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The Analysis of Organic Dry Lettuce (*Lactuca sativa L*) Supply Chain at CV. Artha Krina Denpasar, Bali

Putu Fajar Kartika Lestari[1], I Made Tamba[2], Tengku Ramadan Syah[3]
[123]Agribusiness Study Program, Faculty of Agriculture and Bussiness, Universitas Mahasaraswati Denpasar, Bali
* Corresponding author. email: pfajarkartika@unmas.ac.id

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Abstract
Organic curly lettuce is one of the products in the organic market with increasing demand due to growing awareness of healthy lifestyles and environmental sustainability. Supply chain management activities are carried out to add value to the products offered and in turn, directly enhance the company's competitiveness. A well managed supply chain can increase the company product sales and improve customer satisfaction by delivering high quality products at low costs, accompanied by fast and responsive service. This study aims to analyse the supply chain performance of organic curly lettuce (Lactuca sativa L) at CV Artha Krina Denpasar, Bali, using the Supply Chain Operations Reference (SCOR) method. The analysis includes supply chain mapping, performance measurement based on SCOR attributes, and identification of constraints and potential solutions. The results showed that supply chain performance has generally met most of the specified indicators, such as delivery speed and flexibility. However, there is still room for improvement, especially in order fulfilments which was recorded at 77.7%, which is below the optimal category. supply chain activities at CV Artha Krina involve the flow of supplies from local farmers as the main supplier. If the supply from farmers is insufficient or does not meet the standards set by the company, CV Artha Krina will make purchases from the market as an alternative to meet customer needs. Seasonal factors and distribution constraints are key challenges that need to be managed to support the company's competitiveness. Supply chain mapping shows that CV Artha Krina has implemented an integrated system with local farmers and markets as suppliers, and hotels and villas as the main consumers. The results showed that the delivery performance: 100% (superior category). Supply Chain Flexibility: 3 days (superior category). Total Cost of Product Delivery: 57.14% (low category). Optimizing Order Fulfilments in a way that CV Artha Krina needs to increase cooperation with farmers to ensure product availability throughout the year. Regarding Logistics improvement CV Artha Krina requires investment in refrigeration and packaging technology to maintain product freshness during distribution.

Keywords: Organic, market, company, farmers,

1. Introduction

It is common knowledge that vegetables are one of the important foodstuffs in fulfilling people's nutritional needs. Vegetables are considered a major source of protein and minerals, and some of the nutrients contained in them cannot be replaced by other sources [3]. The issue

of healthy, nutritious, safe and quality food, as well as being environmentally friendly has formed a pattern of public consumption called Green Consumerism. Green Consumerism is a continuation of the global consumerism movement that began with a stronger consumer awareness of their rights to obtain decent, safe and environmentally friendly products [1]. The existence of this pattern, producers began to compete by utilizing this issue to start directing their business by providing healthy and environmentally friendly products by producing organic products or vegetables [2]. Organic products are part of the characteristics of green products and organic products as natural or chemical-free products. The difference between organic products and conventional products is in the way of production or cultivation [8]. How to grow organic products avoids chemicals that can damage the environment and strict maintenance, thus making organic products more expensive than conventional products [11]. Based on statistical data on Indonesian Organic agriculture in 2016, many consumers want organic vegetables [6]. Awareness to consume organic food is quite high, around 94% of respondents have consumed organic food, up 1% compared to 2015 [5]. Various reasons underlie consumers' choice to consume organic. The biggest reason is choosing for health reasons, followed by reasons for protecting the environment and following trends [20]. Denpasar is one of the main vegetable consuming areas in Bali, both from conventional and organic farming [10].

Vegetables are one of the horticultural crops [14]. In the science of horticulture cultivation for vegetables is called Olericulture [12]. Starting to increase awareness of a healthy lifestyle makes the demand for vegetables increase and increase the efforts of horticultural producers to continue to increase the amount of production and increase the economic value of vegetable products [17]. Consumption of horticultural products in Indonesia is still said to be low but there is great potential for market development for vegetable products [18]. Horticultural consumption for the years 2010 to 2013 has a fluctuating level of consumption although it seems to tend to decline [26]. For vegetable consumption the consumption level is fluctuating but tends to increase [25]. Horticultural consumption in Indonesia is still much lower than the FAO/UNDP recommendation of 75 kg/capita/year. Lower than Indonesia's neighboring countries such as Singapore and Malaysia. According to Yul Bahar (2011), in Ajeng Ritzki (2011) Singapore already has a horticultural consumption level of 125 kg per capita per year and Malaysia has 90 kg per year [22]. According to data from the Central Bureau of Statistics, there was an increase in the amount of vegetable consumption in 2018-2020, namely from 0.020 - 0.029. The amount of vegetable consumption is superior to the amount of fruit consumption in the total amount of horticultural consumption so there is great potential for the development of the vegetable market in Indonesia [13]. The increasing number of consumptions of vegetable products was realized by farmers. Efforts to increase the amount of vegetable production are made by farmers to meet the high demand for vegetables. Government support in the development of the vegetable production sector also helps vegetable farmers to increase the amount of production [7]. CV.Artha Krina is one of the companies engaged in the production of organic horticultural crops. The products produced by the company are vegetable products. CV.Artha Krina Industry produces 15 types of organic vegetables. One of the flagship products of the company is organic curly lettuce (Lactuca sativa var. crispa L). Curly lettuce is a crop that has a high demand in the organic vegetable market and the crop has a large contribution to CV.Artha Krina's income because curly lettuce is a product that has a high number of sales [9]. CV.Artha Krina Industri realizes that the company needs to strengthen competitiveness against other organic vegetable producers, especially against competition in organic curly lettuce products. The high demand for organic curly

lettuce and the difficulty of fulfilling the supply of curly lettuce products encourage companies to strengthen the company's supply chain activities for curly lettuce products [15]. Competitors of the company in organic curly lettuce products in the Denpasar City area are Jaya Prakasa Farm, Panen id Fresh, Bali Fresh, Catur Farm and so on. In the supply chain activities of organic curly lettuce and other products at CV.Artha Krina, there are still obstacles in fulfilling vegetable needs, production activities and distribution of organic curly lettuce. Lack of vegetable needs for production, product damage in production and distribution activities are problems that the company must face. The company has standard sales performance criteria that are determined based on the number of goods shipped in accordance with the Purchase Order (PO). Sales performance is said to be good if PO fulfilment is 80% or more, poor at 80% to 50% and poor at below 50%.

It is often found in the field that supply chain actors still experience several obstacles. Farmers as chain actors in the upstream sector often have production problems, order information from companies does not match the amount of harvest. Likewise, companies that manage lettuce commodities with a fairly high annual value pay more attention to maintaining and managing as effectively and efficiently as possible to maximize and maintain the competitiveness of the Company. The company must know how the value chain occurs, whether the distribution of the added value that occurs is in accordance with the treatment of each supply chain actor, for that value chain analysis has an important role for the business run by the Company.

The value chain is a way to test the nature and level of strategy of the company's internal activities. Systematic testing of individual activities can lead to a better understanding of the strengths and weaknesses of the Company in order to provide competitiveness of the products produced by CV. Artha Krina. Therefore, research on the Analysis of the Celery Plant Supply Chain that occurs in the Company is expected to increase the competitiveness of the Company.

2. Material and Methods

The location of this research is located at CV Artha Krina, West Denpasar District, Denpasar City, Bali. This research was conducted by purposive sampling with the consideration that CV Artha Krina has implemented supply chain management in the supply chain activities of organic curly lettuce plants [21]. Respondents are people who respond or answer research questions, both written and oral questions [21]. The population in this study were all employees or owners of CV Artha Krina, namely 6 people. The sample is part of the number and characteristics possessed by the population and must be truly representative or representative [21]. In this study, the sample consisted of 1 person. Data collection in this study was carried out consisting of: Observation is a data collection method carried out by observing, seeing and taking the necessary data directly at the research site. The data sources used in this study are primary data and secondary data and the types of data used are qualitative data and quantitative data [21].

2.1 Analysis Method

In this study, analysis is used to support these objectives, including Descriptive Analysis. Descriptive analysis is carried out to explain and map the company's activities in implementing the organic curly lettuce supply chain as well as activities in the planning

process, procurement of raw materials, product manufacturing, delivery and product return which will be attached to the mapping in the SCOR method [19]. Descriptive analysis is also carried out to explain the obstacles faced in each process of supply chain activities carried out by the company. The analysis used for the second problem is the SCOR (Supply Chain Operations Reference) method [16] where to measure supply chain performance can be calculated through several indicators with the formula:

a. Order Fulfillment
$\frac{(Customer\ requests\ delivered\ on\ time)}{(Total\ orders\ delivered)}$ x 100%

b. Delivery Performance
$\frac{(Total\ products\ delivered\ on\ time)}{(Total\ product\ deliveries)}$ x 100%

c. Fulfillment cycle
Order Planning Time + Packaging Time + Shipping Time

d. Flexibility
Supply Chain Cycle of sourcing goods + Cycle of Packaging Goods + Cycle of Delivering Goods

e. Daily Inventory
Daily Inventory = $\frac{(Average\ inventory)}{(Average\ demand)}$

f. Cash to Cash Cycle
Cash to cash time = average inventory + payment time to farmers - payment time to CVs or suppliers.

The following table Criteria for supply chain performance units of measure:

Table 1
Supply Chain Performance Unit Criteria

Indicator	Unit(s)	Benchmarking		
		Parity	Advantage	Superior
Order Fulfilments	Percentage (%)	94-95	96-97	≥ 98
Delivery Performance	Percentage (%)	85-89	90-94	≤ 95
Order fulfilments Cycle	Day(s)	8-7	6-5	≤ 4
Supply Chain Flexibility	Day(s)	42-47	26-11	≤ 10
Daily Inventory	Day(s)	27-14	13-1	= 0
Cash To Cash Cycle	Day(s)	45-34	33-21	≤ 20
Total Cost of Product Delivery	Percentage (%)	13-99	8-4	≤ 3

Source Data: [23]

3. Results and Discussion

3.1 Dried Celery Crop Supply Chain

CV Artha Krina, as a company that runs a business in the field of agricultural product distribution, has a simple yet effective supply chain model. CV Artha Krina is a supplier company that provides fresh vegetables and fruits, dedicated to meeting the needs of various hotels, villas, and resorts. The company has a unique and well-organized working system. In its efforts to deliver high-quality fresh products, CV Artha Krina establishes direct partnerships with local farmers, enabling them to maintain the quality and freshness of the products from upstream to the hands of consumers. This strong collaboration between CV Artha Krina and the farmers allows them to consistently supply fresh vegetables and fruits to various high-end accommodations. Every day, farmers who collaborate with CV Artha Krina deliver their harvests directly to the company's warehouse. This process helps minimize a lengthy supply chain, ensuring that vegetables and fruits remain in optimal condition upon arrival at the warehouse. One of the flagship products supplied by CV Artha Krina is curly lettuce. This curly lettuce is carefully cultivated and developed by farmers with expertise and experience in high-quality agricultural practices. They prioritize environmentally friendly and sustainable farming techniques, ensuring that each leaf of curly lettuce meets high quality standards.

Based on the mapping results, the supply chain activities at CV Artha Krina involve the flow of supplies from local farmers as the main supplier. If the supply from farmers is insufficient or does not meet the standards set by the company, CV Artha Krina will make purchases from the market as an alternative to meet customer needs. The goods obtained are then distributed directly to a number of hotels, villas, and resorts that are their regular customers. This direct supply chain model allows CV Artha Krina to minimize the middlemen and keep the product quality up to the standard desired by the customers. In addition, by establishing direct relationships with farmers, CV Artha Krina also supports the sustainability of local farmers' businesses and helps them gain wider market access. However, in the event that farmers are unable to provide the required supply, the company has mitigation measures in place through the market, which serves as a secondary source of supply. With this supply chain mapping in place, CV Artha Krina can continuously monitor the performance of each entity in their supply chain and make necessary adjustments to ensure smooth distribution of products to hotels, villas and resorts. It also allows the company to identify areas for improvement, both in terms of stock management, distribution efficiency, and in forging closer relationships with their key suppliers.

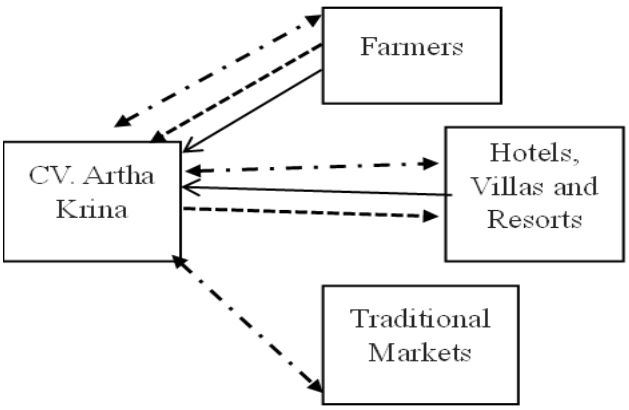

Figure 1 Supply Chain of Curly Lettuce at CV Artha Krina

Description:
Money Flow : ⟶
Goods Flow : ⇢
Information Data Flow : ⟷

3.2 Analysis of Supply Chain Performance of Organic Curly Lettuce Crops

Analysing performance in the context of the supply chain can be done by various methods, one of which is by using the formula contained in the SCOR (Supply Chain Operations Reference) method. The tabel below criteria for supply chain performance units of CV Artha Krina.

Table 2
Criteria for Supply Chain Performance Units of CV Artha Krina

Indicator	Unit(s)	Benchmarking		
		Parity	Advantage	Superior
Order Fulfilments	77,7%	94-95	96-97	≥ 98
Delivery Performance	100%	85-89	90-94	≤ 95
Order Fulfilments Cycle	3 Days	8-7	6-5	≤ 4
Supply Chain Flexibility	3 Days	42-47	26-11	≤ 10
Daily Inventory	7 Days	27-14	13-1	= 0
Cash To Cash Cycle	2 Days	45-34	33-21	≤ 20
Total Cost of Product Delivery	57,14%	13-99	8-4	≤ 3

1) Order Fulfillment

Markets or Farmers in meeting the demand of CV Artha Krina on time without having to wait, can be calculated:

$$\frac{(Customer\ requests\ delivered\ on\ time)}{(Total\ orders\ delivered)} \text{x } 100\%$$

$$\frac{210\ kg}{270\ kg} \text{x } 100\%$$
$$= 77{,}7\ \%$$

It can be seen that in the order fulfilments process, both farmers and CVs (companies) have succeeded in delivering products in accordance with orders received by hotels and villas. This is reflected in the performance measurement results which show a value of 77.7%, which can be categorized as good performance in the context of this supply chain. The percentage of order fulfilments that reaches this figure indicates that most customer orders have been fulfilled appropriately, both in terms of quantity and delivery time. In general, the greater the percentage value in order fulfilments in a supply chain system, the better the supply chain performance. A high percentage reflects that the company or related parties in the supply chain are able to manage the production and distribution process effectively, and consistently meet consumer expectations. In this case, the 77.7% figure indicates that the order fulfilments process is already at an adequate level, although there is still room for improvement to optimize performance. In this context, success in fulfilling orders is one of the key indicators in assessing how well a supply chain is functioning. If order fulfilments can be done with a higher level of accuracy and precision, this will have a direct impact on customer satisfaction, which in turn can increase consumer loyalty and strengthen the company's position in the market.

Conversely, if order fulfilments are low, it could indicate problems in inventory management, production processes, or distribution, which need to be rectified immediately to avoid negative impacts on the company's reputation and customer relationships. Therefore, although the 77.7% figure indicates an already good performance, companies still have the opportunity to optimize supply chain performance by improving operational efficiency, reducing errors in order processing, and speeding up delivery times. These are important steps towards achieving a higher order fulfilments rate, which will ultimately contribute to improving customer satisfaction and the company's competitiveness in the market.

2) Delivery Performance

The number of product deliveries that arrive on time according to the wishes of the hotel and villa, can be calculated;

$$\frac{(Customer\ requests\ delivered\ on\ time)}{(Total\ orders\ delivered)} \text{x } 100\%$$

$$\frac{270\ kg}{270\ kg} \text{x } 100\%$$

= 100 %

It can be seen that the merchant has successfully delivered all products according to consumer demand, with a delivery performance rate of 100%. This 100% figure indicates that every product ordered by consumers has arrived on time and in a condition that matches the requested specifications. This reflects a highly efficient supply chain management, from the order taking process to product delivery. In addition, this 100% achievement can be used as an operational standard that needs to be maintained and even improved. This sends a positive signal to consumers that they can rely on the merchant to fulfil their needs consistently. In the long run, this success in maintaining on-time and on-demand deliveries will strengthen the merchant's reputation and attract more customers, both existing and new. This success can also be a competitive advantage that can differentiate the merchant from competitors in an increasingly tight market.

3) Order Fulfillment Cycle

Order Planning Time + Packaging Time + Delivery Time = 1 Day + Same day + Same day = 1 Day So the time required is 1 day starting from the planning time until delivery.

4) Supply Chain Flexibility

Every business needs time to respond to unexpected orders, if orders are to be increased or decreased, it can be calculated: Supply Chain Cycle of Finding Goods + Cycle of Packing Goods + Cycle of Delivering Goods

= 1 Day + Same day + Same day

= 1 Day/month:

= 30 days

5) Daily Inventory

Daily Inventory = $\frac{(Average\ inventory)}{(Average\ demand)}$

Daily Inventory = $\frac{0\ day}{7\ days}$

= 0 day

The length of inventory that is sufficient to meet operational needs without any incoming demand is one of the important factors in supply chain management. In this case, sufficient days with remaining inventory illustrates how long existing stock can last if no new demand comes in. However, based on the analysis conducted, it is found that the daily inventory value is zero, which indicates that the company (CV) does not store curly lettuce products in the long term. This happens because the company (CV) uses a just-in-time (JIT) system in inventory management, where every incoming raw material is immediately sent to hotels and villas according to the orders requested by the hotels and villas. With this approach, the company (CV) does not keep a stock of curly lettuce products, but only buys and delivers curly lettuce products according to existing requests. Therefore, every time curly lettuce products are received, they are immediately processed and delivered to the hotels and villas that place orders, without any long waiting time or storage for backup purposes. This allows traders to reduce storage and inventory costs, as well as minimize the risk of losses that may occur due to goods that are stored too long or damaged. However, this system also has a drawback, which is the dependence on continuous demand.

6) Total Cost of Product Delivery

The amount of costs incurred in one shipment to be sent is 9 kg and the number of sales received is expressed in percent. The total cost incurred is IDR 20,000 / kg then,

Cost: IDR 20,000 x 270 kg = IDR 5,400,000

Revenue: IDR 35,000 x 270kg = IDR 9,450,000

Cost = $\frac{5.400.000}{9.450.000}$ x 100%

= 57,14%

So, the percentage result in supply chain costs reaches a value of 57.14% or ≥ 13 percent, meaning that performance is commensurate. The smaller the percentage result, the lower the supply chain costs and can be minimized in one shipment.

7) Cash to Cash Cycle Time

This performance is in the form of supply chain speed in converting supplies into money. It is known that the sales value for 30 days is IDR 37,800,000. The account receivable or remaining sales value to be paid by consumers is IDR 18,900,000 (50% of the remaining payment). The supply value at the end of the month was Rp9,450,000. The cost of sales or base price of the product is 57.14% of the sales value. Then it's searched first:

- The sales value per week is (IDR 37,800,000). / 4 = IDR 9,450,000)
- Account Receivable (IDR 18.900.000 / IDR 9.450.000 = 2 days)
- Cost of Sales (57,14% x IDR 9.450.000 = IDR 5.400.000)
- Account payable (IDR 9.450.000/ IDR 5.400.000 = 1,75 or 2 days)
- Inventory days of supply (IDR 9.450.000/ IDR 5.400.000 = 2 days)

So, cash to cash stated in units of days is obtained: Cash to cash cycle time = inventory days of supply + average days of accounts receivable – average days of accounts payable = 2 Days + 2 Days – 2 Days = 2 Days

Based on the calculation, the recorded cash to cash cycle value is 2 days, which shows the best results in the company's cash management. This figure indicates that the circulation of money in the company's supply chain system is very efficient, with the process of converting supplies into cash that can be completed in just 2 days. This means, whenever the Company

receives raw materials, they immediately deliver them to customers without waiting long, so there is not much inventory to store in the warehouse. In other words, this large merchant implements a just-in-time strategy, in which the raw materials received are directly processed and shipped out on demand, minimizing storage time and cost. The relationship between daily supplies and cash to cash cycles is very close, because the sooner the supplies are processed and delivered, the sooner the company gets paid. On the other hand, the account receivable aspect also plays an important role in accelerating cash turnover. In this case, the customer pays for the goods that have been received within 2 days, which indicates that the time of credit given to the customer is very short. This accelerates cash flow into the company, which in turn supports faster and more efficient cash flow. Overall, the achievement of cash-to-cash cycle for 2 days shows optimal operational performance in terms of inventory management, delivery of goods, and payment receipts from customers. This model not only speeds up cash flow, but also reduces the risk of high inventory storage costs and increases corporate liquidity. Thus, the Company can quickly re-use the acquired cash for investment or further development without any significant delays in the operational process.

4. Conclusion

Supply chain mapping shows that CV Artha Krina has implemented an integrated system with local farmers and markets as suppliers, as well as hotels and villas as the main consumers. Measurement of supply chain performance shows strength in delivery speed (100%) and flexibility (1 day), but order fulfillment (77.7%) needs to be improved to achieve superior categories.

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