Analysis of distribution patterns and marketing margins of capture fishery products at the Ujong Baroh fishing port, West Aceh district, Indonesia

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Abstract. The objectives to be achieved in this study are to determine the distribution pattern of capture fishery products at Ujong Baroh Fishing Port and determine an efficient distribution pattern in conducting a marketing system by knowing the margin received. The method used in this study is a survey method with purposive sampling data collection techniques. The data analysis used in this research is descriptive analysis and marketing margin analysis. The descriptive analysis used to describe the distribution pattern in Ujong Baroh Fishing Port. Marketing margin analysis is used to measure the profits of each actor involved in the catch distribution pattern. Results of this study obtained 2 distribution patterns that occur in Ujong Baroh Fishing Port. The first distribution pattern is fishermen to fish collectors to wholesalers to retailers to consumers; second, fishermen to fish collectors to traders to consumers. Both distribution patterns at Ujong Baroh Fishing Port are correct because these patterns get a marketing margin value of < 50% and a fisherman’s profit sharing value of > 50%, where the distribution pattern is classified as efficient. The party who benefits from both distribution patterns is fish collectors because they get a sales profit of 7%.

1. Introduction
West Aceh District has facilities and infrastructure to support capture fisheries activities, one of which is the Ujong Baroh Fishing Port located in Johan Pahlawan District. Fishing Port is a means to support the development of better capture fisheries [1,2]. Fishing Port is expected to be a forum for fishermen
to distribute their catch and be able to increase local revenue [3-5]. This marketing activity is one of the determining factors for the success of the sales business in general, especially fishermen as producers. In the distribution pattern, often using intermediaries as distributors, this intermediary is a separate part, namely between producers and last consumer. The distribution pattern of capture fisheries products at Ujong Baroh Fishing Port needs to be studied, because many parties are involved in marketing activities such as fishermen, fish collectors or toke bangku (local name), wholesalers, retailers and finally consumers. The marketing of capture fishery products also has uncertainty in the selling price of fish in each distribution pattern. This is because there are several paths that are passed before reaching the final consumer, such as from fishermen to fish collectors, after that fish collectors to wholesalers, then from wholesalers to retailers, finally from retailers to consumers. The longer the pattern that will be passed will affect the price of fish that will be used by consumers [6]. According to Hapsari [7], it is necessary to do a good marketing distribution pattern in the flow of goods from producers to consumers.

The distribution pattern that is not optimal can result in only a small income of fishermen, this is because fishermen submit their catch to collectors for sale and fishermen do not sell it directly to consumers, this is what results in distribution patterns that cause different price differences. According to Sarwanto et al. [8], the length of the distribution pattern will determine the quality of the products marketed, costs, margins and marketing efficiency, as well as revenue. Fish marketing, especially in small-scale fisheries, often has not reached the ideal conditions.

The distribution pattern of fish catches at Ujong Baroh Fishing Port in its marketing certainly has several distribution patterns from fishermen to consumers. In general, prices, distribution levels, marketing margins and fish profits in the market depend on the distribution channels that are passed from fishermen as producers to consumers. Therefore, research is needed to find out the right distribution pattern, namely by analyzing the marketing margins of the distribution pattern that occurs at Ujong Baroh Fishing Port.

2. Materials and Methods

2.1. Time and location
This research was conducted for one month, namely in February 2020 at the Ujong Baroh Fishing Port, West Aceh District.

2.2. Method of collecting data
This research method is carried out by direct observation using a questionnaire that has been provided as a primary data collector. The target respondents were conducted by purposive sampling. According to Arikunto [9] the requirements for sampling are based on certain objectives (according to research needs) included: (a) Sampling is based on certain characteristics and characteristics which are the main characteristics of the population, namely fishermen as fish catchers, collectors as traders who accommodate all fish from fishermen's catches which are then resold to retailers or middlemen, retailers or middlemen as traders who sell fish directly to consumers; (b) Respondents taken in the sample are those that contain the most characteristics in the population; (c) Determination of population characteristics is done carefully. Based on the above conditions, the targeted respondents are 60 fishermen, 10 fish collectors, 5 wholesalers, 15 retailers and small sellers.

2.3. Data analysis
The data analysis used in this research is descriptive analysis and marketing margin analysis. The descriptive analysis used is to describe the distribution pattern of the catch based on market, connectivity and marketing actors. In this study, marketing margin is calculated as the difference between the selling price of fish at the fisherman's level and the selling price of fish at the retailer's level. Marketing margin analysis was carried out based on the Septian [10] formulation.
(a) Marketing Margin

\[ MP = Pr - Pf \]

Where: MP is marketing margin (IDR/kg), Pr is Consumer price (IDR/kg), Pf is Producer price (IDR/kg).

(b) Share marketing costs and share profits

\[ Sbi = \left( \frac{bi}{Mp} \right) \times 100\% \]
\[ Ski = \left( \frac{Ki}{Mp} \right) \times 100\% \]

Where: Ski is Share marketing agency profits to i, Ki : profits, Sbi is Share marketing costs to i, bi is Marketing costs, Mp is Margin marketing.

(c) Marketing Costs

\[ Bp = Bp_1 + Bp_2 + \ldots + Bp_n \]

Where: Bp is Marketing costs, Bp1, Bp2, Bpn is Marketing costs per marketing agency.

(d) Marketing advantage

\[ Kp = Kp_1 + Kp_2 + \ldots + Kp_n \]

Where: Kp is Marketing advantage, Kp1, Kp2, Kpn is Marketing advantages of each marketing agency.

(e) Marketing Margin Percentage

\[ Mp = \left( \frac{Pr - Pf}{Pr} \right) \times 100\% \]

Where: Mp is marketing margin percentage Persen, Pf is Price at producer level, Pr is Prices at the last consumer level.

(f) Fisherman Share

\[ F = \left( 1 - \frac{M}{Pr} \right) \times 100\% \]

Where: F is fisherman share, Pr is Prices at the last consumer level, M is marketing margin.

If the share received by the producer is > 50%, it can be concluded that the marketing that occurs is classified as efficient. However, if the share received by the producer is < 50%, then the marketing that occurs is not yet classified as efficient.

3. Results and Discussion

3.1. Distribution pattern

Figure 1 shows that the distribution pattern that occurs at Ujong Baroh Fishing Port consists of 2 patterns, namely the distribution chain starting from fishermen to fish collectors to wholesalers to retailers or muge (local name) to consumers. The distribution pattern for the second level starts from fishermen to fish collectors to retailers to consumers.
3.2. Marketing margin

Table 1 shows that in the distribution pattern at the first level there is a difference in prices for tuna at the wholesaler level of IDR 3,000/Kg with marketing costs of IDR 500/Kg and for the percentage of marketing costs 16.67% with profit received IDR 2,500/Kg and the profit percentage is 83.33%. Retailers have a price difference of IDR 5,000/Kg with a marketing cost of IDR 2,000/Kg and a percentage of marketing costs 40% with a profit received of IDR 2,500/Kg and a percentage of profit of 60%. As for the distribution pattern for skipjack tuna, there is a price difference at the wholesaler level of IDR 4,000/Kg with marketing costs of IDR 1,000/Kg and for the percentage of marketing costs 25% with the profit received IDR 3,000/Kg and the percentage of profit 75%. Retailers have a price difference of IDR 5,000/Kg with marketing costs of IDR 2,000/Kg and for the percentage of marketing costs 40% with the profit received IDR 3,000/Kg and the percentage of profit is 60%. However, the distribution pattern that occurs in scad has a price difference at the wholesaler level of IDR 2,000/Kg with marketing costs of IDR 500/Kg and for the percentage of marketing costs 25% with the profit received IDR 1,500/Kg and the percentage of profit is 75%. Retailers have a price difference of IDR 7,000/Kg with marketing costs of IDR 3,000/Kg and the percentage of marketing costs is 42.86% with the profit received IDR 4,000/Kg and the percentage of profit is 57.14%.

Table 1. Margin of fish marketing level I

| No | Description | Tongkol fish | Cakalang fish | Layang fish |
|----|-------------|--------------|--------------|-------------|
| 1  | Fish collectors | IDR 10,000/Kg | IDR 18,000/Kg | IDR 13,000/Kg |
| 2  | Wholesalers (Distributor) | Purchase price | IDR 10,000/Kg | IDR 18,000/Kg | IDR 13,000/Kg |
|    | Selling price | IDR 13,000/Kg | IDR 22,000/Kg | IDR 15,000/Kg |
|    | Marketing margin = b-a | IDR 3,000/Kg | IDR 4,000/Kg | IDR 2,000/Kg |
|    | Profit = c-e | IDR2,500/Kg | IDR 3,000/Kg | IDR 1,500/Kg |
|    | Marketing costs | IDR 500 | IDR 1,000/Kg | IDR 500/Kg |
|    | Profit share = (d/b-a)×100% | 83.33% | 75% | 75% |
|    | Costs share = (e/b-a)×100% | 16.67% | 25% | 25% |
| 3  | Retailer | Purchase price | IDR 13,000/Kg | IDR 22,000/Kg | IDR 15,000/Kg |
|    | Selling price | IDR 18,000/Kg | IDR 27,000/Kg | IDR 22,000/Kg |
|    | Marketing margin = b-a | IDR 5,000/Kg | IDR 5,000/Kg | IDR 7,000/Kg |
|    | Profit = c-e | IDR 3,000/Kg | IDR 3,000/Kg | IDR 4,000/Kg |
|    | Marketing costs | IDR 2,000/Kg | IDR 2,000/Kg | IDR 3,000/Kg |
|    | Profit share = (d/b-a)×100% | 60% | 60% | 57.14% |
|    | Costs share = (e/b-a)×100% | 40% | 40% | 42.86% |
Table 2 shows that the marketing margin that occurs in the distribution pattern of tuna is IDR 5,000/Kg with marketing costs of IDR 2,000/Kg and the percentage of marketing costs is 40% with a profit of IDR 3,000/Kg and the percentage of profit is 60%. Meanwhile, the marketing margin that occurs in the distribution pattern of skipjack tuna is IDR 5,000/Kg with a marketing cost of IDR 2,000/Kg and the percentage of marketing costs is 40% with a profit of IDR 3,000/Kg and the profit percentage is 60%. However, the marketing margin that occurs in the distribution pattern of scad fish is IDR 8,000/Kg with marketing costs of IDR 3,000/Kg and the percentage of marketing costs is 37.5% with a profit of IDR 5,000/Kg and the percentage of profit is 62.5%.

Table 2. Margin of fish marketing at level II

| No | Description | Price Description / Kg |
|----|-------------|------------------------|
|    |             | Tongkol fish | Cakalang fish | Layang fish |
| 1  | Fish collectors | Selling price | IDR 13,000/Kg | IDR 20,000/Kg | IDR 15,000/Kg |
| 2  | Retailer | Purchase price | IDR 13,000/Kg | IDR 20,000/Kg | IDR 15,000/Kg |
|    |           | Selling price | IDR 18,000/Kg | IDR 25,000/Kg | IDR 23,000/Kg |
|    |           | Marketing margin = b-a | IDR 5,000/Kg | IDR 5,000/Kg | IDR 8,000/Kg |
|    |           | Profit = c-e | IDR 3,000/Kg | IDR 3,000/Kg | IDR 5,000/Kg |
|    |           | Marketing costs | IDR 2,000/Kg | IDR 2,000/Kg | IDR 3,000/Kg |
|    |           | Profit share = (d/b-a)×100% | 60% | 60% | 62.5% |
|    |           | Costs share = (e/b-a)×100% | 40% | 40% | 37.5% |

Table 3. Efficiency of fish catch marketing distribution patterns at level I

| Fish Species                  | Marketing Margin | Marketing Percentage | Margin Share |
|------------------------------|------------------|----------------------|--------------|
| Tongkol (Euthynnus affinis)  | IDR 8,000/Kg     | 44.44%               | 55.56%       |
| Cakalang (Katsuwonus pelamis) | IDR 9,000/Kg     | 33.33%               | 66.67%       |
| Layang (Decapterus russelli) | IDR 9,000/Kg     | 40.91%               | 59.09%       |

Table 4. Efficiency of fish catch marketing distribution patterns at level II

| Fish Species                  | Marketing Margin | Marketing Percentage | Margin | Fisherman Share |
|------------------------------|------------------|----------------------|--------|-----------------|
| Tongkol (Euthynnus affinis)  | IDR 5,000/Kg     | 27.78%               | 72.22% |
| Cakalang (Katsuwonus pelamis) | IDR 5,000/Kg     | 20%                  | 80%    |
| Layang (Decapterus russelli) | IDR 8,000/Kg     | 34.79%               | 65.21% |

Table 3 shows that by using the distribution pattern at the first level, a marketing margin or price difference is obtained from the price at the producer level to the final consumer level. Tuna has a price difference of up to IDR 8,000/Kg with a marketing margin percentage of 44.44% with a marketing efficiency value of 55.56%. Skipjack tuna has a price difference of up to IDR 9,000/Kg with a marketing margin percentage of 33.33% with a marketing efficiency value of 66.67%. Flying fish has a price difference of up to IDR 9,000/Kg with a marketing margin percentage of 40.91% with a marketing efficiency value of 59.09%.

Table 4 shows that the distribution pattern at the second level can result in marketing margins from the price at the producer level to the final consumer level having a price difference of up to IDR 5,000/Kg for tuna with a marketing margin percentage of 27.78% with a marketing efficiency value of 72.22%. Skipjack tuna has a price difference of up to IDR 5,000/Kg with a marketing margin percentage of 20% with a marketing efficiency value of 80%. Flying fish has a price difference of up to IDR 8,000/Kg with a marketing margin percentage of 34.79% with a marketing efficiency value of 65.21%.
3.3. Analysis of distribution patterns of fish catches

The distribution pattern of fish catches that occurred at the Ujong Baroh Fishing Port, West Aceh Regency, consists of 2 patterns. The distribution pattern that occurs at Ujong Baroh Fishing Port, fishermen submit their catch to the fish collectors for marketing. The fish collectors were a fairly important party in the course of the fisheries economy because the fish collectors determine the price and market segmentation. Facts in the field, the selection of fish catch distribution patterns in Ujong Baroh Fishing Port does not sell fish directly to consumers, fishermen submit their catch to the fish collectors then the fish collectors will sell it to wholesalers, and the rest will be sold to traders.

The distribution pattern process at Ujong Baroh Fishing Port begins with fishermen who carry out fishing activities, where all operational costs are borne by the fish collectors. Therefore, the catch of fishermen will be marketed by fish collectors to wholesalers and retailers. The catch that is in the holding fish collectors or wholesaler will switch to the final retailers to local consumers (West Aceh Regency) and consumers outside Meulaboh such as consumers in the West Aceh region. The marketing process of the catch landed at Ujong Baroh Fishing Port is carried out by the fish collectors as the owner of capital, the results of the questionnaire explain that the marketing result of the fish collectors gets a percentage of 7%, then the distribution will be made to ship owners and fishermen after deducting operational costs. Furthermore, the handler will get a 10% percentage from the ship owner. Among the fishing ports in Indonesia that do not carry out the tender process properly are Jayanti Fishing Port, Cianjur Regency [11] and Labuhan Fishing Port, Lombok [12]. The marketing of the catch at Ujong Baroh Fishing Port, has a low bargaining value and does not have a fixed price, making it difficult for fishermen to get a decent selling price, so that fishermen get low profits and losses because the operational costs of each go to sea are given by the fish collectors.

3.4. Marketing margin analysis of fish catches

Marketing actors involved in the distribution pattern are fishermen, fish collectors, wholesalers and retailers. Fishermen hand their catch to the bench gecko to be marketed. Fish collectors markets their catch to wholesalers with prices for tuna IDR 10,000/Kg, skipjack fish IDR 18,000/Kg and kite fish IDR 13,000/Kg. The marketing costs used include the cost of water and additional ice. Wholesalers then sell tuna to retailers at a price of IDR 13,000/Kg with the difference in the offered price of IDR 3,000/Kg which is taken for marketing costs of IDR 500/Kg with a profit received of IDR 2,500/Kg. At the retailer level, they sell it to final consumers at a price of IDR 18,000/Kg with the difference in the offered price of IDR 5,000/Kg with marketing costs of IDR 2,000/Kg with a profit received of IDR 3,000/Kg. Skipjack tuna purchased by wholesalers at a price of IDR 18,000/Kg and sold to retailers at a price of IDR 22,000/Kg. The difference in the price offered for the distribution pattern of skipjack tuna at the wholesaler level is IDR 4,000/Kg with marketing costs of IDR 1,000/Kg with the profit received by wholesalers of IDR 3,000/Kg. At the retailer level, they sell it to consumers at a price of IDR 27,000/Kg with the difference in the price offered is IDR 5,000/Kg for marketing costs of IDR 2,000/Kg and the profit received is IDR 3,000/Kg. The kite is purchased by wholesalers at a price of IDR 13,000/Kg and sold to retailers at a price of IDR 15,000/Kg. The difference in prices offered at the distribution pattern of scad fish at the wholesaler level is IDR 2,000/Kg with marketing costs of IDR 500/Kg and the profit received is IDR 1,500/Kg. Retailers sell to consumers at a price of IDR 22,000/Kg with a price difference of IDR 7,000/Kg with marketing costs of IDR 3,000/Kg and the profit received IDR 4,000/Kg. The marketing costs incurred by the traders are used for labor costs, rent, plastic and ice.

The actors involved in the level II distribution pattern include fishermen, fish collectors and retailers. Fish collectors market fish to retailers with prices for tuna IDR 13,000/Kg, skipjack fish IDR 20,000/Kg and kite fish IDR 15,000/Kg. The marketing costs incurred by the fish collectors include the cost of water and additional ice. The difference in the price offered for the distribution pattern of tuna at the retailer level which will be sold to consumers is IDR 5,000/Kg with a marketing cost of IDR 2,000/Kg with a profit of IDR 3,000/Kg. The difference in price for the skipjack distribution pattern is IDR
5,000/Kg with a marketing cost of IDR 2,000/Kg and a profit of IDR 3,000/Kg, while the difference in prices offered for the distribution pattern of scad fish is IDR 8,000/Kg with a marketing cost of IDR 3,000/Kg and a profit of IDR 5,000/Kg. Marketing costs incurred by retailers usually include labor costs, space rent, plastic and ice. The difference in prices offered ranges from IDR 3,000/Kg to IDR 5,000/Kg, this is according to the statement [13].

The marketing margin or price difference at the first level of distribution pattern, from producer level to final consumer is IDR 8,000/Kg for tuna with a marketing margin percentage of 44.44% and value of fisherman share 55.56%. Skipjack tuna with a price difference of up to IDR 9,000/Kg, marketing margin percentage of 33.33% and value of fisherman share 66.67%. Flying fish with a price difference of up to/Kg, marketing margin percentage of 40.91% and value of fisherman share IDR 9,00059.09%. So, the larger the marketing margin, the smaller the percentage of the share received by fishermen. Therefore, it can be said that the marketing of tuna, skipjack and scad is efficient, with the highest score on the marketing of skipjack tuna with fisherman share of 66.67%.

The distribution pattern at the second level, the marketing margin generated from the producer level to the final consumer level, there is a price difference of up to IDR 5,000/Kg for tuna, the percentage of marketing margin is 27.78% and the value of marketing efficiency is 72.22%. Skipjack tuna has a price difference of up to IDR 5,000/Kg, a marketing margin percentage of 20% and a marketing efficiency value of 80%, while scad fish has a price difference of up to IDR 8,000/Kg, a marketing margin percentage of 34.79% and a marketing efficiency value of 65. 21%. So it can be said that the marketing of tuna, skipjack and scad is efficient, with the highest value in the marketing of skipjack tuna with fisherman share 80% and 20% marketing margin percentage. The results obtained in the field, the level of a good distribution pattern is the level II distribution pattern, but in general the two distribution patterns are efficient. This is because the two distribution patterns, get a percentage fisherman share above 50%. This agrees with research by Purwanti [14], which states that the longer the distribution pattern, the greater the marketing margin so that the distribution pattern is more inefficient and vice versa, as happened in Sungailiat VAT and this statement is also in accordance with Hadijah [15] that the marketing of skipjack that occurred at Lappa Fishing Port was classified as efficient where theyield was fisherman share 90% and the marketing margin percentage was 10%.

4. Conclusion
The distribution pattern of fish catches that occurred at Ujong Baroh Fishing Port consisted of 2 patterns, namely: the first pattern, fishermen to fish collectors to wholesalers to retailers to consumers; the second pattern, fishermen to fish collectors to retailers to consumers. The best distribution pattern for marketing catches at Ujong Baroh Fishing Port is the second distribution pattern because this pattern gets a marketing margin value and value and value fisherman share > 50%, where the distribution pattern is classified as efficient and effective. The party who benefits the most from the two distribution patterns is fish collectors with a profit of 7% from the sale.

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