International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2013): 6.14 | Impact Factor (2015): 6.391

Assessment of Fresh Cut Vegetables Supply Chain Performance and Its Partnership at Bogor Indonesia

Suhartini[1], Rina Oktaviani[2], Heti Mulyati[3]

[1, 2, 3]Management and Business, School of Business, Bogor Agricultural University,
Jl Raya Pajajaran, Bogor, Indonesia

Abstract: ***Vegetable has a contribution as a fiber source for human health. PT Sayuran Siap Saji is an agribusiness company has contributed to provide fresh cut vegetable products for retailers in Jakarta, Bogor, Depok, Tangerang and Bekasi areas. Therefore, it is needed to measure supply chain performance and analyze partnerships between farmer, company, and retailers. The purpose of this research is to measure the supply chain performance of fresh cut vegetables and to analyze the factors that influence the long-term partnership between farmers, company and retailers. The supply chain performance was measured by SCOR model which its priority was calculated by MPE method. Partnership between farmers and the company used Factor Analysis, while the company and the retailer measured by customer satisfaction. Farming analysis calculated the farmer profit and value added of the company used Hayami method. The results show that reliability metric is the first priority with the weight score 0.2911. The other metrics of vegetables supply chain performance are responsiveness (0.2404); flexibility (0.1963); cost (0.1518; and an asset (0.1203). The farmers from Bandung were the highest performance of the vegetable supply chain. Assessment of supply chain performance of farmers from Bogor and Garut were shown in the second and the third ranking. The farmers in Bandung are supported by modern facilities and they produce Paprika which the other farmers do not cultivate it. Farming analysis for R/C ratio of mustard green commodity was 2.44%, Tomatoes was 2.07% and Lettuce head was 1.87%. B/C ratio for mustard green commodity was 1.44%, Tomatoes was 1.07% and Lettuce head was 0.87%. BEP for mustard green commodity was IDR. 7 430, Tomatoes was IDR. 7 422, and for Lettuce head was IDR 9 155. ROI ratio of mustard green was 140%, tomatoes was 200%, and Lettuce head was 140%. ROI ratio indicates that this farming gives profit for farmers. Value added ratio for company showed for mustard green commodity was 66.21%, for Tomatoes was 71.65% and Lettuce head was 75.06. The main factors influencing significantly to the long-term partnership between the farmers and the company are the aid to market product and guidance and tutoring from the company. The highest factor of customer satisfaction receiving by the retailer is vegetables return (score 5). It indicates that retailer is laid on the requirement of product return from PT Sayuran Siap Saji to support their business processing.***

Keywords: analysis factor, farming analysis, Hayami method, MPE, partnership, SCOR, value added ratio

1. Introduction

Changes of people mindset in Indonesia for consume vegetables as natural fiber have an impact of increasing its consumption on their daily diet. The consumption level of Indonesian people based on income and expenditure category presents in Figure 1 (Statistic Center of Bureau, 2016)

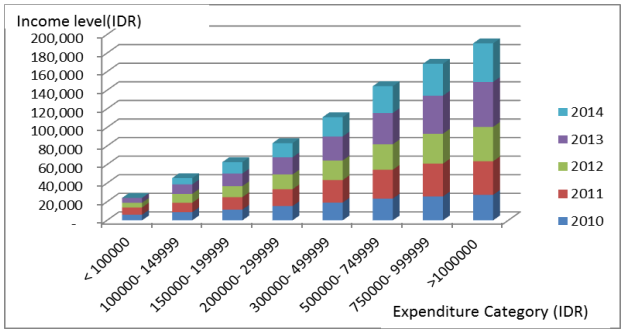

Figure 1: Average consumption of vegetable of Indonesian people based on the income and expenditure category from 2010-2014 year

PT Sayuran Siap Saji is one of the companies that concerns to produce fresh cut vegetables, cutting and packing vegetables. The company distribute to some food retailers in Jakarta, Bogor, Depok, Tangerang and Bekasi area, such as: Bakmi Gajah Mada, 7 Eleven, Domino, Sate Khas Senayan, Pizza Marzano, Rejuve, D' Crepes, TGI Fridays, Moss Burger, Daihatsu, Johny Rocket, Nam Nam Resto, Langgan Segar, Darmawan Park, Sopra & Opera, Purantara, Hisana FC, and Family Mart. The types of fresh cut is made from broccoli, mustard greens, tomatoes, lettuce head, cabbage, cauliflower, long beans, carrot, beetroot, cucumber, spinach and paprika. The retailers are fast food restaurants serving fresh cut as processing vegetables on their menu, like topping for pizza and vegetables mix for salad and noodles.
All activities of company are related to supply chain performance. The partnership among farmers and company has been conducted by written contract to provide vegetables stock. Unfortunately, PT Sayuran Siap Saji faced some problems related with supply chain performance, for example stock product, productivity level, harvest period, partnership and satisfaction level between the farmers and retailers, etc. Neely *in* Shepherd and Gunter (2006) [2] explained that measurement of performance is a process to measure a successful and efficient all activities. Partnership will impact to the long-term cooperation between all involved parties, such as the farmers, company and retailers. PT Sayuran Siap Saji has partnership with farmer from Bogor, Bandung and Garut city to keep supply of vegetables. Three commodities with highest production are: mustard green, tomatoes and Lettuce head. Farming analysis is calculated by three highest productivities. The factors that influence the partnership will be analyzed in purpose to improve the performance and solve the occur problems. From these reasons, it is important to:

1) Measure the value added of farmers and the company; and supply chain performance of fresh cut.
2) Analyze the partnership among farmers and company.
3) Analyze the partnership among retailers and company.

The goal of the research is to improve the efficiency of supply chain performance in purpose to fulfill consumer requirement.

2. Concept of Supply Chain Management

Supply-chain management (SCM) is the integrated planning, coordination and control of all business processes and activities in the supply chain to deliver superior consumer value at least cost to the supply chain as a whole while satisfying the variable requirements of other stakeholders in the supply chain (e.g. government and NGOs) (Van der Vorst 2000) [3]. Activity series of supply chain will be integrated by supply chain management systematically. Austin (1992) [4] and Brown (1994) [5] explained that supply chain for perishable product is large different with manufacture due to: (1) green product is perishable, (2) planting processing, maintenance and harvesting depend on the climate and season, (3) it has variation of form and size and (4) green product is voluminous regularly so it is difficult to be managed.

2.1 Assessment of Supply Chain Performance

Rosenau *et al.* (1996) stated that [6] performance measurement system is defined as a system that enables a firm to monitor the relevant performance indicator of product, services and process in the appropriate time fame. Aramyan *et al* (2006) [7], has developed a pre-research about framework of supply chain performance assessment, especially for green products, according to previous literature studies. The conceptual framework, described in the next section, consists of four main categories: 1), Efficiency; 2) Flexibility; 3) Responsiveness; and 4) Food quality. The supply-chain performance is an overall performance measure that depends on the performance of the individual chain stages and the respective processes that are executed in those stages (Van der Vorst 2006) [8].

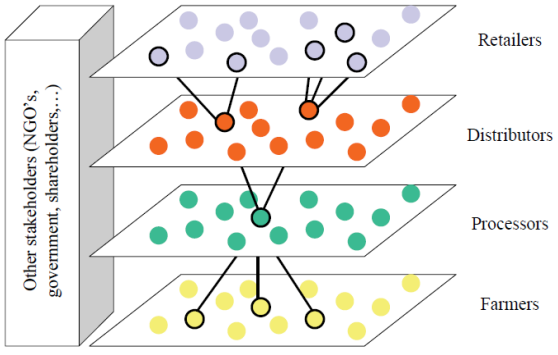

Figure 2: Schematic diagram of a supply chain from the perspective of the processor (bold flows) within the total FSCN (based on Lazzarini et al. 2001).

2.2 Supply Chain Operation Reference

Supply Chain Operation Reference (SCOR) is a reference model that developed and improved by Supply Chain Council (SCC) (2006) [9] and has a function as diagnostic tool for supply chain management. The SCOR model divides into five core supply chain processing, as follows:

1) Plan process, is a process to equalize the demand and the storage in order to fulfill the requirements.
2) Source process, is a process to make product or service to fulfill the requirement.
3) Make process, is a process to transform the raw materials or another component become final product as consumer orders.
4) Deliver process, is a process to fulfill consumer demand of those product and services.
5) Return process, is a process to receive or return products due to any reasons.

2.3 Farming Analysis

Historically, farmers have been known to relegate farm management and cost measurement to the periphery of their activity even though these are crucial elements of the decision making process and financial health of the business (Brannstrom, 2008 [10]. Continuous production and a sufficient supply of raw materials are essential for established business in agriculture. The availability of raw materials, along with price and quality, is the prime concern for this sector, as mentioned by Connor *et al*, 1985) [11]. Generally, some formula calculates for Ratio/Cost ratio (R/C ratio), Benefit/Cost ratio (B/C ratio), Break Event Point (BEP) and Return of Investment (ROI).

2.4 Value Added Analysis

Value-added is all the additional value created at a certain stage by production factors, including tangible added value through the transformation of raw materials, labor and capital goods, as well as intangible added value through intellectual capital (use of knowledge assets) and an exchange relationship (i.e. building cooperative relationship). According to Hayami *et al.* (1987) [12], tangible added value is influenced by technical factors (production capacity, amount of raw materials used and labor) and market factors output price, wage of labor, raw materials prices, and value of other inputs). Tangible added value is obtained through a reduction in raw materials cost and other inputs to the value of products.

2.5 Partnership in a Supply Chain

Partnership in supply chain integration is defined as strategic alliance step from two or more organizations to support facilitation of a business coalition or collaboration to create a great value from some activities, such as research, product development, manufacture processing, marketing, sales and distribution process (Maheshwari *et al.*, 2006; [13] Li *et al.*,2006) [14]. Agriculture products as perishable product, need good collaboration as trust system in their business to support their stock and fulfill the consumer requirement in the exact time. Due to green product is 100% depend on the

season and nature factors. Nguyen (2014) [15] investigated that availability of product is closely with suppliers contributions as supporters and ancillary so that collaboration form and partnership management is very important.

3. Methodology

This research used the SCOR model that references to SCC (2006) [9].

Table 1: Performance Attributes Level 1

Performance Attribute	Performance Attribute Definition	Level 1 Metric
Customer Facing Attribute		
Supply chain delivery reliability	The performance of the supply chain in delivering. The correct product, to the correct place, at the correct time, in the correct condition, in the correct condition and packaging, in the correct quality, with the correct documentation, to the correct customer	Delivery performance
		Fill rates
		Perfect order fulfillment
Supply chain responsiveness	The velocity at which a supply chain provides product to customer	Order fulfillment lead time
Supply chain flexibility	The agility of a supply chain in responding in marketplace changes to gain or maintain competitive advantage	Supply chain respond time
		Production flexibility
Internal Facing Attributes		
Supply Chain Cost	The costs associated with operating the supply chain	Cost of goods sold
		Total supply chain management cost
		Value added productivity
		Warranty/return processing cost
Supply chain Asset Management Efficiency	The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of all asset: fixed and working capital	Cash to cash cycle time
		Inventory days to supply
		Asset turns

Source: Supply Chain Council (2006)

3.1 Formula of MPE Method

MPE is used to score of performance indicator and for weighed scoring. The advantages in using MPE method are below:

1. Reduce the possibilities of fault occurs in the analysis.
2. Scoring value describing the leveling priority is bigger (exponent function) and it will make the level priority of decisions alternative more significant (Marimin 2010) [16].

Total of score $(TNi) = \sum_{j=1}^{m} (RK_{ij})$,

Where are:

$_{TNi}$ = score total for alternative-i

$_{RKij}$ = degree of relative importance of the criteria-i for the selection decision-j

$_{TKKj}$ = degree of relative importance of the decision criteria j; $_{TKKj} > 0$; positive number

n = the number of decisions selection

m = the number of decision criteria

3.2 Farming Analysis of Farmers and Value Added of a Company

Farming analysis uses formula to calculate revenue (profit) for farmer, such as below:

Revenue/Cost ratio = $\frac{R}{TC}$ x 100%,

Benefit/Cost ratio= $\frac{P}{TC}$ x 100%,

Break Event Poin (BEP) = $\frac{Fixed\ cost}{Sales\ price - Variable\ cost/Unit}$,

Return of Investement (ROI) = $\frac{P}{TC}$ *x 100%*

Where:

R=Revenue, TC= Total cost, P=Profit

3.3 Value added for company by Hayami (1987) Method below:

Formula for Hayami method presents on Table 2.

Table 2: Value added using Hayami method

Output, input and price	
(1)	Output (kg/day)
(2)	Raw material input (kg/day)
(3)	Labour input (hour/day)
(4)	Conversion factor (1)/(2)
(5)	Labour coefficient (3)/(4)
(6)	Product price (Rp/kg)
(7)	Wage rate (Rp/hour)
Income and profit	
(8)	Raw material input
(9)	Other current input
(10)	Product (4) x (6)
(11)	Value added (8)-(9)-(10) Value addede ratio %) (11)/(10)
(12)	Labour income (5) x (7) Labour's share %) (12)/(11)
(13)	Processor profit (11)-(12) Profit rate % (13)/(10)

Formula for value added = f {K, B, T, U, H, h, L} (1)

where:

K= Production capacity

B = Raw material

T = Labor

U= Wage of labor

H= Output price

h = Input price

L = Value of other inputs

3.4 Partnership Factors formulated by Analysis Factor

Factors that influence for partnership figure out as variables below then it will be analyzed by Factor Analysis for partnership between farmers, company and retailers.

Table 3: Variables as influenced factors to partnership between farmers and the company

Code	Variables	Description
v 1	The aid of seeds and fertilizers	Company aid to farmer, in form of seeds and fertilizer
v 2	The aid of Agriculture tools	Company aid to farmer, in form of agriculture tools
v 3	Training	Company aid to farmer, in form of training
v 4	Product quality	Satisfaction level of company to product quality from farmer
v 5	Post harvesting activities	Company contribution after post harvesting (transportation)
v 6	Marketing	Company contribution to sell farmer product to another consumer (distributions)
v 7	Payment system	Payment system to farmer
v 8	Failure risk	Company contribution to solve the problem in the field
v 9	Guidance and tutoring	Company contribution to give guidance and tutorial to farmer
v10	Counseling	Company contribution to give counseling to farmer
v11	Capital loan	Company contribution to give financial donation
v12	Output price	Revenue sharing

Adapted from Sánchez Torres 2011 [17] and Nguyen 2014 [15]).

Table 4: Variables as influenced factors to partnership between retailer and company

Code	Variables	Description
v 1	Collaboration	Satisfaction level to partnership
v 2	Benefit	Satisfaction to revenue sharing
v 3	Business risk	Satisfaction to risk sharing
v 4	Product quality	Satisfaction retailer to product from PT Sayuran Siap Saji
v 5	Quantity	Satisfaction retailer to amount of product quantity
v 6	Consumer's prevalence	Satisfaction level of end user to product quality from PT Sayuran Siap Saji
v 7	Claim solutions	Satisfaction retailer to claim management of PT Sayuran Siap Saji
v 8	Return product	Satisfaction retailer to deliver product return
v 9	Return schedule	Satisfaction retailer to return schedule
v10	Promotions	Satisfaction retailer to promotions from PT Sayuran Siap Saji
v11	Rewards	Satisfaction level to rewards from PT Sayuran Siap Saji

Adapted from Morgant and Hunt 1994) [18].

4. Discussion

4.1. Fresh Cut Supply Chain of PT Sayuran Siap Saji.

The actor of supply chain includes:
1. Primary actors, such as: farmer, company, retailer
2. Secondary actors, such as: material shop

Flow of product, financial and information

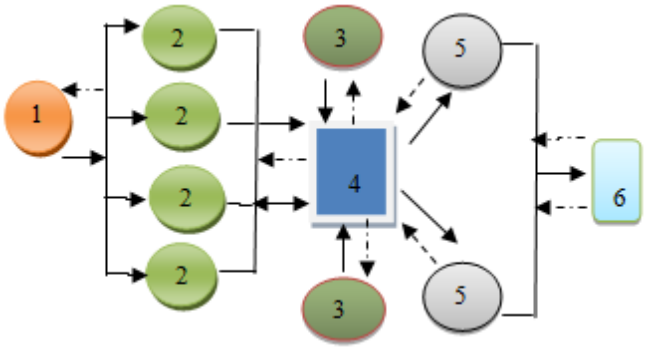

Figure 3: Flow of products, financial and information (Adapted from Subarkah 2008) [19].

Wheres:
1. Facilitator for agriculture products
2. Farmer
3. Facilitator for material products
4. PT Sayuran Siap Saji
5. Retails
6. End user

Flow of product
Flow of financial
Flow of information

Fresh cut vegetables supply chain starts from agriculture facilitator (farmer shop), such as seeds, fertilizers, insecticide (pesticides). Then farmer cultivates their land for producing vegetables (2). PT Sayuran Siap Saji as distributor to deliver product of fresh cut (4). In this stage, PT Sayuran Siap Saji needs some of material for packaging from material shop, such as box, plastic, etc. (3) then deliver product to consumer (retailer) (5). Fresh cut product ends in the end user (customer, and buyer). Flow of product (1.2.3.4.5 and 6 actors), flow financial (1.2.3.5 and 6 actors) and information (2) occur on that process.

4.2 Selection of Performance Indicators

Selection of supply chain measures is a critical measure because managers have to evaluate supply chain on various aspects as a whole entity rather than on an individual basis.. Decision-makers in supply chains focus on developing measurement metrics for evaluating performance (Beamon 1999 [20]; Gunasekaran *et al.* 2004) [21]. Weighted score for performance indicator of fresh cut vegetables presents in Table 5.

Table 5: Weighted scoring of fresh cut vegetables performance indicators

Performance metric	Score	Priority
Reliability	0.2911	1
Responsiveness	0.2404	2
Flexibility	0.1963	3
Cost	0.1518	4
Asset	0.1203	5

Reliability metric is the first priority and has contribution to fulfill consumer requirement to maintenance of satisfaction consumer. Responsiveness metric is as a second priority. Person and Olhager (2002) in Aramyan (2007) [7] conclude that responsiveness level has achievement to fulfill requirement as consumer order in short period. Indicator of flexibility is as third priority. Novich (1990) [22] conclude

that flexibility means in meeting a particular customer delivery requirement at an agreed place, agreed mode of delivery and with agreed upon customize packaging. This type of flexibility can influence the decision of customers to place orders, and thus can be regarded as important in enchanting and retaining customers. Cost metric has fourth priority in performance indicator level. Gunasekaran (2004) [20] mentioned that once the total cash flow time is determined, this can be readily combined with profit to provide insight into the rate of ROI. The last one is an asset metric. In this regard it is essential to determine how the cost associated with each asset, combined with its turnover, affects total cash flow time. One way to address this is by expressing it as an average days required to turn cash invested in assets employed into cash collected from a customer (Stewart 1995) [23].

4.3 Assessment of performance metrics at PT Sayuran Siap Saji

Selection of supply chain performance metrics is a critical aspect. It means that managers have to evaluate the supply chain performance on various aspects as a whole entity rather than on an individual basis. Decision-makers in a supply chain focus on developing measurement metrics for evaluating performance (Beamon 1999 [20]; Gunasekaran *et al.* 2004) [21]. Assessment of performance indicator for fresh cut supply chain presents on Table 6.

Table 6: Assessment of fresh cut vegetables performance metric

Performance metric	Value		
	2014	2015	2016
Delivery Performance (%)	100	100	100
Fulfill requirement (%)	99.13	97.03	95.27
Product quality (%)	99.98	99.97	91.43
Delivery period (day)	3	3	3
Lead time cycle (day)	7	7	7
Supply chain flexibility (day)	90	90	90
Supply chain total cost (IDR/kg)	34 702	34 879	37 303
Cash of cycle to cycle (day)	14	14	14
Inventory days (day)	2	3	2

The value of delivery performance is 100% to fulfill consumer order. Even lateness of order would give bad effect to retail in order to fulfill end user need. Fulfill of requirement from data above shows decreasing level with range difference about 2%. This reason causes some of retailer terminated their corporation with PT Sayuran Siap Saji. Product quality shows decreasing percentage with many claim to company. Delivery period need 3 day and lead time cycle occur for 7 days from order to delivery. Cost of supply chain show increasing price due to inflation. Cycle of cash to cash needs 14 days from order to invoice and inventory maximum 2-3 days from sorting process to reduce production cost and to keep the quality product.

4.4 Assessment of farmer performance

Assessment of farmer performance is evaluated by top management of PT Sayuran Siap Saji. Scoring performance metrics are used by MPE with scale of Saaty (1980) [24].

Table 7: Assessment of farmer performance by MPE Method

Areas' farmer	Scoring by MPE Method	Priority
Lembang farmer	67 504 954	1
Bogor farmer	67 278 293	2
Garut farmer	66 045 183	3

Farmer from Lembang area has the first performance because they are the only one producer of paprika and it is not produced in another area, except in Lembang. Modern facilities are owned to farmer in Lembang to support paprika cultivation, includes: green house, air condition room and transportation. The second one is farmers at Bogor, who cultivate various vegetable, such as broccoli, mustard greens, tomatoes, cabbage, cauliflower, long beans, carrots, beetroot, cucumber and spinach. Farmer from Garut has the third priority as partner because location from the company is far and they only cultivate several vegetables like lettuce head, little tomatoes and beetroot.

4.5. Farming analysis for farmer and added value for company

Farming analysis is used to calculate the revenue and profit for farmer. There are three commodities with highest productivity (highest output that produced by company), such as: mustard greens, tomatoes and Lettuce head. Table 8 present recapitulation data of R/C ratio, B/C ratio, BEP and ROI value.

Table 8: Recapitulation data for R/C Ratio, B/C Ratio, BEP and ROI value

Value	Farming Analysis		
	Mustard greens	Tomatoes	*Lettuce head*
R/C Ratio	2.44	2.07	1.87
B/C Ratio	1.44	1.07	0.87
BEP	7 430	7 422	9 155
ROI (%)	140	200	140

Table 8 showed three commodities which give profit to the farmer because it has good demand in the market. ROI value for tomatoes is 200%. It related to the demand of tomatoes increases rapidly in the recently year due to many restaurants opened in Jakarta, Bogor, Depok, Tangerang and Bekasi area. Tomatoes have many functions as vegetables fillet on hotdog bread and topping on the pizza. Value added for three commodities: mustard greens, tomatoes and Lettuce head presents in Table 9.

Table 9: Value added for company of Mustard greens, tomatoes and Lettuce head

Nilai	Farming Analysis		
	Mustard greens	Tomatoes	*Lettuce head*
Margin	8 585	10 539	16 026
Value added (%)	96.94	93.33	97.45

According to Table 9, company has margin price for mustard greens, was IDR 8 585; for tomatoes was IDR 10 539 and for Lettuce head IDR 16 026. This profit come from difference price both buying vegetables from farmer and selling product to retailer. This margin is calculated for production cost, such as transportation mode, processing,

packaging, delivery process and wage for employees. Value added for fresh cut mustard green is about 96.94%, tomatoes is about 93.33% and for Lettuce head is 97.45%. It means that fresh cut vegetables: tomatoes and Lettuce head contributed to company profit significantly.

4.6. Partnership factors that influence long-term collaboration among farmers and the company

Some variables represent as factors that influence of long term partnership among the farmers and the company. Communal value for seven variables: the aid of seeds and fertilizers (v1), post harvesting activities (v5), marketing (v6), guidance and tutoring (v9), counseling (v10), capital loan (v11) and output price (v12) have fulfilled as conditional factors (Table 10).

Table 10: Communal value for seven variables

Variables	Initial	Extraction
The aid of seeds and fertilizers (v1)	1,000	0,670
Post harvesting activities (v5)	1,000	0,829
Marketing (v6)	1,000	0,852
Guidance and tutoring (v9)	1,000	0,907
Counseling (v10)	1,000	0,824
Capital loan (v11)	1,000	0,798
Output price (v12)	1,000	0,833

Extraction Method: Principal Component Analysis

Two variables: marketing (v6) and guidance and tutoring for farmer (v9) will impact to long-term partnership significantly. It shows with the highest score, 0.852 and 0.907, for these variables. It means that company has helped farmers to market their product with free of transportation mode. The other reason is farmer has certainty of market and when it picks up after harvesting. Benton and Maloni (2004) [25] illustrated that there is a significant positive among relationship and satisfaction which indicates that the quality of buyer-supplier relationships have a strong influence on the satisfaction of its suppliers.

Metric component value

Relation for each variable and the influence to another variable are described in the Table 11.

Table 11: Component matrix value

Variables	Component		
	1	2	3
The aid of seeds and fertilizers (v1)	0,772	-0,192	0,443
Post harvesting activities (v5)	0,765	0095	-0,275
Marketing (v6)	0,750	-0,077	0,533
Guidance and tutoring (v9)	-0,655	0,422	0,465
Counseling (v10)	-1,80	0,848	0,395
Capital loan (v11)	0,267	0,802	-0,344
Output price (v12)	0,464	0,751	0,137

Extraction Method: principal Component Analysis
a. 3 components extracted

Table 10 shows that variables: guidance and tutoring (v9) and counseling (v10) have negative correlation. It means that factor guidance and tutoring from company and counseling effort will influence to farmers productivity indirectly; also for long-term collaboration among farmer and company. In the fact, farmer ignorance about the exact cultivation even complaint will decrease of productivity not only quantity but also for quality. This case needs handing from company fairly to support farmer performance.

The total value of variance explained by the diversity of factors

Data total value of variance is explained by the diversity of factors (Table 12). The percentage of the total diversity is able to be explained by the diversity of factors that were formed then. Those variables: the aid of seeds and fertilizers (v1), aid of Agriculture tools (v2), training (v3) and product quality (v4) have Eigen values value > 1.0 with cumulative percentage reach 71.446%. This means that four variables influence to farmer satisfaction level and it will impact to the long-term collaboration performance.

Table 12: The total value of variance explained by the diversity of factors

Component	Total Variance Explained					
	Total	% of Variance	Comu-lative %	Total	% of Variance	Comu-lative %
1	2.994	24.949	24.949	2.994	24.949	24.949
2	2.771	23.088	48.037	2.771	23.088	48.037
3	1.665	13.877	61.914	1.665	13.877	61.914
4	1.144	9.533	71.446	1.144	9.533	71.446
5	0.996	8.299	79.746			
6	0.709	5.909	85.654			
7	0.615	5.125	90.780			
8	0.411	3.427	94.206			
9	0.338	2.814	97.020			
10	0.162	1.350	98.370			
12	0.120	1.003	99.373			
	0.075	0.627	100.000			

Distribution of partnership former variables

Distribution of the seven variables: the aid of seeds and fertilizers (v1), after harvesting activities (v5), marketing (v6), guidance and tutoring (v9), counseling (v10), capital loan (v11) output price (v12) based on the analysis of Component the plot is presented in Figure 4.

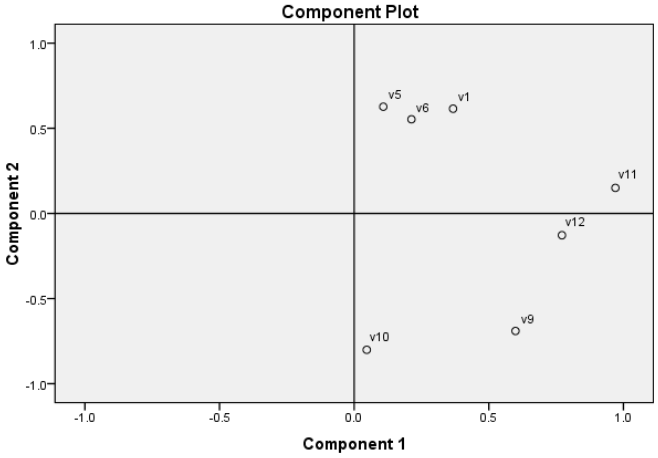

Figure 4: Component plot distribution

Two factors on group are presented on Table 13.

Table 13: Value of factors and variables type for two factors

Factor type	Variable type	Loading Factor	
		Raw	Rescale
Factors 1 (physically contribution)	v1	0,150	0,367
	v5	0,047	0,108
	v6	0,097	0,213
	v11	0,424	0,599
Factors 2 (non physically contribution)	v9	0,019	0,047
	v10	1,058	0.970
	v12	0,463	0,772

There are 2 factors group are F1 (physically contribution) and F2 (non physically contribution). F1 factors are formed by the aid of seeds and fertilizers (v1), post harvest activities (v5), marketing (v6) and capital loan (v11). F2 factors are formed by guidance and tutoring (v9), counseling (v10) and output price (v12).

Customer Satisfaction of Partnership between the Company and the Retailer

Consumer retail is involved as an actor directly in the supply chain activities. Due to only one retailer respondent, the analysis data is explained descriptively. The result shows that some variables have satisfaction level with score average 4, only variable of return schedule (v9) has the highest score 5. It indicates that return schedule has fulfilled requirement for retail need to keep supply of their raw materials. Finally, the customer relationship is sustained, because the resources integration mechanism of supply chain integration can promote the flexibility for every enterprise' activities in the chain, strengthen the ability to respond the demand of customers, and realize the market purpose and customer service performance which cannot be achieved by single enterprise

5. Conclusion

1. Reliability is the first performance indicator of the fresh cut vegetables. The company should improve this performance that related to consumer satisfaction, such as fulfill requirement and compatibility with quality standardization to minimum claim. Farming analysis shows three highest production of fresh cut: mustard green, tomatoes and lettuce head have contributed to company profit as value of R/C ratio: 2.44, 2.07 and 1.87. Value of BC ratio for mustard green, tomatoes, and Lettuce head are 1.44; 1.07; and 0.87. Value of BEP for mustard green, tomatoes and Lettuce head IDR 7 430; IDR 7 422 and IDR 9 155. Margin output for mustard greens, tomatoes and Lettuce head are about IDR 8 585; IDR 10 539 and IDR 16 026. Value added for fresh cut mustard green is about 96.94%, tomatoes is about 93.33% and for Lettuce head is 97.45%.
2. Variables influencing significantly for long-term partnership between farmers and the company are assistances from company to the farmer by marketing (v6) and guidance and tutoring to increase farmers capability (v9) with the score is 0.852 and 0.907. It means that the transportation mode is very urgently for farmers to sell their output..
3. Variable of delivery of return product has the highest score (scale 5) to indicate customer satisfaction of the retailer. It shows that the company pays an attention on return product.

References

[1] Statistic Center of Bureau, "Average consumption of vegetable of Indonesian people based on the income and expenditure category from 2010-2014 year, 2016
[2] Shepherd C, Gunter H, "Measuring Supply Chain Performance: Current Research and Future Directions," International Journal of Productivity and Performance Management III (4), pp. 242-258, 2006.
[3] Van der Vorst, JGAJ, "Effective Food Supply Chains: Generating, Modelling and Evaluating Supply Chain Scenarios, Proefschrift, Wageningen, 2000.
[4] Austin JE, Agroindustrial Project Analysis, John Hopkins University Press, Maryland, 1992.
[5] Brown JE, Agroindustrial Investment and Operations, World Bank Publications, Washington, 1994.
[6] Rosenau MD, Griffin A, Castellion GA, Anschuetz N, The PDMA Handbook of New Product Development, NY Wiley, New York, 1996.
[7] Aramyan L, Ondersteijn C, van Kooten O, Lansink AO, "Performance Indicators in Agri-Food Production Chains," in Ondersteijn, CJ, Wijnands, JH, Huirne, RB and van Kooten, O (eds.), Springer Dordrecht, 2006
[8] Van Der Vorst, GAJ Jack, "Performance Measurement in Agri-Food Supply Chain Networks, An Overview. In: Quantifying The Agri Food Supply Chain/ CJM Ondersteijn, JHM Wijnands, RBM Huirne and O Van Kooten (eds.), Springer Printed, Netherlands, 2006.
[9] Supply Chain Council. Supply Chain Operation Reference Model Version 80, Dictionary, United States and Canada, 2006.
[10] Brannstrom, A, Using Farm Records Effectively for Business and Financial Management, WI: UW Center for Dairy Profitability, Madison, 2008.
[11] Connor J, Heien D, Kinsey J and Wills R, "Economic Forces Shaping the Food-Processing Industry," American Journal of Agricultural Economics, LXVII (5): 1136-1142,1985.
[12] Hayami Y, Kawagoe T, Morooka Y, Siregar M," Agricultural Marketing and Processing in Upland Java, A Perspective from Sunda Village Bogor," The CPGRT Centre, 1987.
[13] Maheswari B, Kumar V, Kumar U," Optimizing Success in Supply Chain Partnerships," Journal of Enterprise Information Management, IX (3), pp. 277-291, 2006.
[14] Li S, Ragu-Nathan B, Ragu-Nathan TS, Rao SS, "The Impact of Supply Chain Management Practices on Competitive Advantage and Organizational Performance. Omega, XXXIV (2), pp. 107-124, 2006.
[15] Nguyen C, Supply Chain Consolidation and Cooperation in the Agriculture Industry, Industrial and Systems Engineering. [disertasi] America (USA): University of Southern California, 2014.

[16] Marimin, Maghfiroh N, Aplikasi Teknik Pengambilan Keputusan Dalam Manajemen Rantai Pasok. PT Penerbit IPB Press, Bogor, 2010.
[17] Sánchez Torres MA. Determinants of the Quality in The Relantionship of The Supply Chain School of Business and Entrepreneurship. [disertasi] Puerto Rico: Universidad Del Turabo, 2011.
[18] Morgan RM, Hunt SD,"The Commitment-Trust Theory of Relationship Marketing," Journal of Marketing. XXXXXVIII (3), pp. 20-38, 1994.
[19] Subarkah, LA. Kajian Kinerja Rantai Pasokan Lettuce Head (Lactuca Sativa) dengan Menggunakan Data Envelopment Analysis (Studi Kasus di PT Saung Mirwan, Bogor. [skripsi]. Bogor (ID): Institut Pertanian Bogor, 2009.
[20] Beamon M, "Measuring supply chain performance," International Journal of Operations & Production Management, IXX (3), pp. 275-292,1999.
[21] Gunasekaran A, Patel C, Mc Gaughey RE, "A Framework for Supply Chain Performance Measurement," International Journal Of Production Economics, LXXXVII(2004), pp. 333–347, 2004.
[22] Novich, N," Distribution strategy: Are you thinking small enough?" Sloan Management Review, XXXII (1), pp. 71–77,1990
[23] Stewart G, "Supply Chain Performance Benchmarking Study Reveals Keys to Supply Chain Excellence," Logistics Information Management. VIII (2), pp.38-44, 1997
[24] Saaty TL. The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation. McGraw-Hill, California, 1980
[25] Benton WC, Maloni M,"The Influence of Power Driven Buyer/Seller Relationships on Supply Chain Satisfaction," Journal of Operation Management, XXIII (2005), pp. 1-12, 2005.
[26] WU JG, Zhang, HD," The Analysis on The Critical Factors of Success of Implementation of Customer Relationship Management." Techno Economics & Management Research, 2004 (3), pp. 23-25, 2004.

Author Profile

Suhartini received Degree in Agriculture Science from Bogor Agricultural University in 2001 respectively. During 2014-2017, she continued her study in the same University and specialized of Business Management subject. She now works as Business Manager in Digital Mobile company.