



Identifying Supply Chain Performance of Organic Rice in Lampung

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ABSTRACT

Lampung Province has organic rice fields which always increase with a planting area of 65.78 hectares. The problem of farmers is the limited access to the organic rice market. Products can't be sold at organic prices; some are still sold by farmers at non-organic prices. Organic rice supply chain networks need to be identified by farmers so that farmers have market information and supply chain performance. For this reason, this research purpose to analyze the supply chain of organic rice in Pringsewu Regency. Data analysis method uses the concept of supply chain performance with the Supply Chain Operations Reference (SCOR) approach. SCOR consists of five elements including flexibility, reliability, responsiveness, assets, and cost. The results of performance organic rice supply chains at all levels in the attributes of flexibility and responsiveness have achieved the superior performance position. The performance of organic rice supply chains attributes of asset at the farm level only achieves an advantage. But the supply chain performance in the attribute of reliability has not been able to reach a good performance position. So, there needs to be an improvement effort through disciplinary shipping arrangements and product quality improvements to improve supply chain performance.

Keywords: Supply chain, organic rice, performance

I. INTRODUCTION

National food security is a development goal in Indonesia, the condition of fulfilling food for households which is reflected in the availability of sufficient food [1]. In addition, the National Food Security Framework is based on food availability, supply stability, and food access [2]. An increase in population will increase the amount of food demand. The main food ingredients of the community consist of rice, maize, and cassava [3]. As the main food in Indonesia, rice has an important position in determining community welfare policies. Availability of rice, both quantity and quality, is an indicator of food security [4].

Organic farming is becoming known to the public given the negative impact of using chemical fertilizers and pesticides, so the awareness of the community begins to consume safe and healthy foods. The concept of organic farming is different from conventional farming in terms of soil fertility, seed use, management of plant pests and diseases, product quality and production stability [5].

Organic rice production is still being increased by the government through various policies, including the government budgeting organic fertilizer subsidies to around 11.75 million tons with a budget of Rp.11.86 trillion, and the Ministry of Agriculture's policy to make a Strategic Plan for 2015-2019 regarding the concept of organic villages food crops, organic fertilizer processing tools [6].

Lampung Province is one of the national rice production centers outside Java which has always experienced an increase in production. According to [7], rice production in Lampung



Province reached 3,320,064 tons, planted area of 648,731 hectares and productivity levels reached 4.2 tons / ha. Rice production centers in several districts can be seen in Figure 1.

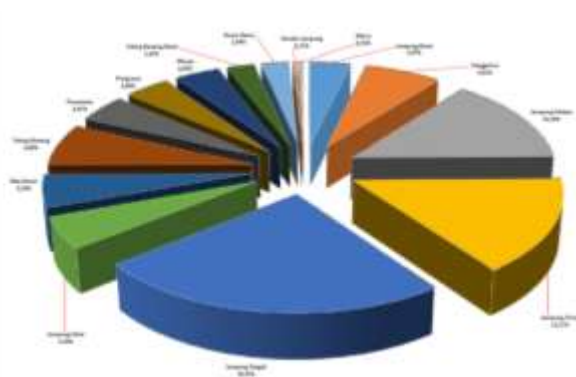


Figure 1. Distribution of rice production by Regency / City in 2014

Based on Figure 1, it can be explained that the rice production center is in Central Lampung Regency, followed by South Lampung, East Lampung and Pringsewu. The four districts have the potential to be able to produce rice production in Lampung Province. The Lampung Provincial Government began cultivating organic rice since 2010 with a planting area of 65.78 hectares. The largest of organic rice planting areas is in Pringsewu Regency, which is 35 hectares [8]. The potential for developing organic rice is very good seeing the rice planting area reaching 23,611 hectares and 88,129 hectares in each of these regencies can be expanded with various agricultural extensification programs [9]. The amount of demand for organic rice in Indonesian reaches 1.1 quintals and this should be an opportunity besides the higher selling price of organic rice. The benefits of growing organic rice increase soil fertility, minimize production costs because they only use organic fertilizer / compost, free of pesticides, and health benefits for the body. In addition, it is beneficial for antihypertensive diseases, cancer, cholesterol, anti-oxidants, and diabetes medications [10].

The productivity of organic rice is contributor to the supply of organic rice in order to fulfill the demand for high-quality rice if supported by clear marketing. The marketing / trading process should play an important role in supporting the distribution of production to consumers. Trading is the flow of delivery of goods and services from producers through various stages to consumers [11]. The third system is efficient when supported by a series of organizations that are interdependent in moving goods / services. This series of organizations will bring goods / services moving from the producer to the consumer, called the marketing channel. The function of marketing channels according to [12] is able to overcome relations that are not efficient in marketing activities. The marketing channel is able to shorten the number of transactions needed to be able to deliver goods to customers from producers and make the variety of goods available in one location only. This method can illustrate efficiency.

The problems of organic agriculture in Lampung Province include limited production capital and market information. The limited capital experienced by farmers includes narrow land ownership, the average farmer in Lampung Province has a land area of less than 0.5 hectares. Another limitation of capital is production capital. Seasonal nature of agricultural crops causes organic rice farmers to have income according to the harvest season. Limitations of market information and marketing channels that have not been clear cause the market conditions for organic rice to be marketed locally, some farmers sell organic rice at the price of ordinary / non-organic rice, and sell to middlemen who make organic rice produced by farmers become trademarks of other regions. This problem causes the acceptance of organic rice farmers in Lampung Province to be less than optimal. The selling price of organic rice at the farmer level is IDR 12,000/kg, while for non-organic rice is IDR 8,000/kg. The price margin should be an opportunity for farmers to increase farm income.

The supply chain concept is used to create cooperation between organic rice supply chain actors so that they can meet consumer needs, with a structured supply chain that will provide satisfaction and create trust in customers. Supply chain management application to determine the existing supply chain performance position. Marketing activities can run efficiently if it has a clear marketing channel, so in this research purpose to analyze the supply chain management performance organic rice in Pringsewu Regency Lampung Province.

II. METHOD

This research uses the method of observation and in-depth interviews (indept interview). Respondents in this research were deliberately chosen (purposive sampling), including organic rice farmers, farmer groups, collectors, and retailers. Data analysis method uses the concept of supply chain performance with the Supply Chain Operations Reference (SCOR) approach. The model of the SCOR popularized by the Supply Chain Council (SCC) [13]. SCOR is a conceptual model consisting of three main elements, namely business process reengineering, benchmarking, and process measurement [14, 15]. SCOR consists of five elements including flexibility, reliability, responsiveness, asset, and cost [16, 17]. The five attributes are a supply chain performance measurement tool that is divided into two, namely internal performance and external performance. The internal performance attributes are assets and costs, while external performance attributes include reliability, flexibility, and responsiveness. Reliability is the ability to carry out work as expected; on time, the quality according to the standard requested, and the amount as requested. Responsiveness is the speed in carrying out work, among others, measured in the cycle of order fulfillment. flexibility is the ability to respond to external changes in order to remain competitive in the marketplace. Measuring tools, including flexibility and adaptability. Meanwhile, assets are the ability to use assets productively, among others, indicated by low inventory levels and high capacity utilities. The performance attribute will be reduced to the following performance matrices:

Reliability

1. Delivery performance

The percentage of delivery of orders on time that corresponds to the date of the consumer's order and or the date the customer wants, expressed in percent. Mathematically, it can be seen as follows:

$$\frac{\text{total products delivered on time}}{\text{total product shipments}} \times 100\%$$

2. Compliance to quality standards

The percentage of product shipments that comply with consumer desires, expressed in units of percent.

$$\frac{\text{Total shipments that conform to the standard}}{\text{total product shipments}} \times 100\%$$

3. Order fulfillment

The percentage of product shipments according to demand and fulfilled without waiting, expressed in units of percent.

$$\frac{\text{fulfilled demand without waiting}}{\text{total Consumer demand}} \times 100\%$$

Flexibility

The average time flexibility needed to respond when there is a change in orders in terms of both addition and subtraction without penalty fees, is written in units of days.

Flexibility = cycle of searching for goods + cycles of packing goods + cycle of sending goods

Responsiveness

1. Lead Time

Fulfillment Orders required from customers, expressed in units of days.

2. Order fulfillment cycle time

Order fulfillment Cycle is time needed for one-time order to supplier, expressed in units of days.

Order Fulfillment Cycle = planning time + sorting time + packaging time + shipping time

Asset

1. Cash to Cash Cycle Time

The time between a supply chain actor pays organic rice to the previous actor and receives payments from the supply chain after that, expressed in units of days.

Cash to cash cycle time = Inventory days of supply + average days of accountreceivable - average days of accounts payable.

2. Daily Inventory

When the availability of products that are able to meet the needs of consumers if there is no continuous supply of products, expressed in units of days.

$$\text{Daily Inventory} = \frac{\text{average demand}}{\text{average needs}}$$

Cost

Total Supply Chain Cost (TSCC) is the total cost of post-harvest management and organic rice logistics as a percentage of revenue, expressed in units of percent.

Total supply chain costs = Planning Costs + Procurement Costs + Packaging Costs + Shipping Costs + Service Fees

After each supply chain performance matrix is measured and calculated, the resulting values are compared with the *foodSCOR* card value, as the benchmark value [18]. The benchmark value used in this study is a combination of Supply Chain Council provisions and supply chain measurements in companies that are in the context of a competitive environment [19].

3. RESULT

The supply chain performance of organic rice was discussed is Sri Lestari Farmers in Pringsewu Regency. conducted to assess the supply chain activities of organic rice, conformity with supply chain objectives, and determine corrective actions both managerially and technically. Steps to improve at the level of the supply chain of organic rice can increase the competitiveness of each member of the supply chain. The measurement performance is based on the SCOR matrix which is divided into two types of performance, is internal and external performance. Internal performance can be seen based on asset and cost attributes, external performance can be measured by the attributes of responsiveness, attributes of flexibility, and reliability attributes. In supply chain evaluation, the head of the farmer group requires a comprehensive approach in order to be able to compare performance from various perspectives from the organization. In this discussion, the company's performance will be divided into two discussions, based on internal and external performance. The average value of performance attributes of the organic rice supply chain in the Sri Lestari Farmers is presented in Table 1.

TABLE 1. RESULTS OF MEASUREMENT OF SUPPLY CHAIN PERFORMANCE OF ORGANIC RICE

SCM attribute	Indicator	Benchmarking			Averege
		<i>Parity</i>	<i>Advantage</i>	<i>Superior</i>	
Reliability	Delivery performance (%)	85.00-89.00	90.00-94.00	≥95.00	73
	Order fulfillment (%)	94.00-95.00	96.00-97.00	≥98.00	100
	Compliance to quality standards (%)	80.00-84.00	85.00-89.00	≥90.00	65
Flexibility	Flexibility (days)	42.00-27.00	26.00-11.00	≤10.00	10
Responsiveness	Lead time (days)	7.00-6.00	5.00-4.00	≤3.00	1.6
	Order fulfillment cycle time (days)	8.00-7.00	6.00-5.00	≤4.00	2
Cost	Total supply chain cost (%)	13.00-9.00	8.00-4.00	≤ 3.00	11.4
Aset	Cash to cash (days)	45.00-34.00	33.00-21.00	≤21.00	23
	Daily inventory (days)	27.00-14.00	13.00-0.01	=0	0

3.1 Internal Supply Chain Performance

Internal performance is a measurement of supply chain activity that involves more resources from farmers. Internal supply chain performance can be measured through two attributes, namely costs and assets. Asset attributes will be calculated using two approaches, the time between supply chain actors pay and receive payments for products and daily supplies [18]. While the cost attribute was not measured in this study because of the limitations of farmers' data.

a. Cash to Cash Cycle Time.

This performance attribute will calculate the speed of the supply chain to convert inventory to money. The faster the time used to change inventory, is the better supply chain performance [17]. Based on Table 1, the value of cash to cash cycle time is 23 days and is in the advanced category. This means that cash turnover at the farmer group level has not reached a superior position because it is more than 21 days. The average payment time of traders to farmer groups is 23 days, and farmer groups pay directly to supplier farmers on the same day that farmers are asked to come to farmer groups. The efforts that can be made to improve the performance of money circulation are by providing cooperation agreements with partners regarding the payment period. According to [20], the closer the standard standard suitability value is to less than <21 days, the better the supply chain performance.

b. Daily Inventory

Daily inventory is the duration of sufficient inventory to meet the needs if there is no further supply, expressed in units of days. After harvest, the farmers directly sell their product to consumers. There is no stock or stock of organic rice stored by farmers. Therefore, the daily inventory value at the farmer's level is zero. When compared with the SCOR card performance evaluation value, the daily inventory value is included in the superior criteria, because the average value of farmers' daily inventory is less than 27 days. This is in accordance with the supply chain objectives, which is to ensure that a product is in the right place and time to meet consumer demand, and ensure that inventory is neither excessive nor less [21].

c. Total supply chain cost

The total supply chain cost is the amount of costs incurred by farmers for business activities ranging from post-harvest to organic rice to the hands of retail partners. This fee is expressed in units of percentages and is calculated from the number of sales accepted by farmers. The average value of the total supply chain cost getting smaller, indicating that supply chain performance is getting better. Table 1 shows that farmers have TSCC achievement values of 11.4 percent and are in the parity category. The supply chain performance of farmers in Lampung province in terms of cost management is still not good. There needs to be

improvement efforts to minimize supply chain costs that have the potential to lead to wasteful allocation of funds. The average management costs of supply cannot be a benchmark for the success of a company in managing supply chain networks [18]. Farmers usually pay little attention to expenses such as planning and procurement costs, so the value of supply chain costs becomes bias.

3.2 Eksternal Performance

External performance is the performance of a supply chain member that involves direct activities and deals with outside parties in an effort to fulfill needs optimally. External performance can be measured through six assessment matrices as derivatives of supply chain attributes, namely delivery performance, order fulfillment, standard conformity, order fulfillment lead time, one period of order fulfillment, and flexibility [18].

a. Delivery Performance

Delivery performance is the percentage of delivery of orders on time that corresponds to the date of the consumer's order and or the date the customer wants, expressed in percent. Farmers always send orders on time with dates desired by consumers within one to two days, but the calculation of the performance of organic rice delivery is calculated within one day and there are three farmers who can meet consumer needs within one day. Table 1 shows that the average value of organic rice delivery performance is 73% or does not have good performance in carrying out supply chain activities. Thus, it can be said that farmers have not been able to meet partners' requests in a timely manner. Timeliness in delivery will affect supply chain reliability. Improvement efforts to increase market share and sales are through product innovation strategies and discipline of delivery time, because both of these actions reflect the strong characteristics of the responsiveness, flexibility, and reliability of a company so that it can influence the increase in company asset ownership Mentzer et al. cited by [21].

b. Order fulfillment

Order fulfillment is the percentage of the number of consumer requests that can be fulfilled without waiting, expressed in percent. All farmers always fulfill orders on time without waiting. The greater the average value of fulfillment of supply chain orders, the better the performance of supply chain performance. According to Table 1, the average performance value of fulfilling orders for organic rice from farmers is 100%, meaning that farmers have been able to meet supply chain performance.

c. Compliance with Standards

Every consumer wants the product purchased according to his wishes. Consumer satisfaction is the ultimate goal of a supply chain of organic rice. Consumer satisfaction indicators are products that are in accordance with the standards desired by consumers. In Table 1, it can be seen that the standard conformity of organic rice products is 65%, meaning that organic rice products have not been able to meet parity position requirements or are in a position of gap parity. This shows that the ability of farmers to meet consumer standards has not yet reached a good position. The efforts that can be made to improve product standard conformity capabilities are by providing training in post-harvest activities to partner farmers regarding product sorting, separating menir, grain, yellow rice, head rice, and rice milling processes that are still mixed with non-organic. Kelompoktani can also provide rewards to motivate farmer members to supply products that are in accordance with retail standards optimally. [20] explained, the closer the standard value of standard suitability to 100%, the better the supply chain performance.

d. Flexibility

Farmers need time to process unexpected orders, both in order to add and reduce the amount commonly referred to as supply chain flexibility. If there is an order, the farmer immediately gets information from the chairman of the Sri Lestari farmer group, and immediately works on the order. The steps taken by farmers are grinding rice into rice into the mill, sorting rice, and packing rice. In Table 1 it can be seen that the flexibility value of the organic rice supply chain is 10 days. That is, the cycle of fulfilling company orders reaches a superior [18]. Then it can be said that farmers are able to fulfill changes in orders not unexpectedly very well, namely in brackets of less than 10 days. The farmer's ability will make retailers feel satisfied in cooperating.

e. Lead Time

Lead time is the waiting time used by farmers to fulfill retail orders known from the value of the average waiting time used by companies to meet retail demand in one supply shipment. Table 1 shows that the average order fulfillment lead time value is 1.6 days, meaning that supply chain performance at the order fulfillment lead time indicator has reached a superior or excellent position. The standard time for order fulfillment lead time if ≤ 3 days is included in the superior criteria [18].

f. Order Fulfillment Cycle

Every time the order fulfillment period shows the length of time it takes the company to fulfill a single order [21]. The lower the order cycle value, the better the performance of supply chain [16]. Table 1 can be seen that the value for the cycle of order fulfillment of organic rice on average is 2 days and this is less than four days, meaning that the cycle of fulfilling the orders of farmers has reached the best or superior position. After the order is prepared by the farmer, the farmer sends his order to the consumer (collector) using a two-wheeled vehicle. Calculation of order fulfillment cycle is done by summing several time variables, namely planning time, sorting time, packaging time, and delivery time.

in general, the performance of the organic rice supply chain has not been efficient, so that it needs to be improved to be efficient. The prospect of developing organic rice is very good because the efficiency value indicates that the business is economically feasible [22].

4. CONCLUSION

Supply chain performance of organic rice at all levels in the attributes of responsiveness and flexibility have achieved the superior performance position. The supply chains performance of organic rice attributes of asset at the farm level only achieves an advantage. But the supply chain performance in the attribute of reliability and cost has not been able to reach a good performance position. So there needs to be an improvement effort through disciplinary shipping arrangements, product quality improvements, and cost efficiency to improve supply chain performance.

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