

Supply Chain Analysis and Distribution of Cut Flowers at PT. Bromelia Indah

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ABSTRACT: The aim of this research is to obtain a broad picture of the cut flower supply chain, cut flower distribution channels that currently exist in the Company. The method used is descriptive analysis using the horticultural product supply chain development method launched by the Asian Productivity Organization (APO), Japan. The method used in this research is a direct interview method with sources who are directly involved in the company's cut flower supply chain, and the data analysis method uses a qualitative descriptive method. There are cut flower distribution channels to the Company, namely: Cut flower farmer groups as suppliers - Companies - Consumers (direct and indirect). Each member of the chain has its own role and function in maintaining the quality of cut flowers. Maintaining the freshness and quality of cut flowers must be carried out from post-harvest by members of the farmer group chain to the company, they can use water directly, or cotton given water to maintain freshness. And cut flowers can extend their life cycle.

KEYWORDS: Cut Flowers, Supply Chain Analysis, Distribution

I. INTRODUCTION

Ornamental plants are a group of plants from the horticulture subsector which can be partially or completely used to create beauty, beauty and comfort indoors and outdoors (Widyastuti. 2018). Ornamental plants have high economic value, so ornamental plants can be a source of income for local communities, both on a small, medium and large scale. Ornamental plants are usually used in four forms, namely potted plants, garden decoration plants, cut leaves, and cut flowers, which are classified as floriculture which is a field of horticulture that operates in the field of ornamental plants such as cut flowers, cut leaves, potted plants, and plants. decorate the garden. The trend of cut flowers in the form of bouquets which have high artistic value and beauty is now very popular among the public.

In 2020 to 2021, there was a decline in production in the cut flower ornamental commodity group of -7.83% or the equivalent of 52,529,971 stalks. Not only that, in the last 5 years, cut flower production has continued to fluctuate as well. The decline occurred as a response to the decreasing demand for cut flowers, due to many reasons. Even though the cut flower business is a very promising business to do.

One of the Cut Flower distributor companies is PT. Bromelia Indah supplies cut flowers to several florists in various regions. And to distribute cut flowers to various

regions, of course you need cut flowers of good quality so that when they arrive in the hands of consumers in various regions they can be received with good quality too. So this certainly requires a flower supplier with good quality.

The problem currently occurring is damage to cut flowers at PT. Bromelia Indah, especially in the process of packaging and sending cut flowers to companies so that the quality of the flowers received is not always the same.

For this reason, the rise and fall of cut flower production from gardens must be supported by improving a good supply chain. This is important to do for the success of the cut flower business at PT. Beautiful Bromeliads. Therefore, each link in the chain is important to analyze.

In this research, the problem that will be studied in more depth is how to analyze the cut flower supply chain at PT. Bromelia Indah and distribution patterns of its supply chain members. This is important to study in more depth which is expected to increase the Company's competitiveness.

The purpose of this research is to provide an overview of the supply chain model used by companies that are directly involved in the cut flower business process, and also to analyze distribution channels that will be seen based on the flow of cut flower products from farmers to arrival at the company.

II. METHOD

This research was carried out from January 2024 to March 2024 at PT. Bromelia Indah Pusat, whose address is Jalan Sulaiman, No. 56, Palmerah, West Jakarta, 11540. The method used in this research is a direct interview method with sources who are directly involved in the company's cut flower supply chain, and the data analysis method uses a qualitative descriptive method. The analysis was carried out descriptively using the horticultural product supply chain development method launched by the Asian Productivity Organization (APO), Japan. The development method follows a process framework that has been modified by Van de Vorst, 2005. The study aspects are arranged in a structured manner which includes supply chain targets, supply chain structure, resources, chain management, supply chain business processes.

III. RESULT

Supply Chain Overview

1. Supply Chain Structure

This aspect will describe who is involved and their role in the supply chain and supply chain flow.

a. Primary Member of the Supply Chain

There are two types of members in a supply chain, namely primary members and secondary members. Primary members are parties directly involved in the supply chain business process. Secondary members are chain members who have influence in business processes but are not directly related to production activities

1) Cut Flower Farmers Group

The Cut Flower Farmers Group is a member of the chain that acts as a supplier in providing cut flower requests at PT. Beautiful Bromeliads. The activities carried out by the combined farmer groups are:

a) Carrying out the process of cultivating cut flowers

Carrying out the process of harvesting cut flowers if the company places an order, the activities carried out include: harvesting in the morning and evening, removing leaves on flower stalks that have been exposed to water, cutting flower stalks or stems. There are no standard provisions which will cause the flowers to be sorted when they are sorted. the possibility of grading decreases, and also does not maximize water absorption. Bring the cut flowers to a shady place to minimize wilting of the flowers.

b) Carrying out post-harvest cut flowers such as: Collecting cut flowers grouped according to the type of cut flowers desired by the Company, transporting them to the sorting and grading place and tying the flowers and then wrapping them.

c) Sending cut flowers to companies using various modes of transportation, ranging from travel, pickup, closed box cars and other modes of transportation that have been mutually agreed upon.

2) Company

PT. Bromelia Indah as the main object of this research plays a role as a fairly large distributor of cut flowers. The company will make requests to purchase cut flowers from various suppliers from several farmer groups to meet consumer demand. Once the cut flower products sent by farmer groups arrive, special handling will be carried out to maintain the quality of the flowers until the time the flowers are sold to consumers.

In its own storage PT. Bromelia Indah has a special cooler for storing unsold cut flowers. The cut flowers will remain stored in the refrigerator until they are sold or damaged due to being stored for too long.

3) Consumers

Consumers at PT. Bromelia Indah as a member of the chain buys cut flower products from the company for their own use or for resale.

Table 1. Activities of Primary Members of the Cut Flower Supply Chain

Activity	Primary Member of the Supply Chain		
	Cut Flower Farmers Group (Supplier)	PT. Bromelia Indah (Distributor)	Consumer
Exchange	√	√	√
Sale	√	√	√
Purchase	-	√	√
Physique			
Cultivation	√	-	-
Transportation	√	√	-
Packaging	√	√	√
Storage	-	√	√
Facility			
Sorting	√	√	√
Market	-	√	√
Information			
Information (√) : Handle (-) : are not done			

(Source: Processed data, 2024)

In Table 1 are the activities carried out by members of the cut flower supply chain. These primary members consist of the cut flower farmer group as suppliers to the Company, then PT. Bromelia Indah as distributor and consumer. Activities carried out by suppliers are selling cut flowers to companies, carrying out cut flower cultivation activities until harvest, carrying out transportation, sorting and packaging of cut flowers. Activities carried out by the Company as a distributor that will resell cut flowers are sales to consumers, purchases to suppliers, transportation, sorting, packaging, storage and sharing market information. The activities carried out by consumers depend on the consumer, because there are two types of consumers, namely direct consumers and

indirect consumers who resell cut flowers. The activity is to make purchases from the distributor company PT. Bromelia Indah, for indirect consumers, will carry out resale activities to final consumers. Carrying out packaging and storage activities, carrying out sorting activities and exchanging market information.

b. Secondary Members of the Supply Chain

Secondary or supporting members in the supply chain are companies that provide starting materials, or other important assets but do not directly participate in activities that produce or convert inputs into outputs.

Secondary Members provide supply chain production needs, namely suppliers of cut flower seeds that are used by farmer groups for planting and cultivation. Supplier of fertilizer used to fertilize plants that have been planted, supplier of packaging boxes, cotton, paper for wrapping cut flowers PT. Beautiful Bromeliads.

2. Supply Chain Flow Patterns

The supply chain has three streams that must be managed. The first is the flow of money and the like which flows from upstream to downstream. The second is the flow of goods from downstream to upstream. The third is the flow of information which can occur from upstream to downstream and vice versa. The flow of the cut flower supply chain starts from the farmer group as the cut flower supplier, which is carried out when the company orders cut flowers by telephone or interacts directly. The information provided by the company to the cut flower farmer group as the supplier is in the form of order quantity, quality of cut flowers, and agreement. price, then these cut flowers will be sent using various modes of transportation, such as pick-up, box car or travel. The company will pay for the purchase of cut flowers using the cash system to the supplier according to the agreement between both parties. The farmer group as the cut flower supplier will receive payment from the company according to the number of cut flowers purchased.

The supply chain flow between PT. Bromelia Indah and consumers start from the exchange of information carried out by consumers with PT. Bromelia Indah in the form of information regarding the number of orders, type of flower, flower color, flower quality, and price agreement. Communication between companies and consumers generally uses telephone and interacts directly, then consumer orders will be prepared by the company and will be sent by workers from the company using vehicles using different modes of transportation according to the number and location of consumers to be sent. Consumers will pay for the purchase of cut flowers using the cash system and transfer to the company according to the agreement between both parties. The company will receive payment from retailers according to the quantity, type, color and quality purchased by consumers.

The supply chain flow pattern that occurs between supply chain members is quite well integrated. This is in line

with research by Supriatna et al. (2016) that a supply chain structure that is well integrated from upstream to downstream or vice versa will influence supply chain performance and collaboration. It can be seen in Figure 4.5 Supply Chain Flow Pattern as follows.

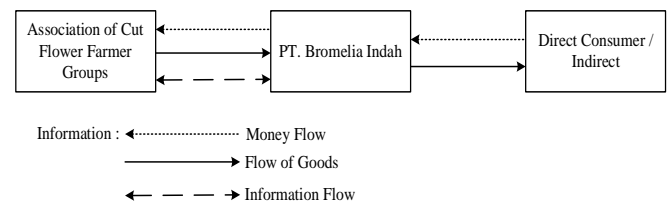


Figure 1. Supply Chain Flow Pattern PT. Beautiful Bromeliads

(Source: Processed data, 2024)

The process of distributing cut flowers ordered by the Company to farmer group suppliers requires a pre-order system. After the order is received, the farmer will harvest the ordered cut flowers for immediate delivery. Delivery does not have special hours, it can be sent morning, afternoon, evening and evening. Suppliers usually send by whatever mode of transportation they feel is quick to arrive at the location.

The information provided by the company when ordering is the type of flower ordered, the number of cut flowers, the color of the cut flowers, the quality of the cut flowers. Price agreement and market information. Communication between the Company and suppliers or farmer groups generally uses the telephone. Communication between companies and consumers can be done via telephone, direct communication and websites. The supply chain flow pattern that occurs between supply chain members is quite well integrated. This is in line with research by Supriatna et al. (2016) that a supply chain structure that is well integrated from upstream to downstream or vice versa will influence supply chain performance and collaboration.

3. Chain Goals

Chain targets are things that will be achieved from the implementation of supply chain management. The targets that have been set will later be used as a reference for whether a supply chain is running well or needs to be re-evaluated. Target cut flowers from PT. Bromelia Indah is so far aimed at all consumers in various regions.

4. Supply Chain Management

a. Partner Selection

Selection of partners in the cut flower supply chain to create sustainable and mutually necessary cooperative relationships. The selection of partners in a supply chain consists of selecting cut flower suppliers and selecting indirect consumers as retailers. According to Pujawan (2005) selecting a good partner is characterized by the quality of the goods offered, price and timeliness of delivery.

The Company's selection of partners is based on the smoothness of procurement. The selling price is determined by both parties, the cut flower supplier and the company, where the price offered is below the sales price to direct and indirect consumers. The company will collaborate with suppliers who are able to fulfill cut flower products according to the company's desired specifications. These results are in line with research by Kurniawati et al. (2013) by choosing the right partner will guarantee the availability of raw materials so that the production process runs smoothly

b. Cooperation Agreement

Contractual agreements aim to establish cooperative relationships between various parties in the supply chain. Making contractual agreements with other parties basically has a goal to be achieved together. It is hoped that mutually integrated and sustainable cooperation can achieve maximum benefits by minimizing risks and utilizing existing resources so that supply chain members can continue to develop and achieve common goals.

There is no written contract between the company and farmer group suppliers, they emphasize the trust system that has existed over a long period of time between the two parties, and the same goes for indirect consumers or retailers. The agreement concerns an agreement to determine the correct selling price of cut flowers, quantity, type, quality and delivery.

c. Transaction System

Transactions carried out by the Company with suppliers are a non-cash payment system or via transfer. When placing an order with a supplier, the Company will pay for the order according to the agreement via transfer. The payment system is only made when ordering on the same day. Likewise, between the company and its consumers, the payment system is also carried out when the order is placed, then the ordered goods can be sent

5. Supply Chain Resources

a. Physical Resources

The physical resources of the cut flower supply chain include farming land, production equipment and infrastructure. To obtain sufficient supplies of cut flowers, the Company gathers various suppliers who are able to supply cut flowers. Suppliers or farmer groups generally have quite a lot of land, they generally help each other in the process of cultivating cut flowers and jointly sell their crops. Plantation equipment is generally still simple, including pest control.

Location of PT. Bromelia Indah is one of the factors supporting business success. Companies that are located in big cities are an advantage in getting more consumers. Having cool storage will also be very helpful in storing cut flowers until they are sold with maintained quality.

b. Technology Resources

The technology used by farmer group suppliers is still simple in the process of cultivating cut flowers in general. There is nothing different from cultivating cut flowers in

other places, only they focus on good seeds and proper pest control.

c. Human Resources

The human resources used by each member of the chain are different. Farmer group suppliers usually involve 3 to 7 workers. Activities include agricultural land preparation, seeding, enlargement, harvesting and distribution.

Human resources involved in the Company are more than 40 people consisting of various divisions, starting from general manager, finance manager and team, warehouse coordinator and team, office manager and team, HRD, Purchasing, Marketing, Sales Coordinator and team, IT , creative team, branch manager BSD and Bali. All teams have their respective roles in advancing the cut flower business in the Company.

d. Capital Resources

The capital aspect used to support the cut flower supply chain business process is already quite well established. Farmer group suppliers' capital comes from their own capital. This is also the same as the company using its own capital.

6. Supply Chain Business Process

Chain business processes are reviewed based on business process relationships between supply chain members and distribution patterns. The chain business process explains the processes that occur in the supply chain to find out whether the entire supply chain flow is integrated and running well or not, and explains how through certain strategic actions it is possible to create a good and integrated supply chain.

a. Distribution Pattern

The distribution pattern in the cut flower supply chain is divided into three main component parts, namely product flow (cut flowers), money flow and information flow. The cut flowers distributed by suppliers are cut flowers with quality according to the company's orders. Distribution is carried out using various modes of transportation such as pick-up, closed box cars and also travel. Cut flowers, as a horticultural product that is very susceptible to damage, must receive proper handling during distribution, because even though the quality of cut flowers from farmers is the best quality cut flowers, if the shipping handling is not correct, the flowers will arrive in bad condition. Cut flowers that arrive at the Company will later be sorted again to sort out whether the quality of the flowers is good or not. The cut flowers will be opened from the box and transferred into a bucket filled with water. Previously, the lower flower stalks will be cut so that they can absorb more water later. The cut flowers are left in the bucket for a while and then the packing process will be carried out again using moistened cotton to be placed at the end of the stem so that the cut flowers can still absorb water and maintain their quality. Once the cut flowers have been packaged, they will be sent to various consumers using the

mode of transportation that has been determined jointly between the consumer and the company.

b. Brand Identity Guarantee

Brand identity is used to identify sellers' products to differentiate them from competitors' products (Lamb 2001). The presence of a brand on a product is an important factor for producers and consumers. PT. Bromelia Indah has a name that is quite well known and has spread to various regions. Having a name certainly has its own advantages for the company towards its consumers.

7. Analysis of the Cut Flower Business Process with Supply Chain Segmentation

A logistics approach using supply chain segmentation can be used to analyze business processes, especially in analyzing distribution processes. A form of supply chain segmentation is necessary for a company to meet the various service and cost needs of its customers as well as what the Company needs to do. The following is the segmentation carried out:

A. Product Segmentation

Cut flowers are a horticultural product that is very fragile in handling. So it is necessary to segment the characteristics of cut flowers:

a. Size

The size of cut flowers affects the packaging during delivery, the total number of orders can determine which cut flowers will be sent using plastic packaging or cardboard boxes.

b. Temperature

The temperature required for most cut flowers to maintain their quality is 33°F which reduces the respiration process and dryness of cut flowers.

The vehicle temperature required for the distribution process so that it can maintain the quality of the flowers from damage is also the same as the storage temperature.

c. Bulk

Cut flowers cannot be stacked too much or around 50 cm because it will reduce the quality of the cut flowers. The width is only adjusted to the length of the stem of the cut flowers to be sent.

B. Demand and Supply Segmentation

The large demand for cut flowers at PT. Beautiful Bromeliads can be predicted by certain celebration days, such as Valentine's Day, Eid al-Fitr, Christmas, Mother's Day and other national celebrations. Demand soars if this celebration takes place. In order to meet consumer demand, the company has implemented a pre-order system for selling flowers that consumers want. This is done so that the company can place orders and send them to a combination of farmer groups that are able to meet the company's demand, but if the order is on the same day, the company can only provide cut flowers according to the stock available in the office at that time. Price offers cannot be made by consumers because the company

has provided a standard price for each flower sold to consumers.

C. Marketing Segmentation

Market segmentation has been widely used to find out how market demand satisfies customers, and this can of course be used in the supply chain. The following is the market segmentation classification:

a. Geographical

PT Bromelia Indah is in West Jakarta. Jakarta is a big city with a wide and densely populated area. Apart from that, because Jakarta is a logistics center, it will certainly make it very easy to send cut flowers to various regions using various modes of transportation. So that it can expand the reach of consumers in various regions, not only in Jakarta.

b. Demographic

The population density in Jakarta can enable the cut flower business to develop rapidly in this location. Income and employment factors will also influence consumers when purchasing cut flowers.

c. Psychographics

Identify personality characteristics and attitudes that influence consumer lifestyles and purchase behavior of cut flowers. PT. Bromelia Indah must know that its target consumers are fans of cut flowers like the ones it markets. This has been done by conducting surveys or interviews with random customers about what they like and what they don't like. Many consumers like cut flowers at PT. Beautiful Bromelia which is of good quality and has a long life cycle. In supporting consumer desires, PT. Bromelia Indah has classified Cut Flowers that will be sent to consumers who will resell their products, they will first check their freshness, there are no damaged flowers and of course the quality is very good so that the durability of the Cut Flowers sent will arrive to consumers in good condition.

CONCLUSIONS

Cut flowers as a horticultural product are a product that really needs to be handled very well in order to maintain its quality. Cut flowers are very easily damaged, therefore every member of the supply chain involved must really participate in carrying out all activities in accordance with standards on how to handle cut flowers appropriately, well and correctly. This needs to be done jointly between chain members in order to achieve sustainable consumer satisfaction.

Based on the research results above, it can be concluded that: Condition of cut flower supply chain at PT. Bromelia Indah is currently running well. The target market already has a clear target, but at the time of implementation the quality of the product produced by one member of the supply chain cannot be maintained due to improper handling. Supply chain management and networks have not been running well due to the absence of written cooperation agreements between

supply chain members which causes the quality of the products produced to always be different when received. The flow of rapidly changing price information can also cause instability in the goods available.

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REFERENCES

1. Asrol, Muhammad. 2015. Measuring and Improving the Performance of the Cane Sugar Agroindustry Supply Chain (Case Study at PT A). Bogor
2. Azka N 2015. Marketing Strategy Analysis of Bogor Perjoeangan Museum Services [thesis]. Bogor Agricultural Institute. Bogor.
3. Angraeni, Lia. 2019. Utilization of Natural Extracts in Management of Post-Harvest Diseases in Fruit and Vegetables: Review. *Journal of Agricultural Processing Technology*, 1 (1) 2019, 18-27
4. Central Statistics Agency (ID). 2017. Statistics on Horticultural Companies and Other Horticultural Businesses [Internet]. [Downloaded on December 2023, 15]. Available at: <http://www.bps.go.id>
5. Central Bureau of Statistics. 2023. Horticultural Statistics 2022. [downloaded on 2023 December 23] Available at: <https://www.bps.go.id/id/publication/2023/06/09/03847c5743d8b6cd3f08ab76/statistik-hortikultura-2022.html>
6. Charles Lamb, W.et.al. 2001. Marketing. First Edition, Salemba Empat: Jakarta
7. Center for Business Intelligence (EU). 2016. Cut Summer Flowers in the European Market. Product Factsheet [Internet]. [Downloaded on 20 November 2023] Available at : <http://www.cbi.eu>
8. Chopra S, Meindl P. 2001. Supply Chain Management: Strategy, Planning, and Operation (3rd Edition). New Jersey (US) : Pearson Prentice Hall.
9. Director General of Horticulture. 2015. Horticultural Production Statistics 2014. Jakarta: Ministry of Agriculture.
10. Fuad. M, Introduction to Business. 2006. Jakarta: Gramedia Pustaka Utama. h. 129.
11. Lakasimi, Hayati. 2010. Prospects for the Agribusiness of Potted Ornamental Plants (POTPLANT). *Scientific Journal of Agribusiness and Fisheries (Agrikan UMMUTernate)*. Volume 3. Issue 2.
12. Gaspersz V. 1997. Total Quality Management. PT. Gramedia Pustaka Utama. Jakarta.
13. Haming M, Nurjanamuddin M. 2012. Modern Production Management: Manufacturing and Service Operations. PT Bumi Aksara. Jakarta.
14. Herdiani, MP, Ir. Elvina. 2014. Post-Harvest of Cut Flowers, Chrysanthemums.
15. Ishikawa K. 1989. Quality Control Guidance Techniques. Mediatama Sarana Perkasa. PT. Gramedia, Jakarta.
16. Ministry of Agriculture. 2010. Strategic Plan. Directorate of Cultivation and Post-Harvest Floriculture [Internet]. [Downloaded December 15, 2023]. Available at: <http://www.sakip.pertanian.go.id>
17. Marimin, Maghfiroh, N. 2011. Application of Decision Making Techniques in Supply Chain Management. Bogor Agricultural Institute. Bogor.
18. Margarita, Sieke. 2017. Supply Chain Segmentation. Springer International. Switzerland.
19. Mayangsari, Putri. 2007. Study of Multi-Modal Transportation Network Supply Chain Management for Tomato and Paprika Products in West Java, Bogor.
20. Pujawan NI. 2005. Supply Chain Management. Guna Widya. Surabaya.
21. NI Pujawan, Mahendrawati. 2010. Supply Chain Management. Surabaya (ID): Guna Widya.
22. Saaty T L. 1994. Fundamentals of Decision Making and Priority Theory with the Analytical Hierarchy Process. Pittsburgh (US): University of Pittsburgh.
23. Weber CA, Current JR, Benton WC. 1991. Vendor selection criteria and methods. England (GB): *European Journal of Operational Research*, Vol. 50.pg: 2-18.
24. Saptana, Rahman HPS. 2015. Conceptual Review of Macro-Micro Marketing and Its Implications for Agricultural Development. *Agro Econ Research Forum*. 33(2):127-148.
25. Shahroodi K, Keramatpanah A, Amini S, Shiri E, Najibzadeh M. 2012. Application of Analytical Hierarchy Process (AHP) Technique To Evaluate and Selecting Suppliers in an Effective Supply Chain. *Kuwait Chapter of Arabian Journal of Business and Management Review* Vol. 1 no.6.

“Supply Chain Analysis and Distribution of Cut Flowers at PT. Bromelia Indah”

25. Supriatna et al, Supply Chain Structure in Vegetable Clusters for Structured Market Purposes, Padjadjaran University, 2016
26. Tinaprilla N, Pratiwi CP, Harianto, Krisnamurthi B, Rachmina D, Nurmalina R, Fariyanti A, Rifin A, Feryanto, Suharno et al. 2017. Towards a Competitive Indonesian Agribusiness. Krisnamurthi B and Harianto. Jakarta
27. Van der Vorst JGAJ. 2006. Performance measurement in agri-food supply-chain-networks: An overview. In: Quantifying The Agri-Food Supply Chain 13-24. Logistics and Operations Research Group. Hollandseweg (NL): Wageningen University.
28. Widyastuti, Titiek. 2018. Agribusiness Ornamental Plant Cultivation Technology. CV. Mine. Jakarta.