish and Giant Guitarfish are 3.63 and 1.51. This value shows that the income earned by fishermen and fish sellers is greater than the total costs they incur. The business carried out by fishermen and fish sellers can be said to be feasible because the R/C ratio value is >1 . The business carried out by fishermen and fish sellers can indeed be said to be profitable, but behind the profitable business, the condition of the two rays is very worrying. The reason fishermen and fish sellers sell Wedgefish and Giant Guitarfish is because of the high price and international market demand for their fins. The Indonesian government has not created regulations that limit catching or prohibit these two types of rays from being caught or captured, this is due to the lack of stock data for these two rays. The government and stakeholders should have started managing the fisheries of these two stingrays in a sustainable manner using various approaches so that stingray stocks can be well maintained.

4. Conclusions

The conclusion obtained from this is that the marketing channel for Wedgefish and Giant Guitarfish in Tasik Agung Fishing Port only has one marketing channel with business actors consisting of fishermen and fish sellers. The marketing margin for Wedgefish and Giant Guitarfish at Tasik Agung Fishing Port is 33.75% for Wedgefish and 34.42% for Giant Guitarfish, marketing efficiency for fish sellers of Wedgefish and pari stinger can be said to be efficient with a ratio of 0.01, and the percentage of fisherman's the share is 66.25% for Wedgefish and 65.81% for the Giant Guitarfish, and the businesses carried out by fishermen and fish sellers have been profitable.

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