Analysis of supply chain management of shallots in Medan

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Abstract. Supply chain is important for business. One of supply chain that needs to be studied is the shallots supply chain. Medan have high demand while the supply of shallots is limited. This study aims to analyze the flow of shallots supply chain distribution in Medan. The method used was survey by using questionnaires to shallots producers, collecting traders, distributors, traders as well as government involved in shallots supply chain. Descriptive analysis was used to explain the shallots supply chain distribution flow. The results showed that there are two shallots supply chain model in Medan that was local shallots model and imported shallots model. Local shallots model could be distinguished based on three producer area, those were models of Medan Marelan, Samosir, and Simalungun. Medan Marelan and Simalungun models have seven supply chains, while the Samosir Model has eight supply chains. This condition indicates that the local shallots supply chain management in Medan was not efficient because of the length of the distribution channel. Supply chain imported shallots was more efficient because it had a shorter distribution flow with five supply chains.

1. Introduction

Shallot is a horticultural commodity belonging to spice vegetables. Problem nowadays is Medan’s Central Market needs a supply of 100 tons/day of shallots to complement the needs of consumers. However, the amount of production in North Sumatra aimed at the Medan’s Central Market is not sufficient to meet these needs. This can lead to scarcity and increasing the price of the shallots. Reported on Info Medan [1] the price of shallots reaches Rp 40,000.00/kg in Medan and shallots supply comes from Samosir and Java.

According Pujawan [2], components in supply chain management is divided into three main stream, namely: (1) The product component contains the flow of goods from the supplier to the consumer; (2) Component information contains order delivery and review of delivery status; (3) Financial component consists of credit line, payment and payment schedule, delivery accuracy and identity of owner.

![Supply Chain Model and 3 Flow of Managed Companies](image)

Figure 1. Supply Chain Model and 3 Flow of Managed Companies

Supply chain model and 3 kinds of flow managed by company as shown in Figure 1 [2]. Supply chain management is a process of regulating the flow of goods or products from a supply chain flow.
Supply chain management model applies how a network of production and distribution activities of a company can work together to meet consumer needs. The main goal of supply chain management is to deliver products on time to satisfy consumers, reduce costs, improve all outcomes of the entire supply chain, reduce time, centralize planning and distribution activities [3].

The structure of the supply chain of agricultural products according to Marimin and Maghfiroh [4] has a uniqueness because it does not always follow the order of the chain above. Farmers can directly sell their agricultural products directly to the retail market, thus cutting off the chain of middlemen, manufacturers and distributors. Manufacturers also do not have to supply products through their distributors to retail, but can go directly to customers. Customers here are usually big customers like restaurants, hospitals, or hotels. Manufacturers also use many services of exporters as distributors to market their products to international customers. The structure of the agricultural supply chain is shown in Figure 2 [4].

This case applies to the supply of shallots in Medan. The supply of shallots that pass through the supply chain is too long can hamper the way of distribution and cause of high price of shallots received by consumers. So supply chain needs cuts that can reduce the price of shallots and that commodities can enter the Medan central market on time and there is no scarcity.

Based on the implementation of the supply chain management theory, it is expected that shallots supply in Medan can be supplied evenly in the central market or distributor so that the price of shallots does not bounce up due to the low supply of shallots and this research purpose is analyzing the supply chain distribution flow at Medan.

2. Material and Method

2.1 Experimental design
The selected research location was Medan Central Market with the consideration that the market is the biggest consumers and distributors of the biggest shallots in Medan.

The sample of chains start from farmers is determined by snowball sampling method. Irianto and Mardikanto [5] stated that the snowball method is a sample selection technique by first defining a key person, then subsequent sample selection depends on the first informant, so on the longer rolling like a snowball. Thus it is expected that shallots supply chain at Medan can be identified.

For the farmers sample, at Medan there are 4 groups of shallots farmers are concentrated in the district of Medan Marelan. As for the area of Simalungun and Samosir which is the main supplier of shallots at Medan, joined 15 farmer groups. Based on the snowball sampling technique, there were 36 samples of producers (farmers) to be informants who have high enough shallot productivity scattered in some areas.

2.2 Data Analysis
Method of data retrieval is a process of activity needed in a research. The process will generate data. The data were divided into two sources, namely Primary and Secondary Data. The way of collecting primary data as follows (a) Field Observation; (b) Survey; (c) Documentation; (d) Questionnaire.
The way of collecting secondary data obtained from the department or institution associated with this research. Sources from these secondary data were obtained from the Department of Agriculture Medan and the Central Bureau of Statistics (BPS) of Medan. These data were the general state of the research area, number of traders, distributors, and producers and other data relating to this research.

Data analysis used in this research was descriptive analysis. Qualitative descriptive analysis is an analysis that describes the distribution and supply chain of shallots at Medan. In addition, this analysis also describes the implementation of shallots supply chain management at Medan.

3. Results
Result of research on distribution of shallots commodities at Medan there are two model of supply chain based on its variety. The first model for the shallots supply chain of Medan and Brebes, and the second model for imported shallots supply chains. In Medan and Brebes shallots supply chain, can be differentiated based on the producer's shallot. The results of the study of supply chain model for the Medan and Brebes shallots displays in Figures 3 to 6.

1) Supply Chain Model of Shallots Medan and Brebes from Medan Marelan

![Figure 3. Model Supply Chain Shallots Medan and Brebes from Marelan District Entering into the Central Market Medan](image)

Based on the study of primary data of supply chain actors and comparison of Indrajit and Djokopranoto [6] theory, can be found of supply chain of Shallots Medan and Brebes from Marelan District is having 7 (seven) supply chains. The first chain is the producer in Marelan, the second is a small collector dealers, the third chain is a big collector dealer, the fourth chain is the distributor of the central market, the fifth chain is the wholesaler, the sixth chain is the small retailers, and the last chain is the consumer.

According to the results obtained in the field, supply chain Shallots Medan and Brebes originating from the producers Marelan not efficient because of the long supply chain that is in the supply chain model of the shallot. This is similar to the theory expressed by Pujawan [2] that the longer the supply chain, the supply chain becomes more inefficient, due to the higher costs incurred.

2) Model of Supply Chain of Shallots Medan and Brebes from Samosir Regency

![Figure 4. Model Supply Chain Shallots Medan dan Brebes from Samosir Regency entering to Central Market in Medan](image)
Based on the study of supply chain primary data and comparison of Indrajit and Djokopranoto [6] theory, it is found that supply chain of Shallots Medan and Brebes from Samosir Producers is having 8 (eight) supply chains. The first chain is a producers in Samosir, the second is a small collector dealer spread in each subdistrict of shallots production center, the third chain is Samosir big collection dealer, the fourth chain is Siantarbig collector dealer, the fifth chain is the distributor of the central market, the sixth chain is the wholesalers, and the seventh chain is the small retailer and the last chain is the consumer.

The results obtained in the field, supply chain shallots Medan and Brebes from Samosir Producers not efficient because of the length of supply chain that is in the supply chain model of the shallot. This is similar to the theory expressed by Pujawan [2] that the longer the supply chain, the supply chain becomes more inefficient, due to the higher costs incurred.

3) Model Supply Chain Shallots Medan and Brebes from Simalungun Regency

![Figure 5. Model Supply Chain Shallots Medan dan Brebes from Simalungun which Entering to Central Market at Medan](image)

Based on the primary data supply chain actors and comparison of the theory of Indrajit and Djokopranoto [6] found supply of Shallots Medan and Brebes from Simalungun is have 7 (seven) supply chain. The first chain is a producers in Simalungun, the second is a small collector dealer in each sub-district of shallots production center, the third chain is Siantar big collector dealers, the fourth chain is the distributor of the central market, the fifth chain is the wholesaler, and the sixth chain is a small retailer and the last chain is the consumer.

The results obtained in the field, supply chain shallots Medan and Brebes from Simalungun have not been efficient because of the length of the supply chain that is in the supply chain model of the shallots. This is similar to the theory expressed by Pujawan [2] that the longer the supply chain, the supply chain becomes more inefficient, due to the higher costs incurred.

4) Model Supply Chain of Imported Shallots

![Figure 6. Model of Supply Chain of Imported Shallots](image)

Based on the primary data supply chain actors and comparison of the theory Indrajit and Djokopranoto [6] found the offender supply of Bawang Merah Medan and Brebes from Imported have 5 (five) supply chain. The first chain is the importer, the second is the distributor of the central
market, the third chain is the wholesaler, the fourth chain is a small retailer, and the fifth chain is the consumer.

Results obtained based on interviews with Head of Sarana and Infrastructure of North Sumatera Province and Deputy Head of Central Market Medan, imported shallots supply chain in Medan including efficient supply chain. Because the chain is not too long, then the selling price of imported shallots tends to be cheap. However, imported shallots in the central market is indicated the illegal shallots because the policy of shallots import has been closed by the government.

Based on the theory of Pujawan [2] there are 3 (three) streams managed in the supply chain. First is the flow of goods or commodities that flow from upstream to downstream, the second is the financial/money flow from downstream to the upstream, and the third is the flow of information that can flow from upstream to downstream or instead.

This study also obtained an overview of the three streams managed in the shallots supply chain at Medan. This description was obtained based on interviews of respondents and comparisons of the Pujawan’s theory [2]. Figure 8 shows the flow pattern in the shallots supply chain at Medan.

![Flow in the Supply Chain of Shallots at Medan](image)

**Figure 7.** Flow in the Supply Chain of Shallots at Medan

### 4. Conclusion and Suggestions

Based on the results of the analysis that has been done in the study, it can be obtained the following conclusions:

The local shallots supply chain distribution flow in Medan has not been efficient, due to the length of supply chain from producer to consumer. For imported shallots, the supply chain distribution flow is efficient because of the short supply chain from importer to consumer. The supply chain distribution flow is as follows: Local shallots supply chain distribution pattern (Medan and Brebes) based on production centre of Medan Marelan was Producers Marelan → Small Collector Dealers → Big Collector Dealers → Distributor → Wholesalers → Retailer → Consumer; Local shallots supply chain distribution pattern (Medan and Brebes) based on Samosir production center was Producers Samosir → Small Collector Dealer Simanindo, Pangururan, Sianjur Mulamula, Harian → Big Collector Samosir → Big Collector Dealer Siantar → Distributor → Wholesale → Retailer → Consumer; Local shallots supply chain distribution pattern (Medan and Brebes) based on Simalungun production centre was Producers Simalungun → Small Collector Dealers Haranggaol, Saribu Dolok, Purba, Dolok Silau → Big Collector Dealers Siantar → Distributor → Wholesaler → Retailer → Consumer; Distribution pattern of imported shallots supply chain was Importer → Distributor → Wholesalers → Retailer → Consumer.

Recommendations proposed to establish efficient supply chain management, need support from all supply chain actors in order to be optimally implemented. The establishment of efficient supply chain
management is able to optimize the speed of service time, creating prosperity among business actors throughout the supply chain. This can be realized through collaborative planning those are production and sales planning undertaken jointly by the parties that collaborate.

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