

Identification of Risk Event of Mushroom Supply Chain in Langsa City By SCOR Method

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Abstract. Supply chain risk management is a series of activities that consist of identifying and managing supply chain risk with a coordinated approach among members of the supply chain, to reduce the disruption that occurs along the supply chain member. The negative impact of risk management can reduce company performance. Business people always try to improve company performance to meet customer satisfaction from suppliers, manufacturers and distributors. Suppliers function to supply raw materials, additives, auxiliary materials, and spare parts needed by producers, while producers function to produce goods and services (output), and function of distributors to distribute output to consumers at the right time. This activity is called the supply chain. The risks that occur along the supply chain must be eliminated so that the products needed by consumers can be fulfilled properly. This research was conducted on mushroom cultivation in the city of Langsa. This research aims to identify risk agents that occur along the mushroom supply chain. The method used is Supply Chain Operations Reference (SCOR). The steps of the research carried out are conducting observation and research of literature, identifying research problems, setting research objectives, collecting data, and analyzing problem solving. The results in this research were found 21 risk events that caused the supply of mushrooms not to be distributed to consumers properly. Of the 21 risk agents who have the most potential occurrence are 3 risk even, they are mushroom demand from customers is not stable, mushroom stock shortage, and retailer is not operating

1. Introduction

Mushroom cultivation in the buket village of Meutuah, East Langsa district is one of the mushroom cultivation businesses in Langsa City. The cultivation business markets the mushrooms it produces in the city of Langsa and its surroundings. Mushrooms are very popular with consumers, besides the good taste of mushrooms also contain high nutritional value. Mushrooms are marketed in two ways, the first is marketed directly to consumers, the second is marketed through collectors, in this case collectors will channel the mushrooms to retailers. Then the retailer distributes mushrooms to consumers. Observations that have been made to various retailers are found to be difficult to get mushrooms but sometimes the mushroom supply at the retailer is excessive.

The mushroom production process through several stages begins with ordering mushroom seeds, preparing mushroom planting media, planting mushroom seeds, maintaining mushroom growth, mushroom harvesting and mushroom distribution. Business actors starting from suppliers, producers and distributors are called supply chains. The long supply chain causes the supply of mushrooms not easily obtained by consumers. A long supply chain, causing the risk that appears higher. The risk must be minimized so that the fungus reaches the consumer in the right time and place both in quality and quantity. These problems can be overcome through continuous improvement, which can support the company's performance.

The purpose of this research is to minimize the risks that occur along the mushroom supply chain. Risk events are caused by risk agents. Risk events can be caused by several risk agents. One model of the supply chain performance measurement system is the method of Supply Chain Operation Reference (SCOR) [1]. The SCOR method helps solve problems that occur, it describes the risk based on the company's business processes. Even when interviewing consumers, most of

them say mushrooms are a rare object, and vice versa when we find it easy to find mushrooms in various retail. The instability of the mushroom supply causes the performance of business people along the supply chain to be unstable.

2. Literature References

Supply chain is a network of companies that work together to create and deliver a product to the end user or consumer [2]. Supply chain systems involve the process of producing, shipping, storing, distributing and selling products in order to meet the demand for these products. Including production processes in manufacturing, transportation systems that move products from manufacturing to retailers, warehouses for product storage, distribution centers where large quantities of shipments are divided into small parts to be sent back to stores and finally to retailers who sell these products. It can be said that there are 3 (three) types of flow that must be managed in the supply chain, namely first, the flow of goods flowing from upstream to downstream. Second, is the flow of money and the like that flows from downstream to upstream. Third, is the flow of information that can occur from upstream to downstream or vice versa [3].

The purpose of the supply chain is to ensure a product is in the right place and time to meet consumer demand without creating excessive or deficient stocks. Efficient operation of the supply chain depends on the complete and accurate flow of data relating to the product requested from the retailer to the buyer, the transportation system and the system of return to manufacturing [4].

The supply chain strategy is basically not a single decision or action but rather a collection of various decisions and actions carried out by an organization or by several organizations together. Long-term goals that have been determined are the target of implementing various decisions and actions [5].

The supply chain strategy is a collection of activities and strategic actions along the supply chain that create reconciliation between what the end customer needs and the ability of the resources that exist in the network [2]. The strategic supply chain objectives in an organization are so that companies become winners or at least survive in market competition for available products, such as low prices, quality products, timely receipt of products and products available in various variations. The four strategic objectives are very important in the eyes of customers, even though the level of importance of each will be different, so is the market segment. The four objectives also depend on the ability of the resources that the organization has, usually seen from the ability to operate efficiently, create products that are quality, fast, flexible and innovative

Risk is a form of uncertainty about a situation that will occur in the future against decisions taken based on various considerations at this time. Understanding of risk according to Ricky W. Griffin and Ronald J. Ebert [6] is the uncertainty about future events. Risks can arise anywhere and risks tend to increase every year due to world globalization, world liberalization and faster information processing and faster investor reactions. [7].

Supply chain risk management is a risk approach method in the supply chain, where the risk events occur in supply chain activities such as scheduling, technology, and cost uncertainty [8]. These risk events can be addressed separately depending on the assumption of the risk event, the risk in the supply chain is divided into 3 categories, including the following:

1. Internal risk, including risk events in processes and control activities
2. External risk, covering sub categories of supply demand and risk
3. 3.Other external risk, covering sub-categories of risk events in an environment that affects upstream and downstream.

SCOR is a reference model of supply chain operations. Like the framework described in the previous section, SCOR is basically a process-based model. This model integrates three main elements in management, namely business process reengineering, benchmarking, and process

measurement into a cross-functional framework in the supply chain [9]. The three elements have the following functions:

- a. Business process reengineering essentially captures complex processes that occur at the moment (as is) and defines the desired process (to be).
- b. Benchmarking is an activity to obtain operational performance data from similar companies. The internal target is then determined based on the best performance in the company.
- c. Process measurement functions to measure, control, and improve supply chain processes.

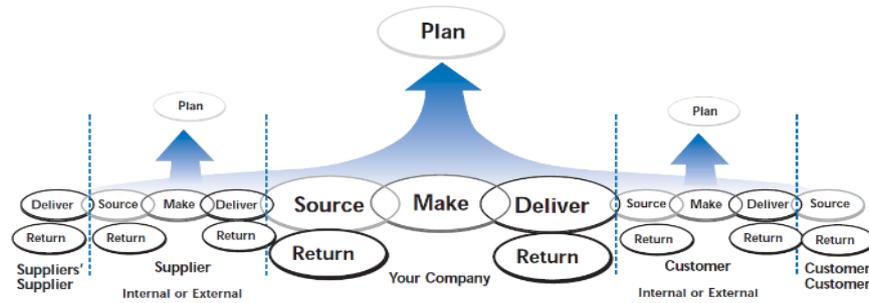


Figure 1. Five Core Process of Supply Chain in SCOR Model [10]

As shown in Figure 1, SCOR divides supply chain processes into 5 core processes, namely plan, source, make, deliver, and return. The five processes function as described, namely:

1. Plan, which is a process that balances demand and supply to determine the best action in meeting the needs of procurement, production and delivery. The plan includes the process of estimating distribution needs, inventory planning and control, production planning, material planning, capacity planning, and aligning the supply chain plan with the financial plan.
2. Source, namely the process of procuring goods and services to meet demand. The process covered includes delivery scheduling from suppliers, receiving, checking, and authorizing payments for goods sent by suppliers, selecting suppliers, evaluating supplier performance, and so on. The type of process can differ depending on whether the items purchased include stocked, make to order, or engineer to order products.
3. Make, which is the process of transforming raw materials / components into products that customers want. Make or production activities can be carried out on the basis of predictions to meet stock targets (make to stock), based on order (make to order), or engineer to order. The processes involved include production scheduling, production activities and quality testing, managing work in process, maintaining production facilities, and so on.
4. Deliver, which is a process to fulfill the demand for goods and services. Usually includes order management, transportation, and distribution. The processes involved include handling orders from customers, choosing a shipping service company, handling warehousing of finished products, and sending bills to customers.
5. Return, namely the process of returning or receiving product returns for various reasons. Activities involved include identification of product conditions, requesting authorization for defective returns, scheduling returns, and making returns. Post-delivery customer support is also part of the return process.

3. Research Methods

The stage of this research can be described as follows:

- a. Field Review

Field Review is an activity carried out to identify the condition of the company and find problems related to the identification of the causes of risk in the mushroom supply chain.

- b. Study of literature

Study of literature is collecting information related to the themes researches through text books, previous research journals and related magazines

- c. Identification of the problem
Identification of the problem in this researches is that mushroom supply is not always fulfilled throughout the supply chain.
- d. Research objective
At this stage set the research objectives. As for the purpose of the research is to identify the causes of risk in the mushroom supply chain.
- e. Data Collection
Data collection is getting the data needed to identify risk events that occur along the supply chain by means of field surveys, interviews, and questionnaires
- f. Data Processing
Processing data in this research is as follows:
Recapitulate the questionnaire
Calculating the probability of a risk agent
- g. Problem Solving Analysis
– Analyze data processing that has been done
- h. Conclusion
Conclude the research obtained from the results of data processing and analysis.

The stages of this research can be seen in Figure 2.

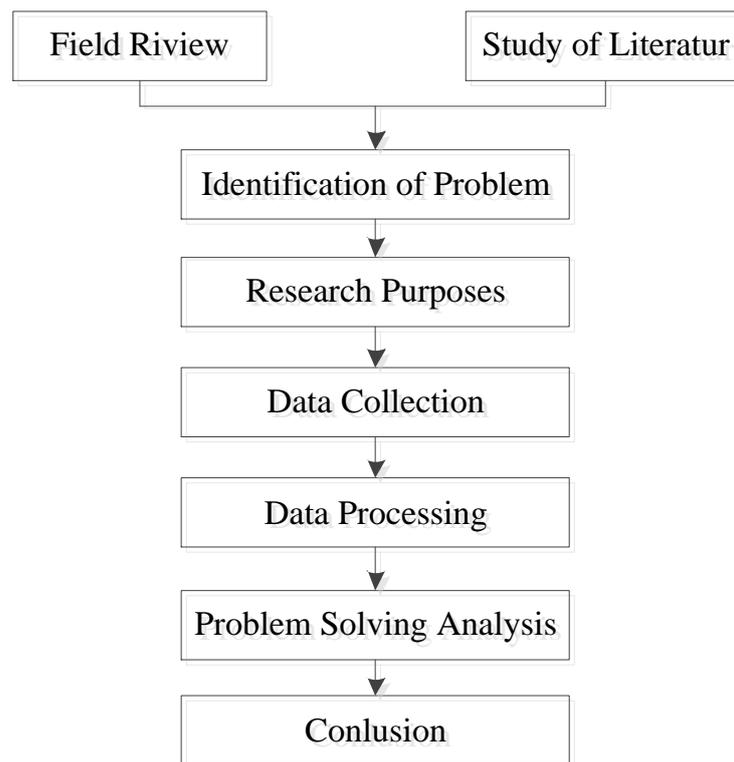


Figure 2. Stages of Research

4. Results

4.1. Business Process of Mushroom Supply Chain Mushroom

Business process of mushroom supply chain mushroom can be seen in Table 1.

Table 1. Business Process of Mushroom Supply Chain Mushroom

Business Process	Sub Business Process
Plan	Demand forecasting
	Production planning
	Delivery planning
Source	Procurement of mushroom seeds
	Check the quality of mushroom seeds
	Mushroom seed storage
Make	Mushroom production process
	Mushroom packaging
	Quality Control
Deliver	Product delivery
Return	Mushroom return from the customer
	Returning mushroom seeds to suppliers

4.2. Identify Even Risk

Identification of the causes of risk from the mushroom supply chain is obtained through interviews with managers of mushroom cultivation businesses, collectors and retailers. The results obtained by identifying the causes of risk can be seen in table 2.

Table 2. Identification the Causes of Risks

Code	Risk Event
A1	Mushroom demand from customers is not stable
A2	Uneven harvest period
A3	Damaged planting media
A4	Mushroom stock shortage
A5	Communication with suppliers is not effective
A6	The procedure for purchasing orders to suppliers has not been standardized
A7	Mushroom seeds out of stock
A8	Mushroom prices are not stable
A9	Error choosing the type of mushroom shipment
A10	Long time delivery of mushroom seeds
A11	Mushroom seeds cannot be used
A12	The package of the mushroom seeds is damaged
A13	Non-standardized mushroom seed storage
A14	Mushrooms grow too long
A15	The package of the mushroom is damaged
A16	Mushroom distribution takes a long time
A17	Mushroom quality decreases

Code	Risk Event
A18	The procedure for purchasing orders by distributors has not been standardized
A19	Mushrooms are not sold out
A20	The procedure for purchasing orders by retailers has not been standardized
A21	Retailer is not operating

4.3. Determining the Probability Level of the Risk Event

Risk event probability is defined as how often the frequency of occurrence of the cause of risk occurs. Each risk event will have a different proportion of emergence opportunities even though the causes of this risk are both triggers for a risk. A cause of risk that has a high probability value, then it must be minimized.

This risk event assessment was obtained by giving a questionnaire to the internal parties involved in the mushroom cultivation business, followed by an interview to discuss the results of the questionnaire filling that had been done. The order of the probability of fungal risk can be seen in table 3.

Table 3. Sequence of Probability Levels Causes of Mushrooms Risks

Aj	Risk Event	Probability
A1	Mushroom demand from customers is not stable	8
A4	Mushroom stock shortage	6
A21	Retailer is not operating	6
A7	Mushroom seeds out of stock	5
A10	Long time delivery of mushroom seeds	5
A2	Uneven harvest period	4
A5	Communication with suppliers is not effective	4
A19	Mushrooms are not sold out	4
A6	The procedure for purchasing orders to suppliers has not been standardized	3
A18	The procedure for purchasing orders by distributors has not been standardized	3
A13	Non-standardized mushroom seed storage	3
A12	The package of the mushroom seeds is damaged	3
A11	Mushroom seeds cannot be used	3
A16	Mushroom distribution takes a long time	3
A20	The procedure for purchasing orders by retailers has not been standardized	3
A17	Mushroom quality decreases	2
A9	Error choosing the type of mushroom shipment	2
A15	The package of the mushroom is damaged	2
A3	Damaged planting media	2
A14	Mushroom quality decreases	2
A8	Unstable mushroom prices	1

5. Conclusions

The conclusion in this research is the mushroom supply chain risk assessment using the SCOR method to identify 21 event risk, which has a high probability (7 d.d 10) is 3 event risk, namely mushroom demand from customers is not stable, mushroom stock shortage, and retailer is not operating.

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