

VALUE CHAIN UPGRADING: EVIDENCE FROM SMOKED FISH AGRIBUSINESS IN CENTRAL JAVA

Peningkatan Rantai Nilai: Bukti dari Agribisnis Ikan Asap di Jawa Tengah

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ABSTRACT

Smoked fish is one of the processed fish products that provided higher added value. However, there are still great opportunities to increase added value of smoked fish products through upgrading their value chains to make them more competitive and sustainable. This study aims to examine value chain upgrading of the smoked fish in Central Java. The data were obtained from 52 smoked fish value chain actors in Central Java by conducting in-depth interviews. The data was analyzed using a qualitative descriptive analysis of value chain upgrading. The results showed that the smoked fish value chain in Central Java can be upgraded through three upgrading types: product, process, and functional. Product upgrading can be done by using vacuum packaging and food boxes for processors and food stallers respectively. Process upgrading can be done by adopting fish detection technology (for fisherman) and administrative system applications (for wholesalers and traders). Functional upgrading can be improved by implementing direct selling from processors to restaurants and online marketing for retailers. As these upgrading activities will require additional costs, the smoked fish value chain actors need to consider the costs to get higher benefits in the implementation of value chain upgrading for smoked fish in Central Java.

Keywords: fishery products, smoked fish, upgrading, value added

ABSTRAK

Ikan asap merupakan salah satu produk olahan ikan yang memberikan nilai tambah yang lebih tinggi. Meskipun demikian, produk ikan asap masih memiliki potensi untuk ditingkatkan nilai tambahnya melalui peningkatan rantai nilai agar lebih lebih berdaya saing dan berkelanjutan. Penelitian ini bertujuan menganalisis peluang peningkatan rantai nilai ikan asap di Jawa Tengah. Data penelitian diperoleh dari 52 pelaku rantai nilai ikan asap di Jawa Tengah dengan melakukan wawancara secara mendalam. Data dianalisis menggunakan analisis deskriptif kualitatif terhadap peningkatan rantai nilai. Hasil penelitian menunjukkan bahwa rantai nilai ikan asap di Jawa Tengah dapat diperbaiki melalui tiga jenis peningkatan yaitu produk, proses, dan fungsi. Peningkatan produk dapat dilakukan dengan menggunakan kemasan vakum dan kotak makanan masing-masing oleh pengolah ikan asap dan pemilik warung makan. Peningkatan proses dapat dilakukan dengan mengadopsi teknologi pendeteksi ikan oleh nelayan dan aplikasi sistem administrasi oleh pedagang besar dan pedagang. Peningkatan fungsi dapat dilakukan dengan sistem penjualan langsung dari pengolah ke restoran dan sistem pemasaran daring oleh pedagang pengecer. Karena aktivitas-aktivitas peningkatan rantai nilai tersebut membutuhkan tambahan biaya, para pelaku rantai nilai ikan asap perlu memperhatikan faktor biaya untuk mendapatkan manfaat yang lebih tinggi dalam implementasi peningkatan rantai produk ikan asap di Jawa Tengah.

Kata kunci: *produk perikanan, ikan asap, peningkatan, nilai tambah*

INTRODUCTION

Fishery products are non-durable and rapidly degrade in quality, so further processing is required. In addition to providing resilience or increasing the shelf life of fishery products, processing of fishery products is carried out to increase added value and product quality. Processing of fishery products in Indonesia is currently dominated by frozen fish processing, with 55.4%. Furthermore, new fish processing is 13.1%, advanced processing such as smoked fish is 9.6%, and canned fish is 5.7% (KKP, 2018). Processing smoked fish and canned fish can provide higher added value when compared to fresh and frozen fish. The existence of processing activities aimed at increasing the added value of a fishery product can impact the creation of various types of processed fishery products that are more valuable and can then reach the domestic and even export markets. Central Java is the second region after East Java with a high production volume in the processing of fishery products, reaching one million tons in 2017 (KKP, 2018), including smoked fish processing. Currently, one of the large smoked fish processing areas is in Demak Regency.

Table 1. Fish processing production in Demak Regency, 2019

Processing Type	Production (ton)	Percentage (%)
Fish smoking	4,886	43.9
Fish salting	2,540	22.8
Fish transfer	1,725	15.5
Fish meat mashing	1,307	11.7
Other fish processing	677	6.1
Total	11,135	100

Source: [DKP] Dinas Kelautan dan Perikanan Kabupaten Demak, 2019

The number of processing fishery products into smoked fish in Demak Regency increases over time. From the point of view of competitiveness, smoked fish products have advantages in product differentiation, namely the distinctive taste of smoked fish products. In addition, consumers are willing to buy at a higher price to get quality smoked fish. Smoked fish products have the advantage of having a better taste than frozen fish (Alhassan et al., 2012) and can be processed into local or regional cuisine such as mangut (Dzaki & Sugiri, 2015). Processing smoked fish is one of the traditional preservation methods with equipment that is still simple, so it is easy to do. Although using simple equipment, this traditional smoking method can increase the shelf life of fishery products to create added value for fishery products. Initially, smoked fish processors in carried out processing activities in their respective homes. However, several problems arise, such as smoke pollution that disturbs residents. Based on this incident, the government handled it so that there were no prolonged problems. The handling carried out by the government is developmental in support of increasing smoked fish product processing activities, namely by building a fish smoking center in Wonosari Village, Demak Regency. This fish smoking center is one of the largest fish smoking centers in Central Java. The development of a fish smoking center is expected to increase the economy in the local and regional areas. The fish smoking center also provide employment opportunities for local community such as fish processors and traders. However, in fact, the fish smoking center in Demak is only a centralized smoked fish processing center in the form of a collaborative business group (*kelompok usaha bersama*, KUB). Related to the smoked fish quality and business activities, this center has not played a role in terms of standardization, hygiene, and waste treatment. On the other hand, the processing activities of the smoked fish products in this center still use traditional methods so that the the product's shelf life is shorter and the product quality is lower. The relationship between actors in the smoked fish value chain also tends to be informal, without a written cooperation agreement. In addition, there are many actors involved in the smoked fish value chain because the processors are also located in several other areas in Central Java such as Semarang and Rembang. It implies that the value chain of smoked fish products tends to be long and less coordinated.

Furthermore, it provides potential misalignment in creating and upgrading added value from smoked fish products. The success of a food value chain in creating valuable products is influenced by the characteristics of the relationships between actors in the chain (Hastings et al., 2016; Muflikh & Suprehatin, 2009). The relationships can be identified based on the activity contribution of each actor in the process of adding value to smoked fish products, which can be seen from the acquisition of marketing margins (Luhur & Yusuf, 2017; Ningsih et al., 2015). Collaborative activities between each actor are essential for adding value to smoked fish products to develop a sustainable value chain of smoked fish. Based on these issues and challenges, it is important to conduct an analysis to explore for opportunities that can be carried out by each actor in the smoked fish value chain in Central Java. This can be achieved through value chain upgrading including product, process and functional upgrading. Upgrading the smoked fish value chains provide more opportunities to make them more competitive and sustainable. Furthermore, it is expected to make a greater contribution to local, regional and national economies.

RESEARCH METHOD

The data used in this study are primary data obtained through interviews using questionnaires and secondary data obtained from the Department of Marine and Fisheries (DKP) of Demak and Rembang districts. Primary data were collected from value chain actors, including fishermen, wholesalers, collectors, processors, retailers, food stalls, and restaurants. The qualitative primary data cover the activities of each actor in the smoked fish value chain in the form of a detailed description or explanation as a result of answers to interviews and questionnaires. On the other hand, secondary data includes data on the volume and production value of fish raw materials at the fisherman level. This research was conducted in Central Java, starting from Demak as the center of smoked fish production to the location that linked to the smoked fish value chains which are Semarang, Rembang, and Pati.

The sampling technique was carried out by snowball and purposive sampling as done by Puspito et al. (2016) and Luhur and Yusuf (2017) in their agribusiness value chain studies. Snowball sampling includes a continuous process of identifying samples in a network by considering each actor (Sugiyono, 2014), namely those involved in Central Java's smoked fish value chain. Meanwhile, purposive sampling was carried out to determine the number of processors involved, considering the number of processors was quite large, namely 76 groups in KUB Asap Indah. The total research respondents were 52 people consisting of five fishermen in Rembang, four traders in Demak, 30 processors in Demak, 10 retailers in Demak, two food stall owners in Demak, and one restaurant owner in Semarang.

Analysis of Value Chain Upgrading

To analyse value chain upgrading for smoked fish in Central Java, this study used three types upgrading: product upgrading, process upgrading, and functional upgrading (Kaplinsky & Morris, 2002). The three types of upgrading are the factors that determine the value chain actors that can create higher added value (Kaplinsky & Morris, 2002). Product upgrading refers to improving the current product or creating a new product different from the existing one. Process upgrading is closely related to the production efficiency produced by each value chain actor and the interaction pattern created between value chain actors. Finally, functional upgrading is generally in the form of more than one activity carried out by value chain actors or other activities different from previous activities (ACIAR, 2012). It should be noted that value chain upgrading have challenges related to vertical coordination, technology, finance, and policy (Soullier et al., 2020).

RESULTS AND DISCUSSION

The smoked fish value chain in Central Java includes fishermen, wholesalers, collectors, processors, retailers, food stalls, and restaurants. These value chain actors are similar to the general processed fish value chain, such as the skipjack tuna value chain in Ambon City (Luhur & Yusuf, 2017). Cooperation between actors in the Central Java's smoked fish value chain results in five different marketing channels (Wicaksana et al., 2020) namely:

- Channel1: Fishermen – Wholesalers – Collectors – Processors – Restaurants – Final Consumers
- Channel 2: Fishermen – Wholesalers – Collectors – Processors – Retailers – Final Consumers
- Channel 3: Fishermen – Wholesalers – Collectors – Processors – Retailers – Food Stalls – Final Consumers
- Channel 4: Fishermen – Collectors – Processors – Retailers – Final Consumers
- Channel 5: Fishermen – Collectors – Processors – Retailers – Food Stalls – Final Consumers

In general, smoked fish processors in Central Java use catfish, tuna, and stingray as the primary raw materials for their smoked fish. These three types of fish provide a more distinctive taste when compared to other types of fish and preferred by consumers. Within the five marketing channels, there are different fish as their raw material. Smoked fish with catfish as raw material is found in channels one, two, and three. Then smoked fish with tuna fish raw materials are found in channels two and three. Furthermore, smoked fish with stingray raw materials are found in channels four and five.

The actors involved in the smoked fish value chain in Central Java carry out the main activities, which can be identified as follows:

Table 2. Main Activities of Smoked Fish Value Chain Actors in Central Java

Main Activity	Value Chain Actors ^a						
	FSM	WSL	CLR	PRC	RTL	FST	RST
Fish catching	√	-	-	-	-	-	-
Storage	√	√	-	-	-	-	√
Processing	-	-	-	√	-	√	√
Distribution	-	√	√	-	√	-	-
Purchase	-	√	√	√	√	√	√
Sale	√	√	√	√	√	√	√
Standardization	√	√	√	√	√	√	√

Source: (Wicaksana et al., 2020)

^aDescription:

FSM: fishermen; WSL: wholesalers; CLR: collectors; PRC: processors; RTL: retailers; FST: food stalls; RST: restaurant

Fishermen in the Central Java's smoked fish value chain only carry out their main activity focused on fishing. This condition is different from the condition of fishermen in India, whose activities include catching fish accompanied by other activities that add value to the product (value-added activities) such as cleaning, separating, washing, weighing, cooling, and packing (Kotni, 2016). On the other hand, wholesalers in the Central Java's smoked fish value chain carry out storage and distribution activities, while collector traders carry out distribution activities without storage. Processors carry out the smoked fish, and retailers distribute the results of smoking fish. Food stalls and restaurants carry out their main activity by processing smoked fish into Javanese culinary, namely mangut.

The average volume of fresh fish raw materials usually processed by all processors at the Demak fish smoking center is 9 tons per day. The fish raw materials used for processed, smoked fish come from fishermen in several areas. The majority of smoked fish raw materials come from Rembang, which is 94%, while the other 3% comes from Demak, 2.2% from Pati-Juwana, and the rest from outside Central Java, such as Probolinggo at 0.8%. Value chain activities begin with fishermen who sell 76% of their fresh fish catch to wholesalers for freezing. Fishermen sell the remaining 24% of fresh fish to collectors. Frozen fish processed by wholesalers will then be sold to collectors (Figure 2).

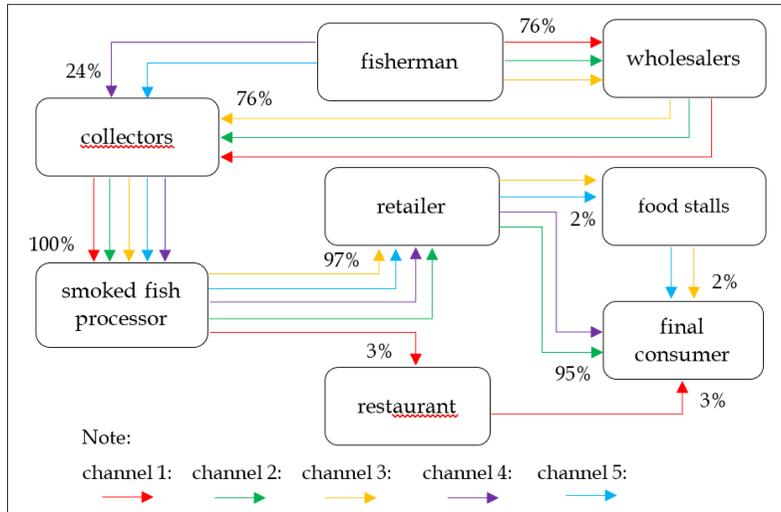


Figure 2.

Percentage of Smoked Fish Product Volume Flow in Central Java

Source: (Wicaksana et al., 2020)

Figure 2 illustrates that both frozen fish and fresh fish were collected by collector traders. Furthermore, all fish raw materials in the collecting traders are sold to processors at the fish smoking center. The processor then sells most smoked fish products to retailers, and a small portion is sold directly to restaurants. The fish smoking center, in this case, acts as a smoked fish processing center and also a smoked fish sales center. Finally, smoked fish in retailers is mainly sold to household end consumers, while the remaining small portion is sold to food stalls which will be processed into dishes to be sold to final consumers.

Product Upgrading

Upgrading analysis that smoked fish value chain actors in Central Java can carry out can be identified with three upgrading activities, namely product upgrading, process upgrading, and functional upgrading. Product creation can play an essential role in determining the success of increasing value chains such as the beef agroindustry value chain in Depok (Sabrina et al., 2015). In the smoked fish value chain in Central Java, the opportunity for product upgrading can be carried out by processors and food stalls because their main activities include product processing activities. Processors carry out the main activity of processing fresh fish into smoked fish. Currently, these processed products are generally sold with simple or conventional packaging. Smoked fish produced by processors is stored in plastic baskets and then sold to retailers. Then the food stalls generally process semi-finished smoked fish into Javanese cuisine, namely

mangut. Processors and food stalls are still very likely to carry out product upgrading activities so that the added value generated will be higher than before.

Processors can make product upgrading by improving packaging using airtight (vacuum) packaging which can extend product shelf life and maintain product quality. This is in line with previous research where airtight packaging can make smoked fish products safer and increase the added value (Swastawati et al., 2017). Although the cost of airtight packaging is considered higher, it can increase the added value of smoked fish products. Airtight packaging makes the price of smoked fish products higher and makes it easier to sell the product outside the region. In the current digital era, marketing through online media can reach all regions and positively impact smoked fish products that use airtight packaging. Airtight packaging will facilitate the sale of smoked fish to various regions.

Table 3. Opportunity Matrix for Each Actor in the Central Java's Smoked Fish Value Chain

aChain Actors	Upgrading Type		
	Product	Process	Functional
FSM	-	Fish detection technology	-
WSL	-	Loading administration	-
CLR	-	Loading administration	-
PRC	Vacuum packaging	-	Direct selling
RTL	-	-	Online marketing
FST	Food box package	-	-
RST	-	Javanese service	-

Source: Primary Data Processed, 2020

^aDescription: FSM: fishermen; WSL: wholesalers; CLR: collectors; PRC: processors; RTL: retailers; FST: food stalls; RST: restaurant.

Furthermore, food stalls can improve their product by using cardboard box packaging to package the typical food of mangut fish that comes from semi-finished smoked fish. In addition to mangut, this box packaging is also accompanied by rice and other side dishes. Packing cardboard boxes will allow food stalls to increase sales because they open up a broader market share, such as office workers, people who hold events, or event organizers who usually order large-scale consumption of boxed rice packages.

Process Upgrading

Process upgrading in the Central Java's smoked fish value chain can be adopted by several actors such as fishermen, wholesalers, traders, and restaurants. In general, fishermen carry out their main activity in fishing by relying on fishing experience. The activity of determining fishing areas only relies on the habit of catching fish in a particular area or territory according to estimates or experience. The catch obtained is relatively uncertain. Furthermore, wholesalers and traders generally only rely on manual recording using notebooks that will impact the possibility of errors or discrepancies in the calculation of transactions and can be detrimental to traders. The restaurants serve processed, smoked fish products with restaurant conditions that tend to be modest and straightforward, like restaurants in general without any particular characteristics. The market share of restaurants generally does not change, and regular customers only visit the majority. The conditions of fishermen, wholesalers, collectors, and restaurants mentioned above make an opportunity for process upgrading activities that can provide higher added value than the previous condition.

First, fishermen can carry out process upgrading activities by carrying out fishing activities using technology assistance in fish detectors. This activity will add value to the fishing process to carry out more efficiently and in measurable time. Fish detection technology will allow fishermen to catch more fish. The utilization of technology will undoubtedly increase costs for fishermen. However, the benefits received by fishermen will be much more significant and make fishermen able to operate more effectively and efficiently. This condition, of course, will certainly increase the added value in the smoked fish value chain, which affects the quantity of fish collected and, in the end, will increase the income of fishermen in fish selling activities. One such technology is fishfinder. Fishing using fishfinders by fishermen in Dumai City helps them detect the presence of fish, making it easier and more efficient to find fish catch areas and increase fish catches (Arkham et al., 2020).

Second, wholesalers and traders can upgrade the process by adopting administrative processes that adapt technology. The utilization of technology is carried out by using a more modern administrative system, namely recording with the help of a sales recording application that can be accessed via a cellular phone or computer. Evolving technology can provide value-added benefits for wholesalers and collectors to be more effective in the recording process. Various recording system applications are available, so wholesalers and traders can customize and use applications tailored to their individual needs. The recording system will be easier to implement and reduce recording errors and make transactions more secure based on this condition.

Third, restaurants can upgrade the process by providing excellent service to consumers while still producing typical smoked fish products on the main

menu. Improving services, such as the friendliness of restaurant employees and a comfortable restaurant atmosphere by adapting natural nuances and with the accompaniment of Javanese music, can increase consumer interest in coming to restaurants. The layout and concept of a typical restaurant can have an impact on increasing the number of consumers who visit and potentially increase the added value of restaurants in the value chain of smoked fish products as culinary tourism spots for both local consumers and tourists from various regions.

Functional Upgrading

Functional upgrading can be implemented by actors of the smoke fish value chain in Central Java such as processors and retailers. The smoked fish processors generally only carry out activities to process fresh fish into smoked fish, then the processed products will be sold to retailers. Retailers buy on a large scale and then resell the smoked fish products to traditional markets without higher value-added activities. Furthermore, retailers, in this case, only carry out the distribution process. There are still opportunities to upgrade functions in the interaction between the two actors so that the added value generated will be higher than before. This functional upgrading is similar to the upgrading activities in the broiler value chain in Bogor in the form of centralizing the main activity locations and market expansion (Tanjung et al., 2013).

The functional upgrading currently being carried out by several processors is to carry out direct selling activities to restaurants. There are several requirements to carry out direct sales activities to restaurants, namely direct sales to restaurants only for smoked fish products made from catfish and smoked fish sold must meet certain criteria desired by the restaurant. Smoked fish that uses catfish as raw material is chosen because it has a more distinctive taste when compared to smoked fish that uses tuna and stingray as raw materials. Direct sales made by processors to restaurants impact the number of marketing margins obtained by processors. If the processor sells smoked fish made from catfish to retailers, the marketing margin obtained by the processor is an average of Rp. 12,583 per kg, while if the processor develops activities by selling directly to restaurants, the average marketing margin obtained by the processor will be higher, namely Rp. 18,000 per kg. In selling directly to restaurants, the processor must bear additional costs, namely distribution costs and costs in the process of finding restaurants that can partner. However, it is comparable to earning a larger margin when selling directly to restaurants without retailers.

Another functional upgrading can be carried out by retailers, namely conducting online marketing. This marketing activity requires assistance using technology. Online marketing provides greater opportunities for retailers to facilitate buying and selling transactions because they can reach a broader market, not only in the local areas and traditional markets but also in other regions. This potential market will have an impact on increasing income for

retailers. In this case, the innovation of functional upgrading through online marketing can be integrated with product upgrading. For example, retailers can package their products in an attractive, durable, and safe way for long-distance delivery so that consumers are interested in buying.

All upgrading opportunities carried out by actors in the Central Java's smoked fish value chain need to pay attention to the minimum cost factor. This is in line with the research by Pranata & Marianti (2017) where the success of increasing the value chain is realized when there is an increase in productivity, better product quality, higher profits, environmentally friendly processes, paying attention to health and safety factors, improving the welfare of actors, and sustainable production. Therefore, value chain upgrading of smoked fish in Central Java are also related to the role of the cooperative for the fish smoking center of KUB Asap Indah. The fish smoking center cooperative can improve by building food stalls around the fish smoking center area. The cooperative's building will impact processors to sell directly to final consumers without going through retailers. In addition, fish smoking center cooperatives also have the opportunity to develop cold storage areas.

Frozen fish storage places can make it easier for processors to get raw materials, especially when fishermen are not going to the sea. However, it is necessary to calculate the cost of frozen fish storage with the benefits, considering it requires a large electrical capacity. It is necessary to consider the involvement of processors, fishermen, and wholesalers in procuring frozen fish storage areas. The smoked fish value chain in Central Java can also be upgraded by strengthening horizontal and vertical coordination by providing supply and access to consumers. This types of coordination was also applied to the fisheries value chain in Zambia (Kaminski et al., 2018) and the tea value chain in South India (Larsen, 2016). To support this, developing a collaborative of whole smoked fish value chain relationships is needed to gives an opportunity to improve smoked fish chain competitive advantage (Muflikh & Suprehatin, 2009).

In addition, vertical and horizontal coordination in the smoked fish value chain in Central Java can be done through a cooperative forum for fish smoking centers. However, improvement efforts driven by the role of the leading value chain actor groups or processing cooperatives in fish smoking centers will be successful if accompanied by an institutional environment and conducive rules to support the creation of value chain upgrading as found in previous research (Lim, 2016). Cooperation with the government is also needed in creating value chain upgrading such as providing assistance in production equipment, providing technology, and providing training. This is in line with previous research (Larsen, 2016; Mwinuka et al., 2015; Rahmatin et al., 2019; Wentink et al., 2017) that government intervention through programs and policies as well as collaboration with the private sector has in fact proven to play a role in developing and strengthening value chain.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Value chain upgrading for smoked fish in Central Java can be done by three upgrading types: product, process, and functional. Product upgrading can be conducted by processors by applying vacuum packaging and by food stalls by using food boxes. Fishermen can do process upgrading by using fish detection technology, then wholesalers and traders can adopt administrative system applications. Processors can do functional upgrading by implementing direct selling to restaurants and retailers can apply online marketing. As these upgrading activities will require additional costs, the smoked fish value chain actors need to pay attention to the minimum cost factor in carrying out upgrading activities so that value chain actors can get higher benefits from value-increasing activities.

Suggestion

The activities of increasing the value of smoked fish is also related to the role of cooperatives in fish smoking centers. It means that cooperatives have potential role as a hub, especially between processors and other smoked fish value chain actors. Therefore, it is recommended that there should be institutional strengthening in fish smoking center cooperatives to optimize coordination between processors or main actors and other actors in the value chain. In addition, the government's role as a mediator, extension worker, and technology provider is also needed to minimize obstacles in increasing the value of smoked fish products in Central Java.

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