Factors Contributing to the Success of Organic Vegetable Supply Chain to Meet Market Demand
A case study in West Java and Greater Jakarta, Indonesia

Puspa Rizki Andhani
920617015110

Study Program:
MSc Management, Economics and Consumer Studies (MME)

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Title Page


Puspa Rizki Andhani

920617015110

Study Program:

MSc Management Economics and Consumer Studies (MME)

Management Studies Group

Wageningen University

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Supervisors:

Prof. Jacques H. Trienekens (Management Studies Group)

dr. Jos Bijman (Management Studies Group)
Abstract

The increasing of consumers’ awareness towards healthy food has made the demand for organic vegetables risen as it is dominate 21% of domestic consumption of organic food in Indonesia. As organic vegetables is perishable product, it needs to be delivered through an efficient supply chain in order to maintain the quality and to sell the product to the consumers. This study, therefore, aims to determine factors contributing to the success of organic vegetable supply chain in meting market demand in West Java and Greater Jakarta, Indonesia. For this purpose, the respondents from three different organic vegetable supply chains and third parties were interviewed. The quality of products, the collaboration between actors, the logistics and the market demand in each supply chain are compared to determine the contributing factors. In terms of current state in organic vegetable supply chain, the first and second chain has better contributing factors compared to the third chain. The current market demand based on quality attributes analysis show that consumers demand is generally driven by health, safety and process attributes. The bottlenecks that has been found in this study are mainly about lower quality and quantity of products due to severe weather condition. The influence of collaboration between actors is more significant to the quality of product compared to the logistics. On the other hand, the logistics also affects to the quality of product. Both the quality of product and the logistic have significant influence to meet the market demand for organic vegetables in urban areas. Possible improvements that can be implement is prioritising the quality of product which needs better logistic facilities and intensive collaboration between actors in the chain.

Keywords: Organic Vegetables, Supply Chain, Quality of Product, Collaboration between Actors, Logistics, Market Demand, Quality Attributes
Executive Summary

This study aims to determine factors contributing to the success of organic vegetable supply chain in meeting market demand in West Java and Greater Jakarta, Indonesia. The general research questions is formulated by focusing on “How does the quality of the product, the collaboration between actors and the logistics within the organic vegetables supply chain in West Java successfully meet the market demand in the urban areas?”

This study implements snowball sampling, which is a common non-random sampling. The comparative analysis is used to explore the data and information that are collected from the semi-structured interviews. The quality of products, the collaboration between actors, the logistics and the market demand in each chain are compared to determine the contributing factors that successfully connect the organic vegetable supply chain to meet market demand.

Three current available market channels in organic vegetable supply chain has been studied. The first chain, the producer distributes the product through registered agents who act as the reseller. The second chain is supplying the products to supermarkets, restaurants and online through the farm’s official website. The third chain is a cooperative that receives supply from the village farmers and sell the product to a school in the urban area. Moreover, the member of the cooperative who works as a distributor also receives supply from the same village farmers and other farms which are later distributed to the end-consumers in urban area.

The findings of the current state in organic vegetable supply chain show that the first and second chain have higher quality products due to a better established quality control system. The collaboration between actors in the first and second chains has a better communication system (the use of mobile messaging application) which contributes to the increase of trust and commitment among the actors. In terms of logistic, the first chain have better transportation (a refrigerated truck) compared to other two chains. While in terms of storage, the chains use other alternatives to replace the cold storage.

The current market demand for organic vegetables in urban areas has been analysed based on four quality attributes. The higher demand for organic vegetables is generally driven by health, safety and process attributes. Most of the consumers associate the organic vegetables to the absence of chemical used from the pesticides and fertilizer, and the improvement of the consumers’ health.

The bottlenecks in the organic vegetable supply chain lower the quality and quantity of products during the severe weather due to the use of outdoor farm. The producer’s sudden notification to the consumers about limited quantity of organic vegetables and limited human resources is the main
A possible improvement for the organic vegetable supply chain is prioritising the quality of the product which needs intensive collaboration among all actors. A higher level of trust, commitment and effective communication has an important role in obtaining better quality organic vegetables. Each chain should consider both transportation and storage in logistic based on the duration of distribution and the distance between the farm and the consumers’ location. Furthermore, more in-depth study can be carried out to analyse each contributing factor in the organic vegetable supply chain.
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### Abbreviations

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<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AF</td>
<td>Amazing Farm</td>
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<tr>
<td>ANO</td>
<td>Abby’s Natural Organic</td>
</tr>
<tr>
<td>AOA</td>
<td>Agatha Organis Agro (BSB Agatho)</td>
</tr>
<tr>
<td>BCI</td>
<td>Biocert Indonesia</td>
</tr>
<tr>
<td>BU</td>
<td>Bakrie University</td>
</tr>
<tr>
<td>FE</td>
<td>Famili Ekokultura (FAM Organic)</td>
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<tr>
<td>IFOAM</td>
<td>International Federation of Organic Agriculture Movements</td>
</tr>
<tr>
<td>KC</td>
<td>Kecipir</td>
</tr>
<tr>
<td>KSUGL</td>
<td>Koperasi Serba Usaha Guna Lestari</td>
</tr>
<tr>
<td>PGS</td>
<td>Participatory Guarantee SYstem</td>
</tr>
<tr>
<td>PMI</td>
<td>Pamor Indonesia</td>
</tr>
<tr>
<td>RPS</td>
<td>Regina Pacis School</td>
</tr>
<tr>
<td>SB</td>
<td>Setiabudhi supermarket</td>
</tr>
<tr>
<td>TBS</td>
<td>Total Buah Segar supermarket</td>
</tr>
<tr>
<td>THF</td>
<td>Two Hands Full restaurant</td>
</tr>
<tr>
<td>TVMS</td>
<td>Tenjolaya Village Mount Salak</td>
</tr>
<tr>
<td>VB</td>
<td>Villa Botani</td>
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1. INTRODUCTION

The motivation to conduct the study is described in the background section of the introduction chapter, which explains the situation of the current state organic vegetables supply chain in Indonesia, specifically in the West Java province and Greater Jakarta area. The aim of this study is formulated in the research objective section, followed by a list of research questions that need to be answered to fulfill the research objective. In order to conduct the research in a more efficient manner, the last part of the introduction illustrates the research framework.

1.1 Background

Changes in lifestyles and consumption patterns promoting healthy food slowly push farmers forward to implement organic farming. The use of inorganic chemicals found in fertilisers, pesticides or growth hormones has an adverse impact on human health, the environment and animal welfare. As stated by the European Union (2007), organic production is an overall system of farm management and food production that combines best environmental practices, a high level biodiversity, the preservation of natural resources, the application of animal welfare standards and a production method in line with the preference of certain consumers for products harvested using natural substances and processes. However, in recent years, the organic agricultural land has extended significantly. FiBL and IFOAM (2016) found that in 2010, the total organic agricultural land in Indonesia was 83.630 ha and decreased slightly to 74.034 ha in the following year. The number fluctuated in 2012 and 2013 by 88.247 and 65,688 ha. However, in 2014, it grew sharply to 113.638 ha. One of the factors that influence those fluctuative trend was the high number of producers who no longer certifying their land. For another case, several producers were unable to follow the organic principle. Thus, their certification was revoked by the organic certification body. The government was trying to increase the organic agriculture land through several programs, such as 1000 organic villages program. The development of organic agriculture land can be seen in Figure 1.
Horticulture is defined as the branch of agriculture concerned with growing plants that are used by people for food, medical purposes and aesthetic gratification (USDA, 1980). Besides rice, horticulture plays an important role as a primary need for people in Indonesia, especially vegetables; in which it used in most of the Indonesian food. It should be available at all times in an adequate amount and quality. Based on David & Ardiansyah (2016), vegetables dominate 21% of domestic consumption of organic food in Indonesia. Areas in which organic vegetables are cultivated has reached 443 hectares in Indonesia by 2014 (FiBL and IFOAM, 2016). However, the increase in the organic vegetable demand is mainly located in big cities in Indonesia, especially in the Greater Jakarta, which is reflected in the higher number of consumers. The middle to higher household income and higher education level raise awareness and financial means to purchase organic vegetable products. In 2015, almost 54% of Indonesian living in urban areas; especially in Greater Jakarta, are middle to higher income households with a good educational background. This characteristic has a significant impact on organic product consumption. Also, young generations living in urban areas tend to be more open to the idea of consuming organic products (David & Ardiansyah, 2016). Hence, the physical markets for organic vegetables grow steadily in urban areas, such as Greater Jakarta area and Bandung city (West Java). The organic vegetable farms in West Java has been targeting their product to fulfil the market demand in both urban areas.

As perishable products, organic vegetables are delivered through an efficient supply chain to maintain the quality and to sell the product to the consumers in the physical market successfully. Supply chain management is an integration of activities that occur in the improvement of the supply chain relationship to achieve a sustainable competitive advantage (Handfield & Nichols, 1999). Several organic vegetable supply chains are currently present in West Java which have different market channels in order to connect the market demand successfully.
Each organic vegetable supply chain has their own unique contributing factors that may differ from others. Thus, contributing factors like market demand, quality of the product, the collaboration between actors in a chain and the logistics need to be investigated. Several challenges that need to be overcome are more likely related to limited logistics facilities, such as the unavailability of cold storage, unsuitable transportation, traffic congestion and high time consumption during the distribution process. The logistics issues will affect the quality of the product. It is important to understand how organic vegetable farms perform the quality control and which quality assurance they followed to produce and maintain a high-quality vegetable product. Moreover, a collaboration between actors in each chain could influence the way they cater to the market demand. If the actors in a chain shared a common understanding of the organic vegetable supply chain, it could increase the chances for success in the urban area’s market. Furthermore, it is important to understand which products consumers’ desire. Even though the trend to consume organic vegetables is now increased due to a high number of new organic vegetable consumers. Yet, the rate of continuous purchase and the commitment to allocate the expenditure for organic vegetable consumption are still below the conventional food product (David & Ardiansyah, 2016).

1.2 Research Objective

This study consists of four research objectives. The first objective is to analyse the current state of organic vegetable supply chain in West Java, Indonesia. The second and the third objectives are to identify the bottleneck and the possible improvements of the quality of the product, the collaboration between actors and the logistics within the organic vegetables supply chain to meet the market demand in urban areas. The last objective of this study is to identify the critical areas for further research in the organic vegetables supply chain.

1.3 General Research Question

To achieve the research objective, a general research question for this study is formulated as follows: “How do the quality of the product, the collaboration between actors and the logistics within the organic vegetables supply chain in West Java successfully meet the market demand in the urban areas?”

1.3.1 Research Questions

1) What is the current market channel in the organic vegetable supply chain in West Java?
2) What are the current states of the quality of the product, the collaboration between actors, and the logistics within the organic vegetable supply chain in West Java?
3) What is the current market demand that based on the quality attributes for organic vegetables in the urban areas?

4) What are the bottlenecks in the quality of the product, the collaboration between actors, and the logistics that affect the organic vegetable supply chain to meet the market demand?

5) What are possible improvements in quality of the product, the collaboration between actors, and the logistics within the organic vegetable supply chains to meet the market demand?

1.4 Research Framework

In order to conduct the study effectively, research framework is formulated. The first step was literature study which is followed by conceptual framework, data collection, analysis, conclusion and recommendation (Figure 2).

![Research Framework](image)

**Figure 2. Research Framework**
2. LITERATURE STUDY

Following the research questions presented in the introduction, this chapter further elaborates on the literature review, which aids in answering those questions. The different types of organic vegetable supply chains that are currently available are described in the first part of the chapter. Furthermore, the previous studies regarding the market demand for organic vegetables provide insights about consumers’ expectations towards the product that offered by the producers. The processes to produce a high-quality product are also explained in depth in the following part. In the end, studies about collaboration between actors and the logistics will help to explore its contribution to a successful connection in an organic vegetable supply chain.

2.1 Type of Available Market Channel in Organic Vegetable Supply Chain

There are several types of market channel in the organic vegetable sector. However, the studies and data related to the different types of organic vegetable supply chains are still limited in Indonesia. Each chain relies on different contributing factors that can help build a successful connection between supply chains with its market.

In a previous study, Dimitri and Greene (2002) state that 60% of farms with land area fewer than 40,000 m² are mostly used direct marketing channel, compared to 12% of farms with more than 40,000 m². The producer can earn a higher profit by selling the organic foods to the consumers directly, instead of selling through a middleman (Dimitri & Greene, 2002). Direct marketing channel enables the producer to sell the products with premium price and to gain consumer trust (Park & Lohr, 2006). Lee, Gareffi & Beauvais (2012) also state that organic vegetable supply chain usually consists of numerous producers and retailers which are small in size with little demand and supply. In this sense, products are traded by price and quantity, with little or no brand recognition (Lee, Gareffi & Beauvais, 2012). In addition, larger farms were more likely to use multiple marketing channels which tends to make the producers earn more than one marketing channel (Park & Lohr, 2006). On the other hand, the additional time and resources that are required to deal with different types of customers throughout multiple stages of the supply chain reduce the company’s ability to focus entirely on its core competencies (Chang, 2002).

Delivering the product to the market through one channel leads to advantages as well as disadvantages for organic vegetable farms. Using only one channel means farms collaborate with a single actor on the market, which implies the strengthening of their relationship and an active collaboration, which may remain long-term (Chang, 2002). Meanwhile, the dependence on a single
actor poses a disadvantage due to the increased risk for the supply chain, which arises from the possibility of the single actor ceasing the collaboration (Chang, 2002).

Thus, this study will be focused on direct marketing channel that commonly found in the organic vegetable supply chain. The number of market channel can differ for each chain which depends on their market demand.

2.2 Collaboration between Actors

The interaction between actors of a food chain is composed of repeated communication that slowly shifts the relationships from the short-term transactional end of the continuum towards the other end. The nature of the relationships differs from the solid collaboration in partnership to more formal and rigid relationship (Barrat, 2004; Kottila & Ronni, 2008). The short and long duration of relationships does not indicate the closeness between the actors to obtain the common goal, which is to deliver the right products to the consumers. Hence, several variables are identified to measure the collaboration between actors in the organic vegetable supply chain, such as trust and commitment, communication and information exchange (Moberg, Cutler, Gross & Speh, 2002; Peng, G. 2011).

2.2.1 Trust and Commitment

Transparency of a supply chain network is the extent to which all the stakeholders have a shared understanding of, and access to product and process related information that they request, without loss, noise, delay, and distortion (Beulens, Broens, Folstar, & Hofstede, 2005). Moorman, Zaltman & Deshpande (1992) define trust as the willingness to rely on an exchange partner in whom one has confidence, while commitment is an enduring desire to maintain a valued relationship. Both trust and commitment are two essential elements of a strong long-term relationship. Furthermore, it can also affect the integrated and efficient logistics and higher quality of organic vegetable products.

2.2.2 Communication

Collaborative communication between actors involves higher frequency, more bi-directional flows, informal modality and indirect, non-coercive content (Kottila & Ronni, 2008). Aligned interests foster shared values, and mutual support may increase in line with the increase of an individual actors’ perception of being an important part of the chain (Kottila & Ronni, 2008). The development of broad interfaces between actors could overcome the lack of communication and create an atmosphere whereby innovative thinking is the support for tackling the problems that occur in the organic vegetable chain (Kotilla & Ronni, 2008).
Veldstra, Alexander and Marshall (2014) state that organic food producer who sell their product at local markets (e.g. directly at their farm, producers’ market, community market) requires face-to-face relationship with their consumers, can communicate their production practices directly. As it is important to open and develop clear and broad lines of communication (Frankel, Goldsby & Whipple, 2002) in order to encourage information exchange and to create a shared understanding (Kotilla & Ronni, 2008).

**Information Exchange**

The processes of information exchange that occur during the supply chain activities are necessary to strengthen the collaboration between actors in the chain. Information exchange is defined as a fundamental component of a successful sustainable supply chain (Cooper, Lambert & Pagh, 1997). Storer (2005) also mentions that the inter-organizational information exchange aims to manage relationships with customers and suppliers and to build competitive advantages. In turn, developing an effective information exchange could share a common understanding among all the actors. Furthermore, it can encourage collaboration in tackling problems and increasing the productivity and efficiency in a chain.

In order to share understanding between the actors, the quality of the information exchange needs to be determined. Factors that should be present are accuracy, timeliness, and proper formatting of the information (Gustin, Daugherty & Stank, 1995). The quality of information flows and transparency in supply chains can affect the costs and non-value adding activities in a chain. Thus, the costs and non-value adding activities in the chains will be reduced.

**2.3 The Logistics**

Logistics refers to a part of a supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services and related information from the point of origin to the point of consumption to meet consumers’ requirement (CSCMP, 2007). Hence, logistics plays a key role in supply chains to successfully deliver organic vegetables from the suppliers to the end-consumers.

A previous study by Xin-Min (2012), states about three types of logistics processes for organic products that sell to specialised stores. First, the producers as a production base who delivers their product by using transportation (i.e. truck) to the warehouse and later to the specialised store. Second, the logistics process starts from production base (purchasing) transport to warehouse, then through the distributor, the product is delivered to the specialised store. Third, production base delivers to the warehouse and later producers conduct promotion themselves at the respective shops.
There is similarity between the direct sales from the producer to the big supermarket and to specialised stores. The big retailers (e.g. supermarkets) pick up the organic vegetables from the producers and deliver the product with their transportation and keep the product in storage before bringing it to the shelf (Xin-Min, 2012). Traditional market channel which is identical with conventional food products involve more actors including the producers, the first distributor, and then a bigger distributor who will sell the products to the vegetable seller in the traditional market and then continue to end-consumers (Xin-Min, 2012). Apart from the traditional market, the distributor also sells their product to restaurants or stores. Several variables are determined to measure the logistics flow in organic vegetable chain.

2.3.1 Transportation

Production areas of organic products are scattered, while the consumption is concentrated. On the other hand, the logistics size is small and scattered, implying higher transportation costs. The organic vegetables are mainly produced in remote areas while the consumption is centralised in the major cities (Xin-Min, 2012). Meanwhile, other problems in urban areas related to transportation are the severe traffic congestion, high gas emissions, and possible accident fatalities, which could significantly affect transportation costs. Hence, the solution is to deliver the product at an off-peak time or night deliveries and use highways in city centres (Pramatari, 2016).

2.3.2 Storage

To ensure the quality of organic vegetables, the utilisation of cold storage is essential in the logistics chain. Due to small production scale and scattered production areas, the development and employment of cold storage are much harder. Based on Xin-Min (2012), the problem of the organic chain is the small production scale and the small volume of refrigeration and precooling equipment, which result in the high operation costs and low economic benefits.

2.4 Quality of Product

Quality refers to the ability of a product to accomplish the purpose to fulfil consumers demand and expectations (Manikas, Hamann & Sentic, 2016). It works as the set of properties and features that satisfy the definite and implicit needs of the consumers (Tzia & Tsiapouris, 1996). However, different chain actors have different interpretations of the concept of quality, even though the ultimate goal is to satisfy the end-consumers. For example, producers tend to be concerned about productivity uniformity and disease resistance. Distributors rate the quality of the product regarding long shelf life, and resistance to damage, while the end consumers have a preference for taste, appearance, healthiness and consistency. To standardise the quality of organic vegetable products for the
consumers, quality control becomes an essential aspect that needs to be conducted appropriately and regularly. Furthermore, specific guidelines need to be followed by organic vegetable producers to standardise the product for the market. These guidelines are included in the quality assurance activities.

2.4.1 Quality Control

According to Luning and Marcelis (2009), quality control is the primary activity in food quality management. The purpose of quality control for organic vegetable products is to keep product properties, production processes, and human processes within certain acceptable boundaries. The activities related to quality control are mainly measuring product and process properties, comparing measurement result with target values and tolerances, and taking corrective actions if considered necessary. Evans and Lindsay (2005) state that the quality control of a product is the evaluation of the performance of technological and human processes, which need corrective actions when required. Knowledge, skills, competence and commitment of the product quality are important factors for producers during the quality control performance (Luning & Marcelis, 2009). In this study, the quality control process in organic vegetable farms during pre-harvest, harvest and post-harvest are analysed.

Pre-Harvest

In previous studies, it is mentioned that pre-harvest practices have a significant effect on the quality of organic vegetable products. The practices include the selection of suitable varieties, cultivation practices, and environmental conditions.

- The selection of suitable varieties is typically based on yield potential, disease resistance, or suitability of local conditions.
- Cultivation practices are related to sowing date, nutrient supply, irrigation, and plant protection. Regarding organic vegetable farming, the producers replace the chemical fertiliser and pesticides with more environmental-friendly (i.e. fermentation of animal manure and certain plants).
- Environmental conditions are related to the environmental temperature, day length and amount of rainfall in the farm area.

Harvest

The major factors in harvesting practices that influence the quality of organic vegetables are harvesting time and mechanical injuries which are part of the physical damage. The harvest time has an impact on the development process during growth and ripening phase. The crops have to be harvested at a particular maturity to be able to sell it to the market. There are two common
characteristics used to determine the crop maturity. First, it depends on grower’s experiences and opinion. Second, the sampling of representative specimens which are tested by smell and or taste. Mechanical injuries during harvesting can accelerate deterioration and reduce the products’ shelf life. This issue is caused by careless harvesting practices, rough field handling of product, inappropriate use of containers (i.e. over packing containers) and by people walking or sitting on the product in containers (Luning & Marcelis, 2009).

Post-Harvest

During post-harvesting, organic vegetable products are transported to the storehouses for sorting, grading, pre-treatments and packaging. The product needs to be carefully loaded and unloaded to prevent physical damage. The product packaging can prevent mechanical injuries during the distribution and storage life, making packaging process an important factor in maintaining the quality attributes of organic vegetable products. Moreover, the packaging is an important marketing tool for quality requirements. In this sense, it can include information about the ingredients, nutrient content, certification, and label of the product.

2.3.2 Quality Assurance

Quality assurance is an important addition to the regular activities of quality control (Luning & Marcelis, 2009). The certification is designed to maintain the highest standards of quality and safety product from the cultivation to the packaging of the product (Scott, Vandergest & Young, 2005). Which is also apply during the distribution process to consumers (Scott, Vandergest & Young, 2005). Several quality assurance guidelines and standards can be followed by organic vegetable producers which the certification is provided by a third party certification (Luning & Marcelis, 2009). They are responsible for determining whether the production process and the quality of the product corresponding to an applicable standard and to conduct a regular inspection of the farm.

By standardising the organic label, the consumers will gain trust about the product safety. Consistent information on the product can encourage new consumers to consume organic vegetable product regularly (Scott, Vandergest & Young, 2005). Johannsen, Wilhelm and Schone (2005) state that certification tends to be introduced by producers to create consumer confidence immediately where the consumer is not in direct personal contact with them. As the products of organic vegetables move into larger markets in urban areas that required longer supply chains, the certification of organic food could give an additional push to food safety and traceability of the product (Johannsen, Wilhelm & Schone, 2005). It has also become a cornerstone of new added value through which agri-food companies have sought to expand to the niche market (Scott, Vandergeest, & Young, 2005).
On the other hand, Klonsky and Tourte (1998) argue that certification is usually done by the large farms, instead of small farms. Several barriers for organic certification consists of the three year transition period, the financial and time cost of certification, and paperwork (Strochlic & Sierra, 2007; Sierra et al., 2008) makes small-scale producer considered the certification process difficult. Marketing strategies for the uncertified products, limited access to organic markets, and belief that the benefits of certifying did not outweigh the cost are other problems that commonly found for organic certification (Dimitri & Oberholtzer, 2008). Some producers preferred not to obtain the certification as means to avoid the requirements and difficult process (Burton, Rigby & Young, 1999). This usually applies to small-scale producers (Veldstra, Alexander & Marshall, 2014). Furthermore, the diversity of crops and market channels does influence the decision of producer to certify their products, though it does decrease the likelihood of obtaining certification (Veldstra, Alexander & Marshall, 2014). Producers who apply organic practices and direct marketing channel are choosing not to obtain the certification (Veldstra, Alexander & Marshall, 2014). Direct marketing becomes the solution as it enables the producer to gain profit and consumer trust without having to do the certification (Park & Lohr, 2006). Local consumers who are willing to pay a premium price can reduce the benefit of certifying from producer’s point of view (Greene et al., 2009). Producers use the local brand as a substitute for the organic certification label (Veldstra, Alexander & Marshall, 2014).

According to Scott, Vandergeest, and Young (2005), organic vegetables in Indonesia are still included in a domestic market-oriented food crop sector. Organic vegetables in this sector are either uncertified but labelled ‘organic’, or certified by a third party certification body (Scott, Vandergeest & Young, 2005). Though Indonesian Government has established one single logo for organic food called ‘Organik Indonesia’, the overall product package for the domestic market have yet to be uniformly labelled with that logo (David & Ardiansyah, 2016; Scott, Vandergeest & Young, 2005). Several producers are still using a variety of terms for their vegetables, including ‘healthy,’ ‘chemical free’ or ‘pesticide free’ (Scott, Vandergeest & Young, 2005). The ‘Organik Indonesia’ logo can only be earned if the producer certifies their products through third party certification. Moreover, there are 23 certification bodies which cover 224 organic producers in Indonesia (David & Ardiansyah, 2016). Though consumers at local markets demand the certification and are willing to pay a premium price for certified organic products, in the end, organic food producers have a strong incentive to decide whether they will do the certification (Veldstra, Alexander & Marshall, 2014).
2.5 Market Demand

Food scandals and increased health awareness combined with shrinking time budgets of consumers have led to the emergence of new markets. The sector has increased in revenues in organic and health food segments. Although these markets are still referred to as ‘niche markets’, they are the markets in which most of the money will be earned (Fuchs, Kalfagianni, & Arentsen, 2009). In this study, the niche market investigated is related to the physical market that is available in urban areas.

Conversely, market demand is defined as the aggregate demand of a large number of households for a product during a specific period in a specific market (Warner, 1994; Kotler & Armstrong, 2014). In developing countries such as Indonesia, the levels of households’ income and education highly influence the numbers of organic vegetable consumers. Wang and Sun (2003) in Dettmann and Dimitri (2009) mention that higher income households are more likely to purchase organic products, but unlikely to consistently devote a large share of their expenditures toward organic vegetables with certification. Moreover, the increased access to education led to a higher probability of purchasing organic vegetables and spending a greater proportion of the household income (Probst, Houedjofonon, Ayerakwa, & Haas, 2012). Besides households, restaurants and hotels as the end-consumers for organic vegetables exhibit relatively little interest in organic certification in contrast to the preferences of higher income consumers with higher educational backgrounds, who associated meals prepared using organic vegetables with relatively higher value (Probst, Houedjofonon, Ayerakwa, & Haas, 2012). Therefore, middle to higher class households with higher level of educational backgrounds play a major role in the market due to their awareness and perception.

It is essential to investigate the real market demand for the organic vegetable products to successfully connect the organic vegetable chain to the market and meet the end-consumers’ expectation. One of the main reasons for the end-consumers to consume organic vegetables is the high-quality of the product. Grunert et al. (2005) differentiate the quality of product into four attributes based on the perspective of the consumers, namely sensory attributes, health attributes, process attributes, and convenience attributes. In contrast, Luning and Marcelis (2009) divide the product attributes into intrinsic and extrinsic attributes. Intrinsic attributes consist of safety, healthy, sensory, shelf life and convenience, while extrinsic attributes consist of production system characteristics and assigned quality by marketing/communication.

To investigate the demand for organic vegetable products in the physical market in urban areas, several variables of product quality from the consumers’ perspective are examined.
2.5.1 Sensory Attributes

Sensory attributes are perceived through receptors in tongue, nose, eyes and ears (Luning & Marcelis, 2009). Reardon and Farina (2002) define the notion of food quality regarding product appearance, cleanliness, and taste, which are currently promoted by retailers to adjust to consumers. Consumers tend to buy fresh vegetables according to its appearance (e.g. fresh red tomatoes, green lettuce leaves, or purple for eggplant) (Reardon & Farina, 2002). Appropriate sensory characteristics of products can affect the food acceptance and long-term repeated purchase (Luning & Marcelis, 2009). According to Luning and Marcelis (2009), sensory attributes are divided into texture, aroma, taste, the product appearance and sound. The interactions of five attributes occurred flavour as a sensation of eating food.

- **The texture is defined as all the mechanical, geometrical, and surface attributes of a product that can be recognized through mechanical, tactile, visual and auditory receptors. It is driven by the perceptions of the structure and the product behaviour when handled and eaten.**
- **The aroma of a product is influenced by volatile and non-volatile odour compounds. It makes the product can be a smell at relatively low concentrations.**
- **Taste are recognized through sweetness, saltiness, bitterness, sourness and savoury attributes contained in a product**
- **Appearance can greatly affect the quality perception of a product before consumption. The common attributes in appearance are size, shape and form, gloss, visual defects, and colour.**
- **The sound is highly correlated to the crispiness and freshness of a product.**

2.5.2 Health Attributes

Health attributes are related to the nutritious contents of the product that is necessary for body functioning and contribute to the people’s health. Healthiness is an essential parameter of quality for many consumers (Magnusson, Arvola, Hursti, Åberg, & Sjödén, 2003). According to Suprato and Wijaya (2012), a good predictor of consumer’s attitude towards organic foods is a healthy consumption lifestyle. Another study from Deliana (2012) also supported the previous result that health, vitamin content, dietary purpose, satisfying product, and supporting the government’s ‘Go Green’ program become the driver for consumers to consume organic food. Organic vegetables have higher concentrations of several essential amino acids, vitamin C, and minerals (Magkos, Arvaniti & Zampelas, 2003). Organic food products contain a higher nutrient content than conventional products, especially in leafy vegetables that contained higher vitamin C (Williams, 2002; Worthington, 1998, Lampkin, 1990). Although Williams (2002) stated that there had been no solid evidence whether organic food is healthier than conventionally produced foods, perceived healthiness is consumers’
most frequently mentioned reason to select organic foods. Consumers believe that organic food is more nutritious due to chemical-free content (Hoang & Nakayusu, 2006; Padel & Foster, 2005). It is supported by the study from MINTEL (2003), the main driving force to consume organic products is the expected health benefit from the absence of chemical residues. Recent studies from (Slamet, Nakayusu & Bai, 2017) found that common beliefs of Indonesian consumers towards organic vegetable products are pesticides-free, artificial fertilisers-free and chemical residue-free contents. Consumer’s decision to consume organic vegetables depend on their perception of the nutritional value and health risk in the products (Akgüngör, Miran & Abay, 2010).

2.5.3 Safety Attributes

In addition to health attributes, Guilabert and Wood (2012) stated that safety attributes have also become consumer value and motive to purchase organic foods. Safety attributes are indicated by fewer chemical, fewer pesticides and naturally produced organic foods (Guilabert & Wood, 2012). Most of the Indonesian consumer’s belief that organic vegetable products are free from chemical residue as a result of the use of pesticides and fertilisers (Slamet, Nakayusu & Bai, 2017).

Luning and Marcelis (2009) defined safety attributes in a product refer to the absence of hazards or an acceptable risk of hazard levels which is a potential source of danger that may contaminate the food product and could lead to health disorders if consumed. The residues of chemical pesticides and fertiliser that remain in vegetables can cause a safety risk for the consumers (Luning & Marcelis, 2009). Furthermore, food safety in organic vegetables encompasses attributes such as levels of pesticide or synthetic residue, and microbial presence in food (Reardon & Farina, 2002). Luning and Marcelis (2009) also assert that the contamination from micro-organism and physical objects can affect the consumer perceptions of organic vegetable products. The common physical hazards that can be seen in a product are minerals, plant-derived and animal-derived (Luning & Marcelis, 2009). In the organic vegetable products, animal-derived hazards sometimes can be found due to free chemical fertilisers (Luning & Marcelis, 2009).

2.5.4 Process Attributes

Process attributes such as the relations to animal welfare, environmental soundness and sustainability, organic production process and free genetic modification can influence the consumer’s perception (Luning & Marcelis, 2009). Aside from the implication to peoples’ well-being, the use of chemical compounds in vegetable farming can harm animals and environment. Organic foods are perceived to be better than conventional foods in terms of environment aspects (Lea & Worsley, 2005). Based on the study from Slamet, Nakayushu and Bai (2017), Indonesian consumers who tend to emphasise the importance of environmental soundness, are more likely to buy organic vegetables.
The environmental issues caused by the application of synthetic pesticides, herbicides, and fertiliser to increase the productivity has led to the establishment of organic agriculture movement in Indonesia (David & Ardiansyah, 2016). Yet, animal welfare and environment remain as the second driver of the market compared to health and safety attributes (MINTEL, 2003; Truong, Yap & Ineson, 2012). Thus, the way vegetables are produced can contribute to the purchasing motives of the consumers.

2.6 Conceptual Framework

Following the findings of literature reviews, the conceptual framework (Figure 3) intends to create a deeper understanding of the structure of the research. Four contributing factors are studied, namely collaboration between actors, logistic, quality of product and market demand. Firstly, the collaboration between actors in the organic vegetable supply chain were studied based on trust and commitment, and communication. Strong relationships and the high collaboration between actors in a chain can result in the improvement of logistics and quality of the product. Secondly, the logistics part which plays an important role in the general supply chain was studied. Transportation and storage are two variables in the logistics part that could influence the quality of the product during the distribution process from the organic farms in West Java to the market in Greater Jakarta area and Bandung city (West Java). Thirdly, the quality of product consists of quality control and quality assurance. To produce a high-quality vegetable product, the producer needs to perform regular quality control. Those quality control will be under several regulations that give quality assurance to the consumers. Four quality attributes (i.e. sensory, health, safety, process) were identified to describe the consumers’ demand for the organic vegetable product. Thus, the quality of a product and the logistics part could connect to the market demand.

![Figure 3. Conceptual Framework](image-url)
3. RESEARCH METHODOLOGY

In this chapter, the methodology of the study is explained in further detail. The first section (3.1) describes the research design, which this study follows. Furthermore, the study area is located in Indonesia, about which more information is included in the second section (3.2). The last section (3.3) contains the explanation of the study instruments and methods that are used in data collection and analysis.

3.1 Research Design

A single case study with a qualitative approach is used as the research design. In order to answer the research questions, a suitable amount of information was collected. Kumar (2011) states that a single case study could provide an overview and an in-depth understanding of a case, as well as process and interactional dynamics within a unit of study.

3.2 Study Area

The study is conducted in two provinces in Indonesia. First, the location for organic vegetable farms in this study is in West Java, Indonesia. The first organic vegetable farm in Indonesia was established in West Java in 1984. Since then, the province became the pioneer in the development of the organic vegetable sector, and it has the highest organic vegetable areas among other places in Indonesia (Jahroh, 2010). Second, most of the organic vegetable farms in West Java is targeting their product towards entering the markets in urban areas. Thus, they are chosen as the location to investigate the market demand for organic vegetable products. Greater Jakarta area consists of Jakarta, as the capital city of Indonesia has the biggest market and the highest economic turnover in the country, and several cities that surround Jakarta area, such as Bogor, Depok, Tangerang and Bekasi. Furthermore, the consumers of organic vegetable products are mainly centralised in this province due to the higher population of middle to higher income and well-educated households. It takes approximately two to six hours by car from West Java to Greater Jakarta area, depending on the exact location of the farm and the physical market.
3.3 Methods of Data Collection and Analysis

The respondents for this study are selected through the application of the sampling method presented in section 3.3.1. Primary data sources is consulted to collect important information, which is then, examined using comparative analysis.

3.3.1 Sampling

In order to determine the respondents, a non-random sampling design is performed. Snowball sampling is a common non-random sampling that is used in qualitative studies. The researchers’ judgement is crucial to decide a few individuals who can provide characteristic and accurate information in order to achieve the objective of the study. They are asked to identify other actors in the chain; these actors also become a part of the sample. Data is collected until a saturation point is reached. Thus, conclusions can be made even if only a small amount of data is available (Kumar, 2011).

Furthermore, three different chains that are used in this study are assumed to represent each type of organic vegetable chain that is available in the sector. Three organic vegetable supply chains are located in two regions in West Java province (i.e. Bogor and Bandung), which is close to Greater Jakarta.

1) The first chain in this study is selected from an organic vegetable producer located in Bogor region, West Java. The AOA farm is the pioneer in organic vegetable farm sector as it was established in 1984. The AOA chain currently applies the registered agents as the distributor for their organic vegetable products. The registered agents are mainly the owners of specialised stores. However,
other registered agents also own organic food restaurants, food caterings, or online stores. Furthermore, a supermarket in Greater Jakarta Area is also supplied by the AOA farm.

In order to gather information for this chain, two representatives from the AOA farm that include the head of marketing division and the head of production division were interviewed. The head of marketing division is responsible to manage the marketing and sales for the products, and the communication between the farm and the registered agents. Meanwhile, the head of production is responsible to manage the whole production of organic vegetable products in the farm, to manage the farm labour and the partner farmers of the AOA. Moreover, a representative from the TB supermarket and four representatives from registered agents, which include two owners of organic specialised store, an owner of organic food restaurant, the CEO of an online store for organic food, are interviewed to collect information about the AOA’s supply chain.

2) The second chain is chosen from the FE organic farm in Bandung city, West Java, founded in 2009. The FE supplies their organic vegetable to several supermarkets, restaurants and the end-consumers, which are located around Bandung city. In addition, the FE also supplies the products to several supermarkets in Greater Jakarta Area from their partner farm in Tenjolaya, Bogor region, which is within a closer distance to Greater Jakarta Area. One of the supermarkets is TB supermarket. For this study, the owner of FE organic farm, a fresh products buyer from SB supermarket in Bandung city, the head chef of THF restaurant in Bandung city, and a staff whom responsible for fresh products in TB supermarket are interviewed.

3) The third chain focuses on the KSUGL cooperative in Cijeruk, Bogor region. This cooperative is divided into two divisions, namely organic products division, and savings and loan division. The KSUGL receives organic vegetables supply from the farmers around their cooperative and sells the products to the consumers in RP School in Bogor city, West Java. Moreover, one of the KSUGL members is an organic vegetable distributor who purchases the products from the same farmers as the cooperative and from an organic vegetable farm close to the cooperative location. These cooperative members distribute the organic vegetable directly to the end-consumers in Bogor city, which are mainly households.

Thus, the respondents for this study are KSUGL staff (responsible for managing the organic vegetable supply chain), a village farmers coordinator, a distributor (member of KSUGL), and a VB farm manager (supplies organic vegetable products to the distributor).

In addition, several third parties that have knowledge and are involved in the organic vegetable supply chain in West Java, Indonesia are interviewed. The third parties are selected in this study includes the IOA, which is an NGO that has important role in the development of organic agriculture in Indonesia, the BC organic certification body, the PMI which is a division in IOA that is responsible in establishing
a Participatory Guarantee System (PGS) for organic agriculture farmers and an academic. The IOA and
the academic have sufficient knowledge and information about the current state of organic vegetable
supply chain in West Java, and in turn assist in answering Research Questions 1 and 2. The organic
certification body and the PMI are interviewed to gather information regarding the quality of products
for organic vegetables which is included in the Research Question 2, 4 and 5. In total, the interview
will be directed towards 18 respondents from three different organic vegetable supply chains and four
external institutions.

Table 1. Overview of the respondents’ data

<table>
<thead>
<tr>
<th>No</th>
<th>Code name of the respondent</th>
<th>Position</th>
<th>Code name of the Company/ Institution</th>
<th>Duration of the interview</th>
<th>Date of the interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AN</td>
<td>Head of marketing division</td>
<td>AOA farm</td>
<td>02:13:07</td>
<td>15/12/2016</td>
</tr>
<tr>
<td>2</td>
<td>DD</td>
<td>Head of production division</td>
<td>AOA farm</td>
<td>00:30:40</td>
<td>15/12/2016</td>
</tr>
<tr>
<td>3</td>
<td>SS</td>
<td>Owner</td>
<td>FE farm</td>
<td>01:58:27</td>
<td>13/12/2016</td>
</tr>
<tr>
<td>4</td>
<td>EM</td>
<td>Person-in-charge for organic vegetable supply chain</td>
<td>KSUGL cooperative</td>
<td>01:06:22</td>
<td>09/01/2017</td>
</tr>
<tr>
<td>5</td>
<td>MR</td>
<td>Coordinator of organic farmers in Cijulang village</td>
<td>KSUGL cooperative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>JI</td>
<td>Manager</td>
<td>VB farm</td>
<td>01:08:05</td>
<td>09/01/2017</td>
</tr>
<tr>
<td>7</td>
<td>SR</td>
<td>Staff of vegetables division</td>
<td>TB Supermarket</td>
<td>00:29:31</td>
<td>19/12/2016</td>
</tr>
<tr>
<td>8</td>
<td>VR</td>
<td>Fresh products buyer for the supermarket</td>
<td>SB Supermarket</td>
<td>00:48:36</td>
<td>06/01/2017</td>
</tr>
<tr>
<td>9</td>
<td>SV</td>
<td>AOA’s agent and owner of specialised store</td>
<td>Organic food store</td>
<td>01:11:44</td>
<td>21/12/2016</td>
</tr>
<tr>
<td>10</td>
<td>HR</td>
<td>AOA’s agent and owner of specialised store</td>
<td>Organic food store</td>
<td>01:21:52</td>
<td>20/12/2016</td>
</tr>
<tr>
<td>11</td>
<td>JO</td>
<td>AOA’s agent and owner of ANO restaurant</td>
<td>ANO Restaurant</td>
<td>01:36:10</td>
<td>23/12/2016</td>
</tr>
<tr>
<td>12</td>
<td>KN</td>
<td>Head chef</td>
<td>THF Restaurant</td>
<td>00:29:54</td>
<td>14/12/2016</td>
</tr>
<tr>
<td>13</td>
<td>TT</td>
<td>CEO</td>
<td>KC online store</td>
<td>01:10:22</td>
<td>18/01/2017</td>
</tr>
<tr>
<td>14</td>
<td>DN</td>
<td>A member in KSUGL and a distributor</td>
<td>KSUGL cooperative</td>
<td>02:18:40</td>
<td>16/01/2017</td>
</tr>
<tr>
<td>15</td>
<td>AP</td>
<td>Director</td>
<td>BCI organic certification body</td>
<td>01:23:54</td>
<td>07/01/2017</td>
</tr>
</tbody>
</table>
3.3.2 Data Collection

Primary data is used to gather necessary information for this study. Furthermore, primary data is commonly used in previous supply chain management studies, in which the information is collected through a first approach (Kumar, 2011). Thus, semi-structured interviews are selected in this study because the different professional, educational and personal backgrounds of the sample group preclude the use of a standardised interview schedule. It aims to explore respondents’ opinions, clarify interesting and relevant issues, elicit complete information and explore sensitive topics (Louise Barriball, 1994). Furthermore, the interviews are conducted individually with each respondent from three different types of organic vegetable supply chain. Several respondents from the third parties will also be interviewed. An interview guideline that consists of open-ended questions is used to allow flexibility for both the interviewer and the respondents. By using open-ended questions, the interviewer can add relevant questions during the interview to gather additional information, whereas the respondent can also provide as much information as they see fit. Rather than using a questionnaire with a Likert-scale, an interview guideline is considered more suitable for this study.

3.3.3 Data Analysis

A comparative analysis is used to process all data that are gathered through semi-structured interviews with three different organic supply chains. The market demand, quality of the product, collaboration between actors and the logistics variables in each chain are compared, to find the main contributing factor that creates a successful connection in an organic vegetable supply chain. The information from the external parties is also be taken into account in the analysis. In the end, the contributing factors that influence to the successful connection of organic vegetable supply to meet market demand in urban areas can be adequately analysed.
4. FINDINGS

This chapter elaborates several findings on the current state and bottlenecks in the organic vegetable supply chain in order to meet the market demand in West Java (i.e. Bandung) and Greater Jakarta. The first section focuses on the existing market channel in the organic vegetable supply chain. The current market demand will be described as the second finding in the following section. The quality analysis of the product, a collaboration between actors, and current logistics flow in the organic vegetables supply chain are explained in the third section. The last part describes the bottlenecks that influence the successful connection in the organic vegetable supply chain.

4.1 Current Available Market Channel in Organic Vegetable Supply Chain

In this section, several producers had been interviewed to analyse the current market channel that available in organic vegetable supply chain in West Java with West Java (i.e. Bandung) and Greater Jakarta area as market. The first market channel that will be analysed in this section is AOA Chain (Section 4.1.1). The FE chain is analysed further in subchapter 4.1.2 and the KSUGL in section 4.1.3.

4.1.1 Description of AOA Chain

The AOA is the pioneer in organic vegetable sector which has been established for almost 33 years. Hence, several changes had been done before the AOA set the current market channel that suitable with the AOA’s organic principle. The increase of demand encouraged the AOA to start selling the organic vegetables to the bigger market, particularly major supermarket mainly which were located in Greater Jakarta area. Those supermarkets were the major players in supermarket business with hundreds of stores throughout Indonesia, ultimately Greater Jakarta as the biggest market area. The consignment sales that is commonly used as the transaction system between a big retailer and its supplier was not in line with the AOA’s organic principle. Even though the demand for the organic vegetables was high, the AOA found that the losses from trading with the supermarket were greater than the profit they gained. Organic vegetables are a perishable product with short shelf life. However, in the consignment sales, the supermarket will pay the producer based on the total sales of the vegetables. For the vegetables that are not sold, the supermarket will return them to the producer. The returned vegetables are likely have lower quality that long journey. Thus, eventually they might no longer be sold to the end-consumers. The AOA considered the consignment sales could not give fair trade for both parties. The AOA decided to end the partnership with the supermarket, even though the demand was high.
As the trade with the supermarket had been stopped, the AOA was implementing the registered agent’s system for the new market channel. The registered agent’s system is still valid at present. Based on that system, the AOA only sells the organic vegetables to the person that already registered as AOA’s agent. This person could be a distributor, the seller of the specialised store, the owner of a restaurant, a supermarket or the end-consumer who agrees to do the fair-trade practice. Fair trade means that the registered agents will not return the vegetables to the AOA due to damage or low demand. However, the registered agent has the privilege to accept or to reject the organic vegetables based on their quality. When the registered agent agreed to purchase the organic vegetables, they will receive a bill from the AOA stating the quantities of the products they received. Hereafter, the organic vegetables are under the responsibility of the agents.

Actors’ Profile

During the data collection, AN, SV, HR, SR and JN had been interviewed. At first, AN as the head of marketing division of AOA recommend several agents that actively involved in the organic vegetable supply chain. SV and HR are the representatives of agents that establish a specialised store in organic products. SR is an employee in TBS that responsible in managing all the vegetables in the supermarket. However, JN is the owner of ANO restaurant which is supplied by the AOA. The following section will be explained about the profile of actors in the AOA chain.

Table 2. Overview of the Respondents’ in AOA Chain

<table>
<thead>
<tr>
<th>No</th>
<th>Code name of the respondent</th>
<th>Position</th>
<th>Company/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AN</td>
<td>Head of marketing division</td>
<td>AOA</td>
</tr>
<tr>
<td>2</td>
<td>DD</td>
<td>Head of production division</td>
<td>AOA</td>
</tr>
<tr>
<td>3</td>
<td>SR</td>
<td>Staff of vegetables division</td>
<td>TB Supermarket</td>
</tr>
<tr>
<td>4</td>
<td>SV</td>
<td>AOA’s agent and owner of a specialised store</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>HR</td>
<td>AOA’s agent and owner of two specialised store</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>JN</td>
<td>AOA’s agent and owner of ANO restaurant</td>
<td>ANO Restaurant</td>
</tr>
<tr>
<td>7</td>
<td>TT</td>
<td>Director</td>
<td>KC</td>
</tr>
</tbody>
</table>
• AOA

The BSBA Foundation known as the pioneer in organic vegetables farming in Indonesia. It is established by Priest Agatho Elsener in 1984. This foundation has committed in the developing of organic vegetable farming since then. Priest Agatho was a Christian missionary from Sweden who had a high concern regarding organist principle and organic farming, respectively. In 2016, the BSBA Foundation established PT AOA which focuses on the organic vegetable business in general, including the organic vegetable farming, the marketing process, and the product supply chain. In order to collect the relevant data from the AOA, AN (marketing head division), and DD (production head division) had been interviewed. The AOA is located in Cisarua, Bogor (West Java).

Organic vegetables are mainly produced on the producer’s farm. The farm has 8 hectares of land area which includes a three-floors building for training, office and sortation and packaging, one building for training division, one building for the seedling process, and one building for the employee housing. The rest of area is for the plantation. Most of the AOA’s organic vegetable production comes from the farm owned by the producer. Recently, the high demand for organic vegetables drives the AOA to establish a partnership with small farmers from around Bogor region.

• Specialised store

Several registered agents of the AOA are the owner of the specialised store for organic foods. Hence, two agents were interviewed to collect the information regarding the AOA’s chain. First, HR who is one of the first agents that involved in the AOA organic vegetable supply chain. He helped the AOA to change the past marketing channel with the big retailers
and established the register system. HR owned two specialised stores which are located in Menteng area and Puri Indah area, Jakarta city.

The second agent who owns one organic food store in South Tangerang (around southeast of Jakarta city). SV has been involved in the organic vegetable supply chain since 2002. At first, SV intention was only to consume the organic vegetables for health reason. The high demand and the big opportunity to sell the organic vegetables became the motivation for SV to open a specialised store. SV stated that most of the consumers were specifically asked for AOA’s organic vegetables. Thus, due to AOA’s image as the first producer of organic vegetables, SV started to purchase the organic vegetables from the AOA.

In comparison to SV, HR had more benefit because of his long collaboration with the AOA and its higher number of store. Based on the interview with AN, supply for organic vegetables is higher for HR. HR receives a supply four times a week, while SV receives a supply for two times a week.

- TB supermarket

AOA representative mentioned in the interview that they had stopped the partnership with a major supermarket in Greater Jakarta area due to the lack of fair trade. However, TB supermarket offers a fair trading to the AOA by not implementing the consignment sales. The trading between the TB supermarket and the AOA gives the supermarket benefit due to the AOA’s image as the pioneer of organic vegetable producer in Indonesia. Many consumers have been familiar with the AOA’s organic vegetable products which influence to the high demand for the products. Hence, the TB supermarket has been supplied by the AOA.

TB supermarket is a medium-scale supermarket that mainly based in Greater Jakarta. It focuses on selling vegetables and fruits in both organic and conventional. The consumers are mostly middle to higher class consumers. Based on the interview with SR, the reason for the supermarket to sell organic vegetables is to fulfil the consumer demand. In TB
supermarket, both organic and conventional vegetables are available on their shelves to capture all the consumer demand and to distinguish the supermarket from the traditional market. TBS has been selling the organic vegetables since 2012.

In order to gather information about the supermarket, SR which is the TB supermarket’s employee had been interviewed. SR is responsible in all the process related to vegetable division in the supermarket. Her task includes ordering the vegetables from the suppliers, communicating with the suppliers, receiving, sorting, weighing the vegetables, placing it on the supermarket shelves, calculating the vegetables that have been sold and taking care of the leftovers.

- ANO restaurant

The current trends show the growth of organic food restaurant in the Greater Jakarta area. ANO is a restaurant which also sells fresh organic vegetable products to the end-consumers. ANO is located in the housing area in Tangeragn city, Greater Jakarta. According to AN (the marketing manager of AOA), the restaurants that has been supplied by the AOA since it was established in 2014.

Moreover, JN (the owner of the ANO) mentioned that the restaurant-cum-store was created due to his concern on healthy food. Organic food was used for self-consume. The choice of received supply from the AOA was based on the AOA’s high reputation amongst the organic vegetable consumers. As the pioneer, many consumers have been consuming the AOA’s organic vegetable products and the demand is stable for their products.
Distributor for online store

The awareness of organic farming and sustainability increase amongst the vegetable consumers in urban areas. KC was founded as an online platform to support trading for organic foods in Greater Jakarta area in 2015. KC is considered to be one of the pioneers in the online store for organic vegetables. KC has carried out intensive researches regarding the organic vegetable supply chain. For that reason, the KC’s system was adopted and modified from the US and France system. According to the interview with TT who is the Co-CEO of the K, the digital systems could be an alternative access that shortens the supply chain from the producers to the end-consumers. To sell the organic vegetables to the urban areas is considered new in the organic vegetable supply chain in Indonesia.

The interaction with organic vegetable producers in the period of 2014 to 2015 brought KC to start the partnership with the AOA. The AOA’s reputation as the pioneer in organic vegetable sector became the main reason for the K to order the supplies from the producer. Moreover, the K and the AOA did not use the consignment sales for its trading system. Instead, the K purchase the products from the AOA based on the quantities they received, without applying any return policy.

The AOA’s market channel in the Organic Vegetables Supply Chain

Based on the interview, the market channel for the organic vegetable supply chain in the AOA has been formulated. Compared to other producers who do not restrict their consumers to register to purchase the organic vegetables, the AOA will only supply their organic vegetables to their registered agents. Due to that reason, people who are not registered cannot purchase the products directly from the AOA. Thus, the producer can ensure the fair trade with the registered agents. Consequently, the communication can be developed more efficiently between the producer and the registered agents which eventually improves the product quality and the logistics.

To summarise, the registered agents are further divided into four channel. Firstly, individual registered agents who are commonly the owner of the specialised store for organic food products. Secondly, the AOA only supply their product for one supermarket which is TB supermarket. Thirdly, the AOA also supplies some restaurants. For this channel, the organic vegetables have been processed into several Indonesian meals and salads. The last market channel is an online distributor that later distribute the organic vegetables to their agents. The organic vegetables that received by the agents will be picked up by the end-consumers.
Among several AOA’s market channel, the highest purchase came from the individual registered agents who sell the organic vegetables directly to the end-consumers through their specialised store. According to the interview with AN from the AOA, the high number of registered agents who own the specialised store and the long duration of partnership between the AOA and thus registered agents makes the first market channel important for the AOA. Hence, the AOA’s market channel in the organic vegetable supply chain is described in Figure 5.

Figure 5. The flow of AOA organic vegetables supply chain.

4.1.2 Description of FE Chain

In the FE chain, the producer focused on supplying the organic vegetables around the Bandung city and Greater Jakarta area. However, in this study, the FE chain is located in Bandung city (West Java).

In this part, several actors had been interviewed to collect the relevant data regarding the organic vegetable supply chain. Two supermarkets which are supplied by the FE including TB supermarket and SB supermarket. Furthermore, the FE has provided their products to several restaurants around Bandung city. THF restaurant is one of the restaurants that has been supplied by the FE since 2013.

Actors’ Profile

The FE sells organic vegetable products mainly in Bandung area, West Java. They focused on the local market with shorter supply chain compared to the conventional vegetable supply chain. SB is a premium class supermarket that has been supplied by FE. As a representative of SB, VR was interviewed to gather the information. SR is the representative of TBS in Jakarta. FE delivers the organic vegetables from their farm in Bogor, West Java to fulfil the demand of Jakarta.
market. Thus, they could keep the chain shorter. The FE also supply their product to several restaurants. One of them is THS in which KN works as the main chef and become the interviewees of this study. The profile of actors involved in FE supply chain will be explained further in the following section.

Table 3. Overview of the Respondents’ in FE Chain

<table>
<thead>
<tr>
<th>No</th>
<th>Code name of the respondent</th>
<th>Position</th>
<th>Company/ Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SS</td>
<td>Owner</td>
<td>FE</td>
</tr>
<tr>
<td>2</td>
<td>VR</td>
<td>Buyer for vegetable products</td>
<td>SB Supermarket</td>
</tr>
<tr>
<td>3</td>
<td>SR</td>
<td>Staff of vegetables division</td>
<td>TB Supermarket</td>
</tr>
<tr>
<td>4</td>
<td>KN</td>
<td>Head chef of THF restaurant</td>
<td>THF Restaurant</td>
</tr>
</tbody>
</table>

- FE

In 2009, the FE was founded by SS and DR in Bandung, West Java. During the early years, they explored and studied in depth about organic from academic sources and leading organic institutions which led them to the intense discussion. They finally found their passion in organic vegetables. Their vision is to promote both healthy people and environment. Meanwhile, their missions’ compromise of inspiring people towards healthy and organic attitudes, becoming a role model of organic edible garden and ethical organic farming, protecting consumers’ interest on organic quality through education and consumption. To achieve the vision and mission, they have a commitment to ethical and moral of organic farming, good production and working environment, as well as healthy and sustainable ecosystem. Thus, they are two fundamental factors that need to be implemented, namely competency and trustworthy. From the interview, it was noted that FE has two organic farms. The first farm is located in Parongpong, West Bandung. It is owned by SS and DR to fulfil the demand from surrounding Bandung region. However, another farm in Tenjolaya, Bogor is owned by
TVMS which establishes a partnership with FE and agree to follow their vision and mission. The FE Tenjolaya farm offers the organic vegetable supply for Greater Jakarta market. It is in line with FE’s concern to cut the distance between the farm and the market.

- SB supermarket
  Since approximately five to six years ago, SB supermarket has been selling organic vegetables. Based on the interview with VR, firstly there were some demands of organic vegetables from two consumers. The supermarket noticed that and then tried to fulfil it. The demand has been increasing lately due to the higher consumers’ awareness and easy access to the internet. To provide that, the supply of organic vegetables is increasing. VR is the buyer of ST supermarket who responsible for managing the trading process with the producers (FE).

- TB supermarket
  TB supermarket focus on selling vegetables and fruit market in Greater Jakarta area. They offer both organic and conventional vegetables to fulfil the consumer’s demand. SR is interviewed to have an in-depth view of the elements in organic vegetables in the supermarket. She is responsible for the vegetable division of the supermarket. One of the organic vegetable suppliers is FE. They deliver the products from Tenjolaya farm due to proximity.

- THF restaurant
  The THF restaurant has been opened since December 2013. KN started to work as the head chef in 2014. The THF is located in Sukajadi, Bandung which is 4.8 Km from the FE store in Sarijadi, Bandung city. Chemical-free and nutritious content of organic vegetables became the main reasons for the restaurant to use in organic products in their foods. The THF buys the organic vegetables from local producers around Bandung area, such as FE. Thus, they can easily check the quality of vegetables by knowing the sources. Moreover, it also increases the brand image for the youths by offering delicious and healthy foods.

*The FE’s Market Channel in the Organic Vegetables Supply Chain*

The FE has supplied the organic vegetables to the supermarket, restaurant and the end-consumers. However, their concern to distribute the products to the local market has made the market divided into two areas. The first market area for the FE is located in Bandung, West Java where the organic vegetables are supplied from the FE’s Parongpong farm. The first channel
distribute the organic vegetables to the several supermarkets, restaurants, and to the end-consumers (e.g. households). For the second market area, the FE supply the organic vegetables from the Tenjolaya farm in Bogor to the supermarkets in Greater Jakarta area. The Tenjolaya farm is selected due to it is proximity to market area.

However, the first market channel is directly under supervision of SS and DR (the owner of the FE) during the daily process of organic vegetable supply chain. Thus, the development of the first market channel is rapid compared to the second market channel. In the first market channel, the FE has supplied the organic vegetables to more various channels. The market channels of the FE supply chain have been summarised in Figure 6.

![Figure 6. The flow of FE organic vegetables supply chain.](image)

### 4.1.3 KSUGL Chain

The KSUGL is a cooperative that focuses on organic products business, saving and loan. Regarding the organic vegetable supply chain, the KSUGL has affiliated with small farmers from Cijulang village, Cijeruk, Bogor. MR is an organic vegetable farmer and a member of KSUGL who interviewed for the purpose of data collection. However, DN (a member of KSUGL and organic vegetable distributor) also collects the organic vegetables from the Cijulang village farmers and sells the products through his supply chain. Aside from the Cijulang village farmers, DN also received a supply of organic vegetables
from VB farm that located in Cijeruk area. The respondent JI (manager of VB farm) had been interviewed.

**Actors’ Profile**

KSUGL is an organic cooperative located in Bogor, West Java. They collect organic vegetables from farmers around the cooperative and sell it to Bogor city. In order to collect the relevant data, several farmers that supply the organic vegetables to the cooperative has been interviewed. The contact person were MR and JI. Meanwhile, EM (the person-in-charge for organic vegetable supply chain) and DN (a distributor and a member of the cooperative) were interviewed.

Table 4. Overview of the Respondents' in KSUGL Chain

<table>
<thead>
<tr>
<th>No</th>
<th>Code name of the respondent</th>
<th>Position</th>
<th>Company/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EM</td>
<td>Person-in-charge for organic vegetable supply chain</td>
<td>KSUGL</td>
</tr>
<tr>
<td>2</td>
<td>MR</td>
<td>Organic farmer in Cijulang village</td>
<td>KSUGL</td>
</tr>
<tr>
<td>3</td>
<td>JI</td>
<td>Manager of VB</td>
<td>VB</td>
</tr>
<tr>
<td>4</td>
<td>DN</td>
<td>A member in KSUGL and a distributor</td>
<td>KSUGL</td>
</tr>
</tbody>
</table>

- KSUGL
  
The KSUGL is an organic cooperative that established in 2007 with the aim to help the women in Cijeruk, Bogor, to increase the capacities regarding knowledge, skills, and income for their households. It also helps the women to be independent. KSUGL divided into two division which consists of *saving and loan*, as well as *organic products business*. At the beginning of the cooperative, the members reached 450 peoples who currently reduced significantly to only 138 members in 2016. In relation to the organic products business, the human resources are limited. One
contact person was interviewed, namely EM (responsible for the whole organic vegetable supply chain process).

- Organic Farmers

After resigning from his previous job in a shoe company in 2011, MR became an organic vegetable farmer. He later becomes the member of KSUGL and works as the cooperatives’ person in charge for the organic vegetable farmers in Cijulang village, Cijeruk, Bogor. MR is responsible for managing the organic vegetable process among farmers, for instances coordinating the planting schedule between the farmers, sharing information and knowledge with other farmers, and coordinating the communication between the cooperative and the farmers. In addition to that, MR is also responsible for managing his farm and supplying the organic vegetable to the cooperative.

Another organic farmer that has been interviewed was JI from VB. VB is a villa located in Cijeruk, Bogor, specifically on the slopes of Mount Salak. It can be accessed in a less than an hour from Bogor toll exit. VB offers several services such as accommodations, outbound facilities, and organic farm. As a general manager, JI is responsible to manage finance, human resources, maintenance of the facilities and security. Moreover, he has to accommodate the guests. JI had supplied the organic vegetables to KSUGL before. However, these days JI only delivered the vegetables to DN, who is a distributor and a member of KSUGL.

- DN (distributor)

DN is a distributor and also a member of KSUGL. Previously, he was actively involved in KSUGL as a member of the board. However, after the election board in December 2016, he resigned from the cooperative board and became an ordinary member of KSUGL. Thus, he signed a contract with the KSUGL and paid contribution fee to KSUGL. By doing that, he
was allowed to collect the organic vegetables from KSUGL farmers. The farmers that supply the organic vegetables to DN are Cijulang’s farmers and JI.

The KSUGL’s Market Channel in the Organic Vegetables Supply Chain

The market channel of the organic vegetable supply chain in the KSUGL has been divided into two categories. For the first category, KSUGL collects the organic vegetables at the pick-up point in Cijulang village in which the farmers are gathered all their products for the cooperative. KSUGL distributes the organic vegetables to the cooperative office for sorting and packaging processes. On the following day, KSUGL sells their product in Bogor, particularly in front of the RP School.

For the second category, KSUGL is indirectly involved because DN is the member of the cooperative. In this case, JI and farmers in Cijulang village supply the organic vegetables to DN. For farmers in Cijulang village, DN will collect the vegetables directly from the farmers. However, JI has to deliver vegetables to the cooperative which later will be picked up by DN. On the following day, DN will deliver the vegetables to the end-consumers.

Among those two market channel, KSUGL prioritises the first market channel because the cooperative is directly involved in the organic vegetable supply chain process. While for the second market channel, KSUGL does not have role in the supply chain process. Even though DN is the member of the cooperative, the supply chain process is separated from KSUGL. The market channel of the KSUGL’s organic vegetable supply chain can be described as in Figure 7.

![Figure 7. The flow of KSUGL organic vegetable supply chain.](image)

4.1.3 Third Parties

Several third parties have been interviewed in order to gather opinions and experiences regarding current state of the organic vegetable supply chain in West Java (Indonesia), especially in quality of product and market demand. The third parties that were interviewed in this study were an organic certification body, a PGS organisation, a NGO specialised in organic agriculture and an academic. The organic certification body and the NGO have important roles in the development of organic agriculture.
in Indonesia as they have been established since 2002. They could be considered as the pioneers in the development of this sector. Meanwhile, PMI is considered as a new comer. The organisation is currently trying to set up a system in which can recognise the quality of the organic vegetable produced by small farmers even though the farmers do not follow the organic certification body. The academic as the third party has a role which is related to the research of product quality and market demand for organic vegetable in the urban areas. The profile of the third parties are describe in this section.

**Actors’ Profile**

In this study, two organic certification bodies; (i.e. BCI and PMI) had been interviewed to collect information about the requirements and processes to receive organic vegetable certification. In order to collect general information about organic vegetables supply chain in Indonesia, IOA (NGO in the organic agriculture sector) and WY (academic lecturer and researcher) were interviewed. The overview table of the respondents could be seen in Table 5.

Table 5. Overview of the Third Parties

<table>
<thead>
<tr>
<th>No</th>
<th>Code name of the respondent</th>
<th>Position</th>
<th>Company/ Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AP</td>
<td>Director</td>
<td>BCI Organic Certification</td>
</tr>
<tr>
<td>2</td>
<td>FM</td>
<td>Staff of PM division</td>
<td>PMI (IOA)</td>
</tr>
<tr>
<td>3</td>
<td>AR</td>
<td>Staff of marketing division</td>
<td>IOA</td>
</tr>
<tr>
<td>4</td>
<td>WY</td>
<td>Academic</td>
<td>BU</td>
</tr>
</tbody>
</table>

- **BCI**

As one of the leading organic certification body which was established by IOA, BCI has been involving in organic agriculture sector since 2002. In 2006, BCI was accredited as organic certification body under ISO 17065 by National Accreditation Committee of Indonesia. BCI was also accredited by IOAS as organic certification of EU equivalence and Canada Organic Regime. BCI carries a vision to be a trusted company in Southeast Asia to ensure sustainable performance and ethical practices in the company. In order to successfully achieve the vision, BCI commits to help and facilitate organisation, company or groups of a partner realising sustainable productivity and achieving the highest level of performance in environmental protection, social responsibility, safety and quality of products.
Moreover, BCI focuses on encouraging them to apply accountability principles, professionalism and sustainable cycle in every initiative and improvements which are in line with sustainability standards (Biocert, 2015).

AP has joined BCI since 2002. Currently, he is the director of the institution. He is responsible for leading the auditor team, inspector team and verifier team for organic, UTZ Certified, Rainforest Alliance, 4C, CAFÉ Practices and ETP. He has some experiences in auditing the organic certification in Indonesia, Papuan New Guinea, China, and Vietnam. AP was interviewed about the role of BCI as the institution that released the organic certification for AOA. The organic certification for AOA was valid from April 14\textsuperscript{th}, 2014 to April 13\textsuperscript{th}, 2017. Now, it is under the process of the renewal (Biocert, 2015).

- **PMI**

  A national workshop involving numerous organic agriculture stakeholders (i.e. producers, consumers, traders, NGO and academics) in 2008 has formed an alternative program to assure the quality of organic agriculture product under the name of PMI. PMI is a \textit{Participatory Guarantee Systems} (PGSs) applied in Indonesia and recognised by IFOAM.

  According to IFOAM (2008), PGSs are quality assurance initiatives that locally relevant and emphasise the participation of organic agriculture stakeholders (i.e. producers, consumers, third party certification). Four basic elements in PGSs includes a participatory approach, a shared vision, transparency, trust and a non-hierarchical structure. PGSs are born from a group of people who realise the benefit of having an organic guarantee. This guarantee could provide recognition in local markets without having constraint from the third party certification (i.e. compliance requirements and costs) (IFOAM, 2008). PGSs is focused on the local market, while third party certification is targeted for a bigger market that located far away from producers (e.g. export markets). In terms of technical aspects, PGS and third party certification share similarities which they both have collective certification tools, standards, mechanisms for verifying compliance, documented management procedures and a farmer’s pledge and seals (IFOAM, 2008). There is not one set of rules which must be followed by all PGS. On the other hand, the key stakeholders are driven to engage in the design and operation of the PGS through the ownership and process control that is coming from inside the overall group (IFOAM, 2008).

  FM (staff of PMI) stated that small producers could not afford the organic certification due to the high cost. Therefore, small producers were unable to sell their organic products to
the domestic market. Yet, the Indonesian government has not acknowledged the existence of PMI as a PGS for organic producers in Indonesia.

“Therefore we adopted the PGS and changed it with a new name PMI. We introduce this new system to the small producers so that they can sell their products to local market. Until now, the Indonesian government has not acknowledged the existence of PMI as participatory guarantee systems for organic producers.”

PMI had 13 units in 2015 with 500 small producers and 117 big producers that registered as the PMI’s members. In order to apply for PMI organic certification process, the producer can contact the closest PMI unit. Then, the PMI unit team will assess the certification process and verify the product. Afterwards, IOA will release the certification and the products have been officially recognised as organic.

- IOA

In April 2002, IOA was established as a civil society organisation which was based on membership. IOA had 117 members, including 80 institution and 37 individuals from 20 provinces in Indonesia. Four main programs of IOA are;

1. **Strengthen the institution and quality of the production in small farmers to access the market**

   To achieve the first program, several interventions have been implemented by strengthening the facilities of market access, protecting the small farmer; through harmonising some standards (i.e. organic, social, fair trade, environment), and developing a participatory guarantee system. The main activity of the first program is to develope and implement an internal control system that is included in the organic certification scheme for farmer group. Moreover, IOA provides financing scheme for fair trade, the product’s quality improvement program, marketing and financing certification. Therefore, IOA founded PMI in 2008 as the participatory guarantee system for farmers.

2. **Advancing the organic agriculture movement and fair trade**

   IOA provides basic data for organic agriculture, campaign and organist education, organic agriculture research, develops the network and policy, facilitates information and market access for organic product and fair trade. In 2009, IOA thus published the Statistic for Organic Agriculture in Indonesia (SPOI). This publication contains data of
the organic agriculture development in Indonesia. On top of that, IOA also regularly holds the exhibition, seminar, discussion and another type of campaign related to organic agriculture and fair trade.

3. **Developing independent services in organic agriculture and fair trade**

The third program focuses on establishing quality assurance services (i.e. BCI and PMI), training and consultation (i.e. ICS) and publication (i.e. ORGANIC magazine).

4. **Strengthen the coordination and implementation of IOA programs with the members within national and international networks**

The coordination of national programs has been done through all the IOA members that scattered around Indonesia. IOA establish a partnership with JMHI, WWFI, and BFTW. In international level, IOA actively contributed through IFOAM and Organic Asia Forum. IOA has been the member of IFOAM since 2007 and becomes the vocal point of IFOAM in Indonesia.

To collect the data from IOA concerning the current state of organic agriculture in Indonesia, AR (representative of IOA) was interviewed. He was previously responsible for marketing, quality assurance and external communication for IOA. He is now a coordinator in fundraising and partnership division in IOA. His main task is to connect the people who interest and support the organic agriculture sector and have interest in IOA programs. IOA is a non-profit organisation which depends on financial support from the donor.

> “The activities that I conducted in fundraising division were aimed to connect and facilitate institutions that wanted to support organic agriculture development through certain programs as well as to provide funds to producers in Indonesia. We could also assist the organisation and companies which need supervision to develop organic agriculture programs for producers.” (AR, 2017)

- **Academic**

To collect data about market demand for organic vegetables in Indonesia from research and academic perspective, WY had been interviewed. WY is currently active as a faculty member of Food Science and Technology in BUI, and a managing editor of Asia Pacific Journal of Sustainable Agriculture Food and Energy. He is also a member of several professional associations; for example, International Society of Organic Agriculture Research (ISOFAR), Indonesian Association Food Technologists, and Sustainable
Agriculture, Food and Energy (SAFE) Network. In 2011, he obtained Doctoral degree in the field of Organic Food Quality and Food Culture from Universitaet Kassel (Germany). He published several publications related to organic vegetables, such as: *local food security and the principle of organic farming (from farm to fork) in the context of food culture in Indonesia: Minangkabau case study in 2011, and organic agriculture in Indonesia: challenges and opportunity in 2016*.

4.2 Current state of Organic Vegetables Supply Chain

In this chapter, the observed current state of organic vegetable supply chain in the West Java will be described. The chapter will be divided into three sections based on the three variables in this study (i.e. quality of product, the collaboration between actors, the logistic). The first section 4.2.1 is explaining about the quality of product. It is followed by the by collaboration between actors in section 4.2.2 and the logistic in section 4.2.3.

4.2.1 Quality of Product

This section will be sorted into three parts which are explaining each supply chain state. First part refers to the AOA chain, followed by the FE chain and then KSUGL chain. Firstly, the definition of product quality is based on Luning & Marcelis (2009). From this definition, the quality of product is focused on the quality control that has been applied by the producers in order to produce high quality organic vegetables and proper quality assurance. The comparison of three supply chain can be seen on Table 6.
<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
<th>AOA Chain</th>
<th>FE Chain</th>
<th>From Cijulang Farmers</th>
<th>KSUGL Chain</th>
<th>VB Farm</th>
</tr>
</thead>
</table>
| 1. | Quality control: Pre-harvesting process | - Implementing an integrated production plan and forecasting system  
- Seeding several local vegetable seeds  
- Pre-treatment for non-organic seeds by soaking in the water for approx. 30 min. While the organic seeds can be planted directly without soaking process  
- Organic fertiliser is made from the fermentation of manure, soil and straws mixture  
- The water source is filtered by using papyrus plants in a pond before using it to watering the plants  
- Polyculture system  
- Manually remove the pests  
- Organic pesticides is given only if it is necessary and cannot be solved manually  
- Hedgerows and repellent plants grows around the farm to prevent the distribution of pests from other farms  
- Regular rotating farming system | - Implementing an integrated production plan and forecasting system  
- Use import seeds  
- Manually remove the pests  
- Organic pesticides is given only if it is necessary and cannot be solved manually  
- Indoor (i.e. greenhouse) and outdoor farm  
- Regular rotating farming system | - Start to implement an integrated production plan and forecasting system  
- Seeding several local vegetable seeds  
- Purchase vegetable seeds that cannot be seeding by themselves  
- Use ground water to watering the farm  
- Compost is used as the organic fertiliser with the mixture of goat manure, chicken manure, rice straw and the remnants of vegetables  
- Polyculture system  
- Hedgerows and repellent plants grows around the farm to prevent the distribution of pests from other farms  
- The organic pesticides is made from the mixture of water and tobacco leaves to repel the pests (given when necessary) | - Implementing a forecasting system  
- Organic fertiliser made by mixture of 5 sacks of the waste of goat’s feed, five sacks of goat manure, one sack of mixture of husk and chicken manure, and the grass which has been grinded before the fermentation process  
- Beans, long beans, carrot and spinach has been seeding by themselves  
- Purchase other varieties of vegetable seeds from AOA and Mr. A (owner) who supplies seeds for salad vegetable  
- Polyculture  
- Manual treatment for pest control  
- Spread the seed to the plots  
- For several vegetables, it grows in the polybag first before move to the plot | - Harvesting process takes in the morning  
- Harvest 35 plots of vegetables per week  
- Manual harvesting process | |
| 2. | Harvesting process | - Harvesting takes six days a week (Tue-Sun)  
- Manual harvesting process (i.e. hand) | - Harvesting takes everyday  
- Manual harvesting process (i.e. hand) | - Manual harvesting process | | |
| 3. | Post-harvesting process | - A big wood basket use to distribute the product from farm to the rotation centre  
- The vegetables are cleaned two times  
- The vegetables sort into grade A and B  
- Weighing process (250 gr/package)  
- Packaging with plastic bag and labeling with AOA’s sticker | - The vegetables is kept in a box during the distribution from the farm to the warehouse  
- Two times of product’s cleaning process; in the farm and in the warehouse  
- Two types sorting products (i.e. Fresh vegetables and Salad)  
- Plastic bag is used as the packaging with FE label at front | - The vegetables sort by its quality in terms of low damages  
- There is no grading in vegetables  
- Clear plastic bag use as the package  
- Price label is putted on the package without brand information  
- One time of product’s cleaning process | - The vegetables sort by its quality in terms of low damages  
- There is no grading in vegetables | |
| 4. | Quality assurance | - Under supervision of BCI | - Member of IFOAM and PMI | - Starting to use PMI | | |
| 5. | Quality attributes | - High freshness and chemical free content | - Sweeter taste, fresh color, similar form and shape, low rates of holes and damages, low rates of animal insects, freshness and crisp sounds, free-chemical content) | - Need longer time to rot (3-4 days compared to conventional) which indicated by withered leaves | | - Crunchier, clean |
**AOA Chain**

- The AOA’s definition for quality of organic vegetables based on quality attributes

According to interview with the respondents from AOA (i.e. AN), the high-quality standard for organic vegetables requires the freshness, minimum damages (e.g. few holes, few insects and free from chemical residues). The shape and form of the product do not have to be standardised. AN stated that there is no significance difference in the taste between the organic and conventional vegetables. The consumers relates the high-quality products to the chemical-free content and product’s freshness. According to the interview, the AOA agents stated that both the agents and the end-consumers have knowledge and information about the characteristic for the organic vegetable products due to long-time relationship with the AOA. The rapid technological development in the past years (specifically internet) has made the end-consumers can conveniently access the information regarding the quality of organic vegetables. To fulfil the consumers’ demand for the product quality, AOA communicated with all the agents regularly and responded to the complaint by directly improved their quality production. However, weather condition has a strong influence to the improvement on quality of the organic vegetables.

- Quality Control

In order to produce high quality standard for the organic vegetables, certain quality controls need to be performed by the farm. Pre-harvesting, production, harvesting and post-harvesting processes are included in the quality control system.

**Pre-harvesting process**

In order to produce high-quality products and prevent the vegetable pest without using chemicals, the organic vegetable production in the AOA farm required an integrated
production plan and forecasting system. For several varieties of seeds that are imported from other countries and unable to be grown in Indonesia, they need to be soaked for approximately 30 minutes to reduce the chemical residues in the seeds. This step needs to be followed as it is written in the organic certification standard rules. The local seeds which could be cultivated in the farm do not need to be soaked. AOA has been seedling several varieties of local seeds as a means to reduce the possibility of chemical contamination and the costs from purchasing the seeds. The seeds are moved to the plot which added with the organic fertiliser from the fermentation of manure, soil and straws mixture. Additionally, the water resource, water filter should be filtered by using papyrus plants. Thus, the chemical input in the organic vegetable farming can be suppressed.

AOA uses polyculture for the organic vegetable farming system, rather than monoculture which is common in conventional agricultural farming. By using polyculture system, AOA plants three different vegetables in one crop from different families which are harvested in different time (e.g. carrot, lettuce and broccoli). Instead of using the chemical pesticides, the AOA farm uses manual method (i.e. using hand) to remove pests from the vegetables. The organic pesticides that have been made by the farm will be applied to vegetables only if it is needed, for example when the number of vegetables that has been attacked by the pests are higher than the farm expectation. DD (responsible for the production division) in the AOA stated that if the production could be done without using any organic or conventional pesticides, it would have been better for them. It is owing to the intention of applying the organic principle to lower the possibility to kill the animals and insects.

Several methods to prevent the pest attack during the severe condition has been applied in the AOA farm. The hedgerows and the repellent plants are planted around the farm to prevent the distribution of pests from other farms. Furthermore, AOA increases the quality of the farming system by implanting integrated production plan and intensive care. It
requires the farm to rotate their harvesting time for each variety of vegetables. The crop that has been harvested will be replaced with other variance of vegetables that different from the three previous vegetables. As a result, this method will helps to prevent pest’s attack to particular vegetables.

*Harvesting process*

The harvesting processes are held every Tuesday to Sunday. The integrated and effective planting plan need to be implemented to have a precise weekly harvesting forecast. Therefore, AOA could accurately inform their agents regarding the organic vegetables that will be harvested in the following two days. Furthermore, to avoid damages and unnecessary harvested vegetables, manual harvesting should be employ. AOA employee could check whether the vegetables ready to harvest and also to avoid the injury in the product.

*Post-harvesting process*

The harvested vegetables are placed in the big wood basket and distributed to the sorting location on the ground floor of the AOA office. The vegetables need to be cleaned two times with clean ground water prior to sorting process. This is done to prevent the attachment of remaining dirt on vegetables. Furthermore, the vegetables are sorted into two grades, namely grade ‘A’ and ‘B’. The grade ‘A’ aims to fulfil the registered agent’s order, while the grade B usually processed into secondary products. The organic vegetables are packed into 250 gr transparent plastic bag to preserve their quality. Each plastic bag is attached with a sticker containing AOA’s name and logo.

- Quality assurance

AOA is implemented under the supervision of BCI, which is a known organic certification body that located in Bogor (West Java). The organic vegetable certification has been released in the beginning of 2016. BCI regularly checks all matters related to the organic vegetables, ranging
from the production system to the packaging phase. Based on the interview with the respondent AN, the agents and the end-consumers of the organic vegetables are aware of the high-quality standard and the organic farming system used by the AOA. This is in accordance with the objective of the BSB Foundation and the AOA themselves. The AOA tries to ensure that the candidate agents, which they will be supplied have understood the AOA’s organic principle before both parties agree to do the cooperation. AN stated that the use of organic certification was actually not necessary for the producer because the farm has already established strong supply chain due to its long-time business cooperation (since 1984). The AOA’s registered agent system is a way to sell the organic vegetable products through fair trading to the consumers. During the interview with AOA, it was discovered that the government regulation to attach organic certification logo (‘Organik Indonesia’) supported the implementation of organic certification. This logo will provide quality assurance for the consumers. Nonetheless, this logo can only be obtained if the producer follows the organic certification’s regulation. Furthermore, the organic certification has obtained increased trust from both registered agents and the end-consumers in addition to attracting new consumers purchasing the AOA organic vegetables.

**FE Chain**

- The FE’s definition for quality of organic vegetables based on quality attributes

In the FE chain, the high-quality products defined by the sweet taste, good appearance (e.g. fresh colour, similar form and shape, low rates of holes and damages, low rates of animal insects, freshness and crisp sounds attributes, and chemical-free residues). Yet, the intensive organic farming practice is required to produce the high-quality products.

In order to measure the consumer’s demand and preference regarding the high-quality of organic vegetable products, FE conducted active communication and information exchange with their consumers. Thus, they could receive necessary feedback that could support the improvement of their products.

- Quality Control

*Pre-harvesting process*

According to the interview with SS (the owner of the FE farm), the integrated production plan and forecasting system has been implemented in the FE in order to reach the optimal production of organic vegetables. The FE uses import vegetable seeds in order to produce organic vegetables with premium qualities.
"If we want to have a high quality vegetables with bigger size, we usually need to buy superior seeds. However, if we only use ordinary seeds but we want to harvest the vegetables with bigger size, it will be impossible." (SS, 2017)

SS also added that the important things is to prepare the suitable environment for the seeds to grow, thrive, and keep healthy. In the Parongpong farm, FE cultivates the vegetables on the inside and outside the greenhouse. This aims to lower the damages rates and pest attack. During the harvesting, FE uses manual method to harvest the vegetables. Organic pesticides is given only if it is necessary and cannot be solved manually. SS stated in the interview that they were trying to avoid the usage of organic pesticides at all by doing intensive care of the vegetables and careful planning of the production. FE carries out the sowing, land processing and weeding every day in the farm. Furthermore, FE performs regular rotation crop system for their vegetables to prevent pests attack which usually experienced by certain variance of vegetables that has been planted in the same plot for long period.

*Harvesting process*

The harvesting process in the FE farm is held from Monday to Sunday. In order to maintain the product quality, FE harvests the organic vegetables before it grows too big and becomes hard to cook. The harvesting process is done by manual method to prevent damages. The manual harvest also helps the producer to measure to readiness of the vegetables to be harvested. This will reduce the possibility of early harvest.

*Post-harvesting process*

The organic vegetables that have been harvested in the morning will be sorted and cleaned in the farm. The remaining vegetables that have been sorted will be used as fertilisers for the next cultivation. The cleaned vegetables are kept inside the box to protect the vegetables from contamination, dirt or damages. The boxes are then distributed from the Parongpong farm to the warehouse in Sukajadi area (Bandung) by motorcycle.

After the organic vegetables arrive in the warehouse, they are cleaned, sorted, weighed and packaged. SS explained that FE will reject the vegetables that indicates early deterioration, especially in leafy vegetables. Thus, FE will sort a lot of vegetables during the sorting process rather than keep it because later they can affect the freshness of the other vegetables. The rejected leaves from the sorting process will be used for other products, such as salad. However, before FE used the rejected vegetables for salad, they still need to be sorted to ensure whether they are fit for consumption. Regarding the grade, FE does not sort the organic vegetables to
certain grades (e.g. grade ‘A’ or ‘B’) but puts focus more on the visual and the healthiness of the vegetables.

“The grade is almost the same. If there is a consumer that asked about the grade, we will ask them back whether they prefer good visual or the healthiness of the vegetables.” (SS, 2017)

The sorted organic vegetables are packed into transparent plastic bag with FE label to distinguish the FE’s products from other producers. In order to keep the freshness of the vegetables, FE seals the plastic bag and only provide holes at the bottom of the package for the water. SS argued this is used to prevent for early deterioration due to enzymatic oxidation that caused by letting the package open. Thus, the vegetables can stay fresh for two to three weeks inside the refrigerator.

- Quality assurance

Instead of using the common organic certification, SS mentioned that he followed the IFOAM programs and regulation on organic farming. Further, he also became the member of it. Therefore, he puts the IFOAM logo on his package instead of the ‘Organik Indonesia’ logo. The ‘Organik Indonesia’ can only be obtained if the producer follow the organic certification from the institution in Indonesia. SS argued that there were several producers cheating even though they already received organic certification. Thus, FE prefer to focus on personal branding instead of certification. SS also stated that even though FE does not have Indonesian organic certification, the consumers are still willing to purchase the FE’s vegetables. FE will consider to follow the Indonesian organic certification if the there is a strong reason, such as supplying organic vegetables to certain company or other countries.

Picture 12. The FE’s organic vegetable product
Source: Author
However, according to the interview with AR from IOA and FM from the PMI, FE also participated in the PMI. PMI is a PGS that helps the organic producers to apply the organic farming and get access to the organic certification from the third party. Even though FE does not have the ‘Organik Indonesia’ logo, FE could supply their products to several supermarkets, restaurant and the individual consumers that trust the quality of FE’s organic vegetables. If FE follows the organic certification regulation, they might increase the consumer purchase but not significantly.

**KSUGL Chain**

- The KSUGL and BV farm definition for quality of organic vegetables based on quality attributes

The KSUGL specified the quality of organic vegetables based on the freshness and minimum damages. According to the interview with EM from the KSUGL cooperative, the organic vegetables usually need longer time to rot, which is three to four days longer compared to the conventional vegetables. It is further indicated by withered leaves for leafy vegetables.

Nevertheless, the BV farm stated that their organic vegetables mostly have crunchier sound and texture. Moreover, the vegetables have cleaner visual because the farm does not use organic pesticides to prevent pest attacks. Thus, consumer will not find the remaining pesticides stick on the vegetables. Additionally, freshness also becomes one of the quality attributes they defined for their organic vegetables.

- Quality control

**Pre-harvesting process**

KSUGL cooperative receives organic vegetables supply from the Cijulang village farmers. According to the interview with the MR (Cijulang farmers’ coordinator) and EM (KSUGL staff), the Cijulang farmers currently starting to implement an integrated production plan and forecasting system for their organic vegetable farming system. The farmers use local vegetable seeds that have been cultivated by the farmers. Nonetheless, KSUGL provides farmers with vegetable seeds that cannot be cultivated by themselves. The Cijulang farmers use ground water to water the organic vegetables. While, compost is used as the organic fertiliser which consists of a mixture of goat manure, chicken manure, rice straw and the remnants of vegetables.
The organic vegetable farming system of Cijulang farmers is simpler, but it started to implement the polyculture system recently. The implementation of polyculture has not been done entirely by all the Cijulang farmers. There are several farmers who are still applying the monoculture system. In the Cijulang village, tillage usually done at the beginning of the farming process by giving organic fertiliser to the soil. The hedgerows and repellent plants grow around the farm to prevent the pest distribution which might be from surrounding farms with conventional farming system. The Cijulang farmers provide a gap between their organic farms and the conventional farms. The purpose is to prevent the chemical contamination (i.e. fertilizer and pesticides) that could affect the organic vegetables. The organic pesticides is made from the mixture of water and tobacco leaves. Though, the use of organic pesticides is minimise by the Cijulang farmers in order to produce higher quality of organic vegetables.

On the other hand, BV implements forecasting system for their organic vegetable crop. The farm cultivates the local seeds for beans, long beans, carrot and spinach. For export seeds, they cannot saddled by themselves, thus the farm receive supply from their owner who often travels to US. The export seeds are mainly used to supply salad vegetable. The BV farm is more specialised in carrot. This is the reason why DN (KSUGL's member and distributor) gets supply from the BV farm. For the organic fertiliser, the farm use mixture of 5 sacks of waste of goat’s feed, five sacks of goat manure, one sack of the mixture from husk and chicken manure, and the grass which has been grinded before the fermentation process begin.

The polyculture system in the farm comprises of three different variety of vegetables in one plot. The seed is mostly spread to the plots instead of planted with certain method. Nevertheless, certain vegetables are grown in the plastic polybag first before they are moved to the plot. Furthermore, the pest control is done manually by hand. The BV farm is located at the foot of the mountain and surrounded by forest. This location provide benefit to the farming due to low rate of pest attack.
Harvesting process

The Cijulang farmers harvest the organic vegetables every Monday and Wednesday, then the vegetables are delivered to the KSUGL. The harvesting process is manually done (i.e. by hand) in order to prevent the damages which often occur if using the tools. MR also stated that the manual method is effective to measure the harvest time for the vegetables. If the vegetables are not ready to be harvested, the farmers will delay the harvesting process.

The BV farm harvest the organic vegetables manually in the morning before it is distributed to the consumers. The farm harvest approximately 35 plots of organic vegetables per week.

Post-harvesting process

The Cijulang farmers clean the organic vegetables that have been harvested in the farm. After the distribution from the Cijulang village to KSUGL, the vegetables are sorted based on its. the degree of freshness and damages without classify into certain grades, such as grade ‘A’ or grade ‘B’. According to the interview with EM, KSUGL does not do grade for the organic vegetables. Instead, they mix the quality for grade ‘A’, ‘B’, and ‘C’. Therefore, they could not define it.

“If you see the farm, you could already know the quality for grade A, B and C. However; we are mixing the grade of vegetable quality here so that we cannot define it.” (EM, 2017)

KSUGL uses clear plastic bag as the package for the organic vegetables and only add price label on the package. There is no brand information on the package which could distinguish the product from conventional vegetables and from the other organic vegetable producer’s products.

Similar method for sorting the organic vegetables from the KSUGL is also applied in the BV farm. They only sort the vegetables based on damages and degree of freshness. The BV farm does not specify the quality of the organic vegetable into grade ‘A’ or ‘B’. The weighing process is done according the consumers requirements and demand. Thus, there is no certain standard for the vegetables that should be added in each package. In relation to the packaging for the vegetables, the farm use paper instead of plastic bag which contains no information about brand and price. Thus, the visitors in the BV farm need to ask them for the price of the vegetables. While for the online consumers, they can check the price in the BV farm website.

• Quality assurance
Since KSUGL does not follow the organic certification regulation, their market is limited to a certain place (i.e. RPS). Similar to KSUGL, BV also stated that the farm does not have accreditation from the organic certification body. Thus, the farm only sells the vegetables to the BV visitor, DN, and online consumers.

4.2.2 Collaboration between Actors

In this section, the collaboration between actors in each organic vegetable supply chain will be explained. The first part will describe the collaboration between the actors that involved in the AOA’s supply chain, such as the AOA farm, the registered agents, the supermarket and the end consumers. The second part of this chapter will focus on collaboration between the FE’s chain actors. The last part will discuss about the collaboration between actors in KSUGL’s chain. The collaboration between actors in this study is focused on the communication that has been established among the actors, including the information exchange. While, for other variable, trust and commitment were also studied to understand the strength level of organic vegetable actor’s relationship. The comparison of three supply chain in terms of collaboration between actors can be seen on Table 7.
Table 7. Current State of the Collaboration between Actors in Organic Vegetables Supply Chains

<table>
<thead>
<tr>
<th>No.</th>
<th>Variables</th>
<th>AOA Chain</th>
<th>FE Chain</th>
<th>Cijulang Farmers</th>
<th>VB Farm</th>
</tr>
</thead>
</table>
| 1.  | Trust & Commitment | AOA:  
- Registered agent system  
- Allow the agents to visit the farm  
- Not accepting return for unsold vegetables from the consumers  
- Replacing the vegetables with better quality for the following sales after receiving complaint from the consumer  
- Open information  
- Regular information exchange  
FE:  
- Online sales to the end-consumers  
- Consignment sales for the supermarket  
- Allow the consumers to visit the farm and the warehouse  
- Vegetables can be returned  
- Replacing the vegetables with the better quality after receiving the complaint  
- Open information  
- Regular information exchange  
Agents/consumer:  
- On-time payment  
- No sudden product changes  
- Check before accepting the products | Farmers:  
- Regular visit from the farmers’ coordinator  
- Starting to implement the harvesting log  
- Miss-communication and miss-data are still occurred occasionally | Farm:  
- Direct visit during the collection of organic vegetables  
- Does not require the log book or farming program  
- Ask for consumers understanding about organic vegetables quality and quantity |

| 2.  | Communication Information exchange | Between AOA and agents/consumer:  
- Whatsapp mobile application use for regular communication  
- Direct visit and phone call occur for urgent matters  
- Regular information exchange about the harvesting vegetables (third times a week)  
- Information sharing about variety and the quantity of vegetables, quality of products, price and distribution time  
- Fast response to consumer’s complaint  
- Information sharing about new variance of vegetables  
Between FE and supermarket/restaurant:  
- Whatsapp mobile application use for regular communication with the consumers  
- Phone call use only for urgent matters  
- Direct visit to FE is rarely happen  
- Information sharing about variety, quantity and quality of the vegetables  
- Information sharing about price changes and distribution time  
- Fast response to consumers’ complaint  
- Fast return for damages product due to short distance between the warehouse and the consumers  
- Information sharing about new variance of vegetables  
Between AOA and the farmers (partnership):  
- Regular visit to farmers’ farm and phone call to report the production plan and harvesting schedule  
- AOA provides workshops about organic vegetables farming and quality of products for the farmers  
- Two months intensive control by the AOA before the farmers’ first harvest to ensure the vegetables’ quality | Between FE and the online consumers:  
- The consumers purchase vegetables through the FE’s website  
- Phone or text is only used for urgent matters  
- FE opens organic farming workshop for consumers and public  
- Communication is mainly done by whatsapp or phone call  
- Direct visit is rarely. It is usually for important or urgent matters | |
AOA Chain

AOA has been adopting the system in which all of products can only be purchased through their registered agents. People who have interest to sell AOA’s products should register themselves to the producer. However, AOA has limited number of agent due to their production capacity. To fulfil the demands from all of their current agents, the producer has decided not to add new agents even though the waiting list of people is increasing.

The idea of selling the organic vegetables only to the registered agents came from the intention to apply the fair trading between AOA and their distributor. Their experience in cooperating with big retailers (i.e. big supermarket CF, HR), has caused high losses for the producer. The majority of big retailers prefer consignment sales in which the products will be returned to the producer if it cannot be sold. However, vegetable is the type of perishable products which easily deteriorate within three days after harvest. By the time the organic vegetables returned to the producer, the quality was already low it cannot be sold to the consumers anymore. The producer needs to deliver the organic vegetables based on the quantity that has been agreed by both of the parties in the partnership contract. Thus, the producer cannot deceive supermarket by reducing the vegetable quantities. To avoid the consignment sales between the retailers, AOA established the register agent system. There is only one medium-scale supermarket that is supplied by the producer. TB supermarket has agreed to do fair-trading with the producer in which they will not return the products. In order to establish fair trading for both parties, the supermarket checks the quality of vegetables before sign the accepted bill from the producer. The bill is usually paid within two weeks after the products arrived.

- Communication

According to the interview with AN, there are total 50 agents of the AOA. Out of that number, approximately 40 agents (i.e. the supermarket, restaurants, catering business and specialised stores) actively purchase the organic vegetables from the AOA. The communication between AOA and the agents has been done mainly through the WhatsApp mobile application. All agents are joined one WhatsApp group. By using that group, AOA inform the variety and the total yield of organic vegetable crop that will be harvested in the following two days, the quality of products, the product price, and the distribution time. The agents will place the order through private message to AOA by mentioning the quantity and variety of product. If the organic vegetable crop yield is lower than the forecast, AOA will directly inform the agents through the WhatsApp group. It is also done to inform quality degradation due to bad weather, especially
during the rainy season in Indonesia. The agents can understand bad weather negatively affect the vegetable crop yield. AOA usually inform the agents a day before the distribution time.

Due to that short notice, sometimes the agents find it difficult to inform the situation to their consumers. After hearing the explanation from the agent, most of the end-consumers finally understand the circumstances. Based on the interview with the respondents from AOA and the representative of agents, the communication through telephone or direct meeting were only applied if there were urgent cases which cannot be discussed via WhatsApp.

- Trust and commitment

Trust and commitment from both AOA and the agents are important factors to keep the relationship strong. To gain trust and commitment from the agents, the AOA sharing all the information regarding the organic vegetable product to the agents regularly and allow them to visit the farm. Therefore, the agents could understand the organic vegetable production system that used by the AOA. By visiting the farm, AOA can also prove the quality of organic vegetables that they produced. AOA also commits to keep the quality and quantity of vegetables as what AOA offered to the agents. On the other hand, the agents will gain trust from the producer if they pay the bills on time and commit with their order. For example, they do not change the order all of sudden which could cause trouble to the producer. Based on the interview with the respondent from the AOA and the agents’ representatives, the current information exchange is effective. The AOA’s quickly response to the questions and complains from the agents to improve the product quality and service. While, the agents also inform AOA about new variance of products that can be cultivated by the farm.

- New collaboration with rural farmers

To fulfil the high demand from the agents, the AOA start to establish a partnership with seven small farmers around Bogor region. The farmers get workshop from AOA regarding the organic vegetable farming system and the quality of products. Additionally, AOA intensively checks the farmers’ farm for about two months before AOA officially purchase the vegetables from the farmers. This is done to ensure that the farmers could provide the similar quality of vegetables as the AOA produced. Moreover, it could avoid the gap which could cause the confusion and distrust from the agents about the quality of vegetables. The communication between the farmers and AOA is maintained through a direct visit to the farm and via phone call. The non-commitment acts could be avoided once the farmers applying the organic vegetables farming system from the AOA. The system requires the farmers to report their planting plan and harvesting schedule in which the AOA could detect whether the vegetables that deliver from
the farmers are supplied from the farmers’ farm, or it is supplied from the conventional vegetable farmers.

**FE Chain**

The actors that are involved in FE chain are supermarkets, restaurants and the end-consumers. FE prefers to sell their products directly to the end-consumers who order the vegetables through the FE’s website. For supermarket and restaurants, the order can be done directly to SS who is the owner of FE. The market segment for FE mainly based in Bandung city and Greater Jakarta area. For Bandung area, the supply comes from FE farm in Parongpong (Bandung, West Java). Whilst FE’ partner (i.e. TVMS) supply the demand from Greater Jakarta area from their farm in Tenjolaya, (Bogor, West Java).

- Trust and commitment

FE commitment to their consumers is showed by providing the high-quality vegetables. They also actively communicate the product quality with the consumers, the supermarket and the restaurant. For example, FE always inform the consumers if they could not deliver high-quality of vegetables due to bad weather which negatively affects the crop. Furthermore, FE tries to inform and give an explanation about the increasing price beforehand to the consumers. Thus, the consumers could prepare to deal with the price changes. The increasing of price is rarely happened, except if there are major changes in the production. On the other hand, the consumers should also inform the producer if there are changes to products their order. As KN (the head chef of the THF) stated:

> “Communications should go well between the supplier and the restaurant. It includes the price, the quality and some products that ordered by the restaurant. For example, if there is increasing in products’ price or if the products quality is lower than it is usually delivered to us, they should inform us about that. Moreover, also if we have changes in a number of products ordered, we will tell them in advance.”

The FE transaction system with the supermarkets uses the consignment sales which means supermarket could return the vegetables if the products were not sold. In FE case, the return case rarely happened because the vegetables are usually sold within three days since they are delivered to the supermarkets. So far, FE still feels the benefit of the consignment sales. Thus they do not change the transaction system with the supermarket (i.e. TBS and SB supermarket).
• Communication

The communication about the vegetable quality, the order, the distribution service with SB supermarket is done through WhatsApp. The communication by phone call only happens for urgent matters. During the interview with VR, the communication through Whatsapp or telephone occurs if there are special orders from the end-consumers (e.g. new variance products or higher amount of order). For TBS case, SR explained that the communication rarely happens through WhatsApp or telephone. SR prefers to give the order list of vegetable products and complain about the product quality via the FE’s employee. The response to the question, order and complain are quick. Thus, the supermarket is satisfied to trade with the FE. The non-commitment acts can be avoided due to the effective communication from both of the FE and the supermarket.

• Collaboration Event

Furthermore, at the last SB annual event in 2016, had invited SS and DR (the owner of FE) to be speakers for the healthy food workshop. The event took place in the SB supermarket building. The programs included workshop and bazaar about healthy food. FE also actively participated in the event by opening a bazaar stand to sell their products (e.g. the organic vegetable product, the micro-vegetables, and the edible flowers).

**KSUGL Chain**

In KSUGL chain, the actors that involved are: ten small farmers from the Cijulang village that supply the organic vegetables to the cooperative and an employee of KSUGL who responsible for the collecting process, sorting, packaging and selling the products. There is an additional employee to help the sorting and packaging part processes.

• Trust and commitment

To maintain the trust and commitment, the regular visit must be carried out. KSUGL mostly visits the visit to farmers’ land during the vegetable collection. If the quality, the variety, and the quantity of products that are supplied to the cooperative do not matched with the harvesting record, the cooperative usually directly asks the farmer and checks the condition of the farm. Yet, the data record was not effectively implemented. Both the cooperative and MR said that there were still some miss-communication and wrong-data. For instance, one variety of vegetables were not written in the log book.

The condition is similar to KSUGL because DN does not the directly visit while collecting the vegetables from the farmers. On the other hand, DN does not require the farmers to have
record book or farming program. DN claims that trust is the essential factor in organic farming. But DN later stated that he does not strictly ask for certain quality standard or check the farming program. DN delivers the vegetables directly to the end-consumers. Thus, the end-consumers can ask or give their complaint about the quality of organic vegetables. DN responds the complaint or question by explaining the condition of organic vegetables so that the end-consumers can understand the problem.

- Communication

The communication between the cooperative and the farmers are established through the direct visits and phone call between the cooperative’s employee (i.e. the respondent EM) and the person-in-charge of the farmers (i.e. the respondent MR). The respondent MR is responsible to help the cooperative by managing the other farmers during the farming process and recording the farming data (the planting plan and harvesting plan).

KSUGL also held several organic farming workshops in the past which were attended by the small farmers. For the invitation to the organic farming workshop from other organisation, the cooperative usually appoints MR as a representative. It occurs to be an effective information exchange between the cooperative and the farmers.

DN is a member of KSUGL cooperative and also works as an independent distributor. DN receive supply from Cijulang farmers for the organic vegetables that will be delivered to the end-consumers in Bogor city area. According to the interview between DN and the cooperative, a contract is made to make a clear relationship between both parties. DN borrows several facilities from the cooperative, thus DN is responsible to pay regular contribution to the cooperative. The communication between DN and the cooperative staffs is mainly done by direct visit.

Furthermore, the DN stated that the communication with the farmers in Cijulang has been done via phone call and direct visit during the collection of vegetables. On the other hand, the communication between the DN and JI (manager of BV farm) is mostly established via WhatsApp mobile application. DN has fixed vegetable orders for BV farm. Thus, the communication between DN and JI is not regular, except the sudden increase in DN’s demand.
4.2.3 The logistics

In this section, the logistic variable will be determined based on the transportation methods that are used by the organic vegetable supply chain actors. It also covers the storage methods that are used to maintain the quality of the organic vegetables during the logistic process. The three supply chain channels will described in this chapter. The logistic comparison of the three different supply chain channels in West Java can be seen in Table 8.

Table 8. The Current State of Logistics in Organic Vegetable Supply Chains

<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
<th>AOA Chain</th>
<th>FE Chain</th>
<th>Cijulang Farmers</th>
<th>KSUGL Chain</th>
<th>VB farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Transportation</td>
<td>• 2 big refrigerated trucks</td>
<td>• 1 motorcycle used for distribution at around Bandung City area</td>
<td>• The cooperative rent a small open truck to collect the vegetables from the Cijulang farmers</td>
<td>• The transportation rent cost Rp 1,400,000/month (exclude the fuel)</td>
<td>• The VB farm distribute the vegetables by motorcycle to the cooperative before it is picked up by DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 middle-size refrigerated truck</td>
<td>• Refrigerator truck used for the distribution in Jakarta area (supplies from the TVMS farm)</td>
<td>• Transportation cost is include in the vegetables price</td>
<td>• Transportation cost is include in the vegetables price</td>
<td>• DN own a small open truck to collect the vegetables from the supplier and to distribute it to the consumers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 motorcycle used for distribution at around Bandung City area</td>
<td>• Refrigerator truck used for the distribution in Jakarta area (supplies from the TVMS farm)</td>
<td>• Farmers harvested the vegetables before the pick-up time</td>
<td>• The transportation rent cost Rp 1,400,000/month (exclude the fuel)</td>
<td>• The transportation cost for DN is reach approximately Rp 3,270,000/month with Rp 2,500.00 for the truck’s instalment fee</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Delivery cost is include in the vegetables price</td>
<td>• In the noon and the afternoon, the vegetables has been harvested and delivered to the FE warehouse</td>
<td>• The cooperative waiting at the pick-up point from 08.00-10.00 WIT to collect all the vegetables from the farmers</td>
<td>• The transportation rent cost Rp 1,400,000/month (exclude the fuel)</td>
<td>• The vegetables are harvested in the morning before it is pick-up by DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 08.00-20.00 for harvesting, sorting and packaging process</td>
<td>• The sorting and packaging process are done in the warehouse</td>
<td>• 10.00-15.00 the sorting, weighing and packaging process are hold in the KSUGL cooperative office</td>
<td>• The cooperative waiting at the pick-up point from 08.00-10.00 WIT to collect all the vegetables from the farmers</td>
<td>• DN collect all the vegetables from the supplier in the afternoon (at around 16.00 WIT)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 23.00-01.00 (the following day) for loading process</td>
<td>• The morning after, the vegetables start to distribute to the consumers</td>
<td>• 08.00-14.00 (the following day), the KSUGL sells the vegetables at the front of RPS building</td>
<td>• 23.00-01.00 (the following day) for loading process</td>
<td>• The distribution of vegetables to the consumers start on the following day (at around 07.00 in the morning)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 01.00-11.00 distribution process</td>
<td>• The farmers harvested the vegetables before the pick-up time</td>
<td>• 08.00-14.00 (the following day), the KSUGL sells the vegetables at the front of RPS building</td>
<td>• 01.00-11.00 distribution process</td>
<td>• The vegetables are harvested in the morning before it is pick-up by DN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 11.00 back to the AOA farm</td>
<td>• The vegetables are harvested in the morning before it is pick-up by DN</td>
<td>• The vegetables are harvested in the morning before it is pick-up by DN</td>
<td>• 11.00 back to the AOA farm</td>
<td>• DN collect all the vegetables from the supplier in the afternoon (at around 16.00 WIT)</td>
</tr>
<tr>
<td>2</td>
<td>Storage</td>
<td>• No cold storage facility is available</td>
<td>• FE owned a small refrigerator in their warehouse</td>
<td>• The vegetables are keep inside the office with room temperature</td>
<td>• No cold storage facility is available at the farmers’ place, KSUGL office or RP school</td>
<td>• No cold storage is available at the VB farm and DN’s place</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The agents mostly own small refrigerator in their store or restaurant</td>
<td>• The restaurant has a small refrigerator to keep the vegetables fresh</td>
<td>• The vegetables are keep inside the office with room temperature</td>
<td>• The supermarket only keep the exclusive vegetables in the refrigerated shelves, while other vegetables are displayed in the open shelves</td>
<td>• DN keep the vegetables on the truck (outside DN’s house)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• The supermarket keep the vegetables in the refrigerated shelves</td>
<td>• The supermarket only keep the exclusive vegetables in the refrigerated shelves, while other vegetables are displayed in the open shelves</td>
<td>• The vegetables are keep inside the office with room temperature</td>
<td>• The supermarket only keep the vegetables in the refrigerated shelves, while other vegetables are displayed in the open shelves</td>
<td>• The vegetables are keep inside the office with room temperature</td>
</tr>
</tbody>
</table>


AOA Chain

In AOA Chain, the organic vegetables harvested a day before the product delivered to the agents. The next steps involve cleaning the vegetables from the dirt and the small insects, sorting and packaging the vegetables into the plastic bag with the AOA logo at the front package. The vegetables are packed in the boxes based on the agent's order. According to the interview with AN, AOA does not have a cold storage to store the organic vegetables. Thus, they try to shorten the time between the harvesting and delivery.

The distribution starts at 01.00 WIT from the AOA office and farm in Cisarua (Bogor). The distribution route is different each day depending on the agents. Yet, the area is still around the Greater Jakarta. The truck used for distribution products equipped with refrigerator to prevent the deterioration during the distribution from the farm to the agents. The distribution starts early at 01.00 WIT to avoid the traffic congestion and to shorten the distribution time. Thus, the organic vegetables could arrive on time before the agents open their store or the products are picked up by the end-consumers. Short the distribution time can maintain the high-quality of products. The injury on organic vegetables that occur during the distribution process is minor. The injury usually happens to the products that are placed at the bottom of the pile.

AOA owns two big-sized refrigerated trucks and a middle-size refrigerated truck for the distribution service. The transportation cost spent by AOA for the distribution service is around Rp 11.000.000 to Rp 12.000.000 which is apply for the overall AOA’s organic vegetables. The transportation cost is free for the agents. Thus, the agents do not have to pay extra cost for the distribution service because the cost already included in the vegetable price.

08.00-20.00
Harvesting, sorting and packaging process

01.00-11.00
Distribution products to the agents and other consumers around the Greater Jakarta

23.00-01.00
Loading process

11.00
Back to the AOA farm

Figure 8. Timeline of logistics process in AOA Chain
FE Chain

FE use a motorcycle as means the transportation during the distribution process. The harvested organic vegetables packed in the box and delivered to FE warehouse in Sukajadi, (Bandung city). In the warehouse, the products from the farm sorted based on the quality and packaged into 250 gr plastic bag with FE label. The organic vegetables delivered to the SB supermarket, restaurants and the end-consumers location around Bandung by using motorcycle. Major product injuries are rarely happened due to the short distribution time from the FE house to the consumers’ place. To illustrate, the distribution process from the FE house to the SB supermarket takes approximately 15 minutes, while it takes 10 minutes to deliver the organic vegetables to the THF restaurant. The distribution process starts from approximately 07.00 WIT due to the demand from the consumers. The SB supermarket opens the store at 08.00 WIT. Thus the distribution products should have done before its opening hour. It is also applied for the restaurant, for example, THF which open at 07.00 WIT to serve breakfast to their consumers. FE usually delivers the product to the restaurant at around 07.00 WIT. The transportation cost for distribution products is free for consumers because it is included in the price of the organic vegetables.

To store the remaining vegetables, the FE has a small refrigerator in the FE house. The vegetables kept in the refrigerator for maximum three days since it harvested. For the SB supermarket, VR explained that the supermarket does not have specific cold storage for the vegetables except the open cold storage for display. This is due to the assumption that the vegetables will be sold in a day. If there are some left-over vegetables that cannot be sold within one day, the vegetables will be kept in the cold display shelves. For some cases, the organic vegetables could be put in a big cold storage that use to keep all of the supermarket’s products but only for one night. The THF restaurant uses the small refrigerator to keep all of the restaurant’s food. For the FE products, KN said that he does not have to repackage into food boxes due to FE’s good quality packaging. Thus, the organic vegetables from FE can be directly put in the refrigerator. The organic vegetables could be finished within one day during the high season (i.e. weekend time). On the other hand, the maximum time to keep the products is three days during the weekdays.
KSUGL Chain

The cooperative uses a small open truck to collect the organic vegetables from the small farmers in Cijulang Village, Cijeruk (Bogor, West Java). The collection time for organic vegetables starts from 08.00 WIT in Cijulang Village. The products that received from the farmers are placed in the wood basket before delivered to the cooperative office by car which is approximately 6 km. At first, KSUGL rented an open truck for the Logistics purposes before finally bought it as the cooperative facility. Due to the decreasing of organic vegetable sales, the cooperative has decided to sell the truck and rent an open-truck instead. The rental cost of the truck is Rp 1.400.000/month, which excluding the fuel. The organic vegetables and fruits from the Cijulang village are delivered to the cooperative office to be further the cleaned, sorted and packaged process at around 10.00 WIT. The packaging of the organic vegetables only consists of used plastic food bag without KSUGL label at the front. EM (responsible for organic vegetable supply chain in KSUGL) said during the interview that they only attach a small white label for the product price. The packaging process usually finishes at 15.00 WIT.

Figure 9. Timeline of logistics process in FE Chain

KSUGL Chain

The cooperative uses a small open truck to collect the organic vegetables from the small farmers in Cijulang Village, Cijeruk (Bogor, West Java). The collection time for organic vegetables starts from 08.00 WIT in Cijulang Village. The products that received from the farmers are placed in the wood basket before delivered to the cooperative office by car which is approximately 6 km. At first, KSUGL rented an open truck for the Logistics purposes before finally bought it as the cooperative facility. Due to the decreasing of organic vegetable sales, the cooperative has decided to sell the truck and rent an open-truck instead. The rental cost of the truck is Rp 1.400.000/month, which excluding the fuel. The organic vegetables and fruits from the Cijulang village are delivered to the cooperative office to be further the cleaned, sorted and packaged process at around 10.00 WIT. The packaging of the organic vegetables only consists of used plastic food bag without KSUGL label at the front. EM (responsible for organic vegetable supply chain in KSUGL) said during the interview that they only attach a small white label for the product price. The packaging process usually finishes at 15.00 WIT.
However, no cold storage solely dedicated for the organic vegetables. The products kept in the open basket, inside the cooperative office. On the next day, the organic vegetables are sold in the front of RP School using similar open-truck in which the cooperative sells the product with open table. The selling time ends on 14.00 WIT, and the remaining products are brought back to the cooperative office by public transportation. The common injury during the logistics process usually caused by the friction between the vegetables and the bottom of the wood basket. Furthermore, there are only two employees that responsible to do the cleaning, sortation and packaging processes.

08.00
The collecting the organic vegetables from the farmers

07.00-07.30
distributes the products to RP school

10.00
distribute the product to the KSUGL office for sorting and packaging process

Figure 10. Timeline of logistics process in KSUGL Chain

On the other hand, DN (member of KSUGL who also collect the product from the organic vegetable farmers in Cijulang Village) explained that he owned an open-truck to support the logistics process. Firstly, he collects the product from the small farmers in Cijulang Village and picks up the supply from JI that delivered to the KSUGL office. The transportation cost for the logistics is approximately Rp 3.270.000/month which includes the instalment fee of Rp 2.500.000/month for the truck. The organic vegetables are kept inside the big plastic box during the transport from the village to DN house in Bogor city (West Java). Collecting is done around 16.00 WIT in the afternoon to shorten the storage period due to lack of cold storage. The organic vegetables in the KSUGL...
vegetables are placed on the open truck if it is collected a night before being actually delivered to the consumers.

**Afternoon (± 16.00)**

The collecting the organic vegetables from the Cijulang farmers and BV farm

±18.00  Sorting process is done in DN’s house

±09.00 (on the next day)  distributes the end-consumers

Figure 11. Timeline of logistics process for DN
4.3 Current Market Demand

Several attributes have been analysed to identify the current state of market demand for organic vegetables in Greater Jakarta and Bandung city (Indonesia). There are four types of attribute used in this study, namely: sensory, health, safety and process. The consumers’ main driving factors for consuming organic vegetables could be discovered to help produce improving the product quality and optimising the market. The overview of current quality attributes based on market demand for organic vegetables is shown in the Table 9.

Table 9. Overview of Attributes in Market Demand

<table>
<thead>
<tr>
<th>No</th>
<th>Attributes</th>
<th>Variables</th>
<th>Current Demand and Acceptance of the product</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sensory</td>
<td>Aroma</td>
<td>No aroma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taste</td>
<td>Sweater taste, Less bitter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Appearance</td>
<td>Unstandardized size, shape and form with few holes for organic vegetable leaves is acceptable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sound</td>
<td>Crunchier, crisp sound, and freshness</td>
</tr>
<tr>
<td>2</td>
<td>Health</td>
<td>Nutritious contents</td>
<td>No demand due to consumers’ limited knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical content</td>
<td>Chemical free content</td>
</tr>
<tr>
<td>3</td>
<td>Safety</td>
<td>Physical hazards</td>
<td>Most of the organic vegetables are free from physical hazards. For particular cases, the caterpillar can be find inside vegetables, such as Chinese cabbage, Caesium or Pak Choi.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical hazards</td>
<td>Free from chemical hazards in pesticides and fertilizer.</td>
</tr>
<tr>
<td>4</td>
<td>Process</td>
<td>Ethical production</td>
<td>Free from chemical compound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The environmental-friendly</td>
<td>No demand due to consumers’ limited knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Animal welfare</td>
<td>No demand due to consumers’ limited knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sustainability</td>
<td>No demand due to consumers’ limited knowledge</td>
</tr>
</tbody>
</table>

4.3.1 Sensory Attributes

The human sensory receptors (i.e. tongue, nose, eyes and ears) are used to observe the sensory attributes that drive people which finally define the food quality. Five sensory attributes of organic vegetables that are studied in this research comprise of texture, aroma, taste, appearance and sound.
The interview results with the respondents from three different chains revealed some facts. For instances, VR and SV mentioned that consumers tend to buy the organic vegetables due their sweeter taste in comparison with conventional vegetables. While an interviewed with AN (head of marketing division in AOA), argued that the taste between organic and conventional is similar.

However, the appearance of organic vegetables is varies in terms of size, shape and form. Generally, a few of small holes are common for organic vegetable leaves.

The supermarket, specialised store, restaurant and distributor could understand that condition and agree to receive the supply from the producers since the holes are still reasonable. Due to this condition, they usually need to explain to end-consumers who are not familiar with organic vegetables’ appearance. Yet, it might be difficult to explain the characteristic of organic vegetables to the new consumers.

The end-consumers who already consume organic vegetables for a long time are already used to this condition. Most of these end-consumers even believe that the holes on organic vegetable leaves proofs that the vegetables are indeed organic. The holes on organic vegetable leaves are caused by the pests (e.g. caterpillar and snail). The pests are restricted to be killed or repelled by using chemical pesticides. Thus, the holes on organic vegetable leaves can be reduced through proper handling and planting specific type of plant to repel the pests.

In terms of texture, the respondents generally said that the organic vegetables are crunchier and crisper compared to the conventional vegetables. Moreover, organic vegetables also tend to have a higher level of freshness than the conventional ones.

4.3.2 Health Attributes

For this study, the health attributes are defined as the nutritional contents in organic vegetables which could contribute to improve the people’s health. Mostly, the responds of all the supply chain’s actors, especially the seller indicated that the main driving factor for consuming organic vegetables is its chemical-free content. The consumers believe that it could improve their health and body function. According to the interview, the previous motivation to consume the organic vegetables was to help
consumers recovering from their illness, besides also doing the treatment. Moreover, healthy consumers stated that after a certain period of consuming organic vegetables, they were more resistant against diseases compared to when they consume conventional vegetables. The increasing awareness towards healthy lifestyle drives young people to slowly shift their diet to organic vegetables. For instance, young married couples start purchasing organic food to feed their children with organic food due to health reason. Meanwhile, young parents still consume the conventional vegetables because they have limited budget for the food. They are prioritise organic food for their children. For some cases, it is shown that an impact of consuming organic vegetables for long-time is chemical allergy. SV revealed that after 14 years consuming organic vegetables, her body becomes sensitive to chemical content in vegetables. The allergy is indicated by itching sensation.

During interview, the respondent could not mention the specific nutritional content in the organic vegetables because they were unable to test the nutrition content of the vegetables. All the producers are regularly checked their products to ensure the chemical-free content in it through a simple laboratory test. The chemical test is crucial to provide assurance for their consumers.

### 4.3.3 Safety Attributes

Consumers might suffer from a health disorder if they consume contaminated food product. Thus, safety attributes indicates the acceptable hazard level in food. The physical hazards (e.g. mineral, plant, animal, etc.) are sometimes found in organic vegetables. The respondents (i.e. SS, AN, VR, SV, HR) explained that their organic vegetables are free from the physical hazard. Nonetheless, in several cases, caterpillar can be found inside Chinese cabbage, caesium or Pak Choi. As HR stated during the interview:

“*That mostly happens in Chinese cabbage, caesium and Pak Choi. Sometimes there are also caterpillar eggs inside that three vegetables.*” (HR, 2017)

In fact, new consumers are struggling to accept the organic vegetables that contain small insects. This is due to the perception from long-time consumption of conventional vegetables. These conventional vegetables are generally free from small insects owing to the use of chemical pesticides. Several loyal consumers believe the vegetables are organic if they find small insects inside the vegetables (e.g. Caterpillar) because it indicates that the vegetables are free from chemical pesticides. This case was supported through the interview with SV.

Chemical hazards define as chemicals content in food that provokes a negative reaction in people which classified into food intoxicants and food sensitivities (Luning & Marcelis, 2009). The organic vegetables are free from the chemical hazards due to the zero chemical input that given during the
farming process (i.e. chemical pesticides and chemical fertiliser). According to the interview with SV and HR, consumer becomes more sensitive after consuming organic vegetables for a certain period. In some cases, they could tell the difference between organic and conventional vegetables. This is because their body rejects the chemical residues in conventional vegetables. The rejection is indicated by itchy sensation after consuming conventional vegetables. Compared to the physical hazards, the consumers are more concern about the chemical hazards. Hence, this concern drives consumers to change their food consumption to organic vegetables.

4.3.4 Process Attributes

The perception of consumer towards production process of organic vegetables is mainly focused on the idea of chemical free residue content. In general, the end-consumers’ motivation to purchase organic vegetables is because they are free from chemical pesticides and fertiliser. Yet, ethical production, environmental-friendly, animal welfare and sustainability aspects are rarely considered. In fact, the producers which implement those four factors are already applying the organic principle thoroughly in their farming process.

Developed farms (i.e. AOA and FE) are more open to the consumer’s visit. They stated that it is a good experience for the consumers to gain knowledge and deepen their understanding about organic vegetable farming. The specialised stores and distributor (i.e. HR, SV and TT), suggest their consumers to visit the farms in order to check the production process of the organic vegetables and to ask the producers directly. Consequently, the end-consumers could trust the quality of the organic vegetables that they are purchased from those stores and distributors. These consumers are willing to pay a higher price to get a high-quality of organic vegetables. For most of the consumers who understand the importance and benefits of consuming organic food as well as the long production process behind it, the high price can be accepted. For consumers who are not familiar with the organic vegetables argued that the prices is too high. Thus it is difficult to afford organic vegetables for daily consumption.

Overall, the majority of consumers still link the process attributes in organic vegetables to the absence of the chemical residues. While, the application of organic farming in practice actually include the ethical production, the environmental-friendly, animal welfare and sustainability factor. This could indicate that currently consumers have limited knowledge and understanding of organic principles.
4.4. The Bottlenecks that affect the Successful Connection in Organic Vegetables Supply Chain

This chapter will describe the bottlenecks that have been found in the three-different organic vegetable supply chains. In section 4.3.1, the bottlenecks in the quality of products is described. The following section will cover the bottlenecks in the collaboration between actors (section 4.3.2) and the logistic (section 4.3.3). However, the comparison of the bottlenecks in the AOA chain, the FE chain and the KSUGL chain can be seen in the Table 10.

Table 10. The Overview of the Bottlenecks in Organic Vegetable Supply Chains

<table>
<thead>
<tr>
<th>No</th>
<th>Bottleneck</th>
<th>AOA Chain</th>
<th>FE Chain</th>
<th>KSUGL Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Quality of products</td>
<td>- Bad weather cause to lower quality and lower quantity of the vegetable</td>
<td>- Bad weather cause to lower quantity of the vegetables</td>
<td>- Bad weather cause to lower quality and lower quantity of the vegetable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lower altitude</td>
<td></td>
<td>- Lower altitude</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Outdoor farm</td>
<td></td>
<td>- Outdoor farm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Early distribution time</td>
<td></td>
<td>- Mixing grades</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Limited source and capacity to access the organic certification</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Collaboration between actors</td>
<td>- The sudden notification from the AOA makes it difficult for the agents to manage their stock</td>
<td>- Limited supply due to bad weather cause the supermarket and the restaurant to find another producers to supply the products to keep the stocks</td>
<td>- Limited access to technology which can help to increase the communication (i.e. WHATSAPP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The agent has to convince the end-consumer related to the limited vegetables supply from the AOA</td>
<td>- Farm labour’s limited ability and skills to conduct the farming independently according to the integrated production plan</td>
<td>- Limited knowledge and information about organic farming</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Farm labour’s limited ability and skills to conduct the farming independently according to the integrated production plan</td>
<td>- Low interest from youth to works in the organic agriculture farming</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Low interest from youth to works in the organic agriculture farming</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>The logistics</td>
<td>- The high demand are not equal with the production capacity and the transport facilities</td>
<td>- NA</td>
<td>- High transportation cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The capacity of the trucks has reached the maximum while the demand is increase</td>
<td></td>
<td>- The capacity of the truck is not optimally used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The delivery needs to be more on time</td>
<td></td>
<td>- No cold storage facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- No cold storage facility</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.4.1 Quality of Product

Several bottlenecks affecting the quality of organic vegetable product in the AOA chain, the FE chain and the KSUGL chain have been found. In the first part of this section, the bottlenecks in the AOA’s organic vegetable supply chain will be described. It is then followed by the FE chain and the KSUGL chain.

**AOA Chain**

In AOA chain, HR and JO stated that the AOA needs to improve the quality of products. During the bad weather, the quality of organic vegetables from AOA are lower compared to another brand (i.e. AF). JO stated that the difference in altitude might deteriorate the quality of products. AF farm is located in Cianjur which has higher altitude compared to the AOA farm.

Furthermore, the organic vegetables that are cultivated outdoor have more severe pest attack damage during the heavy rainy season. Hence, the AOA’s organic vegetables has lower quality products during bad weather because the vegetables are cultivated outdoor.

**FE Chain**

According to the interview with the VR and SR, the quality of the FE’s product was considered higher than the other producers (e.g. AOA). SS mentioned that the use of both outdoor and indoor farms give benefit to the quality of organic vegetables during the bad weather (high pest attacks on the rainy season). However, the quality of the organic vegetables produced by the AOA is lower than the production during good weather.

Beside the quality of the product, the VR and SR argued that the FE supply for the organic vegetables is low in terms of quantities. This fact was also supported by the statement from KN. Even though the limited-supply problem during the bad weather is common, the high demand of FE’s product shall be carefully solved. The SB supermarket, TB supermarket and THF restaurant solved this issue by receiving supply from other organic vegetable producers in order to provide stock for the end-consumers. However, those respondents still wish to have higher supply even during the bad weather in which FE still find it quite difficult to do because it is related to nature phenomenon.

**KSUGL Chain**

According to EM; who is responsible for the organic vegetable supply chain in the KSUGL, the cooperative does not use the grading system for the organic vegetables. Nevertheless, the mixed organic vegetables have lower selling price compared to graded organic vegetables. The highest quality of organic vegetables (indicated by grade ‘A’) has the highest selling price.
Unfortunately, the cooperative could not segment their market. To illustrate, organic vegetables grade A could actually be sold to the supermarket, specialised stores or middle to higher class restaurants. Meanwhile, currently the cooperative only sells their product to the end-consumers, which mostly are the parents of RPS’s student.

Furthermore, KSUGL does not follow the organic certification due to its limited source and capacity to access the certification. The high fee organic certification also became one factor that made the cooperative did not follow the certification process. Intensive monitoring from the cooperative and the third party to the small farmers who produce the organic vegetables are required during the certification process. Moreover, it is challenging to urge farmer performing regular recording for the organic vegetables farming. However, it is found in the KSUGL. The farm record keeping is important for the certification. Hence, KSUGL has to encourage farmers by informing the importance of recording farming process for the cooperative and the farmers.

The bottlenecks found in BV farm are similar to the KSUGL. The use of outdoor farm makes the vegetables more prone to pest attacks. However, as the BV farm is located in the middle of forest on the foot of Salak Mount, the threat from pest attack is lower than Cijulang farmers’. According to the interview, JI stated that the farm does not grade the vegetables. Furthermore, the BV farm does not have organic certification for the organic vegetables because they found it too difficult and too complicated.

4.4.2 Collaboration between actors

In the organic vegetable supply chain, the actors who are involved are fewer than the conventional vegetables. There are still several bottlenecks that affects the success of organic vegetables supply chain. Hence, the collaboration between actors become necessary to be studied. In this chapter, three different supply chain will be described.

AOA Chain

Since the AOA chain change the trade system from consignment with the supermarket to the registered agents, the collaboration between the AOA and the consumers could be improved. For example, both the AOA and the registered agents agreed to do the transaction after checking the quality and the quantity of the delivered organic vegetables. Furthermore, the frequency of communication increases due to the use of WhatsApp mobile application which enables the actors to share information regarding the organic vegetables. The AOA representative stated that the current communication allows the registered agents to
complaint the quality, the quantity, the price or distribution time. At the same time, producer can quickly response to it. When the AOA changes the market channel by selling the organic vegetables to their registered agents, the producer could avoid losses that happened with the consignment sales.

On the other hand, the AOA agents (i.e. JO, HR, and SV) mentioned that they found an issue difficulties when the producer gave them a sudden notification about the lower quantity and quality of products due to the bad weather. The producer usually told the agents one day before the distribution time. Meanwhile, the agents expect higher quantity and quality to fulfil the high demand from the end-consumers. The sudden notification might affect the sales, most likely lead to lost sales. Several end-consumers will only purchase organic vegetables from AOA, rather than buying the products from other supplier because of trust issues. Furthermore, for the agents who do not have alternative supplier for the organic vegetable products, their sales might be highly influenced. The majority of agents claimed that they understood the situation related to sudden notification. However, the agents wished the producer to improve the system.

Therefore, the agents found the solution by having more than one suppliers for their organic vegetables. If there were lower quantities of organic vegetable supply from the AOA, the agents suggested the end-consumers to buy the products from another supplier. For some cases, the end-consumer does not want to change the organic vegetables from AOA to another supplier. This is because the end-consumers already trust and consume the AOA’s organic vegetable for long-time. Thus, the agents stated that they have to convince them in order to buy the products from other suppliers. In some cases, it was difficult because several end-consumers tend not to buy the organic vegetables from the agents if they could not get the AOA product from the AOA. Eventually, it will have impact on agents’ sales.

DD (head of production division) mentioned during the interview that production labours still have limited ability and skills to conduct the farming independently (according to AOA’s integrated plan). Thus, regular monitoring and control from the farm are still needed to be done. Furthermore, AOA finds it difficult to employ youths because of low interest from youths to work in the agriculture sector.

**FE Chain**

FE and AOA similar bottleneck which is related to the effects of bad weather causing lower production. The sudden notification to the supermarkets and restaurant might disturb the organic vegetables stock which will be sold to the end-consumers. According to the interview
with SS, FE strategy to maintain the stable supply of the organic vegetables is by having two types of farming area (i.e. outdoor farm and indoor farm). In some cases, the productivity of the organic vegetables during severe weather condition cannot be predicted.

SV stated that the supermarkets tried to prevent the lower supply by increasing the partnership with other suppliers which is located far from the FE. Supplier diversification helps to provide stable supply. For example, if FE experiences lack of supply for Kale’s supply. FE will inform SB supermarket during the harvesting time, then SB supermarket tried to find a solution by asking the other supplier whether they have the stock for the product.

On the other hand, the THF restaurant has to contact a small farmer in Lembang area to deliver the organic vegetables to the restaurant if both of the restaurant suppliers could not supply the product (one of the supplier is the FE).

SS (owner of FE) stated about the difficulties to get youths to works in the organic farming. Youths are tend to see agriculture as unpromising sector for their career. Furthermore, the farm labours are still have limited ability and skills to conduct the farming based on the integrated production plan independently. Thus, SS explained that the production process in FE’s Parongpong farm is under strict supervision of SS and DR (both are owner of FE).

**KSUGL Chain**

In the KSUGL chain, the communication were limited compared to other chains. The communication between the cooperative and the Cijulang farmers were mainly done via phone call and direct visit by the cooperative. Moreover, the direct visit is regularly held when the cooperative collecting the organic vegetables from the farmers. However, limited access to the new mobile technology hampers the communication, specifically the information exchange between the actors. WhatsApp is a new mobile application which is hardly known by the actors in the chain.

Yet, the limited knowledge and information about organic vegetables among the cooperative member were observed during the interview. Due to the limited human resources in the KSUGL, the member who is in charge for the organic vegetables supply chain should do all the activities in the chain. The activities ranging from collecting the products, buying, cleaning, sorting, packaging and selling the organic vegetables to the end-consumers. The cooperative could not actively observe the farmers’ progress and solve the problems because they give the responsibilities to certain people (e.g. EM and MR). Thus, there is a knowledge gap about
organic vegetables supply chain between the members who actively involved in the sector to the other members.

On the other side, the knowledge and information related to the organic vegetables farming mainly known by MR who is often invited to attend the workshop and training for organic vegetable farming. DN (cooperative’s member) explained that the knowledge and information that MR shared might not be equally distributed to all the Cijulang farmers. MR said that he usually checked the others’ farm every once a week and note the harvesting schedule from each farmer, respectively. This could be the reason for the less-effective communication between the farmers.

Furthermore, the relocation of KSUGL’s selling location from inside the building of RPS to the outside lower the sales of organic vegetables. Hence, the cooperative reduce the quantities of organic vegetables that collected from the Cijulang farmers to lower the costs. The Cijulang farmers has to find alternative supply chain due to the excess of organic vegetables that cannot be absorbed by the cooperative. For instance, MR supplies the rest of the organic vegetables production that cannot be purchase by the cooperative to the landlord of his farm. For other Cijulang farmers, they supply the organic vegetables to DN.

For BV farm, the limited human source is a challenge that needs to be solved. The BV farm has one farm coordinator and two farming labours. Half of the farm has not been cultivated due to limited human resource.

“We hardly find suitable human resources to manage the vegetables production, even though we are alleviate them by giving the capital.” (JI, 2017)

4.4.3 The Logistics

During the logistics process within three different organic vegetable supply chain in West Java and Jakarta, several bottlenecks that still need to be solved have been found. The implications of the bottlenecks in the AOA chain, the FE chain and the KSUGL chain will be explained in detail in this section.

AOA Chain

According to SR, it would be better if the AOA could deliver the organic vegetables earlier than current delivery time. The organic vegetables from the AOA arrives in the TB supermarket at around 08.00 WIT. By distributing the products to the supermarket earlier, SR stated that the organic vegetables from AOA can be displayed before the peak of grocery time which happens
in the morning. Considering that the organic vegetables does have not long shelf life, the product can be sold within one day. Thus the end-consumers will receives fresh vegetables every day.

However, the high demand for organic vegetables from the agents are not in line with the production capacity of the product and also the transportation facilities. During the distribution process, the capacity of trucks already reach the maximum. Meanwhile, the demand increases each day and the necessity to delivers the product on time also becomes more urgent. Nevertheless, due to the increase of traffic congestion, the distribution time becomes longer. AN stated that the distribution time usually started at 03.00 WIT previously, but since two years ago, it started earlier at 01.00 WIT to avoid the severe traffic congestion that happened along the Cisarua road and the Greater Jakarta area. According to SR, even though the distribution had started at 01.00 WIT, the demand for earlier arrival time for the organic vegetables was still high. As the high number of agents that need to be supplied were high, the problem for distribution time has to be solved carefully. The addition of truck for the transportation is related to the higher expenses as well as the total productivity of the organic vegetables.

Furthermore, AOA do not have cold storage facility to store their organic vegetables products. This is affects the AOA’s decision to shorten the time between the post-harvesting process and the distribution process in order to maintain the product quality.

**FE Chain**

FE use motorcycle as the means of transportation for its logistics. The distribution of product from the FE house to the other actors (i.e. supermarket, restaurants and the end-consumers) can then be done in a short time. The motorcycle could reach the location faster than the car because it can avoid the traffic congestion. Even though the motorcycle has several benefits, the capacity of the organic vegetables that can be distributed is limited compared to other transportation, such as truck. However, the distance between the FE farm to FE warehouse and to FE warehouse to the consumers that located in Bandung city are close. Hence, the motorcycle can be a suitable transportation for the logistics of organic vegetables.

Different from the refrigerated truck used by the AOA, the motorcycle is not equipped with refrigerator. Therefore, FE uses box to keep the organic vegetables fresh during the distribution to the consumers. This practice is found to be quite effective to keep the product quality.

For the distribution of organic vegetables from Tenjolaya farm to TB supermarket, FE uses refrigerated truck rather than motorcycle due to longer distribution time and distance between
the farm and the consumer’s location. Refrigerated truck can distribute higher number of organic vegetables compared to motorcycle. To conclude, the transportation facilities should be adjusted to the distance, the distribution time and the number of organic vegetables that need to be distributed.

**KSUGL Chain**

In the logistics process of KSUGL chain, several problems have occurred in terms of the transportation facilities and storage. The decreasing sales of organic vegetables affected the cooperative’s ability to cover the transportation cost for the distribution of the products. The high transportation cost has made the cooperative sold their medium-size truck in order to reduce the maintenance cost.

The location to sell the products moved from the inside of RPS building to the outside of RPS. The changes in selling location have made significance decreased in the cooperative’s profit from organic vegetables. The cooperative thus decided to lower the quantities of product that are sold in the RP School. The current rental cost of the truck is high for the cooperative considering the capacity of the truck that still can be maximised.

In relation to the cold storage, the time between the harvesting and the selling is quite long (approximately around 26 hours). This can lead to the high possibility of rapid deterioration. The limited availability of facilities in the cooperative causes the organic vegetables to be stored inside the room, instead of in the cold storage or small refrigerator. Therefore, the organic vegetables can deteriorate faster. This indeed will negatively affect the product quality.

Related to BV farm chain, DN (KSUGL member and distributor) and JI (manager of BV farm) stated that high transportation cost is one of the biggest bottleneck in logistics. BV farm delivers the vegetables to the consumers’ location around Bogor city by using motorcycle, while DN delivers the vegetables by using open truck (without refrigerator). Beside the fuel costs, DN also pay the instalment fee and service cost for the truck.

Moreover, both BV farm and DN do not have cold storage facility. Even though it is necessary to have cold storage to keep the high-quality of products, the electricity cost and purchasing of the refrigerator are higher. BV and DN cannot afford the cold storage. Thus, they try to find an alternative to keep the quality of products by reducing the time between the harvesting and the distribution.
5. DISCUSSION AND LIMITATION

The first section (5.1) in this chapter will discuss the comparison on three different organic vegetable supply chains that currently available in West Java and Greater Jakarta market channel, current states of three supply chain factors (i.e. quality of product, collaboration between actors, and the logistics), and market demand. The key findings that have been explained in Chapter 4 are deliberated with the conceptual frameworks (Section 5.2). In addition, the limitation of the study is described in the last part of the chapter.

5.1 Discussion: Comparison on Three Organic Vegetable Supply Chains

The comparison on three different organic vegetable supply chains in West Java and Greater Jakarta area, includes AOA chain, FE chain and KSUGL chain will be further explained into details. Meanwhile, the brief comparison of those chains can be seen in Table 11.

Table 11. Comparison on three different organic vegetable supply chains

<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
<th>AOA Chain</th>
<th>FE Chain</th>
<th>KSUGL Chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Market Channel</td>
<td>More than one market channel (use of registered agents)</td>
<td>More than one market channel</td>
<td>One market channel</td>
</tr>
<tr>
<td>2.</td>
<td>Current states of</td>
<td>Integrated production systems which requires high-quality control</td>
<td>Integrated production systems which requires high-quality control</td>
<td>Started to implement integrated systems</td>
</tr>
<tr>
<td></td>
<td>Quality of product</td>
<td>Strong supervision from higher level of management (better understanding and knowledge of organic principle, higher skills in organic farming practice)</td>
<td>Strong supervision from higher level of management (better understanding and knowledge of organic principle, higher skills in organic farming practice)</td>
<td>Low supervision from higher level of management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BC certification</td>
<td>No third party certification</td>
<td>No third party certification</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Member of PMI and IFOAM</td>
</tr>
<tr>
<td></td>
<td>Collaboration between actors</td>
<td>High trust and commitment between producer and consumers (long-time relationship with registered agents)</td>
<td>High trust and commitment between producer and consumers (long-time relationship with registered agents)</td>
<td>Trust and commitment are well developed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Effective communication (i.e. Direct visit, phone call, WhatsApp)</td>
<td>Effective communication (i.e. Direct visit, phone call, WhatsApp)</td>
<td>Less intensive communication (i.e. direct visit and phone call)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rapid information exchange</td>
<td>Rapid information exchange</td>
<td>Limited information exchange</td>
</tr>
<tr>
<td></td>
<td>The logistics</td>
<td>Better transport facilities (i.e. two big refrigerated trucks, one medium-size refrigerated truck)</td>
<td>Transport facilities (i.e. motorcycle for distribution in Bandung area, refrigerated truck for distribution in Greater Jakarta area)</td>
<td>One medium-size truck (without refrigerator)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No refrigerator for storage</td>
<td>Refrigerator for storage is available</td>
<td>No refrigerator for storage</td>
</tr>
<tr>
<td>3.</td>
<td>Market demand</td>
<td>Health, safety and process attributes become the most contributing factors for market demand</td>
<td>Health, safety and process attributes become the most contributing factors for market demand</td>
<td>Health, safety and process attributes become the most contributing factors for market demand</td>
</tr>
</tbody>
</table>
As argued in the literature review, most of the organic food producers use direct marketing channel to sell their products with premium price and to gain consumer trust (Park & Lohr, 2006; Dimitri & Greene, 2002). As larger farms were likely to use multiple channels (i.e. AOA and FE), higher risk on sudden termination of collaboration by the single actor can be reduce (Park & Lohr, 2006; Chang, 2002). As well as the increasing on profit sales and number of consumers (Chang, 2002). AOA sells organic vegetables to multiple market channels, such as specialised store, supermarket, online distributor, and restaurant. Meanwhile, FE supplies their products to local supermarket, local restaurant, and households. Xin-Min (2012) explains that organic vegetable producers that sell their product through specialised stores have more advantages. AOA established the registered agents system for their market channel which the majority are specialised store owners. The end-consumers for this type of chain tend to be more loyal than other chains, which it is highly related to the trust and commitment in the collaboration between actors.

Smaller-scale of farms are tend to using one channel, especially during early stages of market channel development. In KSUGL chain case, they only sell organic vegetables at the RP School. Since the displacement of their selling location from inside to outside RP School's building, the profit sales has been significantly decreased. Those were disadvantages that occurred the dependence on a single market (Chang, 2002). Moreover, KSUGL also found difficulties to sell their products to other channels due to its low brand recognition (Lee, Gareffi & Beauvais, 2012).

Moreover, trust and commitment play important roles in the collaboration between actors of organic vegetable supply chain (Moberg, Cutler, Gorss & Speh, 2002; Peng, G, 2011), especially because of shorter supply chain and local market focus. As AOA establish a long-time relationship with the registered agents to obtain a common goal, the communication naturally develops to answer the market demand. AOA and FE show quick responsiveness to the consumer's complaints by improve their product quality.

As Kottila and Ronni (2008) argue that collaboration between actors could overcome the lack of communication and create an innovative thinking which support to tackle the problems in organic vegetable supply chain. The information exchange is an essential factor in collaboration between actors (Cooper, Lambert & Pagh, 1997). The rapid information exchange is an effect of the intensive communication since higher technology is used (i.e. WhatsApp). Meanwhile, KSUGL communicates with other actors mainly through direct visits and telephone which leads to less intensive communication, more time consumed, and higher costs. While regarding trust, the relationships among the farmers, KSUGL and the end-consumers are already well developed.
For the logistics facilities, this study refers to transportation and storage of organic vegetables supply chain. AOA has better transport facilities among three chains in which they have two big refrigerated-trucks and one medium-size refrigerated-truck. Despite the use of motorcycle as the transportation for FE, the organic vegetables are kept inside the box during the distribution process from the farm to the markets that are located around Bandung area. The motorcycle is chosen to shorten the distribution time. Though for Greater Jakarta area, FE uses the refrigerated truck to supply the organic vegetables from their farm in Tenjolaya, Bogor. KSUGL rents an open medium-sized truck to distribute the product during the logistics process. Therefore, the quality of products could be maintained better using the refrigerated truck for longer distribution time. Meanwhile, the motorcycle can be used only if the location between the farm and consumer is close.

The problem that usually occurred in small scale organic vegetable supply chain is related to lack of refrigeration and precooling equipment as an effect to minimise the operation cost (Xin-Min, 2012). Among three producers, the FE is the only producer who owns refrigerator in their warehouse. The quality of organic vegetables can still be maintained by shortening the time between the harvesting and selling.

Furthermore, the quality control activities during the whole supply chain process influence the level of organic vegetable quality which includes control in production properties, production processes and human processes (Luning & Marcelis, 2009). Among the three chains, AOA and FE have intensive and integrated production system which requires high-quality control. Both of the chains could produce grade ‘A’ vegetables. It is supported by the strong supervision from the higher level of management with better understanding and knowledge of organic principle, and higher skills in organic farming practice. On the other hand, KSUGL seems lacking in these factors.

Following the quality control, quality assurance becomes the important part that designed to maintain a consistent standard for product within the production to distribution processes (Luning & Marcelis, 2009; Scott, Vandergeist & Young, 2005). AOA is the only chain among the three that own organic certification from third-party. Meanwhile, FE is one of the producer that preferred not to obtain the certification which requires difficult process, financial and time cost (Burton, Rigby & Young, 1999; Strochlic & Sierra, 2007; Sierra et al., 2008). FE argue that they are following the IFOAM regulation which is the guideline for all the organic certification in Indonesia, even though they do not have the Indonesia organic certification. KSUGL neither has the organic certification from third-party institution nor claim as the member of IFOAM. Thus, both FE and KSUGL cannot labelled their product with ‘Organik Indonesia’ logo as they are not certify the product to third-party certification body (David & Ardiansyah, 2016; Scott, Vandergeist & Young, 2005).
With regards to the market demand, the increase of health awareness has currently been followed by increasing of organic vegetable demand. The easy access to information becomes one of the drivers for the people in urban areas (e.g. youths) to engage in organic vegetable consumption. While previously, old people with high household income have a higher portion of organic vegetable consumptions. In contrast to the past condition, young people with higher education yet average household income start purchasing organic vegetables because of their awareness for healthy food consumption (Probst, Houedjofonon, Ayerakwa, & Haas, 2012). For many cases, young couples purchases the organic vegetables for their young children to prevent residual chemical contamination which could cause health problems.

The consumers’ perspective towards the four quality attributes is described in the previous chapter to get insight into the current market demand. The health, safety and process attributes tend to be the most contributing factors that drive the consumption of organic vegetables compared to sensory attributes (Slamet, Nakayusu & Bai, 2017; Guilabert & Wood, 2012; MINTEL, 2003). Chemical-free and organic production contribute to the increase of people’s health. In some cases, the consumer becomes more sensitive and grow allergy towards foods that contain chemical residues. The sensory attributes have more varying results to which some people state that the taste and appearance of the organic vegetables are not different from the conventional vegetables. While others agree that it is the significant difference after a certain period of consumption.

To summarise, among three different organic supply chains that are analysed in this study, the AOA chain has higher contributing factors that help them success in organic vegetable supply chain and meet the market demand. The FE has higher quality products, yet it has fewer market channel compared to AOA. Lastly, the KSUGL needs to improve the supply chain factors, which include the quality of products, collaboration among actors and their logistics, to successfully meet the market demand.
5.2 Discussion: reflection on the conceptual framework

The findings in the previous chapter is reflected to the conceptual framework in order to explore the influence of each factors (i.e. collaboration between actors, the logistics, and quality of product) on meeting the market demand in West Java and Greater Jakarta. It can be seen in the Figure 12.

![Conceptual Framework Diagram]

**Figure 12. Reflection on conceptual framework**

*The relation of the collaboration between actors to quality of the product*

According to the findings in the previous chapter, the AOA farm and the FE farm have more integrated supply chains compared to the KSUGL cooperative. In the first variable, which is the collaboration between actors, both trust and commitment factor and communication factor have significant influence in the improvement of product quality. Both AOA and FE understand the importance of commitment as it aligns with trust between the farm and the consumers that could improve the quality of the vegetables and meet the market demand. The farms commit to focus on providing high-quality vegetables, especially in relation to free chemical compound aspect, freshness and cleanliness. By ensuring the high quality of the vegetables, consumers trust could be obtained (Moorman, Zaltman & Deshpande, 1992). Commitment and trust should be applied for both sides. The consumers gain trust from the farms by being responsible for their order, which means they do not cancel or change the order in short notice and pay the products on the scheduled time agreed by both sides.

Moreover, the utilization of mobile messenger application to facilitate the communication between the producer and the consumers cause the increase of information exchange that helps the improvement in the quality of organic vegetables. The consumers could easily send their complaints
or compliments regarding the products, and receive quick response from the producer. Therefore, the producer will replace the product with a better quality on the following delivery time. The quality control of the organic vegetables production is improved to ensure that the product’s quality is acceptable to the consumers. However, the quality of organic vegetables generally declines during bad weather. Hence, intensive communication is highly important for the producer to share the information and to gain the consumer’s understanding about current quality of organic vegetables that could be supplied by the producer. Both producers state that they are open to the consumers visit to the farm as a means to verify the real condition and situation of the organic vegetables production process. Thus, both producer and consumers intensive communication could create an innovative thinking that helps to tacking the current organic vegetable supply chain problems (Kotilla & Ronni, 2008)

Quality assurance as one of the aspects analysed in this study, in this sense refers to the organic certification owned by the third party that is recognised by the government. Findings from the interview show that consumers accept the organic vegetables without organic certification as long as the quality of the organic vegetables is high. Consumers are still willing to pay a premium price (Veldstra, Alexander & Marshall, 2014), even though the product is not certified by third-party certification body. Organic vegetable consumers often visit the farm without prior notification to the producer as a means to check the production process and the quality of the product for quality assurance. Producers who supply their product to local market have a more direct communication to consumers which can be the substitute for certification (Veldstra, Alexander & Marshall, 2014) which implies the influence of collaboration between actors to product quality. In general, trust, commitment and communication in the collaboration between actors are important factors that affect the improvement of organic vegetable products quality, especially due to its relation and interaction with the consumers as the target market.

The relation of the collaboration between actors to the logistics

Furthermore, the influence of the collaboration between actors’ variable to the logistics is not as significant as the previous model (i.e. the impact of collaboration between actors to the quality of product). The producer’s commitment to deliver the organic vegetables on time cannot always be fulfilled because of the unpredictable situation on the road (e.g. severe traffic congestion). The producers such as AOA found a solution by starting the delivery time earlier than usual (i.e. they are currently starting the delivery process from 01.00 WIT while a year ago it was at 03.00 WIT). The information collected from the interview shows that even though the delivery starts from 01.00 WIT, a few agents and supermarket still ask the producer to come earlier because the demand from the end-consumers are high at around 07.00 to 10.00 WIT. While for FE, they prefer to only deliver the
organic vegetable around Bandung city region, which can be accessed by motorcycle from the warehouse and takes approximately 15 – 30 minutes. Compared to AOA, the FE market area in Bandung is smaller. Thus, it is reasonable that FE uses motorcycle to distribute their product while the AOA needs to use two refrigerated trucks to deliver the organic vegetable to greater Jakarta area (i.e. Jakarta, Bogor, Depok, Tangerang and Bekasi). FE use the refrigerated truck due to the longer distance between their Tenjolaya farm in Bogor to the Jakarta area. On the other hand, KSUGL chain with the Cijulang farmers do not show any demand to have earlier delivery time, which also applies to the other chain (i.e. KSUGL chain with VB farm). In relation to the storage, the farmer, the cooperative and the distributor do not have the refrigerator as the facility to keep the quality of the organic vegetables. The actors decided that the refrigerator is not obligatory at that time due to the limited cost allocated to the cold storage.

Moreover, the relation between collaboration and storage aspects in logistics is not significant. The AOA and the KSUGL do not have cold refrigerator for storage, and instead keep the organic vegetables, that has been packed to plastic bag, within room temperature inside the warehouse. While FE use the small refrigerator to keep the organic vegetables that have yet to be distributed to the consumers. There are no requirements from the producer to the specialised store, supermarkets or restaurants to have refrigerators to keep the quality of the organic vegetables before it is purchased or served to the end-consumers. However, those actors generally claim that they have refrigerators in their stores. During the interview, it is found that trust, commitment and communication do not have influence in storage variable.

The relation of logistics to the quality of the product

As the logistics is assumed to have impact in the quality of product, both transportation and storage are two key factors that keep the product’s quality high. In terms of transportation, the duration of distribution and the type of transportation used by the producer during the delivery process significantly affect the quality of the organic vegetables. Whereas, the usage of refrigerator as the storage is another factor which needs to be taken into account.

Some producers (e.g. AOA, KSUGL) do not own refrigerators as the cold storage for their organic vegetable products. Though in general, the specialised stores, restaurants and supermarkets that are interviewed in this study state that they have at least small refrigerators in their store due to the necessity to offer fresh vegetables to the end-consumers. It is mentioned in Chapter 4 that the high-quality of products desired by the end-consumers includes the freshness factor in sensory attributes. Thus to maintain the freshness of the products, producers need to shorten the duration between harvesting and distribution processes by having early delivery time.
On the other hand, the relevance of transportation to the quality assurance is also studied. Veldstra, Alexander and Marshall (2014) notion that farm location and distance to market are important influences on organic certification. FE and KSUGL who focused on local market due to its proximity from farm location are both do not have organic certification. Meanwhile, AOA has organic certification from third-party because of its large market area (i.e. Greater Jakarta). Therefore, it can be concluded that short duration of distribution process and the usage of refrigerator are recommended to manage the high-quality of organic vegetables (occurred from quality control and quality assurance processes) demanded by the consumers.

The optimisation of the quality of the product and the logistics to meet the market demand

Based on the conceptual framework, optimization of two variables, namely logistics and quality of product, is expected to meet the market demand. The quality of product directly interacts with the sensory, health, safety and process attributes that have been analysed in market demand. To get the desired result in those four attributes, high-quality control and the use of quality assurance are two key factors in the production of organic vegetables. AOA and FE have been implementing integrated organic farming system in their farm’s production. In terms of quality control, both producers explain that integrated farming plan needs to be made before the farming starts, which is marked by the seedlings process and the land preparation. According to that plan, the producer will try to manage the suitable crop protection for every weather condition, which also includes pests and disease control. In addition, mechanical injuries occurs from the careless harvesting practices and rough field handling of product can accelerate deterioration and reduce the products’ shelf life (Luning & Marcelis, 2009). Careful and integrated farming plan is essential in order to produce the organic vegetables that meets the requirements of four attributes. The free chemical input in the product is in accordance with the aspects in health, safety and process attributes. While, the sensory attributes are linked to freshness, taste, colour or cleanliness of the product.

The integrated farming plan allows the producer to be able to calculate the expected yield and expected variance of vegetables for each plot in the farm. Based on that calculation, the producer offers organic vegetables that will be harvested within several days to the consumers. In the AOA case, they open the quota for the consumers’ order two days before the expected date of harvesting process, and later the data from the order history is used for the next farming plan. FE does not necessarily apply the quota system to their consumers as what has been done with AOA. Meanwhile, KSUGL has just started to implement the integrated farming plan to their production in order to fit the market demand. Therefore, in terms of quality of the product, AOA and FE have better organic
vegetables quality compared to KSUGL, making them have a better opportunity to meet the consumers demand.

The consumers are generally more open to the quality assurance requirement in the organic vegetables. The information that has been collected during the interviews shows that the quality assurance is not compulsory as long as the producer is known by the consumers which means the direct marketing is used in for this case. Direct marketing can gain higher profit and consumer trust without carry out the certification (Park & Lohr, 2006; Veldstra, Alexander & Marshall, 2014). Thus, producer’s image is important for the consumers so they could trust the production process (in relation to health, safety and process attributes) held by the producer. It is also applicable to shorter supply chain. On the other hand, the longer supply chain usually needs quality assurance due to the consumer’s unfamiliarity with the product. The certification could give an additional push to food safety and traceability of the product which is usually required for indirect marketing channel (Johannsen, Wilhelm & Schone, 2005).

The logistics part is directly related to the sensory attributes. The longer the distribution time, the use of unrefrigerated truck or open truck could particularly affect the texture, taste, appearance and sound attributes. The lower quality in regards of sensory attributes could also be affected by the storage that is used by both the producer and the store. Though, several producers do not have refrigerator and precooling equipment (Xin-Min, 2012), the use of those equipment are necessary to store the organic vegetables and maintain the product quality. The use of refrigerator as the cold storage makes the organic vegetables stay fresh for approximately two to three days longer than the products not stored in the refrigerator. The higher quality of organic vegetables (e.g. fresher) the more attractive they are for the consumers.

As the data that has been collected on the field are referred to the conceptual framework, the result shows a high interaction between ‘the quality of product’ and ‘the collaboration between actors’. While the collaboration and the logistics aspects do not show a high interaction and influence between each other. However, the impact of logistics management to the quality of product is high because it is directly related to the quality control of the organic vegetables. Both logistics and quality of product are aimed to capture the market demand based on four attributes. It is answered through the high impact of quality of product to the sensory, health, safety and process attributes, respectively.

5.3 Limitations

Due to the time constraints and scattered location of the respondents, the study could not explore the whole supply chains within three actors. The supply chains that are analysed in this study are the
representative of all the chains from each producer. The study also focuses on organic vegetable producers in West Java as it is one of the highest organic vegetable areas among other regions in Indonesia. Furthermore, this study offers more general ideas of the current state of the organic supply chain, rather than an in-depth study for each supply chain factor.
6. CONCLUSION AND RECOMMENDATION

This chapter is the final chapter of the study. The first section provides the conclusion (section 6.1) of the study, which contains the answer for each research questions that have been listed in Chapter 1, Introduction. Furthermore, recommendation for possible improvement and further study related to organic vegetable supply chain is include in section 6.2.

6.1 Conclusion

In order to answer RQ1, which is about the current market channel that present in West Java, it is found that there are three different market channels in the organic vegetables supply chain. First, the organic vegetable producer (i.e. the AOA) who distribute the product through the registered agent’s system in order to keep the fair trade. This chain proves to be quite effective because most of the registered agents act as the reseller of the organic vegetables by selling the product in their specialised stores. The second chain (i.e. the FE) is more focused on selling the product to the supermarkets, restaurants and online stores via their website. This chain tries to focus on local markets and shorten the distance between the farm and the markets. The last chain (i.e. KSUGL) has relatively simple market channel. They collect organic vegetables from village farmers and carry on sorting and packaging processes at the cooperative office (serves as a warehouse). The cooperative only sell their product to a school in the Bogor city. Meanwhile, a member of the cooperative who also works as a distributor receives supply from both village farmers and the BV farm. The organic vegetables are distributed to the end-consumers which mainly consist of households in the Bogor city.

In the RQ 2, the current state of quality of the product, the collaboration between actors and the logistics within the organic vegetable supply chain have been found. The comparison among three supply chains has showed that AOA and the FE has better products quality due to better quality control system compared to KSUGL. In terms of quality assurance, AOA was the only producer among three producer that obtained organic certification. In terms of collaboration between actors, both AOA and FE also show a better communication system in which they has used the recent mobile messaging technology (e.g. WhatsApp). The communication is more direct between the producer and the consumers as the information exchange has been well developed, in which the consumers could directly file complaints and give recommendations to the producers. The communication between the KSUGL and other actors is rather limited, which in turn could lead to misunderstanding during the supply chain processes. For the logistic, two variables have been studied, namely transportation and storage. AOA has three refrigerated truck in order to meet the demand from all their registered agents that are located in Greater Jakarta area. In contrast, the FE uses motorcycle as the means of transportation to distribute around Bandung city and refrigerated truck to distribute to the Greater
Jakarta area. On the other hand, the KSUGL rent a open-truck to distribute the organic vegetables from the farmers to end-consumers in Bogor city. Regarding the storage, both the AOA and the KSUGL do not have cold storage to keep the organic vegetables during the logistic process while the FE owned refrigerated storage that is placed in their warehouse.

Furthermore, RQ 3 aims to understand the current market demand in urban areas based on the quality attributes of the organic vegetables. The quality attributes are studied in order to give an idea of the consumer’s perspective toward the organic vegetable product. It shows that higher demand for organic vegetable products mainly drives from the health, safety and process attributes. While the sensory attributes are also important, it does not significantly influence the consumers to buy the products in the first place. The consumers generally refer the organic vegetables to the absence of chemical use and the improvement of health level.

For RQ 4, several bottlenecks in the quality of the product, the collaboration between actors, and the logistics have been found in the three organic vegetable supply chains. In terms of quality of product, all three farms are suffering from lower quality and quantity of organic vegetables during bad weather (e.g. heavy rainy season) due to the use of outdoor farm. Beside the outdoor farm, the FE also provides indoor farm for the organic vegetable farming to prevent those bottlenecks. The bottlenecks that are found in the collaboration between actors include the sudden notification regarding the limited quantity to supply the organic vegetables to the consumers during the severe weather, and limited human resources. KSUGL chain has additional bottlenecks, namely limited access to communication technology (e.g. WhatsApp), limited knowledge and information, and unequal distribution for knowledge and information sharing among the KSUGL cooperative and the village farmers. Regarding the bottlenecks in logistics, AOA state they find that problems related to the high demand are not equal with the production capacity and the transport facilities, and the on-time delivery service to the consumers, especially supermarkets. While for KSUGL chain, the high transportation cost and the non-optimal use for truck are their main concerns. Moreover, both the AOA and the KSUGL do not have storage facility (e.g. refrigerator) to maintain the quality of product during the logistic process.

In relation to the conceptual framework for this study, it is found that the influence of collaboration between actors has a higher influence to the quality of product compared to the logistics. The influence of the logistic facilities (i.e. transportation and storage) is high due to the relation with quality control which is one of the variables in the quality of product. Moreover, the quality of product and the logistics have higher influence in meeting the market demand in the urban areas based on the four quality attributes (i.e. sensory, health, safety and process attributes).
6.2 Recommendation

RQ 5 is included in the recommendation section as it answers the question about the possible improvements in the quality of product, the collaboration between actors, and the logistics within the organic vegetable supply chains to meet the market demand. Regarding the current state of organic vegetables supply chain in Indonesia, the high quality of the product should be prioritised. Thus, it needs intensive collaboration between actors which requires a higher level of trust, commitment and effective communication. The logistics works in keeping the quality of the products during the distribution process. The suitable transportation has to be considered based on the duration of distribution and the distance between the farm and the market.

More in-depth study can be developed further to analyse each factor that contributes to the organic vegetable supply chain. As in this study, the organic vegetables supply chain in Indonesia is analysed only in West Java and Jakarta. Furthermore, the third organic vegetable supply chain can take the opportunity to learn from developed organic farms (i.e. AOA and FE), to improve the quality of products, collaboration and logistics factors.
REFERENCES


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Tzia, K., & Tsiapouris, A. (1996). Hazard analysis and critical control points (HACCP) for the food industry.


Appendix.

INTERVIEW GUIDELINES FOR FARMER
Factors Contributing to the Success of Organic Vegetable Supply Chain
To Meet Market Demand
(A study case in West Java and Jakarta, Indonesia)

Name of the respondent :
Position :
Name of the organic farm :
Duration :

A. The introduction of the interview of the research background and objective from the interviewer.
B. List of questions for farmer:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General information</td>
<td>1.1 What is your responsibility in the organic farm?</td>
</tr>
<tr>
<td></td>
<td>1.2 When did you implement organic farming for the vegetable product?</td>
</tr>
<tr>
<td></td>
<td>1.3 What is your main reason to convert to organic vegetable farming?</td>
</tr>
<tr>
<td></td>
<td>1.4 How much the size of the land?</td>
</tr>
<tr>
<td></td>
<td>1.5 How much is the turnover every month?</td>
</tr>
<tr>
<td></td>
<td>1.6 How much the amount of vegetable has been produced?</td>
</tr>
<tr>
<td></td>
<td>1.7 What type of vegetables produced in the farm?</td>
</tr>
<tr>
<td></td>
<td>1.8 How many number of employees in the farm?</td>
</tr>
<tr>
<td></td>
<td>1.9 Where are your market target region?</td>
</tr>
<tr>
<td></td>
<td>1.10 What kind of consumers that purchased your products?</td>
</tr>
<tr>
<td>2. The quality of product</td>
<td>2.1 What is your definition of high quality in the organic vegetable</td>
</tr>
<tr>
<td></td>
<td>product? (regarding texture, aroma, taste, appearance, and sound</td>
</tr>
<tr>
<td></td>
<td>attributes of the product)</td>
</tr>
<tr>
<td></td>
<td>2.2 What are your challenges to provide the quality of product that meet</td>
</tr>
<tr>
<td></td>
<td>the consumers’ demand?</td>
</tr>
<tr>
<td></td>
<td>2.3 How do you measure the quality of product that consumer wanted?</td>
</tr>
<tr>
<td></td>
<td>2.4 Quality assurance:</td>
</tr>
<tr>
<td></td>
<td>• What quality control regulation do you follow?</td>
</tr>
<tr>
<td></td>
<td>• Do you have an organic product certificate?</td>
</tr>
<tr>
<td></td>
<td>• What is the name of the institution that releases the certificates?</td>
</tr>
<tr>
<td></td>
<td>• Do they monitor the quality of organic vegetable products regularly?</td>
</tr>
<tr>
<td></td>
<td>• Do you think the certificate helps to gain consumers’ trust to</td>
</tr>
<tr>
<td></td>
<td>purchase the product?</td>
</tr>
<tr>
<td></td>
<td>• What are the challenges you face during the quality assurance?</td>
</tr>
<tr>
<td></td>
<td>(regarding the certain regulations that the producers should follows</td>
</tr>
<tr>
<td></td>
<td>during the production and the supply chain process, e.g.</td>
</tr>
<tr>
<td></td>
<td>Organic certification or HACCP)</td>
</tr>
<tr>
<td></td>
<td>• How do you solve quality assurance challenges?</td>
</tr>
</tbody>
</table>
2.5 Quality control:
- How do you control the quality of product during cultivation? (related to the selection of suitable varieties, cultivation practices, and environmental conditions)
- How do you control the quality during the harvest process?
- How do you decide the harvesting time?
- After harvest, how do you deliver product from the farm to the storehouses?
- How do you grade the product during the sorting process?
- What kind of standards do you use in the grading process?
- What is the targeted market for each grade of the product?
- How do you manage the knowledge, ability and understanding of the employees in order to ensure the performance of quality control activities? (e.g. provides employee training, regular sharing and evaluation sessions)

3. Collaboration between actors
3.1 How many actors are involved in the organic vegetable supply chain?
3.2 What kind of collaboration that develops between farm and other actors? (e.g. distributor, supermarket or specialised store, traditional market, the end-consumers)
3.3 How do you maintain the trust and commitment of other actors?
3.4 Have you experienced non-commitment from other actors (regarding the logistic and quality of product)
3.5 How do you communicate with other actors? (e.g. face-to-face, telephone, email or video call)
3.6 Is the information exchange in the vegetable supply chain effective?
3.7 If not, what could be improved?

4. Logistic
4.1 How many chains do you have to deliver your product to the market?
4.2 Who is your distributor?
4.3 What transportation do you use to deliver the product to the next actor?
4.4 What is the major injury of product that often occurred during the transportation process?
4.5 What are your cost of transportation?
4.6 What time of the day do you usually deliver the product?
4.7 How do you manage the lead time? (e.g. FIFO)
4.8 Do you have a cold storage for the product?
4.9 If not, what kind of storage do you have?
4.10 How do you manage the stock keeping unit? (e.g. MTO, MTS)
4.11 What are the main challenges in transport and storage of your product?
**INTERVIEW GUIDELINES FOR DISTRIBUTOR/AGENT**

Factors Contributing to the Success of Organic Vegetable Supply Chain To Meet Market Demand

(A study case in West Java and Jakarta, Indonesia)

Name of the respondent : 
Position : 
Name of company : 
Duration : 

A. The introduction of the interview of the research background and objective from the interviewer.

B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General information</td>
<td>1.1 What is your responsibility?</td>
</tr>
<tr>
<td></td>
<td>1.2 When you become involved in distributing organic vegetables?</td>
</tr>
<tr>
<td>2. Logistic</td>
<td>2.1 Where do you deliver the product?</td>
</tr>
<tr>
<td></td>
<td>2.2 What transportation do you use to deliver the product from the farmer to the market?</td>
</tr>
<tr>
<td></td>
<td>2.3 What are your cost of transportation?</td>
</tr>
<tr>
<td></td>
<td>2.4 What time of the day do you usually deliver the product?</td>
</tr>
<tr>
<td></td>
<td>2.5 How long the delivery time from the farmer to the market?</td>
</tr>
<tr>
<td></td>
<td>2.6 How do you manage the lead time? (e.g. FIFO)</td>
</tr>
<tr>
<td></td>
<td>2.7 Do you have a cold storage for the product?</td>
</tr>
<tr>
<td></td>
<td>2.8 If not, what kind of storage do you have?</td>
</tr>
<tr>
<td></td>
<td>2.9 How do you manage the stock keeping unit? (e.g. MTO, MTS)</td>
</tr>
<tr>
<td></td>
<td>2.10 Do you own a warehouse to gather organic vegetable products from all the farmers you worked with?</td>
</tr>
<tr>
<td></td>
<td>2.11 What are the main challenges in transport and storage of your product?</td>
</tr>
<tr>
<td>3. The quality of product</td>
<td>3.1 What is your definition of high quality in the organic vegetable product? (regarding of texture, aroma, taste, appearance, and sound attributes of the product)</td>
</tr>
<tr>
<td></td>
<td>3.2 Have you experience the mechanical injury during the delivery process?</td>
</tr>
<tr>
<td></td>
<td>3.3 How do you maintain the quality of the product during the delivery process?</td>
</tr>
<tr>
<td></td>
<td>3.4 What are your challenges in meeting the consumers’ demand?</td>
</tr>
<tr>
<td></td>
<td>3.5 How do you measure the quality of product that consumers’ wanted and inform it to the farmers?</td>
</tr>
<tr>
<td></td>
<td>3.6 Do you oblige the farmers to have an organic certification or other quality assurance?</td>
</tr>
<tr>
<td></td>
<td>3.7 How do you control the quality of the product during the logistic process?</td>
</tr>
<tr>
<td></td>
<td>3.8 What is the targeted market for each grade of organic vegetable product?</td>
</tr>
</tbody>
</table>
3.9 What kind of knowledge and ability that should be present to understand the high quality of the organic vegetable product?

<table>
<thead>
<tr>
<th>4. Collaboration between actors</th>
<th>4.1 How many actors are worked with you in the organic vegetable supply chain?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.2 What kind of collaboration that develops between you and other actors? (e.g. farmers, supermarket or specialised store, traditional market, the end-consumers)</td>
</tr>
<tr>
<td></td>
<td>4.3 How do you maintain the trust and commitment of other actors?</td>
</tr>
<tr>
<td></td>
<td>4.4 Have you experienced non-commitment from other actors? (regarding the logistic and quality of product)</td>
</tr>
<tr>
<td></td>
<td>4.5 How do you communicate with other actors? (e.g. face-to-face, phone, video call, email, etc)</td>
</tr>
<tr>
<td></td>
<td>4.6 Is the information exchange in the vegetable supply chain effective?</td>
</tr>
<tr>
<td></td>
<td>4.7 If not, what could be improved?</td>
</tr>
<tr>
<td></td>
<td>4.8 What are the main challenges that still needs to be solve?</td>
</tr>
</tbody>
</table>
INTERVIEW GUIDELINES FOR SUPERMARKET/SPECIALISED STORE

Factors Contributing to the Success of Organic Vegetable Supply Chain To Meet Market Demand (A study case in West Java and Jakarta, Indonesia)

Name of the respondent : 
Position : 
Name of supermarket/specialised store : 
Duration : 

A. The introduction of the interview of the research background and objective from the interviewer.

B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
</table>
| 1. General information       | 1.1 What is your responsibility in this supermarket/specialised store?  
1.2 What is company’s main reason selling the organic vegetable product in this supermarket?  
1.3 Since when you started?  |
| 2. The quality of product     | 2.1 What is your definition of high quality in the organic vegetable product? (regarding texture, aroma, taste, appearance, and sound attributes of the product)  
2.2 Do you oblige the farmers to have an organic certification or other quality assurance?  
2.3 How do you maintain the quality control of the product when the product being displayed in the supermarket/specialised store?  
2.4 How do you measure the quality of product that consumers’ wanted and inform it to the farmer or the distributor?  
2.5 What are your challenges in meeting the consumers’ demand?  
2.6 Which grade of organic vegetable product that has higher end-consumers demand?  
2.7 How do you manage the knowledge, ability and understanding of the employees in order to ensure the performance of quality control activities? (e.g. provides employee training, regular sharing and evaluation sessions)  |
| 3. Market Demand             | 3.1 How many organic product have been sold in a month?  
3.2 Have the consumers ever return the product due to injured product?  
3.3 Do the consumers ever complain about the quality of product?  
3.4 What kind of sensory attributes that drives the consumers to buy the organic vegetable product? (regarding texture, aroma, taste, appearance, and sound attributes of the product)  
3.5 What kind of health attributes that could drive the consumers to start purchasing the product?  
3.6 Do the consumers always ask the process attributes of the product? (related to ethical production, environment-friendly, animal welfare, free chemical use)  |
| 4. Collaboration between actors | 4.1 How many actors are worked with you in the organic vegetable supply chain?  
4.2 What kind of collaboration that develop between you and other actors? (e.g. farmers, distributor)  
4.3 How do you maintain the trust and commitment of other actors?  
4.4 Have you experienced non-commitment from other actors? (regarding the logistic and quality of product)  
4.5 How do you communicate with other actors? (e.g. face-to-face, phone call, video call, email, etc)  
4.6 Is the information exchange in the vegetable supply chain effective?  
4.7 If not, what could be improved?  
4.8 What is the main challenge that still needs to be solve? |
| 5. Logistic | 5.1 How is the logistic flow in your organic vegetable supply chain?  
5.2 What is transportation do you use to deliver the product from the farmer or the distributor to the store?  
5.3 What are your cost of transportation?  
5.4 What time of the day do you usually receive the product?  
5.5 How long the deliver time?  
5.6 How do you manage the lead time? (e.g. FIFO)  
5.7 Do you have a cold storage for the product?  
5.8 If not, what kind of storage do you have?  
5.9 How do you manage the stock keeping unit? (e.g. MTO, MTS)  
5.10 Do you own a warehouse to gather organic vegetable products from all the farmers you worked with?  
5.11 What are the main challenges in transport and storage of your product? |
INTERVIEW GUIDELINES FOR RESTAURANT
Factors Contributing to the Success of Organic Vegetable Supply Chain
To Meet Market Demand
(A study case in West Java and Jakarta, Indonesia)

Name of the respondent: 
Position: 
Name of restaurant: 
Duration: 

A. The introduction of the interview of the research background and objective from the interviewer.
B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
</table>
| 1. General information        | 1.1 What is your responsibility?  
1.2 What is company’s main reason to purchase organic vegetable product for their food?  
1.3 Since when it is started?                                                                                                                                 |
| 2. The quality of product     | 2.1 What is your definition of high quality in the organic vegetable product? (regarding texture, aroma, taste, appearance, and sound attributes of the product)  
2.2 Do you have any preference about the supplier for specific organic vegetable product?  
2.3 Do you oblige the farmers to have an organic certification or other quality assurance?  
2.4 How long do you keep the product before you cook it?  
2.5 How do you keep the product in the stock?  
2.6 What kind of controlling that you use to maintain the quality of the product?  
2.7 How do you manage the human resources to ensure the performance of quality control activities?  
2.8 Do they need to have basic knowledge and understanding about the quality of the organic vegetable product during the purchasing or the food processing in the kitchen? |
| 3. Market Demand              | 3.1 How many organic vegetable product the restaurant purchased in a month? (in kg)  
3.2 How much do the restaurant have to pay to purchase the product?  
3.3 Do the consumers ever ask the process attributes of the product? (related to ethical production, environment-friendly, animal welfare, free chemical use)  
3.4 Do the end-consumer ever ask for the health and safety attributes of the product they consume in the restaurant?  
3.5 Does the restaurant offer additional information about the quality attributes of the organic vegetable they use for the foods? |
| 4. Collaboration between actors | 4.1 How many suppliers the restaurant have for organic vegetable products? |
| 4.2 | What kind of collaboration that develops between the restaurant and other actors? (e.g. farmers, distributor) |
| 4.3 | How do you maintain the trust and commitment of other actors? |
| 4.4 | Have you experienced a non-commitment from other actors (e.g. late delivery products, low-quality products) |
| 4.5 | How do you communicate with other actors? (e.g. phone, direct meeting, email) |
| 4.6 | Is the information exchange in the vegetable supply chain effective? |
| 4.7 | If not, what could be improved? |
| 4.8 | What are the main challenges that still needs to be solve? |

| 5. Logistic | 5.1 Where are the supplier for your organic vegetable products mainly based? (i.e. the suppliers’ address in West Java) |
| 5.2 | Does the restaurant prepare their transportation to purchase the product from the farmers or the distributor? |
| 5.3 | What are your cost of transportation? |
| 5.4 | What time of the day do you usually to purchase the product and deliver it to the restaurant? |
| 5.5 | How long is the delivery time? |
| 5.6 | Do you have a cold storage for the product? |
| 5.7 | If not, what kind of storage do you have? |
| 5.8 | What are the main challenges in transport and storage of your product? |
INTERVIEW GUIDELINES FOR IOA
Factors Contributing to the Success of Organic Vegetable Supply Chain To Meet Market Demand (A study case in West Java and Jakarta, Indonesia)

Name of the respondent :
Position :
Name of the NGO :
Duration :

A. The introduction of the interview of the research background and objective from the interviewer.
B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
</table>
| 1. General information     | 1.1 What is your job?  
1.2 Since when did you consume organic vegetable product?  
1.3 Do you buy the organic vegetable product regularly?  
1.4 Do you allocate your expenditure to buy the organic vegetable product for daily consumption? |
| 2. Market Demand           | 2.1 What is your main reason to consume organic vegetable products?  
2.2 Do you have any preferences in the quality of organic vegetable product related to sensory attributes? (i.e. texture, aroma, taste, appearance and sound)  
2.3 What do you think about the nutrition contain in the organic vegetable product? Why?  
2.4 What do you think about the safety attributes of organic vegetable product?  
2.5 Do you think the process attributes in organic vegetable product is important? Why?  
2.6 Do you think it is necessary for the farmers to have organic certification or other quality assurance?  
2.7 Will you still buy the organic vegetable product without certification?  
2.8 How long do you keep the product before you cook it?  
2.9 How much money do you spend to buy organic vegetable every month?  
2.10 How many organic vegetable product do you usually purchased in a month? (in kg) |
| 3. Collaboration between actors | 3.1 Where do you usually buy organic vegetable products?  
3.2 Do you have a specific store to buy organic vegetable products?  
3.3 What factors that drives you to buy the product from that store? (related to trust and commitment)  
3.4 Have you experienced non-commitment with the store? (e.g. low-quality products)  
3.5 Do you collect information about the production process before you buy the organic vegetable product in the supermarket or traditional market? |
<table>
<thead>
<tr>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 Does the store offer necessary information about organic vegetable product they sell to the consumers?</td>
</tr>
<tr>
<td>3.7 Do you think organic certification is an important factor that drives you to buy organic vegetable products?</td>
</tr>
<tr>
<td>3.8 Will you still buy the organic vegetable product without certification?</td>
</tr>
<tr>
<td>3.9 Have you ever complaint or give suggestion to the store related to the quality of product?</td>
</tr>
<tr>
<td>3.10 If yes, how do they respond to your complain or suggestion?</td>
</tr>
</tbody>
</table>
INTERVIEW GUIDELINES FOR IOA
Factors Contributing to the Success of Organic Vegetable Supply Chain
To Meet Market Demand
(A study case in West Java and Jakarta, Indonesia)

Name of the respondent : 
Institution : 
Duration : 

A. The introduction of the interview of the research background and objective from the interviewer.
B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
</table>
| 1. General information | 1.1 What is your responsibility?  
1.2 What is the organisation’s role in the organic agriculture sector in Indonesia?  
1.3 What is the organisation’ main reason to focus on the organic agricultural sector in Indonesia? And since when it is started?  
1.4 What is your organisation think about the development of the organic vegetable sector in Indonesia, especially in West Java and Jakarta? (general explanation about the history, farming practices, supply chain & market) |
| 2. Market Demand  | 2.1 What are current market demand for the organic vegetable product in urban areas? (i.e. sensory, health, safety and process attributes)  
2.2 Do you think the organic vegetable product that are available in the market already meet the consumers’ preferences?  
2.3 How much the market demand for the organic vegetable product in a month or a year? (the organisation’s data)  
2.4 How many farmers that currently available in West Java?  
2.5 How many distributors that currently available in West Java and Jakarta?  
2.6 Which physical market in Jakarta that mainly targeted by the producer and distributor in West Java?  
2.7 What are the challenges that still faced by traditional and modern supply chain to enter the market in Jakarta? |
| 3. The quality of product | 3.1 What are the quality of organic vegetable product that currently offer by the farmers? (regarding texture, aroma, taste, appearance, and sound attributes of the product)  
3.2 What are the bottlenecks in producing and maintaining the quality of organic vegetable product that still occurred in the supply chain?  
3.3 Do you think having organic certification or other quality assurance give more benefit for the organic vegetable supply chain to success in the market?  
3.4 What are the challenges for traditional and modern supply chain to maintain their quality of the product? (overview) |
<table>
<thead>
<tr>
<th>3.5 Which supply chain that is more successful to offer a high quality product for the market?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4. Collaboration between actors</strong></td>
</tr>
<tr>
<td>4.1 How many types of organic vegetable supply chain that currently available in West Java and Jakarta?</td>
</tr>
<tr>
<td>4.2 What kind of collaboration that develops between the actors in the chain? (e.g. farmers, distributor, supermarket, restaurant/hotel, end consumers)</td>
</tr>
<tr>
<td>4.3 Do you actively involved in sharing information related to the organic vegetable supply chain? (e.g. innovation, subsidise for the logistic and production, current market demand, quality standard)</td>
</tr>
<tr>
<td>4.4 What is the main challenge that still needs to be solve?</td>
</tr>
<tr>
<td><strong>5. Logistic</strong></td>
</tr>
<tr>
<td>5.1 What kind transportation facilities that are generally used by the farmers or distributors to deliver their products?</td>
</tr>
<tr>
<td>5.2 What kind of storage that generally used by farmers or distributors to keep the product before deliver it to the physical market?</td>
</tr>
<tr>
<td>5.3 What are the main challenges in the logistic?</td>
</tr>
</tbody>
</table>
INTERVIEW GUIDELINES FOR ORGANIC CERTIFICATION INSTITUTION

Factors Contributing to the Success of Organic Vegetable Supply Chain To Meet Market Demand
(A study case in West Java and Jakarta, Indonesia)

Name of the respondent: 
Position: 
Name of the institution: 
Duration: 

A. Introduction of the interview of the research background and objective from the interviewer.
B. List of questions:

<table>
<thead>
<tr>
<th>Themes</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. General information</td>
<td>1.1 What is your responsibility?</td>
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<td></td>
<td>1.2 How many farmers that currently registered for the certification in West Java?</td>
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<td>1.3 What are the regulations that need to follow by the farmers to get the certification (or to manage their certification)?</td>
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<td>1.4 How the institution control the production and the quality of the product in the organic farm? (i.e. regular inspections)</td>
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<td>1.5 What is the standard for organic agricultural practices? (regarding quality of product)</td>
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<td>1.6 How long the certification is applied since the registration?</td>
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</tbody>
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