ANALYSIS OF JAMBAL ROTI SALTED FISH SUPPLY CHAIN MANAGEMENT IN PANGANDARAN DISTRICT

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ABSTRACT

This research is about the analysis of jambal roti salted fish supply chain management in Pangandaran District which was held in May 2018 - February 2019. The purpose of this research was to analyze the conditions of the jambal roti salted fish supply chain in Pangandaran District. The method used is descriptive qualitative and quantitative using primary and secondary data with the snowball sampling method. The analytical tools used was analysis of conditions, risks and consequences of jambal roti salted fish supply chain. The results of this research illustrate the supply chain conditions run quite well marked by the flow of products and the financial flow of jambal roti salted fish supply chain that runs with all of business perpetrator with each of the consequences. Jambal roti salted fish supply chain distribution cahannel which is 3 are (1) fisherman > processors > traders, (2) fisherman > Fish Auction Place > processors > traders, (3) fisherman > collectors > processors > traders.

Keywords: Jambal Roti, Supply Chain, Risk, Distribution Channel

1. INTRODUCTION

Pangandaran District is known as one of the marine tourism areas and the jambal roti salted fish production area in Indonesia, especially in Java. Production of jambal roti salted fish in Pangandaran District is included in the type of home industry with a fairly low production capacity (Suharna 2006). The availability of raw materials is a problem for jambal fish salted fish processors which is proven according to Nurhayati (2013), the condition of capture fisheries in Pangandaran District tends to decrease production results based on the calculation of capture fisheries resources bioeconomics.

Manyung fish (Arius thalassinus) has the same properties as other types of fish which according to Nurhayati et al. (2018) intrinsic character of fishery products is perishable, voluminous and seasonal. Management, good handling and processing of manyung fish can minimize the decay and extend shelf life. Decay will occur starting from the fish caught or dead. In conditions of tropical temperatures, the fish will rot within 12-20 hours depending on fish species, tools, or methods of arrest (Prabowo et al. 2017).

Manyung fish in Pangandaran were captured using nylon gillnet, strings gillnet and rawe fishing gear. According to data obtained from the Marine Fisheries and Food Security Agency of Pangandaran District (2016-2018), capture fisheries production for manyung fish in 2016 is 4,368.6 tons , 2017 is 7.7 tons and in 2018 (January-April) is 7.1 tons.

The length of product flow of processed fish products in the supply chain will increase costs because prices are the highest ranking factor, followed by shipping and quality (Suryaningrat 2016). Therefore a strategy is needed in designing the most effective and efficient supply chain process in order to prevent concentrated distribution at one point (Benassi 2017).

2.MATERIALS AND METHODS

Place and time of research

This research was conducted in Pangandaran Subdistrict, Pangandaran District, West Java Province, especially in places related to the salted fish jambal supply chain starting from the procurement of raw materials from Fishermen, Collectors and some Fish Auction Place in Pangandaran District (Cikidang, Jongorbatu and Pangandaran) until it reaches consumers in the form of salted fish products. The implementation time for research activities starts from May 2018 to February 2019.

Research methods

The method used in this research is descriptive qualitative and quantitative. The data used are primary data taken by interviewing respondents and secondary data taken from the Marine Fisheries and Food Security Department of Pangandaran District and West Java Marine and Fisheries Department. Respondents used were selected by the snowball sampling method, namely taking respondents based on recommendations from the first respondent. The number of respondents is 46 people consisting of fishermen, Fish Auction Place, collectors, producers, beach stall owners, market stall owners and traveling traders or small traders on the beach.

Data Testing Method

a.Variable definitions and operations

Supply chain management is integration between suppliers, employers, warehouse, etc. efficiently, so that the product can be produced and distributed with quantity and quality that can satisfy consumer needs (David et al., 2000 in Prayoga et al. 2017). Jambal roti is a processed fishery product that is included in the type of salted fish, processing using thick fleshed fish such as manyung fish (Arius thalassinus) by salting and drying (Christie et al. 2016).Operational variables used to measure variables in this study are presented in table 1.

Table 1. Variable Operations

Variable	Operational Variables		
	Assessment Aspect	Score	Measurement Scale
Supply Chain Management	Condition of catch Procurement of raw materials Price Risk Payment Marketing Competition	Very good = 5 Good = 4 Ordinary = 3 Not Good = 2 Very Bad = 1	Ordinal
Jambal Roti	Quality Continuity of production	Very good = 5 Good = 4 Ordinary = 3 Not Good = 2 Very Bad = 1	Ordinal

Validity test is used to determine the level of validation of the questionnaire instruments used in data collection. Using a valid and reliable instrument in data collection, it is expected that the research results will be valid and reliable (Sugiyono 2010). So that it can be seen that the questionnaire submitted to obtain data related to research to respondents is true and has been tested.   c. Data Reliability Test Reliability testing in this study was carried out by calculating the value of Cronbach's Alpha instruments from each of the research variables tested. The formula used is as follows:

1. Calculate item variance (σ_b^2):

$$\sigma_b^2 = \frac{\sum Xi^2 - \frac{(\sum Xi)^2}{N}}{N}$$

2. Count the number of variances item ($\Sigma \sigma_b^2$):

$$\Sigma \sigma_b^2 = \sigma_b^2 1 + \sigma_b^2 2 + \ldots + \sigma_b^2 n$$

3. Calculates the total variance (σ_t^2):

$$\sigma_t^2 = \Sigma (\Sigma Xi)^2 - \frac{(\Sigma Xi)^2}{N}$$

4. Determine the Cronbach's Alpha reliability coefficient:

$$\alpha = \left(\frac{k}{k-1}\right)\left(1 - \frac{\Sigma \sigma_b^2}{\sigma_t^2}\right)$$

Information:

α   = Reliability coefficient Cronbach's Alpha

k = Number of items

Xi = Item answer

σ_b^2 = Item variance

σ_t^2 = Total variance

N = Nymber of population

Reliability measurement indicators according to Sekaran (2000) which divide the level of reliability with the following criteria:

If alpha or r count:

1. 0.8 - 1.0: Good reliability

2. 0.6 - 0.799: Reliability is accepted

3. Less than 0.6: Reliability is not good

Tool for Analyzing the Conditions, Risks and Consequences of the Jambal Roti Salted Fish Supply Chain

The analysis of the conditions of jambal roti salted fish supply chain management was carried out using the product flow and financial flow approach which was described descriptively qualitatively and supported by an evaluation of the indicators in the two streams based on the opinions of selected respondents. The product flow approach includes marketing objectives, application of supply chain management, demand and supply. The approach to financial flows covers capital and payments (cash and payment due).

In abnormal supply chain conditions, there are risks that can threaten the sustainability of supply chains, both those that are easy to replace and those that are not easily replaced quickly in the management timeframe (Neureuther & Kenyon 2009). This risk value is referred to as a risk consequence (α) which can be calculated using the following formula:

$$\alpha = \frac{\delta \text{ replace}}{\delta \text{ collapse}}$$

Information:

α : The risk consequences of a product in the supply chain

δ replace : The time needed for a supply chain to replace a sub-product or the time needed to handle a disruption of a product flow, and return it to normal scheduling conditions with the same level of quality.

δ collapse   : The time of the sub-product failed to be completed before the supply chain suffered a loss at a critical point in its market service.

Assessment indicators for the risk of supply continuity are presented in Table 2 .

Table 2. Risk Consequences Value

Consequences	Information	α
Important	Irreplaceable	1.0
Needed	Not easy to replace	0.6
Needed	Easy to replace	0.3
Desirable	Easy to replace	0.1

3. RESULTS AND DISCUSSION

General Conditions of Pangandaran

Pangandaran District Marine and Forestry Department (2014) states that the geographical location of Pangandaran region is at coordinates $108^0 18$'-$108^0 47$'W and $7^0 30$'20''-$7^0 50$'00''S with adjacent territorial borders north namely Ciamis District; west of Tasikmalaya District; east of Cilacap District, Central Java; south of the Indonesian Ocean.

The value of marine fish produced by fishermen who entered the Fish Auction Place in Pangandaran in 2017 reached 2,831 tons with a value of IDR. 68.94 billion (Department of Marine Fisheries and Food Security in 2016- 2018).

Characteristics of Respondents

Respondents were obtained with a snowball sampling technique where the first respondent provided information to get the next respondent. Respondents were obtained include raw material suppliers, processors and jambal roti salted fish traders with a range of age that is still in a productive state.

Instrument Testing

a.Test Data Validity

Each item in the questionnaire was tested for its validity level to be able to determine the level of accuracy of the answers obtained from the results of the questionnaire. The value of validity in each questionnaire is higher when compared with the r value of the table with a significance level of 0,05.

b.Data Reliability Test

Each item in the questionnaire was tested for its reliability to be able to determine the level of consistency of the answers given by the respondents. The Cronbach Alpha coefficient value obtained is more than 0.6 which indicates that the questionnaire data is good and acceptable.

c.Analysis of the Condition of the Jambal Bread Salted Fish Supply Chain

The condition of the jambal roti salted fish supply chain in Pangandaran District is going well. This is indicated by the flow of products from the procurement of raw materials to the consumers as they should. The payment system carried out is cash and payment due in accordance with the agreement between the two parties. Some risk that must be faced by the perpetrators of the supply chain jambal roti salted fish included the availability of raw materials manyung fish and salt, late payments, weather, rot after the product is finished, jambal roti unsold and fraud ordering raw materials are worth the consequences are not easily replaceable and irreplaceable with its important and necessary characteristics.

The distribution cahannel of jambal roti salted fish supply chain in Pangandaran District, detail presented in Table 3.

Tabel 3. Distribution Channel of Jambal Roti Salted Fish Supply Chain

	Fisherman	→	Processors	→	Traders		
(1)	(22.000 IDR/kg)	(12 hour)	(100.000 IDR/kg)	(2 hour)	(120.000 IDR/kg)		
	Fisherman	→	Fish Auction Place	→	Processors	→	Traders
(2)	(20.000 IDR/kg)	(12 hour)	(21.000 IDR/kg)	(1 hour)	(110.000 IDR/kg)	(2 hour)	(120.000 IDR/kg)
	Fisherman	→	Collectors	→	Processors	→	Traders
(3)	(16.000 IDR/kg)	(12 hour)	(17.500 IDR/kg)	(36 hour)	(100.000 IDR/kg)	(2 hour)	(120.000 IDR/kg)

Each distribution channel has its own characteristic. Time of efficiency and the best quality of jambal roti salted fish is channel (1). Overall the channel has the same price for each consumer or traders.

4 .CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Supply chain conditions of jambal roti salted fish in Pangandaran District went pretty well. There are three distribution channels are (1) fisherman > processors > traders, (2) fisherman > Fish Auction Place > processors > traders, (3) fisherman > collectors > processors > traders with time efficiency in distribution channel (1). The risk that must be faced by the jambal roti salted fish supply chain perpetrator is the availability of manyung fish (0.6) and salt (0.6), late payments (0.6), weather (1.0), decay after the product is finished (0.6), unsold jambal roti (1.0) and fraudulent ordering of raw materials (1.0). The value of the risk consequences is not easily replaceable and irreplaceable with its important and necessary characteristics.

Recommendations

Further research is needed regarding farmer share and market share in order to find out how much profit is gained by each of the jambal roti salted fish supply chain perpetrators.

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