

## ANALYSIS OF BROCCOLI SUPPLY CHAIN MANAGEMENT

Case Study at “X” Fresh Vegetables and Fruits Company, Malang, East Java, Indonesia

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### Abstract

The purpose of this research are to know the concept of broccoli supply chain management in “X” Company; analyse the variable value of longterm relationship such as trust, commitment, communication, satisfaction and dependency between “X” Company and broccoli farmers; farmer’s performance level in broccoli supply chain management, and relationship between trust, commitment, communication, satisfaction and dependency and performance level. Methode that used to know the supplier’s performance are Scheduled Orders to Customer Request (SOCR) and Delivery Performance to Request Date (DPRD). Based on the value of the longterm relationship of “X” Company to their suppliers it has a good commitment, often communication, satisfaction and has dependency to them. The performance level, the suppliers has a high on generalized situation but in partially, the second supplier is a supplier who has the highest performance level showed by the average value of SOCR dan DPRD for about 77,3 percent which mean that those supplier can fullfiled the “X’s” need for about that percentage. In other hand, based on the variables value of longterm relationship and performance level of suppliers that can be proven that there is a relation between longterm relationship’s variables and the performance level of suppliers.

Keywords : *longterm relationship, performance level*

### Introduction

Horticulture commodities especially vegetables are one of the commodities which have brightly prospective to be develop in Indonesia. The land characteristic and also widely covered area supporting to be develop by tropic and sub tropic horticulture. According to general directorate of horticulture, agricultural ministry of Republic of Indonesia, there are several land potency to be develop for horticulture commodities that spread by field yard for about 5,33 million hectare, dry field near the rice field but used for vegetables and other secondary crops for about 11,61 million hectare, temporary field that haven’t been exertion for about 7,58 million hectare and land for wood for about 9,13 million hectare (BPS, 2003; identification result by Ditjen Bina Produksi Hortikultura, 2001).

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The demand on vegetables products in Indonesia are sharply increased a long with the increasing of the amount of people. The increasing of the people causing the demand of vegetables production numbers significantly. According to Indonesia Central Bureau of Statistic (BPS, 2007) vegetables production numbers in Indonesia in year of 2000 are about 7.418.070 ton until year of 2006 sharply increased to 9.423.011 ton. Vegetables consumption in Indonesia still fluctuated since 2003 for about 34,52 kg/year, 2004 for about 33,49 kg/year, 2005 for about 35,33 kg/year and 2006 for about 34,16 kg/year (horticulture general directorate, 2008).

Consumption rates of Indonesian vegetables still lower than FAO recommendation for about 75 kg/capita per year and lowest when compared to another advanced countries. The great opportunity to increasing the consumption are huge by then, and for that chance it need more bigger efforts. Campaign and promotion need to be important things to motivate the consumption increase which mean increasing society nutrition and health.

Product quality increase can be provide by cooperation among the business actors in other hand that would be important to build business partnership organization which is going to be needed by each other and profitable for both side with good quality management so that can fulfill the market demand of vegetables. Partnership organization unity on a network or chain that called supply chain which doing to distribute product or services supply from its origin to the buyers or customers. Supply chain related to continues relation about product, money and information flowing from upstream to downstream, money from downstream to upstream, whereas information are upstream to downstream in spite of on the contrary.

Supply chain management superiority is how the process can manage the product flow from supply chain flows. In other words the supply chain model implemented how the networking of production activities and distribution from the company can work together to fulfill the customer needed. The supply chain management main goal are delivering the product on the time to satisfy the customer, and reducing cost and time.

“X” company are one of private company which act as a supplier for vegetables and fruits for several supermarket in Indonesia. The main products that can be produce are vegetables and fruit packaging because of the product will have added value and make a good performance with a better quality. The “X” company nowadays has 304 products for example broccoli, tomatoes, sweet corn, potatoes, cabbage, etc. Broccoli has the largest demand which constantly for about 1000 – 1500 kg per month. The demand comes from

East Java especially and other island such as Kalimantan, Bali and Lombok. The “X” company must choose the good supplier and that’s why that needs a good cooperation among the supplier and the ‘X’ company so that can fulfill the supermarket demand.

Cooperation can be doing smoothly if there were a good relation with trust each other and give benefit for booth of them. The relation consist of satisfaction, trust, dependency, commitment and good communication among the “X” company and broccoli supplier. The “X” company and the supplier should create satisfaction each other, trust, dependency, and have a good communication and commitment that must be on time delivery from the supplier to the “X” company’s order. One way to find out the accuracy and suitability of the broccoli delivery should be known about the performance level of the supplier. Good performance can be seen from the delivery performance running by the broccoli supplier. Delivery performance are consist of Scheduled Orders to Customer Request and Delivery Performance to Request Date.

The “X” company doing act as a vegetables and fruits supplier for the supermarket in Indonesia and has many customer. Not only as a supplier of “Giant Supermarket” as a main customer but also nowadays more coverage area of their market to several supermarket in Sulawesi Island, Kalimantan, Bali and Lombok. The “X” company must guarantee the quality, velocity, information accuracy with the high level. Broccoli has a stable demand along the time.

Cooperation among the “X” company and its supplier can integrate all the element of the networking that related from the early supplier until the latest consumer. The relation series include continues relation of the product flows, money, and information from the origin of the product till the customer hands from upstream to downstream or on the contrary.

The approach of this supply chain can be success if there were a good cooperation between the chain actors in all the step of product marketing. That’s why it needs a long relationship for all those stakeholder involved. The “X” company should pay more attention to thus five dimension so that the relationship can give more benefit for each other and they also should know about level of supplier performance that can be measure how good are the work performance of supply chain management that implemented by the broccoli supplier.

According to the explanation above, the research problem are how is the concept of the broccoli supply chain of the “X” company, how are the trust; commitment; communication; satisfaction; and dependency happened among the “X” company and its

broccoli supplier, how is the performance level of the supplier toward supply chain management work performance, and the last is how the relation among the trust; commitment, communication; satisfaction; and dependency with the supplier performance level.

### **Reference**

Indah et al (2008), explained on her research about the coordination simulation of banana supply chain in East Java. On this research, she tried to develop a model and experiment toward several scenario using the dynamic system simulation to evaluate the coordination influenced the banana supply chain work of performance in East Java. The performance measurement that have been evaluate on her research are selling revenue, over-supply lost sales, and availability. The result conclude that the coordination combination in upstream and downstream side resulting the best supply chain performance in selling revenue side, the experiment also showed that coordination into supply chain capable to increase the supply chain performance in totally, although there was always one or several business actor which has decreasing experience of the same performance measurement. In other hand, that can be known of the government program to increase the numbers of supplies from the upstream side would carry out the biggest benefit if the program could be realized with the condition which had better coordination into the supply chain.

Another research about the supply chain management has done by Batt (2003) with measuring satisfaction, trust, and dependency power among the actors that involved in potatoes agribusiness supply chain. The result showed that the upstream relationship in order to the relation between farmer, collector and seller/trader, in almost of the trader tells that they have highest level in satisfaction and trust. Generally, the trader more believed in collector than farmer in personal whereas in the downstream relationship, most of the farmer has a positive relation with their business partner. Farmer fell satisfied and believed to their business partner. Farmer also showed that their business partner is always honest and keep their promises and also independently act from their business partner, and farmer can choose the quickly alternative of their business partner although most of the farmer hopefully that they can kept the good relation with their business partner. Farmer opinion that their business partner sometimes has a power to control the information until some

purpose the business partner can pushed the farmer to make the decision that would not be beneficial for farmers.

Wijayanti (2008) also have been done a research about the supply chain management of carelessly negligent chips (*gnetum gnemon*)/"*melinjo*" chips that focused on the long term relationship consist of satisfaction, trust, dependency, commitment and communication between agroindustry and their business partner. The result of this research mention about the relationship among agroindustry and its business partner they felt satisfied, very dependent, and have high level commitment and communication with clearly information for both of them. There are positive relation for how long that relationship with all variables.

This research aimed to measure about the performance level of the supplier toward work performance of supply chain management and find out the role of the supplier to broccoli supplies for the "X" company.

### **Theories**

Said (2006), explained about the basic principal of supply chain management are :

1. Integration

All of the element which involved into supply chain management series which has compact one unity and realized the dependency for each other.

2. Networking

All of the element which has on work relation with harmony

3. Point to point

The operation process consist of the element of supplier from upstream to downstream customer

4. Dependency

In every element of supply chain management realized that to reach the competition benefit need more cooperation which will make benefit for booth of them

5. Communication

Data accuracy became the blood into a networking to make information and material more accurate.

Supply chain management used to be illustrated in some literature when the product delivery function of a company tends to be the main important thing. Supply chain is a

networking creation between raw material supplies and services which to extend the raw material transformation to be a kind of product and services and deliver to company consumer.

The main purpose that can be justified are the supply chain request the approach or integration method with the basic spirit if collaboration. The supply chain is not only oriented to company's internal affair but also external affair which has related to their partner. It need more than collaboration among the companies into the supply chain because the companies which based on a supply chain specifically wants to satisfied the same latest consumer and they must work together to make a cheap product, on time delivery, and good quality inside the product. Cooperation is only the way to put the elements together into a supply chain's goal will be reach.

Building the long term relationship with the supplier, consumer and buyer could reach saving cost through reducing searching cost and evaluation cost, reducing transaction cost, and influenced the knowledge and relation of special economic scale.

The main reason to build the relationship with the supplier is the customer realized that supplier can creates the value, provide the benefit to increase the market access of production input supplies more reliable, increasing quality and product performance, ethnic interaction level more higher into information exchange, potencial product adaptation and technical helping, also more backup from supplier in developing and launching a new product.

To be more closer with the customer, understanding and consumer need satisfaction, supplier can reach more over customer with loyalty and more selling with highest. The marketing relationship between supplier and consumer can give more stronger benefit and sustainable so that can be difficult for the competitor to enter the market (Batt, 2003).

Moorman, et all (1993) said that trust basically came from a good will to rely on another. More over Morgan and Hunt (1994) said that trust is a result of partner superiority and integrity that can be showed by attitude for example consistency, competence, fair, responsibility, easy to help and have a sense of care. In this context of the relation between company and its retailer, the retailer trust will show when the company proved the ability and superiority.

Sako, 1990 (in Batt, 2004) divided trust into third levels are contractual trust which mean a hope that partner of work would stay because of their duty by paper or words act based on business implementation which can be acceptable in general, competence trust

which mean that trust result by assumption means company can be trusted to do its activities professionally and acceptable, and goodwill trust mean that both of side develop a hope that can be profitable for them where other will do more than in general.

Commitment can be define as perennial wishes to maintain the relation with regarded relationship. The company will commit with its partner when the relation considered to the most important as a business demand. Thus shows a wish to continue the relationship in a future. The substance of inter-organization commitment and interpersonal relationship are stability and sacrifice. Commitment related to long term orientation adoption toward relationship to relationship, hope for doing short term sacrifice and to reach profit in a long term condition.

Delivery performance used to measure how far delivery performance of a supplier toward its working partner. Measuring work performance of supplier can make the company easier to evaluate that supplier so later on the company can choose which supplier feasible to get cooperation with.

Delivery performance in a supply chain management can be divided into two ways are :

- a) Scheduled Orders to Customer Request (SOCR) which mean the presentation of order numbers that delivered as a customer request that have been scheduled.

$$\text{SOCR} = \frac{\text{Orders Scheduled to the Customer's Request Delivery Date}}{\text{Total Orders Scheduled}} \times 100\%$$

- b) Delivery Performance to Request Date (DPRD) mean that the presentation of order numbers which fulfill as a date that customer request on time or before the date that customer request on directly or indirectly.

$$\text{DPRD} = \frac{\text{Number of Orders that are fulfill on time}}{\text{Total Number of Orders}} \times 100\%$$

## **Methodology**

### **Data Collecting**

The data using for this research are primary which collected from interview through the questionnaire from some people whom work at the "X" company and secondary data

from the buying report of broccoli's farmer, article related and also about company's profile.

### **Data Analysis**

Descriptive analysis used to analysis the data which describes and illustrated the data collection without giving any summarize that have been already accept in general opinion (Sugiyono, 1999). The descriptive analysis used to illustrated the shape of broccoli's supply chain at the "X" company and also shows long term relationship between the "X" company and its supplier with all variables such as trust, commitment, communication, satisfaction and dependency.

Likert Scale also used to measure the instrument of answering the question which has a different weight are consist of :

- a. Very agree weighting on 5
- b. Agree weighting on 4
- c. Undecided weighting on 3
- d. Disagree weighting on 2
- e. Very disagree weighting on 1

### **Result**

Basically, the supply chain is a logistic network where many actors getting involved such as suppliers, manufacturer, distributor, retail outlets, and customers. Supply chain starting from the supplier whom the first source to supplies the first product. Thus can be seen in raw materials or additional raw. The first actors in this research is broccoli's farmers and the first raw that used is broccoli seed that planted by farmers. Several farmers whom didn't buy the seed directly but they are using the seed that giving by the collector traders. Thus farmers then sell their broccoli to the collector traders otomatically by cooperation and understanding or dealing among them.

### **The "X" company's broccoli supply chain concept**

The first chain originate from supplier will be connected to the second chain whereas in this research the broccoli will be buy by collector trader. The trader will eliminate the broccoli which will be disbursed to the "X" company. The quality of broccoli



consist of two such as super quality and standard quality with code ST. The quality that usually ordered by the “X” company are the super quality with characteristic of medium size, broccoli’s flowered tight, and green yellowish coloring. The ordered form the “X” company must be adjusted by the request of supermarket because finally the “X: company will be distributed to the supermarket.

Broccoli which has distributed to the traders then delivered to the “X” company and for the next what “X” company doing is production process to make the quality stable and have a great performance. The first step in production begin on selecting the broccoli which has a perfect shape. Next step is cleaning to make it clear from bugs or dirt on broccoli skin. The latest is film wrapping to make the broccoli still in a good quality.

Broccoli will distribute to the supermarket then came to the customers hand. The supply chain concept of “X” company are broccoli farmer (A), collector trader (B), “X” company (C), supermarket (D) and the last is customer (E).

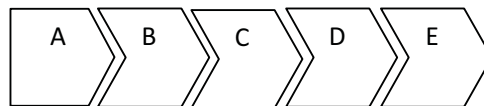
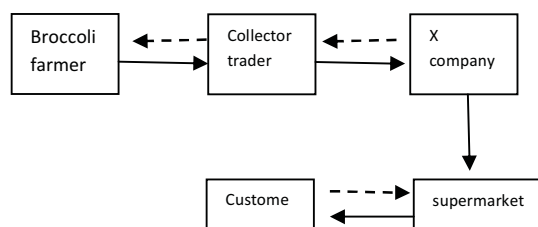


Diagram 1 : Supply Chain Concept “X” company

Product flows, money, and information on “X” company broccoli supply chain can be seen on next diagram.



Legend :

- > Product and information flows
- - - -> Money flows

Diagram 2 : Product, money, and information flow on X company

### **Analysis of Trust, Commitment, Communication, Satisfaction and Dependency**

- **Trust**  
According to the reasearch all of the sixth supplier shows the average value of trust is 18,5 from 25 for the maximum value where in general the “X” company believe or trust the supplier exactly.
- **Commitment**  
All of the sixth supplier shows the score 11,5 from 15 for the maximum value with the average value of good category which means that both of them can work together without any difficulties.
- **Communication**  
The average value of communication is 16 from 20 from the maximum value which mean that the communication among them are often
- **Satisfaction**  
Satisfaction value is 18,83 from 25 for the maximum score which mean that booth of them are satisfied on each work.
  
- **Dependency**  
According to the research the value of dependency is 16,17 from 20 for the maximumvalue which mean among the “X” company and its supplier very dependent.

### **Supplier Performance Level Analysis**

One way to make the supply chain management can be succesfully is to choose the supplier which is competence into supplying a product and that can be measure from the SOCR value for the first supplier is 70,8 %, second supplier is 88,6 %, third supplier is 65 %, fourth supplier is 75,7%, fifth supplier is 70,8% adn the sixth supplier is 79%.

### **Delivery Performance to Request Date Analysis**

Supplier of the “X” company have a different score of DPRD. That can be measure clearly in work performance of the broccoli supplier considering availability of the supplier when the “X” company suddenly need about broccoli supplies.

The score of the first supplier is 73,8 % for DPRD and it shows that the supplier available to supply eventhough for the suddenly situation. The second supplier have a 62,3 % then increased for the next delivery periode. The third supplier is 54,6 % and becoming 73,6 % for the last delivery periode of time. The fourth supplier have 63,9 then become 83,2 % increased for the last periode of time because in that periode of time the increasing happen because of many holiday such as Hari Raya Idul Adha, Natal etc. The fifth supplier have a 74,5 % for the last periode of time and the sixth supplier have 67,5% for the first periode of time and increase become 77 % for the last periode of time and that showed the availability to supply the need of broccoli suddenly.

### **The Relation Analysis of Trust, Commitment, Communication, Satisfaction, and Dependency toward Supplier Performance Level**

The important thing to analysis this relationship is to find out the linkages between the “X” company with its supplier so that can evaluate supplier performance toward its company. When the performance level of a supplier is high then work relationship such as trust, commitment, communication, satisfaction, and dependency that tied between the “X” company and its supplier will be working smoothly.

The relationship of trust and supplier performance level for all supplier in average is high with the score 63,8 % and it showed that the “X” company trust with the supplier because of they have higher performance which mean that they can fulfill the “X” company need of broccoli.

The relationship of commitment and supplier performance in average have a good commitment with high performance level because they have a good commitment.

The relationship of communication and supplier performance level in average have a good communication beause they are often making communication each other and they can avoid miscommunication in their cooperation.

The relationship of satisfaction and supplier performance level in average the supplier has a high performance level because the “X” company felt staisfied with all of the supplier’s work performance.

The last is the relationship of dependency and supplier performance level in average have a high performance level that can be illustrated for the “X” company are very dependent to its suppliers because their all can fullfil the nedds of broccoli supply..

## **Conclusion and Suggestion**

The conclusion of this research are the concept of supply chain management that have been doing by the “X” company starting from the broccoli farmer then collector trader until its supply to the “X” company then goes to the supermarket. The last chain is for the final consumer which will buy from the supermarket.

According to the score of trust, commitment, communication, satisfaction, an dependency of the “X” company toward its suppliers felt trusted, have a good commitment, often communication, satisfied and have a strong dependency.

The SOCR and DPRD score for all the supplier shows that the second supplier have a higher score with 77,3 % it means that the second supplier can fullfil all of the “X” company needed of broccoli supplies.

There is a relationship among all the long term relationship variables with the supplier performance level which means if the relationship between the “X” company and its suppliers in good relation then the suppliers also have a high performance level.

The suggestion of this research is for the second supplier which has the highest performance level hopefully can maintain and sustaining to supply all the broccoli needed appropriate with the request and scheduling of the “X” company and for the supplier which have lower delivery performance can improve its ability to supply broccoli in a good quality and availability for the “X” company.

The “X” company also have to make addition of the supplier which can supply broccoli needed and have ability to fullfil the supermarket request.

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