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SUPPLY CHAIN ANALYSIS IN THE DISTRIBUTION OF LEADING COMMODITY-BASED CATCHES IN PPN KEJAWANAN

ANALISIS RANTAI PASOK DALAM DISTRIBUSI HASIL TANGKAPAN BERBASIS KOMODITAS UNGGULAN DI PPN KEJAWANAN

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ABSTRACT

Indonesian Republic Law No.45 of 2009 concerning fisheries states that fishing ports have government and business function to support activities related to marketing distribution. In the activities of catch distribution, fishing ports are seen as one part of a single supply chain system. This study was aimed to determine the potential of primary caught fish that landed at PPN Kejawanan and review of supply chain performance in catch distribution activities. The research methods are survey method and in-depth interview with respondents who related to the supply chain. Data analysis was performed by analysis of Location Quotient (LQ) and descriptive analysis. The results showed that primary fish commodities had a 3 score positive growth values of LQ, which were Squid, Stringray, flying fish, and Tetengkek fish, respectively. The 3 score of LQ indicates those fish are relatively concentrated landed in PPN Kejawanan and can continue to be developed. The supply chain performance assessment showed that there was 80% of the criteria already in the supply chain. while 20% of the criteria did not yet exist. In general condition, the supply chain of fish caught by primary commodities, especially squid, is appropriate but still not optimal.

Keywords: distribution, fishing port, supply chain

ABSTRAK

Undang-undang RI No.45 tahun 2009 tentang perikanan menyatakan bahwa pelabuhan perikanan memiliki fungsi pemerintahan dan pengusahaan guna mendukung kegiatan yang berhubungan dengan distribusi pemasaran. Dalam aktivitas distribusi hasil tangkapan pelabuhan perikanan dipandang sebagai salah satu bagian dalam satu kesatuan sistem rantai pasokan. Penelitian ini bertujuan untuk mengetahui komoditas ikan hasil tangkapan unggulan yang didaratkan di PPN Kejawanan dan mengkaji kinerja rantai pasok dalam aktivitas distribusi hasil tangkapan komoditas unggulan di PPN Kejawanan. Metode penelitian adalah metode survei dan wawancara mendalam dengan interview terhadap pihak-pihak terkait berkaitan dengan rantai pasok. Analisis data dilakukan dengan analisis Location Quotient (LQ) untuk mengetahui potensi unggulan ikan dan analisis deskriptif kinerja rantai pasok. Hasil penelitian menunjukkan komoditas ikan unggulan yang memiliki nilai pertumbuhan LQ positif dengan skor 3 yaitu Cumi-cumi, Pari, Layang, dan Tetengkek. Skor LQ 3 mengindikasikan bahwa jenis-jenis ikan tersebut terkonsentrasi pendaratannya secara relatif di PPN Kejawanan dan dapat terus dikembangkan. Penilaian kinerja rantai pasok menunjukkan terdapat 80% kriteria yang sudah dimiliki dalam rantai pasok. Sedangkan 20 % kriteria tidak atau belum ada. Secara umum dapat dikatakan bahwa rantai pasok ikan hasil tangkapan unggulan khususnya cumi-cumi sudah baik namun masih belum optimal.

***Kata kunci**: Distribusi, pelabuhan perikanan, rantai pasok*

I. INTRODUCTION

The port function development from the service center to be the marketing distribution center will optimize results of fish resources utilization by fishermen. Marketing distribution can be interpreted as a link between producers and consumers, including all procedures, flows, services, and business people (Anwar, 2011). Therefore, catch distribution activities must be present in every marine fishery production activity.

Fishing port has a strategic role in the development of fisheries businesses and fishing communities. This is because fishing ports are the center of fisheries community activities in which there are inter-group relations such as fishermen, traders, processors, and other related community elements. One of the B Port types located on the north coast of West Java Province is the Nusantara Fisheries Port (PPN) in Cirebon city. As one of the locations of fisheries industrialization, PPN Kejawanan has an important role for the economic development of the West Java region and the economy of Cirebon city, due to this fishing port has land access (hinterland) to large cities and high marine potential in Fisheries Management Areas (WPP) 711, 712, 713, 718 and 573 fishing areas (fore-land). Regarding distribution management, the problem faced by PPN Kejawanan is that the fishing port has not been able to become a marketing distribution center for catches. In addition, the absence of information on primary fish that landed in PPN Kejawanan as raw material processed also becomes one of the causes of the underdevelopment of the fishing industry in PPN Kejawanan.

According to the report on PPN Kejawanan statistics, fish production that landed at PPN Kejawanan in 2018 amounted to 4,276 tons with a production value of 173 billion. The potential of marine fisheries resources needs to be utilized optimally and sustainably, thus can drive the regional economy. Utilization of the marine fisheries sector needs to focus on determining primary commodities in fishing ports so that can be the first step towards fisheries development that rests on the concept of efficiency to achieve comparative and competitive advantages to facing trade globalization (Irnawati *et al.,* 2011). Demand for primary fish commodities in PPN Kejawanan needs the appropriate supply chain because it has important economic value, high demand and has a significant impact on fishermen. appropriate supply chain management in leading marine fisheries commodities is expected to be able to improve supply chain performance for each party involved, especially increasing the bargaining position of fishermen as the main producers in fish marketing. Research on the development of fisheries supply chains has previously been carried out, which examines the value chain of large pelagic fisheries development in Indonesia (Supriatna *et al*, 2014) and Nurani *et al.* (2013), but not yet covering the management of fish supply chains which are focused on catches based on primary commodities. Therefore, supply chain analysis in the distribution of primary commodity-based catches is very important to do. This study was aimed to determine the superior commodities of fish caught landed at PPN Kejawanan and review supply chain performance in the distribution of superior commodity catch activities in PPN Kejawanan.

II. METHODS

The study was conducted during April-May 2019 at PPN Kejawanan, Cirebon City, West Java. The research methods were survey method and in-depth interviews with respondents that have relation to the supply chain. Data analysis was performed with Location Quotient (LQ) analysis to determine the primary potential commodity and descriptive analysis of supply chain performance. Data collected consisted of primary and secondary data. Primary data

were obtained from the results of in-depth interviews with several stakeholders related to the supply chains performance of leading commodities in PPN Kejawanan which were the production of catches, distribution, production and distribution costs, and institutions. The number of respondents was determined by purposive sampling, consisting of 4 respondents from Hygienic Hygiene Fish (TPI), 1 respondent from UPT port, 2 respondents from fish processing companies. Secondary data were obtained from the PPN Kejawanan, Central Statistics Agency, Fisheries and Maritime Services of West Java Province. Data were analyzed using Location Quotient (LQ) to search for primary catch fish in PPN Kejawan. The LQ method is calculated by using the following equation:

$$LQ = \frac{\frac{Xij}{Xi.}}{\frac{X.j}{X..}} \quad \text{----------(1)}$$

Information:

Xij : Volume of j-type fish production in PPN Kejawanan

Xi. : J-type fish production volume in West Java Province

X.j : The total production volume of all types tested in PPN Kejawanan

X .. : The total production volume of all types tested in West Java Province

A : 1,2, ..., n (many types of fish tested).

Interpretation of LQ values:

LQ> 1, indicates the occurrence of fisheries production/market concentration in the PPN Kejawanan relative to the production/market fisheries in West Java Province, or there could be a concentration of activities related to fish production and marketing in the PPN Kejawanan, or a higher production in PPN Kejawanan compared to in other PP / PPI in West Java Province.

LQ = 1, The PPN Kejawanan has fisheries production/market, or fishery activities are equivalent to the total production of West Java Province or equivalent to all other PP-PP in West Java Province.

LQ <1, The PPN Kejawanan has a relatively smaller production/market for fisheries or fishery activities compared to in West Java Province or the fish production in PPN Kejawanan is smaller than in other PP / PPI in the West Java Province.

Selected data processing of primary catches is continue analyzed with the fisheries supply chain analysis framework, especially in the distribution of catches activities through observations and qualitative descriptive analysis of supply chain conditions in the PPN Kejawanan. Then, the data are analyzed using an overall fish supply chain performance evaluation. The assessment can be seen in Table 1.

Table 1. Modified supply chain performance.

No.	Description
1	Identify catch market objectives
2	Identify business actors who play a role in the supply chain
3	Communication between actors at each level of the supply chain has been going well
4	A market survey has been carried out to determine consumer desires for the quality of the products that has produced
5	Actors in each supply chain have received the appropriate price
6	The payment system in the supply chain has been going well
7	The product / market information flow has gone well in the supply chain
8	Facilities and infrastructure are in adequate condition
9	The process of distributing products to consumers is going well
10	Fishermen understand the commodity targets being sought, including for export

No.	Description
11	Implement fishing operations in accordance with regulations
12	Availability of fisherman human resources
13	Availability of refrigerated transport transportation infrastructure
14	Fish Marketing Sites Available
15	There is cold storage infrastructure
16	Electricity network infrastructure
17	There are government institutions
18	Availability of market information systems
19	A communication network information dissemination system is available
20	Availability of product security systems

Source*:* Marimin dan Maghfiroh 2011

The supply chain performance evaluation is then performed using the checklist method. This checklist assessment can be seen from what parts are good enough and from what parts still need to be improved to create a smooth supply chain, by looking at the percentage of supply chain performance as presented in Table 2.

Table 2. Describes the percentage of supply chain performance.

Interval (%)	explanation
0 – 50	Bad
50 – 62,5	Less
62,5 – 75	Enough
75 – 87	Well
87,5 – 100	Very good

Source*:* Marimin dan Maghfiroh 2011

III. RESULTS AND DISCUSSION

3.1. Identification of Fish Commodities in PPN Kejawanan

Generally, there were 25 caught fish species that were landed in the PPN Kejawanan during the last five years (2014 to 2018). There are 22 fish species that are same in the PPN Kejawanan and West Java Province in the period 2014-2018 with the LQ value as listed in Table 3. Based on the LQ calculation results, there are 11 fish species that have a 3 score positive growth value. There were Squid, Pari, Layang, and Tetengkek, respectively. 3 score of LQ indicates that the fish species are relatively concentrated landed on the PPN Kejawanan and can continue to be developed as optimal as possible to become the raw material for the fish processing industry in the PPN Kejawanan, especially the squid processing industry due to the relatively high fish production volume. The greater the value of the LQ produced shows the more concentrated exploitation of these commodities in the PPN Kejawanan and indicates the commodity has a comparative advantage. Other catch commodities are nonbasis with an LQ 1 score indicating that the landing of catch fish species is not concentrated in the PPN Kejawanan. Data on the LQ value for each fish species in the 2014-2018 PPN Kejawanan Report can be seen in Table 3.

Table 3. Location Quotient (LQ) Value per type of fish in the 2014-2018 PPN Kejawanan.

No	Fish species	Average LQ Growth	LQ score
1	Squid	3,81	3
2	Kembang Burung Stingray	14,62	3
3	Layang	2,24	3
4	Tetengkek	27,80	3
5	Grey cob	4,48	3
6	Giant traveling	12,76	3
7	Japuh	9,86	3
8	Alu-Alu	7,54	3
9	Biji Nangka	7,21	3
10	Golok-golok	1,97	3
11	Talang	1,10	3

No	Fish species	Average LQ Growth	LQ score
12	Teri	0,09	1
13	Mackerel	0,33	1
14	Tembang	0,21	1
15	Selar	0,78	1
16	Manyung	0,25	1
17	Layur	0,01	1
18	Grouper	0,17	1
19	Kembung laki	0,14	1
20	Red Snapper	0,10	1
21	Cucut	0,59	1
22	Bawal Hitam	0,26	1

3.2. Supply Chain in PPN Kejawanan

Supply chain management studies involve descriptive studies on chain structures and members, chain objectives, chain management, chain business processes, chain performance, constraints, and recommendations. (Marimin and Maghfiroh 2011). Supply chain management also involves integration between planning, coordination, and control of all business processes and activities in the supply chain to meet consumer needs (Chopra and Meindhl, 2007). The fishing port has a very important role in marine fisheries due to fishing port is an economic center from the time the fish are landed, after catching activities in catching area, until marketed at the fishing port (Lubis, 2011). Based on this condition, fishing ports are one of the parts that have an important role in the flow of the fishery products supply chain based on a supply chain perspective. The role of ports in the supply chain can be investigated by observing the distribution activities of catches in ports (Muninggar, 2008). The results of observations and interviews with a variety of marketing activities of catch distribution in the PPN Kejawanan is known that the catch fish distribution is in a frozen condition. Based on the quality of the catches production by fishermen, generally, the product has good quality. The quality of fishing products from fishermen will be determined from the capturing time, handling onboard, until distribution to the exporter. Most of the catches distribution for export purposes (80%), which is China through Jakarta and the remaining 20% is sold to local or domestic markets in East Java, Gresik. Based on the primary catch commodities identification, squid is one of the selected primary commodities that has dominantly landed in PPN Kejawanan. A large number of fishermen using bouke ami fishing gear and demand from inside and outside the PPN Kejawanan that caused high production volume for squid (*Loligo sp*). The PPN Kejawanan fish supply comes from vessels that were owned by the fish processing industry, fishing companies and shipowners who have agreement to sell their catches to the fish processing industry.

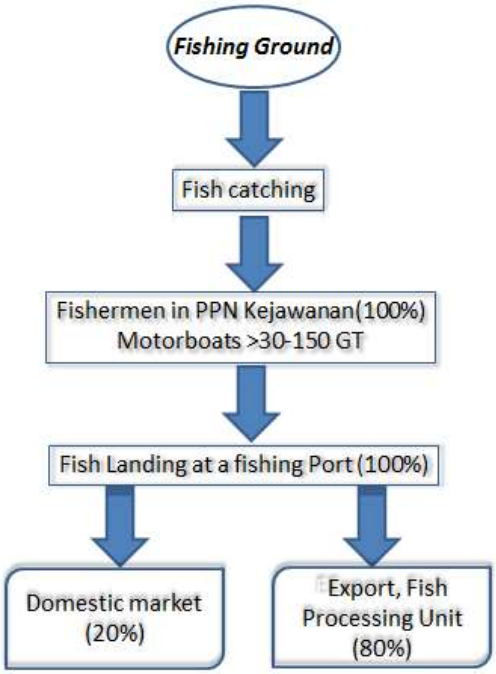

Figure 1. Supply chain for fishery products.

Figure 1 shows that the supply of fish for the export market in the PPN Kejawanan was sufficient by local fishermen. Fishermen, using a large fleet of ships (motorboats <30-150 GT), that are dominated by PPN Kejawanan were able to meet sufficient

quantities of market demand. But for domestic, fish supply can be fulfilled only 20%. The availability of fish supplies issue needs to get attention. It can be pursued through the application of networks between fishing ports to ensure the availability of fish supply by developing integrated information systems between fishing ports that related to local and export marketing become important (Gumilang *et al.,* 2016).

The parts of the supply chain are a commodity, especially a squid for export purposes, squid fishing units, boat owners, fish processing units, exporters, overseas marketing agents, and consumers. Positive interaction patterns that support each other between fish processing fishers, retail traders, wholesalers, exporters, and consumers will be in good condition because they need each other to carry out their respective roles (Ekici *et al*., 2014).

The squid in PPN Kejawanan is produced by fishermen using Bouke Ami, Cast Net, and Squid Fishing. Bouke Ami is the dominant fishing tool used by fishermen to catch squid. The squid supply chain starts from fishermen and boat owners who have an agreement to produce fish with optimal profits. Fishermen carry out fishing operations on request or with the approval of the shipowner. Shipowners continue to be encouraged to increase their fishing fleet because of the high demand for squid from exporters. Exporting companies purchase squid raw materials based on export market demand.

Squid that has export quality will be sold to exporters, while the other squid quality will be sold in the domestic market. The squid export is carried out in the frozen condition of whole products. The production pattern starts from the fishing process by fishermen, followed by the freezing process. Fishermen perform the fishing process with a monthly trip. Exporters carry out the squid production process from raw materials to frozen products. The catches distribution pattern starts from the shipowner buying fish from fishermen. further, the fish are sold to exporters. Exporters carry out freezing and packaging processes, which are distributed to the export market.

3.3. Supply Chain Performance

Performance analysis is assessed qualitatively based on 20 predetermined performance criteria. Assessment is carried out using the checklist method. Through the checklist table, it can be seen in terms of what is already good enough and in terms of what should be improved. then the chain performance is calculated. Supply chain performance can be seen in Table 4.

Tabel 4. Supply Chain Performance.

Supply Chain Performance	Number of criteria	% Percentage
Yes / Already	16	80
No / not yet	4	20
In the process	0	0
Total	20	100

Based on the checklist assessment, there are 80% of the criteria that have been owned in the supply chain. While 20% of the criteria do not or do not yet exist. Generally, it can be concluded that the supply chain of primary catch fish, especially squid, is already appropriate but not yet optimal. thus, it becomes important to improve performance so that the squid supply chain can run smoothly. This improvement can be pursued by means of the criteria in the check-list table to be increased up to 100%, including conducting a market survey to determine consumer desires for the quality of the products produced and realizing the flow of product/market information. The improvisation will run well in the supply chain and providing system technology market information with a strong foundation for marine and fisheries business. Sunoko and Huang (2014) and Persaulian *et al.* (2013) states that in order to strengthen the foundations of the fisheries business, the

paradigm of fishermen who previously only accepted the selling price turn into the selling price determinant. In addition, the squid supply chain system in PPN Kejawanan still needs to be developed through the cooperation of various parties involved in the supply chain. Marimin and Maghfiroh (2011) explained that to overcome obstacles in the supply chains development we could use a key success approach which are trust, coordination and cooperation, easy access to finance and good government support.

IV. CONCLUSIONS

The conclusion from this study is the primary fish commodities that have a 3 score positive growth value of LQ is Squid, Stingray, Fly, and Tetengkek, Respectively. These fish species are relatively concentrated in landing on the Kejawan VAT and can continue to be optimally developed by efforts to manage primary fish resources sustainably. The supply chain performance evaluation shows that 80% of the criteria are already in the supply chain. While 20% of the criteria do not or do not yet exist. Generally, it can be concluded that the supply chain of primary catch fish, especially squid, has been running well but is still not optimal. thus, it is necessary to optimize the effort with marine and fisheries-based information technology.

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