

Analysis of distribution channels, margins distribution, and efficiency distribution of smoked skipjack tuna in Kawangkoan Traditional Market, Indonesia

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Abstract. Fisheries play a vital role in managing and utilizing fish resources, encompassing various stages from production to distribution and marketing. Smoked fish products, including skipjack tuna *Katsuwonus pelamis*, are processed to extend shelf life and enhance flavor, addressing challenges posed by perishability. The Kawangkoan Traditional Market serves as a hub for both fresh and smoked skipjack tuna, contributing significantly to local economic activities. The objectives of this research are to analyze the distribution channels, margins, and efficiency of smoked skipjack tuna in Kawangkoan Utara District, Minahasa Regency. Methodologically, this research employed a census approach targeting all smoked fish sellers in the market area. Data collection involved structured interviews with 14 identified sellers, ensuring comprehensive coverage of relevant population segments. Primary data from interviews and secondary data from literature sources facilitated detailed analysis. Findings reveal a direct distribution channel from producers to consumers via traditional market outlets. Analysis of distribution margins indicates a consumer price difference of 70,000 IDR with a corresponding margin of 42.85% from the purchase price. The efficiency of distribution is evaluated at 3.57%, indicating effective distribution practices according to established criteria. In conclusion, the study underscores the efficient and direct distribution pathway of smoked skipjack tuna in Kawangkoan, highlighting its role in local economic sustainability and micro-enterprise development. Understanding these dynamics is crucial for optimizing fisheries management and enhancing economic opportunities in local communities.

Key Words: economic activities, fisheries, *Katsuwonus pelamis*, marketing, North Sulawesi.

Introduction. Fisheries are organized activities related to the management and utilization of fish resources and their environment, encompassing all stages from pre-production, production, processing, to distribution and marketing (Mustika et al 2021). Fishery products are highly perishable due to their high protein and water content, making them a suitable medium for spoilage bacteria, especially in their fresh state (Yu et al 2020; Asche et al 2021; Rathod et al 2021). Therefore, preserving fishery products is crucial (Ayeloja 2020). One common method of processing fishery products is smoking, which combines salting, drying, and smoking processes (Puke & Galoburda 2020; Andhikawati & Pratiwi 2021).

In Indonesia, various smoked fish products, including skipjack tuna *Katsuwonus pelamis*, have been developed (Sayuti et al 2021; Hamid et al 2023). Processed products such as smoked skipjack tuna have an extended shelf life due to lower water content and the presence of smoke-derived chemical compounds that inhibit microbial growth, act as antioxidants, and enhance color and texture (Isamu et al 2012; Botutihe et al 2023). Skipjack tuna is one of the economically important pelagic fisheries resources in Indonesian waters, hence it is widely marketed in various markets (Sumbu et al 2023). The Kawangkoan Traditional Market in Kawangkoan District, Minahasa Regency, North Sulawesi is one example. Skipjack tuna products at the Kawangkoan Traditional Market are commonly found both fresh and in smoked forms (Lumantow et al 2022).

The importance of smoked fish products extends beyond just preserving the fish. Smoking also enhances the flavor, making the products more appealing to consumers, and can increase the economic value of the fishery product (Belichovska et al 2019). This added value is particularly significant in regions where traditional smoking methods have been passed down through generations, providing a unique selling point that differentiates these products in the market. Moreover, the use of traditional smoking techniques supports local cultural heritage and can contribute to the sustainability of fishing communities by providing alternative livelihoods that are less dependent on fresh fish markets, which are often volatile and affected by supply chain disruptions (Hasmawaty et al 2022).

So far, there is no comprehensive data on the distribution or marketing of smoked fish in Kawangkoan Traditional Market. Considering that marketing is an important aspect for fisheries businesses, it is crucial to be studied (Nahumury & Manuhuttu 2019). Distribution or marketing involves various activities by intermediary institutions, including transporting the product from collectors to consumers (Sharma et al 2021). The costs incurred by each distribution institution impact the final price paid by consumers (Nguyen et al 2020). Effective distribution and marketing are crucial to ensure that fishery products reach consumers efficiently (Viswanathan et al 2023). Starting from this background, the objectives of this research are to analyze the distribution channels, margins, and efficiency of smoked skipjack tuna in Kawangkoan Utara District, Minahasa Regency.

Material and Method

Description of the study sites. This study was conducted at Kawangkoan traditional market. This market is located in Uner village, North Kawangkoan sub-district. Uner is a sub-district in North Kawangkoan sub-district, Minahasa Regency, North Sulawesi Province. The number of traders in the Kawangkoa traditional market is 391 traders. The market area is 18,766 hectares, with 52 local government-built kiosks, 208 local government stalls, 35 self-help shophouses, and 200 self-help stalls. The time needed to carry out this research, starting from the preparation of the Research Work Plan to the implementation of the exam, is approximately 6 months, namely from August 2022 to January 2023.

Donor reef and nursery setup. The method used in this research is a census. A census is a complete data collection procedure for all population units without missing any. The census ensures that all population units are completely recorded without exception. In statistics, there are two kinds of data collection methods, namely the census method and the sampling method. Census research refers to a methodology that considers one population group as the entire sample, utilizing a structured questionnaire as the primary data collection tool to gather specific information. In this context, the census comprises all respondents, treating them as the main subjects of the research. A census is defined as a method of data collection in which all elements of the population are examined individually (Mazhar et al 2021). In this study, the respondents identified were all smoked fish sellers in the studied area. The results of the study showed that the number of smoked fish sellers was 14 individuals. Therefore, these 14 individuals were selected as respondents for this study. To collect data, all respondents were visited individually for interviews. During these interviews, researchers recorded all information conveyed by the respondents and directly checked the accuracy and logic of all answers provided. This approach ensured that the data obtained were accurate, reliable, and covered the entire relevant population in this research.

Method of collecting data. The data collected consisted in primary and secondary data. Primary data was obtained directly from the source without intermediary, namely the smoked fish sellers (14 individuals). The collection of primary data was carried out through interviews using pre-prepared questionnaires. On the other hand, secondary data was obtained indirectly, in the form of documents, notes, reports, or existing

journals. This data was used to support the analysis and provide deeper context for the research.

Data analysis. The analyses conducted in this study included an analysis of distribution and marketing channels, an analysis of distribution and marketing margins, and an analysis of distribution and marketing efficiency. The analysis of distribution and marketing channels was performed using a descriptive method, tracing the flow from smoked skipjack tuna producers to end consumers. The distribution and marketing margin analysis examined the margins of each institution by subtracting the buying price from the selling price, as mathematically illustrated by Kuswardhani et al (2019):

$$M_p = P_r - P_f$$

where: M_p = distribution margin;
 P_r = price at the consumer level;
 P_f = price at producer level.

Analysis of distribution/marketing efficiency, namely the comparison between distribution/marketing costs and the value of products sold (retail prices) was expressed in percent. Distribution/marketing efficiency can be calculated using the formula (Ojogho et al 2012):

$$E_p = \frac{B_p}{HE} \times 100$$

where: E_p = distribution efficiency;
 B_p = distribution costs;
 HE = retail price.

Results. The distribution and marketing channel for smoked fish observed at the Kawangkoan Traditional Market consisted of a single channel, as illustrated in Figure 1. The research findings revealed that producers of smoked skipjack tuna typically sell their products directly to traditional markets, which then serve as the direct link to final consumers. For a comprehensive overview of distribution and marketing margins for fresh fish, please refer to Table 1. The analysis in Table 1 shows a price difference at the consumer level of 70,000 IDR, resulting in a margin of 42.86%. The efficiency of distribution and marketing for smoked fish in the Kawangkoan Traditional Market is detailed in Table 2. According to the data presented in Table 2, the efficiency analysis for smoked skipjack tuna reveals a rate of 3.57%, indicating that it is efficient.

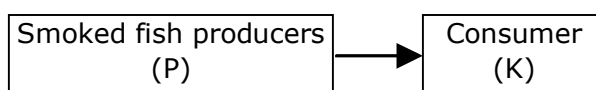


Figure 1. Distribution channels of smoked skipjack tuna in the Kawangkoan market.

Table 1
Distribution margin of smoked skipjack tuna in the Kawangkoan market

<i>Distribution margin</i>	<i>Result</i>
Prices at the producers level	30.000 IDR/kg
Prices on the consumer level	70.000 IDR/kg
Margins	0.4285 IDR
Percent	42.86%

Table 2
 Efficiency distribution of smoked skipjack tuna in Kawangkoan traditional markets

<i>Efficiency distribution</i>	<i>Result</i>
Distribution costs	250.000 IDR
Retail price	50.000 IDR/clip
Distribution efficiency	3.57%

Discussion. The analysis of distribution channels, margins, and efficiency is crucial to observe. By analyzing these three aspects, companies can optimize their distribution chain, reduce unnecessary costs, and increase profit margins, while also formulating more effective marketing strategies to ensure products are available in the right markets, at the right times, and at competitive prices (Ha et al 2020).

Distribution channel analysis is important to ensure products reach end consumers efficiently. This analysis can map the distribution reach of products, identify areas with access to their products as well as areas needing distribution improvements, and understand the roles and contributions of each party in the distribution chain, from producers to retailers. Distribution channels can be categorized into two types: direct and indirect channels. Direct channels involve products moving directly from producers to consumers without intermediaries or distributors. In contrast, indirect channels involve companies distributing or marketing products through intermediaries and retailers before reaching consumers (Truong et al 2020). Based on observations (Figure 1), the distribution channel for smoked skipjack tuna in the traditional Kawangkoan market is short, directly from producers to end consumers. The raw material, skipjack tuna, is sourced from fishing vessels. The smoked fish trader as a producer processes fresh skipjack tuna into smoked fish and distributes it to end consumers.

Margin analysis is critical as it helps determine product pricing by understanding cost components affecting the final price. It also allows producers to identify profit margins at each distribution stage (Ailawadi & Harlam 2004). Essentially, distribution margin is the difference between consumer-level and producer-level prices. Based on margin analysis results (Table 1), the price difference at the consumer level is 70,000 IDR or a margin of 42.85%. A 42.85% margin means the smoked fish trader earns a profit of 42.85% from the purchase price, indicating a significant profit after selling to end consumers.

Efficiency analysis of distribution and marketing is equally important as it aims to identify and eliminate waste or inefficiencies in the distribution chain, ensuring products reach consumers optimally timed and competitively priced to enhance customer satisfaction (Yusuf et al 2019). Distribution efficiency analysis compares distribution costs with the value of products sold (Lau 2013). Based on distribution efficiency analysis results (Table 2), the efficiency of distributing smoked skipjack tuna is 3.57%, indicating efficiency according to Swastawati et al (2015), who considers it efficient when it is less than 5%.

Conclusions. The research findings lead to several important conclusions. Firstly, the distribution channel for smoked skipjack tuna in Kawangkoan District is a short route, directly from producers to consumers. Secondly, the distribution margin for smoked skipjack tuna amounts to 70,000,- IDR with a 42.85% margin from the purchase price. Lastly, the distribution efficiency is evaluated at 3.57%, indicating efficiency according to the criteria. These conclusions highlight the efficient and direct distribution pathway of smoked skipjack tuna at the Kawangkoan traditional market, contributing significantly to local economic activities and sustainable micro-enterprises.

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Conflict of interest. The authors declare that there is no conflict of interest.

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