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**Modernization of Vegetable Supply Chain and Farmers` Organization
: A Case Study of West Java, Indonesia, Focusing on Behavior of Leaders**

(野菜サプライチェーンの近代化と農民組織
—インドネシア・西ジャワにおけるリーダーの行動に注目した事例研究—)

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ABSTRACT

Modernization of vegetable supply chain is inevitable trend. It solves some problems but also bring new problems. This study clarifies the real situations of modernization supply chain in West Bandung District, West Java Province, Indonesia. We conducted in-depth interview with 37 leader farmers in 40 farmers' organizations, other agents in modern and traditional supply chains and government.

Modernization of supply chain creates new structure of supply chain and solves problems in traditional supply chain, such as improvement of farmer's bargaining power through the role of leader in farmers' organization. However, new problems are emerged in the modern supply chain, such as instability of supply, weak of commitment and disunity of farmers' organization.

Leader farmers who play a role as an agent farmer applied the strategy of production plan, farmers' organization management and utilizing the traditional supply chains and modern supply chain. The condition of farmers' organization is so fragile and fully depends on the leader's decision.

Finally, our study is convinced that leaders who play a role as an agent farmer will adjust the trade business expansion by selling the products from his own farm and other sources, e.g. organizing the collective action of member farmers through certain type of FO. The extension of modern SC does not mean the reduction of traditional SC and both types of SC are coexisting and connected. Thus, government should empower the role of farmers' organizations and utilize the role of agent farmers to support member farmers to get better of a farm business.

Keywords: modernization of supply chain, agent farmers, farmers' organization

Preface

P. 1 Background

Many research articles have discussed modernization of fresh vegetable supply chain (SC) (Blandon, 2006; Natadwidjaja, et al., 2007 and Sahara, et al., 2015). Factors that triggered the modernization, for example, the existence of transnational supermarkets that introduced new procurement system focusing on quantity, quality, continuity, and payment method that is different from that in the traditional SC (Reardon, et al. 2015). Those supermarkets are located in urban areas as the expenditures trend of urban people has been changed. Also, the changes in consumers` lifestyle that more concern on safety, quality and appearance increase the demand-driven for the modernization of SC (Smith, 2008 and Dyck, et al., 2012).

Besides the demand-driven, e.g. the growth of population, urbanization, and consumption rate, there are also factors affecting the changes in SC from the supply sides. The increasing of production and ability of farmer in being adaptive to the changes contributes to the modernization of SC.

In Indonesia, the modernization of SC started to be growing in 1998, marked by the signed of Letter of Intent between the International Monetary Fund (IMF) and The Republic of Indonesia. On that letter, according to IMF (1998), as the effect from monetary crisis, The Government of Indonesia should make the liberalization and allowed the Foreign Direct Investment (FDI). Thus, the starting point of new modern retailers entering Indonesia and brought new procurement systems that are different from that in a traditional wholesale market.

The modernization has solved the problems that are used to be found in the traditional SC previously. The modernisation of SC has improved the bargaining power of farmers to the middleman, shorten the SC through the role of leaders as agent farmers to make direct trade with buyers, applied the collective actions through farmers` organization (FO), dissolution of the unsymmetrical market information and introduced the scheduled supply.

The government intends to promote establishing FOs to modernize vegetable SC. Government has produced some regulations to manage the consumers, market, and also the FOs. Some regulations support the modernization of SC; meanwhile, other regulations are not benefited for the farmers.

Research questions

The process of modernization seems to be inevitable and keep going. However, several questions inspired us to conduct this research. First, could the modernization of SC solve all the problems? And second, will it create new problems? Those questions are still further issues.

In addition, we have a big concern about the condition of FOs and the role of leader farmers. Therefore several research questions to guide the study are: first, is the situation of FO stable or instable?, second what are the reasons why FOs are so fluctuated and third how is a leader`s business connected with FO?

Purpose

This research clarifies the real and actual condition after the modernization of SC that has been introduced in West Bandung District and the problems that emerged in modern SC. Besides this study investigates the relation between traditional SC and modern SC, is modern SC substitutional or just supplementary?

P. 2 Objectives of Study

This study wants to reveal the actual condition of modernized SC as the main objectives. Then, the aim is being developed into four particular objectives.

(1) To investigate the structure of the supply chain

The structure of SC consists of several parts, and each part is nothing but the relation between agents. The structure will explain the existence of agents and their roles. Their characteristics will create a relationship among agents in the SC. This objective will guide to the position of leader of FO as the agent farmer in the modern SC and utilizing the existence of both traditional SC and modern SC.

(2) To clarify the conditions of FO

The existence of FO as the primary concern of the government to flourish the collective action among farmers could contribute to the modernization of SC. This objective discusses the role of FO and the persistence of FO.

(3) To analyze the behavior of a leader of FO

A leader of FO has competitive and comparative advantages compared to ordinary farmers. This objective investigates the behavior of leaders and also FO, as there are many types of leaders and FOs found in modern SC.

(4) To analyze the instability problem

Modern SC requires scheduled supply, but vegetable production is not stable, and the relationship between players is not permanent. We clarify the issues emergence in modern SC, investigate factors that caused the new problems and how to deal with the issues.

P. 3 Methodology

This research used empirical and study literature approaches. The study literature reviewed research articles, statistical documents, government's documents and scientific reports related to vegetable business management in west Bandung District, West Java Province and in Indonesia.

We applied snowball and purposive sampling methods to select the locations of sampled respondents. We first approached supermarkets, traders at wholesale markets and subsequently interviewed representatives of supplier companies and middlemen, followed by farmers (as shown in Table P.1).

The selected research area is the northern part of West Bandung District (including the subdistricts of Lembang, Parongpong, and Cisarua). We chose the subdistricts based on inputs received from extension officials. Moreover, our previous research indicated that SC practices are more diverse in these areas than in other parts of the district.

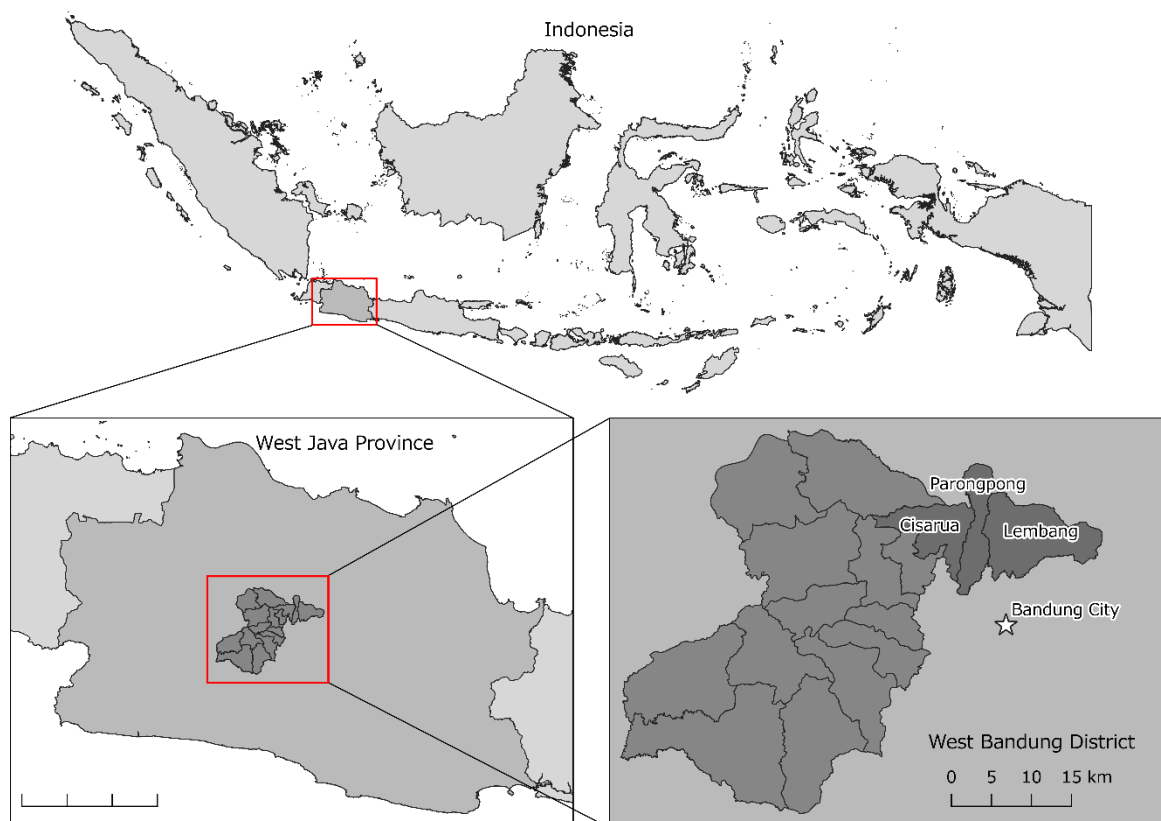


Fig. P.1 Map of Indonesia, West Java Province and West Bandung District

We conducted the survey from 2016 to 2019. We mainly conducted the field survey through an in-depth interview to key farmers who have been known by the extension officials as the leading farmers who play a role of modernizing the farm business and organizing FO.

We make the analysis based on the interview results from leader farmers who shared their current information related to the condition of FO and difficulties found after entering modern SC. We selected respondents according to their capacity to generate changes in SC. We focused on the roles of leaders within the FOs and the current conditions of SC.

There are 37 respondent farmers. They comprised 28 farmers in Lembang Subdistrict, four farmers in Parongpong Subdistrict, and five farmers in Cisarua Subdistrict. Also, we examined different types of FO, namely four cooperatives, four farmers' group unions (FGUs) and 32 farmers' groups (FGs).

Table P.1 Number of respondents

Traditional SC		Modern SC	
Farmers who play the middleman role :			
2	Farmers as Big Collector	19	Farmers as Supplier
1	Farmer as Small Collector	4	Farmers as Small Collector
7	Farmer with no role of Middleman	4	Farmers with no role of Middleman
Other agents :			
3	Big Collectors	2	Supplier Companies
6	Traders at wholesale market	1	Exporter Company
10	Retailers	1	Supermarket
		1	Fast Food Company

Source: Field Survey, 2016-2019.

Organization of the dissertation

This thesis is composed of preface and five chapters. The preface chapter explains the inspiration of why this study is conducted and is still essential. There are explanations about the purpose and objectives of the research and also how the research has been conducted.

The first chapter provides the changing situation of vegetable economy and government policy in Indonesia. This chapter gives a general description of vegetable economy. It addresses the attention of the government to improve the SC of farmers. Besides, there are still some policies that prevent the improvement of farm business management mainly in SC.

The second chapter discusses the agriculture and FOs in West Bandung District. This chapter discusses the general condition of agriculture and the characteristic of FO in Lembang, Parongpong, and Cisarua Subdistricts in West Bandung District.

The third chapter describes the development of the vegetable economy and changing of fresh vegetable SC. This chapter discusses the strategy to improve vegetable economy practiced by the respondents and the behavior of agents who involved in the SC as well.

The fourth chapter focuses on the relation between the roles of leaders and FO. There are some differences in roles among FO and the role of leaders. Therefore this chapter clarifies the relationship of FO and leaders' business.

The last chapter gives the conclusion of the research. Based on the discussion and findings, this chapter generates some policy recommendations for modernizing the SC and empowering the role of FO by utilizing the role of leader farmers.

Analytical Framework

There are several relationships of trade among agents in the SC from producers to consumers. First is the relationship between farmers and middlemen, second the middleman with buyers and buyers or retailers and consumers. Our study focuses on the first [A] and other relationships [B and C] because we intend to clarify the condition at leader farmer's level (see Fig. P.2).

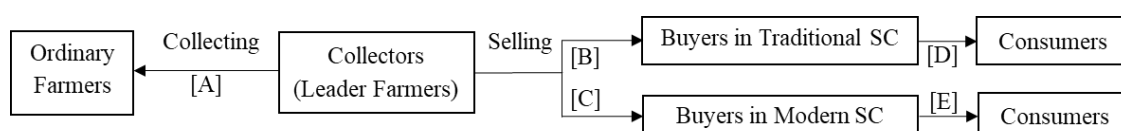


Fig. P.2 Common Vegetable Trade by Leader Farmers, Field Survey, 2016-2019.

The traditional SC has many agents involved in, complicated and such a structure of SC has some kinds of problems of a vegetable economy: the gap of supply and demand, fluctuation of prices and no improvement in the farm business. From our field survey, some farmers already play the role as a middleman that we called as agent farmers. This agent farmers exist in traditional SC and modern SC.

Agent farmers collect and sell vegetables to a buyer. They get vegetables from acquainted farmers and other farmers. They already know about the character of each buyer and then search the production sources. Those agent farmers can be divided into a small collector and a big collector. Agent farmers who play as a small collector mostly have limited volume of vegetables and they immediately transport the products to a big collector or other buyers. Their capacity for trade is less than 100 kg of each kind of vegetable for every delivery. Agent farmers who play a role as a big collector can make a trade with much more volume and various types of vegetables.

Small collectors locate in the same area as ordinary farmers. The relationship between small collectors and farmers is strong because they still have a family relationship or live in the same rural community. Such a close relationship among them makes it easier to maintain trust and commitment.

Meanwhile, big collectors can manage more than 100 kg of each kind of vegetable for every delivery. They can find various buyers. Big collectors manage supplies from member and non-member farmers and also from small collectors. Big collectors receive supplies beyond their own village and sub-district.

In addition, the relationship between collectors and buyers also have no permanent relationship, and it can be changed at any time. The instable relationship creates instability from the trading side.

A farmer sells a part of his products to a particular collector, and the relationship is changeable. On the other side, every big collector also has its own relationship with certain buyers, but the relationship is also volatile.

Middleman agents apply debt-bondage practices. It is a common strategy of the middleman agents to ensure the supply and maintain the trust with the farmers. We found that a trader at wholesale market sometimes provides money to big collectors to search supplies from farmers or small collectors. Big collectors also offer money and production inputs to certain farmers and even to a small collector.

Furthermore, a big collector sometimes applies the '*tebasan*' or '*borongan*'. '*Borongon*' is a common practice done by middlemen both in traditional and modern SCs. The middleman will do '*borongan*' when he does not have products any more from his partner farmers while there is an order from his buyers.

The modernization of vegetable SC requires stable quantity, quality, and scheduled supply. Thus, there have been a new agent and new relationship pattern marked by the existence of FO and leader of FO. The agent farmers have the ability in post-harvest handling practices, e.g. cleaning, grading, packaging, and labeling, thus they are different from a collector and we classified as a supplier. The shifting of the business orientation of agent farmers as a supplier in modern SC creates a new business relationship through FO. It also influences the farm practices.

The government of Indonesia has intended to form FOs by providing supports to help farmers access into modern SC. In modern SC the existence of FO creates collective action to match the targeted order and production plan. The collective action is similar to contract farming or scheduled of a farm business.

In General, the contract of vegetable supply between FO and modern SC players is made with a production plan. The FO has tried to do the followings to realize scheduled supply.

- (1) Establish management of FO for collective production and supply of vegetables. Transfer

information about technology, provision of seed and money. (2) Flexible marketing by using traditional SC when over/short production to the order. The agent farmers play such a role.

Eventually, management of FO depends on the leaders' character and abilities. Leader's personal farm business much influences FO's performance. Some of FOs' leaders get a chance to develop their business through FO. Agent farmers in modern SC and traditional SC have similarity in gaining the margin of trade.

However, modernization of SC maintains the traditional relationship among agents, especially the debt-bondage and '*borongan*' practices between agent farmers and member farmers to manage the supply. The modern SC also creates new problems such as farmers' organizational problems, distrust or weak commitments in the relationship between leaders and member farmers.

The existence of modern SC has been a supplementary SC for farmers and not as a substitution SC. Any farmer can join into the modern SC and return to traditional SC or make a mixture of supply on both SC anytime.

In addition, any farmer could join any FO and stop the membership from any FO anytime. Furthermore, the condition of FOs is so varied, and they can be active, inactive, and also dissolved in anytime. FO also could be transformed from single-layered FO into multi-layered of FO.

Finally, based on those investigation results, our research clarifies the actual condition of farmers after being able to enter the modernization of SC and reveals the objectives of the study. We hope there should be new policy direction from the government to prepare the farmers from changes in SC and more empowering the role of FO.

Chapter 1

Changing Situations of Vegetable Economy and Government Policy in Indonesia

1.1 Changes in Vegetable Economy

Agriculture sector plays an essential role in the economy of a country, especially developing country where the source of economy mainly is generated from agriculture economy. Several factors influence the changes in the vegetable economy in Indonesia. First is from the consumer side, and the other is from the production side.

Population

Indonesia has the biggest number of population in ASEAN region. According to ASEAN (2018) the number of population in Indonesia in 2017 has reached 261.9 million people.

Table 1.1 Population in Indonesia, 2010 to 2017 (million people)

Location	1980	1990	2000	2010	2017	(1980-2010)	(1990-2000)	(2000-2010)	(2010-2017)	(1980-2017)
National	147.5	179.4	203.5	237.6	261.9	21.6	13.4	16.8	10.2	77.6
West Java Province	23.4	29.4	35.7	43.1	48.0	25.5	21.4	20.5	11.6	105.0
Proportion (%)	15.9	16.4	17.6	18.1	18.3					
West Bandung District				1.5	1.7				10.3	
Proportion (%)				8.3	9.1					

Source: Statistic Indonesia and Statistics West Java Province, 2000 and 2018.

Statistics Indonesia (2018) recorded that the number of population in National, West Java Province and West Bandung District had been increasing for several decades. However, the growth trend of population and national level are becoming lower. As shown in Table 1.1, in the first decade, from 1980 to 1990, the number of population had been increasing for 21.6% for national level and 25.5% for West Java Province level. Then in the next decade, from 2000 to 2010 the increasing rate of national level was 16.8% and West Java Province level was 20.5%

The number of population in West Java Province contributed on average 18.3% to the number of population in Indonesia, meanwhile, on average around 9.1% population of West Java Province live in West Bandung District in 2017.

The changes in population affect the number of consumption for food, e.g. fresh vegetables. The increasing pattern of the number of population will trigger the increasing demand of fresh vegetables.

Consumption per capita (kg/capita)

The diet pattern of consumption for fresh vegetables had been changing from 2007 to 2017 (see Table 1.2). From 21 selected types of vegetables, there is a various number of the growth noted from 5.5% (bean sprout) until 44.5% (tomato). However, there are also

decreasing patterns as noted from 2% (small chili) to 38.7% (stink beans). On average the total consumption of vegetables for the decade is around 1.8 kg per capita in a year. This indicates the changes on the demand side influence the supply sides. Unbalanced supply and demand will affect the fluctuation of the selling price.

Table 1.2 Vegetable Consumption Per Capita (kg/capita)

No	Vegetables	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	(2007-2017)	Average
1	Stink beans	0.7	0.5	0.3	0.5	0.3	0.4	0.3	0.3	0.0	0.0	0.4	-38.7	0.3
2	Long beans	3.8	3.8	3.5	3.7	3.4	3.1	3.0	2.8	3.3	3.3	2.6	-32.5	3.3
3	others	2.5	2.8	2.6	2.3	1.7	2.3	1.9	2.1	0.0	0.0	1.7	-31.2	1.8
4	Cabbage	1.9	1.9	1.6	1.6	1.8	1.5	1.3	1.4	0.0	0.0	1.4	-25.1	1.3
5	Egg plant	3.5	2.9	2.5	2.6	2.6	2.4	2.5	2.4	2.7	2.9	2.7	-22.3	2.7
6	Spinach	4.5	4.0	3.8	4.0	3.8	3.7	3.5	3.5	4.0	4.5	3.5	-20.8	3.9
7	Carrot	1.2	1.2	1.0	0.9	1.0	0.9	1.0	1.0	0.0	0.0	0.9	-20.0	0.8
8	Kangkung	5.0	4.8	4.4	4.6	4.3	4.2	4.0	4.1	4.4	4.8	4.2	-15.7	4.4
9	Shallot	3.0	2.7	2.5	2.5	2.4	2.8	2.1	2.5	2.7	2.8	2.6	-14.6	2.6
10	baby corn	2.6	1.8	1.2	1.5	1.7	1.3	1.8	1.8	0.0	0.0	2.3	-10.1	1.5
11	Cucumber	2.1	2.1	1.8	1.7	1.8	1.6	1.6	1.6	0.0	0.0	1.9	-7.7	1.5
12	Squash	1.5	1.5	1.3	1.1	1.0	1.2	1.0	1.1	0.0	0.0	1.4	-7.1	1.0
13	Beans	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	1.1	1.1	0.9	-2.6	0.9
14	Small chili	1.5	1.7	1.4	1.4	1.4	1.4	1.3	1.3	3.0	2.5	1.5	-2.0	1.6
15	Bean sprout	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.9	0.9	0.9	5.5	0.8
16	Garlic	1.5	1.7	1.4	1.4	1.4	1.6	12.1	1.6	1.7	1.8	1.6	7.4	2.5
17	Mushroom	0.1	0.1	0.0	0.0	0.1	0.1	0.6	0.1	0.0	0.0	0.1	10.0	0.1
18	Chilies	1.5	1.6	1.5	1.5	1.5	1.7	14.2	1.5	3.0	2.3	1.8	20.4	2.9
19	Green chili	0.3	0.3	0.2	0.3	0.3	0.2	2.0	0.2	0.0	0.0	0.4	23.3	0.4
20	Chinese cabbage	0.7	0.9	0.7	0.6	0.9	0.7	0.8	0.9	0.0	0.0	1.0	42.9	0.7
21	Tomato	2.1	2.2	2.0	1.9	2.1	1.9	1.7	1.9	4.2	4.4	3.0	44.5	2.5

Source: Ministry of Agriculture, 2013-2018.

In addition, the Ministry of Health (2014) informed that in 2014, the daily consumption of Indonesian people for fruit and vegetable were 33.5 and 57.1 gram per capita. This diet pattern is still far from the recommendation from FAO, i.e., 400 gram of fruit and vegetables in a day (FAO, 2003). Therefore the demand side will be potentially increasing in the future as the awareness of the people about the intake standards is raising.

Urbanization

The trend of urbanization has emerged because more people have been moving from the rural area to be concentrated in the urban area. In 2010 the percentage people live in urban was 49.8% and in 2015 it had been to 53.3% (Statistic Indonesia, 2018). This indicates all the economy have been shifting to metropolitan area. It is including the demand for food by urban consumers. This trend will affect the SC of food from the rural area to the urban area. The distance and condition of road affect the delivery handling practices of fresh food, such as fresh vegetable.

Consumer's expenditures

The trend of consumers' expenditure on vegetables in the urban area and rural area were increasing from 2007 to 2017 for 203.6 % and 214.6 % respectively. Urban people spent more vegetables than rural people. However, both urban and rural people still spend their monthly expenditures for vegetables below 10% on average and mostly spent on non-food commodity.

Table 1.3 Monthly Average Expenditure Per Capita by Commodity Group, 2007-2017 (Rp)

Commodity	2007		2017		(2007-2017)	
	Urban	Rural	Urban	Rural	Urban	Rural
Fruits	11,346	6,913	27,531	17,574	142.6	154.2
Vegetables	14,220	13,195	43,178	41,517	203.6	214.6
Total Food	201,218	148,613	590,082	457,927	193.3	208.1
Total non-food	257,707	106,197	673,444	322,666	161.3	203.8
Total	458,925	254,810	1,263,526	780,593	175.3	206.3

Source: Statistical Indonesia 2008-2018.

Note: 1 Rupiah = 0.0076 Japanese Yen; or = 0.000070 US\$

Production of vegetables

Table 1.4 Area and Production of Vegetables in Indonesia, 2008 - 2017

Commodity	2008	2017	(2008-2017)
Area (Ha)	974,852	1,137,024	16.64
Volume (Ton)	9,510,896	12,481,893	31.24

Source: Directorate General of Horticulture, 2009 and 2018.

The domestic production of vegetables had been increasing by 31.24% from 2008 to 2017. The increase in volume was also supported by the increase in farmland by 16.64% in the same period (see Table 1.4).

Table 1.5 Vegetable Production in West Java Province in 2013-2017

No	Commodity	2013	2014	2015	2016	2017	Percentage to National					(2013-2017)
							2013	2014	2015	2016	2017	
		(Ton)	(Ton)	(Ton)	(Ton)	(Ton)	(%)	(%)	(%)	(%)	(%)	
1	Shallot	115,585	130,082	129,148	141,464	166,865	11	11	11	10	11	44.37
2	Garlic	1,775	1,593	1,008	1,548	1,395	11	9	5	7	7	-21.43
3	Leek	191,345	172,327	169,671	169,144	169,181	33	29	33	31	33	-11.58
4	Potato	258,716	245,332	259,228	288,368	277,187	23	18	21	24	24	7.14
5	Cabbage	319,492	296,943	270,770	310,852	291,541	22	21	19	21	20	-8.75
6	Cauli Flower	22,923	26,284	20,821	21,546	30,787	15	19	18	15	20	34.31
7	Chinese Cabbage	233,030	210,493	194,270	193,700	216,174	37	35	32	32	34	-7.23
8	Carrot	125,044	125,646	132,638	139,905	147,553	24	25	25	26	27	18.00
9	Radish	20,820	19,917	13,280	13,938	15,804	64	63	62	72	70	-24.09
10	Red Beans	76,984	75,138	30,493	19,805	53,791	74	75	72	53	72	-30.13
11	Long Beans	120,393	116,668	102,017	92,948	87,202	27	26	26	24	23	-27.57
12	Big Chili	250,914	253,296	240,864	242,113	274,311	25	24	23	23	23	9.32
13	Small Chili	123,756	115,831	112,634	101,542	134,910	17	14	13	11	12	9.01
14	Chili Pepper	5,387	4,490	3,331	3,127	5,014	79	64	57	60	68	-6.93
15	Mushroom	32,684	25,194	18,140	23,189	18,114	73	67	54	57	49	-44.58
16	Tomato	353,340	304,687	296,218	278,394	295,321	36	33	34	32	31	-16.42
17	Eggplant	87,682	92,999	88,823	82,844	82,269	16	17	17	16	15	-6.17
18	Beans	102,108	94,623	86,622	78,610	82,354	31	30	30	29	30	-19.35
19	Cucumber	155,350	155,882	149,366	140,022	129,765	32	33	33	33	31	-16.47
20	Squash/Chayote	131,848	122,392	107,632	110,272	121,020	34	34	25	18	21	-8.21
21	Kangkung	65,419	60,509	56,235	54,408	51,383	21	19	18	18	19	-21.46
22	Spinach	27,933	21,083	22,801	26,884	26,090	20	16	15	17	18	-6.60
	Total	2,822,528	2,671,410	2,506,009	2,534,621	2,678,030	25	23	23	22	22	-5.12

Source: Directorate General of Horticulture, 2015 - 2019.

West Java Province is one of the biggest provinces for vegetable production. There are several types of vegetables produced in West Java Province that mostly give a high contribution to national production. They grow red beans, radish and chili pepper that contributed above 50% of the national production (see Table 1.5). It means that some provinces have been able to produce fresh vegetables and potentially support the domestic supply.

Horticulture sub-sector contribution to Gross Domestic Product (GDP)

Agriculture sector plays an essential role in the national economy, especially in developing countries where the source of economy is generated mainly by agriculture. Agriculture Sector contributes around 10% of the national GDP on average, based on current market price from 2013 to 2017. Among agriculture sector, on average, the contribution of estate crops sub-sector, such as rubber, palm oil, coconut, coffee, and others, is the highest 3.59%, followed by of food crops, such as paddy, corn, and others, with 3.36%, of livestock, such as cattle, swine, chicken and others, with 1.58% and of horticulture, such as fruits, vegetables, ornamental plants and biopharmaceutical plants, with 1.49% (see Table 1.6).

Table 1.6 Contribution of Subsectors in Agriculture Sector to National GDP (%)

Sub Sector	2013	2014	2015	2016	2017	Average
Food Crops	3.48	3.25	3.45	3.43	3.22	3.36
Horticulture	1.44	1.52	1.51	1.51	1.44	1.49
Estate Crops	3.75	3.77	3.52	3.46	3.47	3.59
Livestocks	1.55	1.58	1.60	1.62	1.57	1.58
Hunting and Agriculture Services	0.20	0.19	0.20	0.20	0.19	0.20
Agriculture	10.42	10.31	10.27	10.21	9.90	10.22
National GDP	100.00	100.00	100.00	100.00	100.00	100.00

Source: Statistic Indonesia 2018 and Ministry of Agriculture, 2018.

Export and import of vegetables

Table 1.7 Balance Trade of Export - Import of Agriculture, 2007 and 2017

Sub sector		2007	2017	(2007-2017)
Food Crops	Volume (ton)	-8,399,060	-20,232,153	141
	Value (thousand US\$)	-2,440,098	-6,321,100	159
Horticulture	Volume (ton)	-899,548	-1,330,488	48
	Value (thousand US\$)	-541,081	-1,790,270	231
Estate Crops	Volume (ton)	17,821,046	34,488,930	94
	Value (thousand US\$)	16,588,468	26,732,497	61
Livestocks	Volume (ton)	-491,618	-1,422,395	189
	Value (thousand US\$)	-947,928	-2,746,342	190
Total Agriculture	Volume (ton)	8,030,820	11,503,893	43
	Value (thousand US\$)	12,659,361	15,874,785	25

Source: Statistics Agriculture, 2012 and 2018.

The export and import of agricultural products had fluctuated from 2013 to 2017. In general estate crops contributes positively to the balance of trade. It means the value of export is bigger than import. Meanwhile, other subsectors, e.g. food crops, horticulture and livestock are negative or the volume and value of import are bigger than those of export (see Table 1.7).

Horticulture sub-sector consists of fruits, vegetables, ornamental plants and biopharmaceutical plants. In total, the value of export for horticulture commodities had been increasing between 2007 and 2017 for around 73.32%.

Table 1.8 Export of Agriculture Commodities in Indonesia, 2007 and 2017

Sub sector		2007	2017	(2007-2017)
Food Crops	Volume (ton)	999,460	286,193	-71.37
	Value (thousand US\$)	289,049	170,885	-40.88
Horticulture	Volume (ton)	393,863	394,449	0.15
	Value (thousand US\$)	254,765	441,561	73.32
Estate Crops	Volume (ton)	22,089,288	40,351,662	82.68
	Value (thousand US\$)	19,964,870	31,815,012	59.35
Livestocks	Volume (ton)	458,900	226,292	-50.69
	Value (thousand US\$)	748,531	625,144	-16.48
Total Agriculture	Volume (ton)	23,941,511	41,258,596	72.33
	Value (thousand US\$)	21,257,215	33,052,602	55.49

Source: Ministry of Agriculture, 2012 and 2018.

Export and import are created by the condition of supply and demand adjusted to the domestic production and condition of demand from the foreign market. However, several fresh vegetables have significant contribution to export and import volume from 2013 to 2017. For examples, the volume of export for shallot has increased 53% and the volume of import of potato has decreased for 87% (see Table 1.9).

Table 1.9 Export and Import of Selected Vegetables in Indonesia, 2013 and 2017

Commodity	2013		2017		(2013-2017)	
	Ton	US\$ (Million)	Ton	US\$ (Million)	Volume	Value
Export						
Cabbage	53,672	13	36,642	7	-31.73	-44.48
Chili	11,008	26	8,610	20	-21.79	-20.36
Shallot	4,982	3	7,623	10	53.01	219.44
Pototao	6,089	4	5,215	4	-14.35	1.60
Import						
Garlic	422,767	367	559,728	596	32.40	62.62
Onion	37,722	29	155,799	77	313.02	165.79
Potato	1,079,000	94	140,087	107	-87.02	14.67
Radish	155,413	54	24,475	15	-84.25	-71.57

Source: Ministry of Agriculture, 2018.

Effects of vegetables` selling price to national inflation and deflation

The flow of supply of fresh vegetables, as included in volatile goods, contributes to the condition of inflation and deflation. Bank of Indonesia (BI) highlighted some vegetables

because of giving the affection to the national inflation and deflation, for example, from December 2017 to December 2018, the price of chili in May affected to deflation by a 0.08% but in October it affected the inflation by 0.08%.

Table 1.10 Contribution of Vegetable Month to Month Inflation (+) / Deflation (-) to National Inflation in 2018 (%)

Commodity	Dec-17	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Small chili	0.02	0.03	0.01	0.02	-0.01	-0.03	0.03	0.03	-0.02	-0.02		-0.01	0.01
Big chili	0.06	0.03	-0.01	0.07	-0.03	-0.08	-0.02	-0.02	-0.02	-0.03	0.08	-0.03	-0.03
Spinach		0.01	-0.01	0.01	-0.01			0.01	-0.02				0.01
Tomato	0.02	0.01		-0.01	0.01		0.01	0.01	-0.01	-0.02	-0.01	0.01	0.01
Potato		0.01	-0.01	-0.01						0.01	-0.01		
Shallot	-0.01	-0.01	0.02	0.04		0.02	0.01	-0.05	-0.04	-0.04	-0.02	0.04	0.05
Garlic			0.04	0.04		-0.04	-0.01		-0.01				
Long beans			-0.01					0.02		-0.01			
Chinese Cabbage			-0.01	0.01					-0.01				
Kangkung				0.01	-0.01			0.01	-0.01				
Carrot				-0.01								0.01	0.01
Cucumber									0.01	-0.01			

Source: Bank of Indonesia, 2018.

Mainly several fresh vegetables have become a national level hot issue. Especially the conditions of the prices of chili and shallot. The fluctuate of selling price sometimes become the political pressure for the government. Therefore the government pays more attention to control the instability of supply and disparity of selling price for those products.

Changes in selling price at the wholesale market of Kramat Djati in Jakarta

Bank of Indonesia recorded the extreme changes in selling price at the wholesale market of Kramat Djati in Jakarta in 2017. For example, small red chili had the highest of the selling price of Rp180,000/kg and the lowest selling price of Rp25,000/kg (see Table 1.11). The difference in selling price can be 620% (from Rp25,000/kg to Rp180,000/kg).

Table 1. 11 Changes of Selling Price of Red Small Chili at Wholesale Market of Kramat Djati Jakarta in 2017 (Rp thousand)

Selling Price	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Highest	150	180	160	80	40	80	60	50	35	30	35	65
Lowest	135	150	90	65	38	48	48	30	25	25	25	27

Source: Bank of Indonesia, 2018.

Therefore the condition of supply and demand of vegetable affects the national economy. The changes in weather and uncontrolled production created the fluctuation of supply. The policy of the government to control the volume of import also affects the creation of inflation and deflation. Thus, Bank of Indonesia (2008) suggested policy recommendation for the food system, e.g. supporting farmers by providing production technology, post-harvest technology, and improvement of the management of SC and market structure.

Changes in food trade form

FAO (2017) paid attention that there have been changes in trade forms of food. It can be caused by the rapid urbanization, changes in consumer preferences and also the existence of modern markets. Those changes will affect the ability of farmers who used to be involved in the traditional forms of trade.

Furthermore, Reardon, et al. (2007) informed that the emergence of the modern market, e.g. the supermarket has been started since the early 1990s. Supermarkets influence the SC and also farming by their procurement systems. Transnational supermarkets introduced the modernized procurement system to its suppliers. In Indonesia, 35% of total sales of fresh vegetable are traded by supermarket chains; meanwhile, in the case of fruits it was already 65%. It means that the rapid of changes for fresh vegetables trade from traditional SC to modern SC is slower than that in fruit trade.

The increase of Foreign Direct Investment (FDI) in Indonesia started in January 1998 as the Letter of Intent (LoI) between the Government of Indonesia and the IMF had been signed. On the LoI, the restrictions on foreign investment in wholesale and retail trade should be revoked by March 1998. The LoI gave transnational modern retail companies opportunities to enter Indonesia market.

Emerging of modern retailers

United States Department of Agriculture (2016) found that after the liberalization of trade and allowing for FDI in 1998, numerous transnational modern retail companies have invested in Indonesia. Companies: Carrefour (French), Lotte Mart (South Korea), Lulu (Indian), Aeon (Japan), Giant, and many others. They sell high-quality fresh products adjusted to the changes in consumer preferences, especially those with middle and upper-level income who are influential buyers at the stores.

The modern retail companies affect the creation of fresh vegetable modern SC. Hernandez, et al. (2015) informed that the changes in trade form has influenced the emergence of agents in the SC of tomato. Where in 1986s, small collectors dominated the trade at a local market near the village or cities. But in 1990s new big collectors bought the vegetables from small collectors and sold again at a wholesale market in big cities, such as Jakarta and Bandung. Then in the 2000s, a new middleman agent has emerged and he has been specialized and dedicated to certain particular belonging to modern SC such as supermarkets, hotels and fast-food companies.

The modern SC gives advantages to farmers who could access it. Sahara et al. (2013) found that small chili farmers could get 75% higher income per capita in supermarket SC then

that in traditional SC. Some factors could support the decision of small chili farmers to enter the business with a supermarket. They were the open-minded and adapt to new procurement systems with post-harvest storage facilities ownership.

Our study found that there are also buyers in modernized SC that have a different form of trade from traditional SC and influence the farm business of farmers. Agriculture products are mostly produced in rural areas and it will be influenced by the condition of SC. Thus, there are transformations meaning not only the creation of new agents and trading behavior in the SC but also the farm business done by the farmers who have been able to access modern SC.

Schultz (1964) posited that it is crucial to transform traditional agriculture into modern agriculture to achieve the improvement of the national economy. Modernization is a process of changing from traditional practices into advanced practices. Modernization can improve productivity through the utilization of new technologies and new organization of farms (Kusz, 2014).

The development of agriculture can also be affected by the changes in the behavior of marketing agents, for example, the transformation from ordinary farmer to agent farmers. The advent of new modern markets that are linked across the nations through the transnational company has brought changes to the development of a vegetable economy. Transnational supermarket spread the effects of their procurement mechanism, mainly being concerned about high-quality requirements, on the SC and finally transform the farming practices (Reardon et al., 2007).

Type of farmer

(1) Ordinary farmer

A farmer who only produces vegetable and cannot organize the marketing of other farmers' product to buyers directly. They prefer to be ordinary farmers because they do not want to deal with the complexity of tasks as agent farmers. In addition, they do not have enough capital to play the role as a middleman

(2) Agent farmer

Agent farmer is a type of farmer who produces vegetables and also organizes the marketing of other farmers' to the buyer directly. They can be identified based on the type of SC, i.e. collector farmers and supplier farmers.

(2-1) Collector farmer

Collector farmer is a farmer who can organize the marketing of his products and other farmers' products to certain buyers in traditional SC. Based on its capacity of trade, there are the small collector and big collector. A small collector will collect vegetables from farmers in

the surrounding area near his house and then sell to big collectors. Meanwhile, big collector will collect big volume of vegetables from several farmers and small collectors and then sell it to traders at the wholesale market.

(2-2) Supplier farmer

Another type of agent farmers is identified as supplier farmers. They mostly are recognized based on the ability not only collecting vegetables from many sources but applying the post-harvest handling practices such as cleaning, grading the quality, packaging and transporting. Therefore their post-harvest handling facilities unit is known as *`gudang`* or post-harvest handling storage. The respondents explained that *`gudang`* means a business unit of a particular supplier to modern SC. They supply the products to supplier companies, supermarkets, exporter companies and fast-food companies. They also have a specific target of order and therefore they adjust the production to ensure the continuity of supply.

The government then should prepare the farmers to adjust to the dynamic changes in the SC. Weak and poor farmers should be able to participate in modern SC to get the improvement of income and farming culture. Therefore, in the next discussion, some policies have been applied by the government related to the changes in the SC in Indonesia.

1.2 Government Policy

Government plays an important role in improving the fresh vegetables SC. The government produces some policies through regulations, policy directions and strategic actions. This chapter will discuss the roles of government related to the modernization of fresh vegetable SC management practices. This study collects relevant information from several regulation documents and also the interview results from government officials.

Regulations

Regulation is needed as the direction for all stakeholders in the fresh vegetable industry. Based on several regulations, some regulations can improve the SC. Meanwhile, there are also some regulations that can intricate factors to make changes. In addition, this study found there is a gap of regulations that hamper the improvement of SC.

(1-1) Supporting regulations

(1) LoI 1998

In 1998 when Indonesia was suffered from monetary crises, the government signed the Letter of Intent (LoI) with the International Monetary Fund (IMF). One of the points was to encourage the FDI to have a business in Indonesia. Carrefour as French-owned transnational company was recorded to open their first store in Jakarta in the same year. After that, more numerous multinational companies were following to open their stores in certain big cities in

Indonesia. They recently took part as big players of modern retailers (for food and non-food products). Their existence has introduced procurements system, e.g. fresh vegetable trading mechanism and affected to the farming system (Bahri et al., 1998; Natawidjaja et al., 2007, Prastowo et al., 2008, USDA, 2016).

(2) Law Number 18 in 2012

The government also has produced the Law Number 18 in 2012 (as a revision of law number 7 in 1996) about food that mainly to protect consumers. This law regulates comprehensively all stakeholders involved in the food business (fresh or processed food). Consumers should also be protected from bad marketing system that can create monopoly or cartel.

This regulation also emphasizes the application of post-harvest handling practices, good handling practices, good manufacturing practices and good marketing practices in the SC. Consumers have the right for information about the food they want to buy and consume on the label. This regulation describes the implementation of standardization that matches with the modern market procurement systems.

(3) Law number 19 in 2013

On the producer side, there is Law number 19 in 2013 that protects and empowers farmers. In this law, the modern market should prioritize the sales of agriculture products from domestic production. The government will restrict modern market that does not cooperate with farmers' organization (FO), e.g. farmers' group (FG), farmers' groups union (FGU), cooperative or other farmers' economic organization. This regulation also suggests the wholesale market to apply the auction systems that protect farmers' income as the priority. This regulation is more clearly described the attention of government to increase the welfare of farmers as a producer to modernize the SC.

Other derivative regulations that can be considered supporting the modernization of the fresh vegetable SC are:

(4) Government Ordinance number 28 in 2004

Government Ordinance number 28 in 2004 about food safety, food quality and food nutrition. It directs related agents to fulfill the sanitary along the SC by applying Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Good Marketing Practices and Good Retailer Practices.

(5) Agriculture Ministerial Decree Number 61 in 2006

Agriculture Ministerial Decree Number 61 in 2006 about Guidance of GAP of Fruits. This decree explains about quality certification for the production system. There are three classifications for the production system.

The first one is named Prima 1. It is a qualification for a production system that can produce crops that qualified as safe to consume, good quality and eco-friendly of production practices. Prima 2 is a classification for the production system that can produce crops that qualified as safe to consume and good quality. Prima 3 is the classification for the production system that can produce crops that qualified as safe to consume. This regulation guides farmers to match with the requirements asked by the exporter and supermarket to have Prima 1 and 2 for the products.

(6) Agriculture Ministerial Decree Number 48 in 2009

Agriculture Ministerial Decree Number 48 in 2009 about Guidance of Good Agricultural Practices for fruits and fresh vegetables production system. This decree is complimentary for the previous Agriculture Ministerial Decree number 61 in 2016 that just adding fresh vegetables.

(7) Agriculture Ministerial Decree Number 20 in 2010

Agriculture Ministerial Decree Number 20 in 2010 about food quality guarantee system for agriculture products. This regulation was produced to protect consumers and increase the competitiveness of agriculture products from domestic production. In this decree, farmers and other agents in the food business should comply with the HACCP system in the production, post-harvest and manufacturing systems. The organic product producers should also have organic certification.

(8) Agriculture Ministerial Decree Number 22 in 2015

In addition, Agriculture Ministerial Decree Number 22 in 2015 about the Guidance of Good Post-Harvest Handling Practices (GHP) for Agriculture Products. This decree is produced to keep low of losses, extend the duration of storage lifetime, maintain the freshness, increase the value-added, increase the competitiveness, grow profit and develop good post-harvest handlings practices continuously.

(9) The Indonesia National Agency of Drug and Food Control Decree Number 03.1.23.12.11.10569 in 2011

Furthermore, The Indonesia National Agency of Drug and Food Control Decree Number 03.1.23.12.11.10569 in 2011 about the Guidance of Good Retailing Practices in traditional and modern markets. This regulation explains that modern market can be formed as minimarket

(less than 400 m²), supermarket (400-5,000 m²), and hypermarket (more than 5,000 m²). Cold storage facility is recommended to be available in every market for food retail.

In this regulation, some requirements affected the procurement mechanism in the modern market. For example, the modern market should require the supplier about food safety standard certificate, GAP, GHP and GMP. Modern market should conduct the selection and check for freshness and quality before selling at the store. The handling of food during transportation should preserve the temperature to maintain the freshness and quality of the products.

Modern market should provide a special system to control the process of acceptance, storage and handlings of food products at the storage. The system should be able to trace food that is missing or overstock or any irregularity situation. This regulation also recommends the place to display the fresh vegetables, the modern market should inform the expired date of the fresh vegetables and set the schedule to circulate the new products.

However, this decree mostly regulates for the modern market but for the traditional market is not included. This decree might also be the factor that creates a difference in procurement system between modern and traditional markets.

Furthermore, for organic labeled products, there is regulation named SNI 01-6729-2002 about requirements of production and labeling organic foods. This regulation is also to harmonize with international requirements for organic products related to the standard of production and marketing, inspection and labeling in Indonesia.

(1-2) Enfeeble regulations

(1) The Indonesia National Agency of Drug and Food Control Decree Number 5 in 2015

Some regulations impeded the improvement of SC. First, the Indonesia National Agency of Drug and Food Control Decree Number 5 in 2015 about Guidance of Good Retailing Practices in traditional markets. It defines that a traditional market is a place that has a bargaining process between consumers and the traders in the transaction. This bargaining process creates on-the-spot selling price or uncertainty condition. This regulation is different from the regulation that manages the modern retailer to show the selling price of the products on the packaging and without bargaining process.

In addition, there is no recommendation to have a refrigerated vehicle to bring fresh vegetables to traditional market from the farm area. The observation mechanism concerns only about the freshness, cleanness and free from other things. This regulation, therefore, affecting the suppliers have fewer concerns on modernizing procurement system.

(2) Trade Ministerial Decree number 70 in 2013

Another regulation is Trade Ministerial Decree number 70 in 2013 about guidance on managing and guiding traditional market, shopping center and modern shops. It states that there are requirements of the transaction between supplier and modern market including the ability of the supplier on providing their facilities, type of costs such as rebate and other types of cost. Those detail requirements make individual farmer will not be able to access.

In addition, this regulation explains that the period of payment from modern retailer to its supplier, especially small medium enterprises for the total value of supply until ten million rupiahs, can be paid directly by cash or during 15 days after all the invoice documents has been confirmed. This period of payment is in line with the information gathered from respondents of supermarkets staffs and supplier companies. This length of the period of payment is a burden for suppliers and also agent farmers` cash flow. This regulation also has no direction that manages about the transaction between supplier and trader at the traditional market.

Furthermore, the modern retailer with minimarket formed cannot sell fresh food in bulk or groceries. This regulation creates a dilemma, because mainly it protects the existence of a local traditional market, however, because modern retail of minimarket can influence to change the SC for farmers who located near the minimarket so that the traditional SC will keep the practices remain traditionally.

This situation describes how difficult to improve if there is no changes in the procurement system and transaction systems at the wholesale market and also at the local traditional market in which the current system gives advantages more to traders.

(1-3) Vacuous regulations

Besides revising some existing regulations, more regulations are still needed, especially that can protect farmers from being exploited by bad middlemen. No regulation manages the activity of middleman in the traditional SC. Also, there is no strict regulation that manage cropping schedule and also the distribution or flow of crops in every fresh vegetable production center. This regulation is needed to provide updated information of production or supply and prevent hoarding or tricky stockpiling by certain middleman or agents who want to take benefit from the suddenly increasing of selling price at the market by delaying supply.

Policy directions

Directorate General (DG) of Hortikultura, as one of the units of the organization under the Ministry of Agriculture (MoA), has made some policy directions related to the improvement of the SC.

The policy direction has been changing adjusting with the current problems. Before 2009, the policy directions focused on how to increase the production of several commodities, mainly

fruits and vegetables. During 2009 until 2015, the implementation of quality standard, e.g. GAP, GHP and GMP had been aroused. Then, from 2015 until now, the policy direction concerns on stabilizing the selling price of shallot and chili and also increasing the production of orange for reducing import. Shallot and chili are considered as volatile goods that have a strong influence on national inflation. The fluctuation of selling price at the consumer level becomes a political issue for the government. Therefore, recently, the focus is more to maintain the supply of shallot and chili all the year.

The issue about improving fresh vegetable SC has been already accepted as important since 2009 by stressing the empowerment of farmers' organization (FO), providing post-harvest handling facilities and also supporting promotion and investment to support farmers' organization.

In general, problems faced by farmers in Indonesia are low of bargaining power especially during harvest seasons, little of value added of agriculture products, limited of capital and limited access of food at offseasons.

In 2015, MoA produced Ministry of Agriculture Decree number 11 in 2016 about technical guidance for empowering the distribution organization of society food. Unfortunately, this regulation concerns only for paddy and corn and not yet about fresh vegetables and other commodities.

Notwithstanding, the government has implemented several strategic actions to support the improvement of fresh vegetable SC. Government comprehensively provides supports, e.g. technical guidance, field school of integrated pest management, provision of good quality seed, orchard registration, quality standards (GAP, GHP and GMP) certificate registration, marketing and empowering farmers' organization.

Interview results

This study interviewed government officials at DG of Horticulture, MoA, and Agriculture office of West Java Province and Agriculture office of West Bandung District and also Extension officials at Lembang, Parongpong and Cisarua Subdistricts (see Table 1.12).

All respondents informed that in general fresh vegetables is supplied through traditional SC with a complex and inefficient marketing channel. The production area of a farmer, in general, is small or less than 0.5 ha, this is in line with the classification definition of a small farmer in Law number 19 in 2013 and scattered in isolated areas. Farmers also produce in traditionally because they have difficulties in accessing the capital from a bank or other sources of credit. Farmers also have less opportunity to access market information. This situation

creates dependency on certain middlemen who can provide loan and marketing service. This dependency is also a factor that creates farmers have weak bargaining power.

The respondents proposed that improvement should be started by changing the mindset of every individual farmer to be organized farmers. They believed that through farmers' organization, they also could access to the modern market and then improve their farm business management.

Table 1.12 Government Respondents

Government	Institution	Respondent
National	Directorate General of Horticulture, the Ministry of Agriculture	4
Provincial	Agriculture and Food Crops Office of West Java Province	3
District	Agriculture and food security Office of West Bandung District	4

Source: Field Survey, 2016 - 2019.

Government has produced Law No. 19 in 2013 about protection and empowering farmers. This regulation emphasizes that the government should protect and empower farmers. Therefore, through their budget (national, provincial and district) government implement the strategic actions. Also, Government distributes supports through farmers' organization.

Respondents at provincial and district levels informed that the capacity of every provincial and municipal government level are different based on the condition of its regional economy. They have minimal budget capacity to support farmers to improve the SC practices. The respondents agreed that the most prominent role is still from the MoA.

The respondents admitted that the support from the government to make significant changes into SC practices is still low. It happened because budget allocation from national income and expenditures also mostly influenced by political concerns. Until now, the focus is still on how to stabilize the selling price of shallot and chili all over the year by ensuring the production pattern in all over production center.

However, several supports that have been delivered to some respondent farmers in West Bandung District are as listed in Table 1.13. Based on our interviewed and observations, some FOs received supports from various sources. Respondents from Ministry of Agriculture and Agriculture Office at Provincial and District level informed that they have a small budget to support the fresh vegetable farmers. Most of the supports are mainly from the MoA. Supports given by the government, e.g. field school of GAP and Integrated Pest Management (IPM) practices, facilitation of partnership between farmers' organization with certain buyers, e.g. exporter or importer from Singapore, facilitation of promotion for farmers' organization into certain events.

Table 1.13 Supports Received by FOs

Supports	Source	Year	Respondents
Production trainings	JICA	2016-2019	Cooperative-No. 3 Cooperative-No. 1 Cooperative-No. 2 FGU No. 2
Agribusiness trainings	Taiwan International Cooperation and Development Fund (ICDF)	2015-2019	Cooperative-No. 3 Cooperative-No. 2 FG-No. 16 FG-No. 17 FG-No. 18 FG-No. 28
Investment capital partnership	Fast-food Company	2017 2013	Cooperative-No. 2 Cooperative-No. 3
Production facilities	Bank of Indonesia	2015	Cooperative-No. 2
Production trainings	West Bandung District	2016 2000	FGU-No. 2 FG-No. 2
Business meeting facilitation	Ministry of Agriculture	2012	FG-No. 14
Post-harvest handling facilities	Ministry of Agriculture	2016 2012 2010	FG-No. 14 FGU-No. 2 FG-No. 1
Investment capital	Ministry of Agriculture	2010	FGU-No. 3

Source: Field research, 2016 - 2019.

The government also encourages other organizations that have concerns to improve the fresh vegetable SC. The MoA facilitates the provision of support from other agencies, e.g. when the study was conducted, JICA and Taiwan ICDF to develop the fresh vegetable business in West Bandung District. The JICA project, for instance, is focussing not only on learning and increasing the productivity of farmers' production but also trying to connect FO to targeted exclusive Japanese supermarkets in big cities.

Meanwhile, Taiwan ICDF tries to improve the farm business of vegetable farmers in West Bandung District to access modern SC. They selected various leaders of FOs in West Bandung District as the core farmers to organize 1,800 farmers participating in the program.

Moreover, Rankin et al. (2016) informed a case of public-private partnership in the project of sweet pepper pilot SC project from 2003 until 2010 in Cisarua Subdistrict supported by HORTIN. The project emphasized the improvement of farm business management and provided supports and loan. HORTIN project selected farmers' groups who already have an agreement with an exporter company as the loan guarantor.

The beneficiaries should be member farmers of FO, i.e. farmers' group (FG), farmer groups' union (FGU) and cooperative, not an individual farmer. Those FOs that have excellent

performance in agribusiness and been well-known among the officials of Agriculture Office at provincial and district level will be easy to be acknowledged and be chosen as the potential targeted beneficiaries in government projects and also other agencies projects.

The distribution through FO has increased the awareness to other farmers as one of the benefit of forming FO. Other agencies like Bank of Indonesia also implemented some projects to the selected and trusted FOs. The good performance of FOs and networks also created other sources like a fast-food company would like to make a direct partnership with them.

The approach through FO shows how the government has developed collective action to improve the agribusiness of a farmer. However, there are still tasks to do, especially empowering the roles of FO in managing the SC.

Government has realized that global trade competition has been changing fast, for example, the ASEAN Free Trade Agreement (FTA) since 2010 and ASEAN Economic Community (AEC) since 2015, will create competition in the fresh vegetable industry. Therefore, the government still has a lot of homework to increase the competitive advantages of farmers. It should be considered to make a revolution in managing the trading system at the wholesale market as the key access point to make huge changes in the traditional SC. The government should produce critical policies that can catch the potency of FDI to improve the farm business management.

Chapter 2

Agriculture and Farmers' Organizations in West Bandung District

2.1 Agriculture in West Bandung District

West Java Province consists of 27 Districts, 627 Sub Districts and 3,291 villages. West Bandung District is one of the Districts of West Java Province. West Bandung District was officially enacted in 2007 by the enactment law number 12 in 2007. West Bandung District previously was a part of Bandung District. West Bandung District consists of 16 subdistricts where the economy is dominantly supported by the agriculture sector.

According to Statistic West Bandung District (2018), the district is located in 6°37'3" - 7°13'1" South Latitude and 107°11'0" - 107°14'40" 06" East longitude. It has 1,305.77 km², the minimum of temperature 16.2 °C and the maximum is 32 °C. The precipitation is 112.6 mm and the duration of sunshine is 51.58 percent. The highest number of rainy days are in March, April, October and November.

Table 2.1 Profile of West Bandung District in 2017

No	Subdistrict	Area (km ²)	%	Population	%	Density	Village
1	Rongga	113.2	8.7	55,821	3.4	493.12	8
2	Gununghalu	160.64	12.3	74,153	4.5	461.61	9
3	Sindangkerta	120.47	9.2	66,413	4.1	551.28	11
4	Cililin	77.79	6.0	86,929	5.3	1,117.48	11
5	Cihampelas	46.99	3.6	111,069	6.8	2,363.67	10
6	Cipongkor	79.96	6.1	88,638	5.4	1,108.53	14
7	Batujajar	32.04	2.5	93,832	5.7	2,928.59	7
8	Saguling	51.46	3.9	29,958	1.8	582.16	6
9	Cipatat	126.05	9.7	129,339	7.9	1,026.09	12
10	Padalarang	51.4	3.9	168,512	10.3	3,278.44	10
11	Ngamprah	36.01	2.8	167,034	10.2	4,638.54	11
12	Parongpong	45.15	3.5	105,880	6.5	2,345.07	7
13	Lembang	95.56	7.3	187,815	11.5	1,965.41	16
14	Cisarua	55.11	4.2	72,403	4.4	1,313.79	8
15	Cikalongwetan	112.93	8.6	117,533	7.2	1,040.76	13
16	Cipeundeuy	101.09	7.7	80,989	4.9	801.16	12
	Total	1,305.9	100.0	1,636,318	100.0	1,253.07	165

Source: Statistic West Bandung District, 2018.

West Bandung District has competitive advantages for the vegetable farm business. It is located 150 km from the capital city, Jakarta, and 16.8 km from Bandung city as the capital of West Java Province.

In addition, it has a hilly and mountainous contour that suitable for vegetable and dairy farming rather than food crops (such as paddy) or estate crops (such as palm oil) production.

Furthermore, the extension officials in Lembang, Parongpong and Cisarua Sub District are mainly experts on vegetable farming.

For those advantages, Ministry of Agriculture locates Vegetable Research Center and Horticulture Agribusiness Center in Lembang Sub District. Several big supplier companies, e.g. PT Momenta Agrikultura and PT Bimandiri as the main suppliers of Transmart Supermarket Retailer, of fresh vegetables, also locate their storage and office in Lembang Sub District. Our interview results with the respondents of the supplier companies explained that they want to get closer to the producer and have better infrastructure, e.g. electricity and high-way to reach Jakarta area as the main target of supply.

Therefore this area has been known to have the advanced case in terms of modernization of vegetable SC. We picked up Lembang Sub District and neighboring sub-districts, Parongpong and Cisarua following the suggestion by extension officials and such sub-districts have the following characteristic about vegetable production.

Table 2.2 Contribution of Agriculture, Forestry and Fisheries Sectors to GRDP at Current Market Prices 2013-2017 (Rp million)

Sub Sector	2013	2014	2015	2016	2017	(2013-2017)
Agriculture, Forestry and Fisheries	4,034,058	4,476,094	4,642,950	5,187,604	5,778,646	43.2
West Bandung District GRDP	27,382,963	30,675,318	33,979,150	37,084,119	41,196,694	50.4
Contribution Sector to Total GRDP (%)	15	15	14	14	14	85.7

Souce: Statistic West Bandung District , 2018.

The agriculture sector accounts for 14% of Gross Regional Domestic Product (GRDP) of West Bandung District. It has a positive trend because the agriculture, forestry and fisheries sectors had been increasing for 43.2%. Therefore, agriculture, forestry and fisheries sectors play an important role in the economy of West Bandung District.

The agriculture sector also plays an essential role in the view of providing occupation for the citizens. In 2017, Statistic of West Bandung District recorded that almost 175,113 people were working in the agriculture sector, and they can be farmers and other professions related to agriculture. The biggest number of people working in the agriculture sector are those of Lembang Sub District (23,460 people) and Cisarua Sub District (20,908 people).

The data indicates that agriculture is an important sector in some regions. For example, based on Table 2.3, 57.8% people are working in the agriculture sector in Cisarua Sub District, 62% the residents are working in the agriculture sector in Rongga Sub District.

Vegetable production in West Bandung District

Table 2. 3 Number of Working People Based on Job Field in West Bandung District in 2017

No	Subdistrict	Agriculture	Industry	Trade	Service	others	Total	Agriculture (%)
1	Rongga	12,948	1,233	1,274	2,026	3,410	20,891	62.0
2	Gununghalu	12,024	1,606	5,558	3,626	8,058	30,872	38.9
3	Sindangkerta	11,713	2,221	3,485	2,682	8,372	28,473	41.1
4	Cililin	9,384	4,748	7,451	6,244	6,978	34,805	27.0
5	Cihampelas	7,643	10,392	7,008	6,848	9,407	41,298	18.5
6	Cipongkor	10,392	2,172	2,832	1,316	11,816	28,528	36.4
7	Batujajar	3,018	11,328	4,184	5,591	7,682	31,803	9.5
8	Saguling	6,167	1,894	945	676	2,814	12,496	49.4
9	Cipatat	8,485	5,996	5,665	4,641	18,685	43,472	19.5
10	Padalarang	3,685	26,968	13,070	6,369	16,048	66,140	5.6
11	Ngamprah	9,396	21,474	11,454	9,644	17,740	69,708	13.5
12	Parongpong	8,871	1,931	8,889	10,520	10,941	41,152	21.6
13	Lembang	23,460	3,145	19,635	12,835	19,040	78,115	30.0
14	Cisarua	20,908	1,944	5,512	2,896	4,914	36,174	57.8
15	Cikalongwetan	13,825	7,574	8,838	4,220	13,906	48,363	28.6
16	Cipeundeuy	13,194	4,068	4,896	2,536	9,364	34,058	38.7
	Total	175,113	108,694	110,696	82,670	169,175	646,348	27.1

Source: Statistic West Bandung District, 2018.

Statistic of West Bandung District in 2015 recorded that there were several vegetables mainly produce in West Bandung District. Chili pepper for example, account for 95%, then mushroom for 23%, squash for 22% and cauliflower for 11% of West Java Province production respectively. This production data is in line with the result of the interview to Procurement staff of Transmart Supermarket informing that primary sources of fresh vegetables are from Lembang area (West Bandung District) and Puncak (Bogor District).

Table 2.4 Vegetable Production and Area in West Bandung District, 2015 and 2018

No	Commodity	2015		2018*		(2015-2018)		Compared to West Java Province in 2015	
		Area (Ha)	Production (Ton)	Area (Ha)	Production (Ton)	Area (%)	Production (%)	Area (%)	Production (%)
1	Shallot	14	87	11	101	-21.4	15.7	0	0
2	Garlic	-	-	-	-			-	-
3	Leek	207	1,903	263	3,246	27.1	70.6	2	1
4	Potato	52	1,310	55	1,690	5.8	29.0	0	1
5	Cabbage	149	2,714	288	4,111	93.3	51.5	1	1
6	Cauli Flower	145	2,310	165	2,141	13.8	-7.3	10	11
7	Chinese Cabbage	167	1,554	263	2,793	57.5	79.7	1	1
8	Carrot	74	878	60	557	-18.9	-36.6	1	1
9	Radish	56	604	44	548	-21.4	-9.2	9	5
10	Red Beans	70	323	43	445	-38.6	37.8	1	1
11	Long Beans	356	3,855	186	1,484	-47.8	-61.5	4	4
12	Big Chili	272	4,132	747	6,825	174.6	65.2	2	2
13	Small Chili	275	4,608	683	4,750	148.4	3.1	3	4
14	Chili Pepper	76	3,156	190	2,324	150.0	-26.4	86	95
15	Mushroom	22	425	58	139	162.1	-67.4	7	2
16	Tomato	329	9,423	366	5,377	11.2	-42.9	3	3
17	Eggplant	155	3,319	197	2,261	27.1	-31.9	3	4
18	Beans	269	5,465	349	2,825	29.7	-48.3	5	6
19	Cucumber	198	4,530	374	4,250	88.9	-6.2	2	3
20	Squash/Chayote	248	23,623	441	8,240	77.8	-65.1	19	22
21	Kangkung	116	1,626	213	2,136	83.6	31.3	2	3
22	Spinach	49	417	161	872	228.6	109.0	1	2
	Total	3,299	76,259	5,157	57,113	56.3	-25.1	2	3

Source: West Bandung District, 2016 and 2019.

Note: * Temporary data

Table 2.5. Vegetable Production in Sub Districts of West Bandung District in 2015

No	Subdistricts	2015		Percentage of every Sub District	
		ha	ton	Area (%)	Volume (%)
1	Rongga	69	335	1.4	0.6
2	Gununghalu	59	279	1.2	0.5
3	Sindangkerta	426	5,595	8.9	9.5
4	Cililin	277	2,405	5.8	4.1
5	Cihampelas	52	419	1.1	0.7
6	Cipongkor	52	340	1.1	0.6
7	Batujajar	109	639	2.3	1.1
8	Saguling	73	405	1.5	0.7
9	Cipatat	485	3,481	10.2	5.9
10	Padalarang	62	375	1.3	0.6
11	Ngamprah	1,018	6,262	21.4	10.7
12	Parongpong	410	3,535	8.6	6.0
13	Lembang	234	2,520	4.9	4.3
14	Cisarua	283	4,295	5.9	7.3
15	Cikalongwetan	108	712	2.3	1.2
16	Cipeundeuy	1,045	27,110	21.9	46.2
Total		4,762	58,708	100.0	100.0

Source: West Bandung District in Figures, 2016.

In 2015, the major vegetable production area were regions of Cipeundeuy, Ngamprah, Sindangkerta, Cisarua, Parongpong and Lembang Sub Districts (see Table 2.5). According to the result from interview to extension officials and Agriculture Office of West Bandung District, the northern part of West Bandung (which is Lembang, Parongpong and Cisarua Sub Districts, as shown in Fig. 2.1) is a role model for advanced of farm business in this area.

**Fig. 2.1 Map of West Bandung District**

Every sub-district in the northern part of West Bandung District has its major vegetables. Based on temporary data in 2018, there were some vegetables produced over 500 kg in a year in the northern part of West Bandung District. As shown in Table 2.6, in Lembang Sub District, produced chili pepper (750 ton), tomato (740 ton), small chili (720 ton), potato (720 ton) and squash (520 ton). Parongpong Sub District produced squash (1,510 ton), cauliflower (882 ton)

and cabbage (795 ton) were produced. In Cisarua Sub District squash (2,220 ton), tomato (1,260 ton), chili pepper (1,094 ton), cabbage (1,034 ton), beans (623 ton), big chili (610 ton) and leek (500 ton) were produced.

Table 2.6 Vegetable Production and Area in Selected Sub Districts in West Bandung District in 2018*

No	Commodity	Lembang		Parongpong		Cisarua		West Bandung District	
		Area (Ha)	Production (Ton)	Area (Ha)	Production (Ton)	Area (Ha)	Production (Ton)	Area (Ha)	Production (Ton)
1	Shallot	-	-	-	-	-	-	11	1,010
2	Garlic	-	-	-	-	-	-	-	-
3	Leek	37	435	48	310	49	500	263	32,464
4	Potato	26	720	-	-	1	10	55	16,900
5	Cabbage	47	120	50	795	76	1,034	288	41,114
6	Cauli Flower	33	240	51	882	62	750	165	21,409
7	Chinese Cabbage	32	240	43	222	23	288	263	27,930
8	Carrot	13	180	37	228	10	149	60	5,566
9	Radish	17	360	27	188	-	-	44	5,480
10	Red Beans	8	26	-	-	-	-	43	445
11	Long Beans	17	18	15	73	-	-	186	1,484
12	Big Chili	79	700	55	302	67	610	747	6,825
13	Small Chili	88	720	42	178	42	320	683	4,750
14	Chili Pepper	32	750	-	-	38	1,094	190	2,324
15	Mushroom	2	8	-	-	44	67	58	139
16	Tomato	44	740	23	187	56	1,260	366	5,377
17	Eggplant	18	270	22	110	28	224	197	2,261
18	Beans	30	510	16	144	63	623	349	2,825
19	Cucumber	24	230	-	-	13	164	374	4,250
20	Squash	29	520	56	1,510	34	2,220	441	8,240
21	Kangkung	6	60	7	104	-	-	213	2,136
22	Spinach	6	36	7	14	-	-	161	872
Total		588	6,883	499	5,246	606	9,313	5,157	193,799

Source: Statistic West Bandung District and Directorate General of Horticulture, 2019.

Note:* Temporary

Table 2.7 Percentage of Vegetable Production and Area in Three Selected Sub Districts to West Bandung District Level in 2018*

No	Commodity	Lembang		Parongpong		Cisarua	
		Area (%)	Production (%)	Area (%)	Production (%)	Area (%)	Production (%)
1	Shallot	-	-	-	-	-	-
2	Garlic	-	-	-	-	-	-
3	Leek	14	13	18	10	19	15
4	Potato	47	43	-	-	2	1
5	Cabbage	16	3	17	19	26	25
6	Cauliflower	20	11	31	41	38	35
7	Chinese Cabbage	12	9	16	8	9	10
8	Carrot	22	32	62	41	17	27
9	Radish	39	66	61	34	-	-
10	Red Beans	19	6	-	-	-	-
11	Long Beans	9	1	8	5	-	-
12	Big Chili	11	10	7	4	9	9
13	Small Chili	13	15	6	4	6	7
14	Chili Pepper	17	32	-	-	20	47
15	Mushroom	3	6	-	-	76	48
16	Tomato	12	14	6	3	15	23
17	Eggplant	9	12	11	5	14	10
18	Beans	9	18	5	5	18	22
19	Cucumber	6	5	-	-	3	4
20	Squash	7	6	13	18	8	27
21	Kangkung	3	3	3	5	-	-
22	Spinach	4	4	4	2	-	-
Total		11	12	10	9	12	16

Source: Statistic West Bandung District and Directorate General of Horticulture, 2019.

Note: *Temporary

Compared to other sub-districts, Cisarua Sub District could account of 48% of chili pepper of the West Bandung District. Meanwhile, Lembang Sub District accounts for 32%. It indicates that some regions in the northern part of West Bandung District have been familiar for exclusive vegetable production.

This study found there are several farming systems found in Lembang, Parongpong and Cisarua Sub District. This farming practices adjusted to the type of supply chain.

Soil surface treatments

There are two types of soil condition, one is without plastic cover and another is with a plastic cover that is known as '*mulsa*', in Indonesia language (see Fig. 2.2 and Fig. 2.3). The initial cost using plastic cover is more expensive than open surface soil. The leader of FG-No. 16 have to spend Rp1.8 million for plastic cover that can be used for planting 2,000 seedlings. Also the leader of Cooperative-No.1 has to pay Rp1 million for one roll of plastic cover that can cover 250 m of area. However, plastic cover soil can be used until two or three years so that it can decrease the preparation soil cost. Farmers make several holes in the plastic surface as the location for sowing the seeds and it is easier to manage the distance among seedlings. *Mulsa* soil makes it easier for farmers to make a multi-cropping system.



Fig. 2.2 Mono-cropping type of Shallot in Open Soil,
Source: Field Survey in a Respondent's Farm in
Parongpong Sub District, 2018.



Fig. 2.3 Mono-cropping type of Chili pepper in Green
House and plastic-covered soil, Source: Field Survey in a
Respondent's Farm in Cisarua Sub District, 2017.

Farming system

This study identified there are two cropping types found in the field research: mono-cropping and multi-cropping system or '*tumpang sari*' in Indonesia terminology. Mono or single-cropping (see Fig. 2.2) type means that only one kind of vegetables is grown in the field, while multi-cropping type (see Fig. 2.3) means more varieties of vegetables are grown in the same production area. These cropping types are used both in the traditional and in modern SC.



Fig. 2.4 Mono-cropping type of Lettuce in open field and plastic covered soil, Source: Field Survey in a Respondent's Farm in Lembang Sub District, 2016.

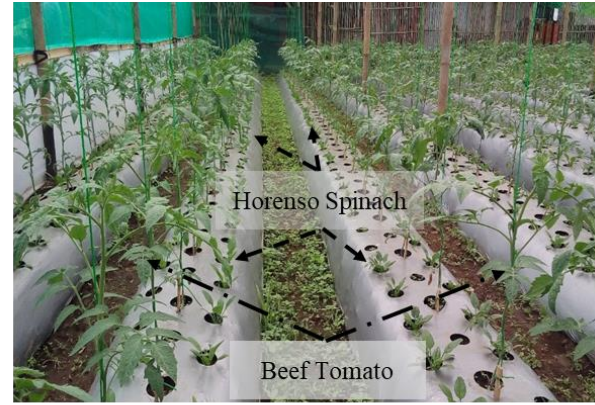


Fig. 2.5 Multi-cropping type, Beef Tomato and Horensso spinach, Source: Field Survey in a Respondent's Farm in Lembang Sub District, 2019.

Some farmers choose mono or single-cropping type because of the characteristic of the plant that is not suitable for multi-cropping type, e.g. chili pepper. Such a plant cannot be planted with other vegetables because they have thick branches and high sticks. In addition, a short period of the production cycle and sparse branches and leaves, e.g. Romain lettuce that needs around 20 through 30 days makes it suitable to do the single cropping system.

Other farmers choose the multi-cropping type because they want to optimize the farmland use, rotate of production capital and manage the cash flow, especially to cover the daily expenses. For example, a farmer member who joins the production plan program of FG No. 12 planted horensso spinach, beef tomato and beetroot on a ridge. The horensso spinach revenue can be used to cover the cost to maintain the beef tomato and beetroot production.

In addition, respondent farmers know about the benefit of rotation farming, mainly for recovering the condition of soil and control pest and diseases attacks. The idle time can be varied based on the soil condition and in general, the respondents answered one month is needed for the preparation time for the new production cycle.

Open field and greenhouse

Open field production area is a farming system that grows vegetable without any cover above the plants (see Fig. 2.2 and Fig. 2.4). Meanwhile, greenhouse (GH) production area is a farming system that grow vegetable inside a house covered by plastic or glass (see Fig. 2.3 and Fig. 2.5). Greenhouses in the field research area are mostly covered by plastic and the structure is made of bamboo.

Farmers in traditional and modern SCs grow vegetable in open field and greenhouse. Their reasons are the suitability of plants and the availability of production capital. Vegetables that planted inside GH are chili pepper, beetroot, beef tomato, horensso spinach, kale and other

exclusive vegetables. However, GH production is known as modernized production system than the open field.

Kenya beans cannot be produced in a multi-cropping system because it is a very dense tree and very tall so that it will not be optimized to combine cropping with other crops on the same ridge. The plants also need more sunlight and open-field production is more efficient from the aspect of sunlight used to produce in open-field soil rather than in GH.

Employment and wage

Vegetable production has generated income for farm workers. According to our interview with farmer respondents, the labor cost for production is around Rp50,000/person for a female and Rp75,000/person for a male a day where working hours start from 7 A.M. to 12 A.M. Farmers who own post-harvest handling facilities hire additional workers for cleaning, grading, and packaging of the products. The labor cost is around Rp75,000/person for a female and Rp100,000/person for a male with working hours from 7 A.M. to 4 P.M.

Our study found that instability of production is one of the big problems. They could not ensure the production and it triggers the condition of overstock and lack of stock. This condition will affect the fluctuation of selling price and behavior of spot market.

2.2 Farmers' Organizations (FO)

The government intends to establish FO to modernize vegetable SC and there are many FO found in this area and this is one of the reasons why this area has been recognized as an advanced case of transformation to modern SC. We are going to look at the situation of FO in this area.

Outlook of FOs

This study found three types of FOs. They are cooperative, Farmers' Groups Union (FGU) and Farmers' Groups (FG). Unfortunately, we could not get any statistic information about FO, so we collected information about FO as many as possible by interview to FO leaders. We observed 4 Cooperatives, 4 FGUs and 32 FGs (see Table 2.8). Year of establishment is varied and the oldest FO was established in 1990 and the latest one was established in 2018.

The number of the latest members are different. The smallest number of farmer is 5 and the biggest number is 40 farmers in one of FG. FGU is a union of several FGs and the number of members becomes bigger.

We listed all the FOs' respondents based on the classification of cooperative, FGU and FG. We put the order based on the year of establishment and the role of leader. The Table 2.8 is adjusted to Tables of leader's respondent used in Chapter 3 (Table 3.4. and Table 3.8 to 3.10) and Chapter 4 (Table 4.2 and Table 4.3).

The condition of every FO is very changeable. The changes can be acknowledged by looking at the process of increasing or decreasing number of member farmers from the initial year of formation (see Table 2.8). 4 FOs had been dissolved, 20 are not active and 16 FOs are active.

Active condition means that an FO still exists and has collective activities, e.g. participating in any training or the leader's production plan and marketing program. Inactive means that an FO still exists without certain activity. They will appear when there is an offer of support from government or other organizations and the member farmers still admit the existence of the FO. The last condition is dissolved where the FO totally does not exist anymore or has no member anymore.

Two FGs have been dissolved because some of the member farmers had been retired and others could not continue the rent contract with the landowner. One cooperative was dissolved because there had been a conflict among members and one cooperative was dissolved because there had been bad management of financial records by the board of management.

Other FOs are not active because they do not have a certain meeting or collective action of production and marketing. They will gather only when there is an invitation to join into specific training or if there are some supports such as production inputs from government or other organizations.

In addition, the number of members can easily be changed, and some FOs have increased to match the requirement to participate in specific training programs or to get the support from the government.

In 2019, we observed that the smallest number of members in a FO is 5 and the biggest number of member is 40. In case of a FGU, it is not changed but all are inactive. They are relatively stable, while other FOs are changed. This instability indicates that after forming the FO the next problem is to maintain the unity of the membership. Also, the increasing number of members creates a high risk of turmoil and then it can cause the dissolved and inactive condition.

Thus, the age of a FO does not so significantly affect the condition of FO. One FO dissolved after 20 years while the other FO was dissolved only after 1 year, meanwhile, the other 17 and 7 years respectively. The FO can be broken up at any time. So other factors create the disunity of an FO. Other findings are the weak of commitment from members to maintain the harmony in the FO and unclear purpose to form an FO. So there is no firm spirit on the agreement among members after the establishment. Besides, leaders have the biggest decision to manage an FO.

Table 2.8 Profile of Farmers' Organization (FO)

FO	Sub District	Establishment		Condition in 2019		Role	
		Year	Member	Status	Member	FO	Leader
Cooperative							
1	Cisarua	1999	50	Dissolved	0	Organising Member, production plan and marketing	Board Management of
2	Lembang	2012	95	Active	200	Organising Member, production plan and marketing	Board Management of
3	Lembang	2012	18	Active	7	Organising Member, production plan and marketing	Board Management of
4	Lembang	2018	20	Dissolved	0	Organising Member, production plan and marketing	Board Management of
Farmers' Groups Union (FGU)							
1	Lembang	2008	220	Inactive	220	Organizing Member	Supplier
2	Lembang	2009	100	Inactive	100	Organizing Member	Supplier
3	Lembang	2009	200	Inactive	200	Organizing Member	Supplier
4	Parongpong	2014	90	Inactive	90	Organizing Member	Big Collector
Farmers' Group (FG)							
1	Cisarua	1997	10	Active	6	Organizing Member	Supplier
2	Parongpong	2000	8	Inactive	10	Sharing information	Supplier
3	Lembang	2005	40	Active	26	Organizing Member	Supplier
4	Lembang	2005	26	Active	26	Organizing Member	Supplier
5	Lembang	2007	30	Active	20	Organizing Member	Supplier
6	Lembang	2007	10	Active	40	Organizing Member	Supplier
7	Lembang	2007	15	Inactive	31	Organizing Member	Supplier
8	Cisarua	2007	5	Active	5	Organizing Member	Supplier
9	Lembang	2008	10	Active	31	Organizing Member	Supplier
10	Lembang	2010	10	Active	6	Organizing Member	Supplier
11	Lembang	2010	10	Inactive	9	Organizing Member	Supplier
12	Lembang	2010	6	Active	40	Organizing Member	Supplier
13	Lembang	2010	8	Inactive	10	Organizing Member	Big Collector
14	Cisarua	2012	6	Active	6	Organizing Member	Supplier
15	Cisarua	2017	14	Active	14	Organizing Member	Supplier
16	Lembang	2010	5	Inactive	31	Organizing Member	Small Collector
17	Lembang	2010	18	Inactive	31	Organizing Member	Small Collector
18	Lembang	2012	17	Active	31	Organizing Member	Small Collector
19	Parongpong	2013	7	Inactive	7	Organizing Member	Small Collector
20	Lembang	2016	25	Inactive	31	Organizing Member	Small Collector
21	Lembang	1990	20	Inactive	31	Sharing information	No role
22	Lembang	1999	25	Inactive	15	Sharing information	No role
23	Lembang	1999	9	Active	13	Sharing information	No role
24	Lembang	2000	15	Inactive	15	Sharing information	No role
25	Lembang	2002	9	Dissolved	0	Sharing information	No role
26	Lembang	2007	8	Inactive	10	Sharing information	No role
27	Lembang	2008	10	Inactive	32	Sharing information	No role
28	Lembang	2009	20	Inactive	31	Sharing information	No role
29	Lembang	2010	10	Inactive	31	Sharing information	No role
30	Lembang	2012	5	Dissolved	0	Sharing information	No role
31	Parongpong	2013	6	Inactive	10	Sharing information	No role
32	Lembang	2013	10	Active	10	Sharing information	No role

Source: Field Survey, 2016-2019.

Chapter 3

Development of Vegetable Economy and Changing Supply Chain

The linkage between the demand of buyers and supply by producers influence the creation of supply chain (SC). Changes in demand pattern in every SC creates new agents who could connect farmers to consumers. On the other hand, farmers who have a competitive advantage of innovation and adapt to new technologies could form a new type of SC (Dolan and Humphrey, 2007; Natawidjaja et al., 2007).

Weak farmers, who are isolated from the access of information and technology, are stuck in the dependency of middlemen in traditional SC. This condition gives less opportunity for weak farmers to improve their farming business. Sahara et al. (2013) found that chili farmers, in eight districts in West Java Province, who can access the supermarket can get better income and change the culture of agribusiness to adapt to advanced technologies. They also found that the supermarket channel would keep increasing so that weak farmers should be prepared for capacity buildings by the government and other organizations. Moreover, Natawidjaja, et al. (2007) insisted that farmers' association could give positive effect to farmers to enter the modern market.

This study intends to provide empirical evidence about the changes in the vegetable economy in West Bandung District. This chapter discusses the development of the vegetable economy and its influences on the farm business in West Bandung District. The discussion starts with the result of the investigation on the current structure of SC and the improvement of farm business as the result of the development of the vegetable economy and strategy to deal with problems in SC.

We conducted a field survey in Lembang, Parongpong and Cisarua Sub-districts, the northern part of West Bandung District, to identify producers who can access the modern SC. We asked extension officials to select targeted respondents who can represent the changes in SC. We investigated how they improve their trading business and farming business and why it is still difficult for other farmers to change their farming.

We interviewed buyers of two supplier companies, one exporter company, one supermarket and one fast-food company, and three big collectors and six traders at wholesale and 10 retailers at the local traditional market to get information about their procurement mechanism and trades with farmers. We also interviewed 19 agent farmers as a supplier, four

agent farmers as a small collector and four farmers without the role of middleman in modern SC. In addition, we observed two agent farmers who play a role as big collector, 1 agent farmer as a small collector and seven farmers without a role as middleman or just ordinary farmer.

3.1 Outlook of Traditional and Modern SC

Table 3.1 Traditional Supply Chain and Modern Supply Chain (SC)

Aspects	Traditional SC	Modern SC
Requirements	No	Quantity, quality and continuity
Selling price setting	On the spot	Contract
Period of payment	One day	More than two weeks
Role of agents	Based on regular trade	Based on contract
Exclusivity	Open access	Closed access
Farmer's share	Relatively smaller	Relatively bigger
Existence of FO	No	Yes
Pattern	Relatively longer	Relatively shorter

Source: Field survey, 2016-2019.

There are distinctive characteristics of fresh vegetable SC resulted from the procurement system. In traditional SC there are no strict requirements. The instability of supply and information in traditional SC creates the spot selling price. Farmers face the situation of selling price like gambling. Any farmer can access the traditional SC and therefore do not need a role of farmers' Organization (FO). This condition is preferable for the existence of collectors' role. The existence of various collectors creates the length of SC is relatively longer and then creates the disadvantage of farm gate selling price entirely depends on the decision of collectors.

Meanwhile, modern SC is concerned about quality, quantity, continuity and period of payment. Thus it modernizes the farming and marketing behavior of farmers. Farmers can get a higher share from the grading of good quality products. They are more organized into a certain production plan adjusted to the targeted order. The new trading mechanism in modern SC gives stable of selling price through a flat selling price contract. Access to modern SC is closed for the accepted suppliers based on its supplying performance. Then farmers can participate in the modern SC through FO. Thus, FO can be used to replace the existence of traditional collectors. We summarize the differences from both SCs in Table 3.1.

Traditional SC

We gathered the typical features of traditional SC from middleman agents. Information was collected through the interview with small collectors, big collectors, traders at wholesale

market and retailers. Every agent gave a similar answer about the characteristic in traditional SC (see Table 3.3).

There are various patterns of flow from a producer to a consumer as the followings (see pattern 1 to 3). We asked every respondent about the source of supply and buyers. The most extended flow of supply in traditional SC can be drawn as the pattern (1) below.

Pattern (1)

Farmer → small collector → big collector → trader at wholesale market → retailer/trader at local traditional market/hawker → consumer

Table 3.2 Characteristic of Agents in Traditional Supply Chain

Characteristic	Small collector	Big Collector	Trader at wholesale market	Retailer
Respondent	(n=5)	(n=5)	(n=6)	(n=10)
Other profession	as farmer	2 as farmers and 3 only as collector	no	no
Margin of transaction	Rp1,000/kg	depends on the transaction	depends on the transaction	depends on the transaction
Component to set margin of transaction	transportation cost Rp500/kg and profit adjustable	transportation cost Rp500 - 1,000/kg and profit adjustable	operational cost Rp1,000/kg and profit adjustable	transportation cost Rp500 - 1,000/kg and profit adjustable
Weight losses of product	no	more or less 50%	more or less 50%	more or less 50%
Selling price	on the spot	on the spot	on the spot	on the spot
Type of vegetables	regular	regular	regular	regular
Quality grading	no	no	no	no
Quantity of volume	less than 100 kg per item	around 3 to 5 tons per delivery	more than 3 tons per type of transaction per day	less than 50 kg per type of vegetables in a day
Coverage area of sources	in a village	inter districts	inter provinces	traders at Wholesale market and other retailers
Packaging material	not specific	not specific	not specific	not specific
Schedule of transaction	any time	any time	24-hour	before 6 am
Production plan program	no	no	no	no
Debt-bondage practice	yes	yes	yes	no
Asset	motorcycle	motorcycle and truck	kiosk	motorcycle, cart and small kiosk
Location	near farmers` place	near farmers` area	in city	near consumers` area

Source: Field Survey, 2016-2019.

Every agent in the SC will get a margin of trading. The marketing agents, e.g. a small collector and a big collector, mostly set Rp500/kg as the transportation cost and Rp500/kg as the profit. However, it will be different based on the type of vegetables and condition of supply or selling price at the wholesale market.

The agent farmer in FG-No.19 in Parongpong Sub District plays a role as a small collector who sells the products of members to a big collector. Similar to an ordinary small collector, an agent farmer sets up the transportation cost and profit in every trading. However, the relationship with farmers is closer than that of common small collectors because an agent farmer is a leader in the FO. The pattern can be drawn as follows:

Pattern (2)

Farmer → agent farmer (small collector) → big collector → trader at wholesale market → retailer → consumer

The agent farmer that has transportation vehicles, in FGU-No. 4 in Parongpong Sub District, plays a role as a big collector. He can manage the trading of more than one ton for every type of vegetable in one day and can make a direct trade with traders at the wholesale market. The pattern where agent farmers exist is drawn as below.

Pattern (3)

Farmer → agent farmer (big collector) → trader at wholesale market → retailer → consumer

Patterns (1) to (3) show the condition of the inefficiency of SC because the number of agents creates the selling price disparity between consumer's and farmer's level. Those patterns are in line with the findings of Zakaria et al (2015) about the inefficiency of vegetable SC in Indonesia. Every agent, especially a marketing agent or a middleman, will try to get their margin. This situation creates a big burden for farmers if there is a fall in selling price at the market.

However, traditional SC is still needed by farmers who do farming traditionally and cannot access the market directly. Therefore, the existence of middlemen is essential to facilitate farmers in such conditions. Respondent' farmers in traditional SC admitted that it would be very complicated and troublesome if they have to sell directly to the wholesale market individually.

Modern SC

We interviewed key agents in modern SC to understand the distinctive features of modern SC. A different pattern was found in modern SC and we found the existence of agent farmers. Based on the interview with all related respondents in modern SC then the flow of supply from farmers to consumers are described below.

Pattern (4)

Farmer → agent farmer → supplier company → supermarket → consumer

Pattern (5)

Farmer → agent farmer → supermarket / online shop company → consumer

Pattern (6)

Farmer → agent farmer → exporter company

Pattern (7)

Farmer → agent farmer → fast-food company

Those patterns show the possibility to shorten the length of SC through agent farmer replacing middleman. Agent farmers who organize some farmers through FO can have an opportunity to make a direct supply to buyers. Those patterns increase the bargaining power of farmers because they can have negotiation rights with a buyer, especially when making the trade agreement.

We found a new way of trading that is through the internet or known as online shopping. Four respondent farmers answered that they have trading with that type of supplier companies (i.e. Rego Pantes and Sayur Box). Those companies approached several agent farmers in Lembang, e.g. leaders of FG-No.12, FG-No.10 and FGU-No.2.

The emergence of a new style of trading gives alternative markets for farmers. Modern SC has solved the obstacles of unsymmetrical information between producers and marketing agents in the SC through contract or negotiation. Farmers can understand the characteristic of order from the buyers.

A linkage of SCs

This study found linkage of marketing behaviors of middlemen. In certain conditions, they have to interact with each other (see Fig. 3.1). In case that supply is over or short to the order, access to traditional SC is needed for the adjustment. This situation creates coexistence of traditional SC and modern SC (Freddy et al., 2017).

Suppliers in modern SC can trade with those agents in traditional SC easier rather than collectors in traditional SC in the opposite direction. This happened because marketing agents in modern SC use the traditional SC as an alternative market to sell products which are not up to standard (as known as grade C or D or rejected products) to buyers in modern SC. Meanwhile, it is difficult for collectors in traditional SC to sell products to the buyers' in modern SC without agreement or contract.

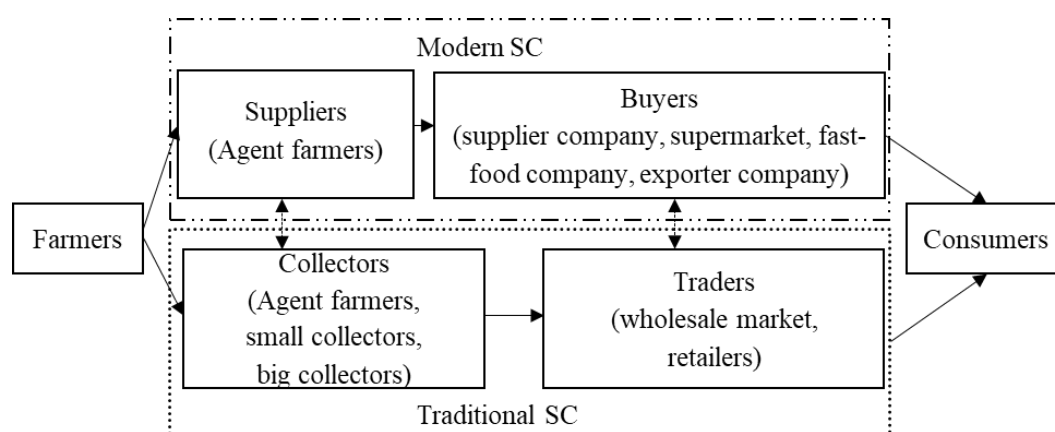


Fig. 3.1 A linkage of SCs, Sources: Field Survey, 2016 - 2019.

Table 3.3 Characteristic of Players in Modern Supply Chain

Aspect	Supplier company [Bimandiri]	Exporter Company [Momenta Agrikultura]	Supermarket [Transmart]
Location	Lembang	Lembang	Jakarta
Buyer partner	Supermarkets	Foreign Countries and Supermarkets	Consumer
Supplier	Middlemen	20 partners with 50 tons per month capacity	Supplier company
Supplier area	Inter villages and sub districts	Inter districts	Inter provinces
Farmer direct accesibility	Yes	Yes	No
Number of types of vegetables	127	More than 150	200
Daily transaction	7 ton	More than 100 ton	Around 30 kg/item/day/store
Production area	No	80% supply are from internal production (40 ha)	No
Contract with supplier	No	Weekly flat selling price	Yes
Margin of transaction	around 30%	More than 30%	More than 40%
Transportation cost	Rp750/kg	Rp15,000/kg by airplane	on supplier cost

Source: Field Survey, 2016-2019.

3.2 Players of Modern SC

There are some key players who contribute to the creation of modern SC and introduction access to modern SC to farmers (see Table 3.3). Their existence affects the vegetable economy in West Bandung District. We interviewed staffs of the procurement division and owners of Transmart (supermarket), Momenta Agrikultura (exporter company) and Bimandiri (supplier company). We also had a chance to interview Pizza Hut Company staffs about their vertical coordination partnership with a cooperative in Lembang Sub District.

(1) Transmart

Carrefour is a multinational retailer company, one of the primary commodities at the stores is vegetables, which officially opened in Indonesia in 1998. The retailer company was bought up by an Indonesian businessman in 2014 and then the name has been changed to Transmart or Trans Retail Indonesia. Transmart has a distribution center to manage supplies to regions around Jakarta, Bogor, Depok, Tangerang and Bekasi Cities (known as ‘*Jabodetabek*’ regions). Transmart is one of the biggest supermarket companies in Indonesia. They have 95 stores in Indonesia and 45 of them are located in Jakarta and hire 11,000 employees.

They need a legal document when trading with every supplier. Therefore individual farmer is difficult to supply directly to Transmart. They sell around 200 types of vegetables. Source of vegetable supplies are mainly from Lembang and Puncak areas in West Java Province.

The acquisition of ownership has changed the policy of the company. Previously they have a strategy of low selling price to compete with other retailer companies. Now, they focus on the good quality of vegetables from domestic production areas. The changes of policy gives vegetable farmers in Indonesia an opportunity to have alternative buyers.

However, there is a new procurement mechanism applied by the company that is different from the common practices in the traditional wholesale market. They introduce their standard of procurement concerning about quality, quantity, continuity and flat of selling price. Payment from Transmart will be made around two weeks later while the supply is delivered daily. The supermarket sets the service level of supplier performance, for example, if a supplier company repeat the failure of the supply twice, which means it would be under 80% of targeted volume, the supplier then will be replaced by other suppliers.

There are two main supplier companies to Transmart, Bimandiri and Momenta Agrikultura (which is also an exporter company). Momenta Agrikultura has a vendor name of

‘Amazing Farm’ on its packaging label. Meanwhile Bimandiri uses a vendor name of ‘Bimandiri’. Both of the supplier companies are the biggest vegetable supplier companies to supermarkets in Indonesia. They have their main storage facilities located in Lembang Sub District.

(2) Supplier Company

(2-1) Momenta Agrikultura

Momenta Agrikultura is owned by two alumni of Universitas Padjajaran. They started in 1998 with 2,000 m² farmland. In 2019 they have 7.5 ha and are planning to build additional farmland with more than 20 ha. They locate their main office in Tangerang City to manage the distribution of supplies for Jakarta, Bekasi, Bogor, Depok, Tangerang and foreign countries. They export various types of vegetables, e.g. around one ton of Super or Kenya beans to Singapore and 50 kg to Brunei Darussalam for every delivery, two times a week. They hire 300 employees to be engaged in their activities.

Momenta Agrikultura started their business as a producer in 1998 and then developed their business as a supplier and an exporter company. Nowadays they focus on exclusive commodities which are fit for export standard and therefore they operate 25 greenhouses (GHs) of 7.5 ha in Lembang Sub District using highly advanced production technology.

They apply three production systems adjusted to suitable products. The first is nutrient film technique for leafy vegetables. The second is drip irrigation regulating sensor for cherry tomato, mini cucumber, and kyuri. The third is soil grown system for leafy vegetables and the fourth is hydroponic for other exclusive vegetables. They learned those techniques through a seed company from the Netherlands. Their supplies are mostly from their own farm; meanwhile, around 20% of their supplies are received from 20 farmers.

(2-2) Bimandiri

Bimandiri was formed by five alumni of Faculty of Agriculture, Universitas Padjajaran in 1993. In the period from 1998 to 2013 Bimandiri was tied to supply only to Carrefour stores. However, after changes ownership from Carrefour to Transmart in 2014, Bimandiri became able to supply to other supermarkets. Now it has 135 employees and the daily supply is more than five tons, which are worth around Rp115 million.

It officially started the supply business in 1994. Bimandiri supplies vegetables to around 40 supermarket stores and capacity of supply is around seven tons a day. They have 260 farmer

partners whose vegetables come from across West Java Province and many farms are located near their storage place in Lembang Sub District. They admitted that strong cash flow is needed to pay to farmers for a supplier in supermarket SC to run a business. They had to sell their share in 2013 to an investor to get support to their finance and sustain the business.

Both of supplier companies locate their main facilities in Lembang Sub District because they intended to arrange them to be close to the vegetable production area. Their existence facilitates access for farmers to modern SC. However, the respondents informed that there are still problems to be solved, i.e., farmers is fragile to keep the commitment because their production is easily affected by weather and they often sell the product to the others so that it is difficult to continue vegetable supply.

(3) Pizza Hut Company

In addition, there is a fast-food company that makes a direct partnership with farmers through FO, i.e., Cooperative-No2 and Cooperative-No.3 in Lembang Sub District. They want to ensure the quality and are much concerned mainly about the maximum chemical residue limit, and continuity of chili pepper that is used as one of the ingredients of their final products. They run the partnership under the Corporate Social Responsibility (CSR) program.

The fast-food company provides seven greenhouses (GHs), with a size of 400 m² per unit which can be used to grow 1,800 plants. The cost to build one GH of bamboo is Rp50,000/m² and can be used for five years. Farmers are obliged to supply (chili pepper, Romain lettuce, tomato, head lettuce and beans) to 21 shops in Bandung city. Farmers are already able to adjust the production plan program with the order from the fast-food shops. Their daily supply is 80 kg and it should arrive at the outlets before 6:30 A.M. or before the opening time of the shop.

(4) International Agencies

Some of the respondent farmers participated in certain trainings managed by international agencies, e.g. Japan International Cooperation Agency (JICA) and Taiwan Technical Mission (TTM). They have provided training programs for vegetable farmers in West Bandung District since 2014, which focused on improving the condition of vegetable farmers. They learned that farmers could improve their income by accessing modern SC. They educate farmers about how to produce good quality, do efficient production and also develop skills including managerial ones and trading with supermarkets. They admitted that leader farmers in an FO are the key person to organize farmers into the training program.

International Cooperation and Development Fund (ICDF), Taiwan and the Ministry of Agriculture, the Republic of Indonesia signed a cooperation project in 2013. The project was implemented from 2014 until 2019 in West Bandung District by Taiwan Technical Mission (TTM) and Lembang National Agriculture Training Center (LNATC). The main activity of the project is to improve the ability of vegetable farmers in West Bandung District focusing on seed production techniques, marketing model and production-marketing integration. The project has a target to increase 35% of the income and 50% of sales of the farmers.

They selected 60 core farmers who were known as the leaders of FGs and then suggested each core farmer to organize 30 member farmers participating in the projects, so totally around 1,800 farmers were expected to participate in the projects. TTM provided facilities: three semi-automatic greenhouses and one full automatic greenhouses (each of GH has the size 8m x 30 m, 240 m²) for seed production, three units of cold storages and cooling machines, one post-harvest facility. The facilities are located in the LNATC office area in Lembang Sub District. The facilities will be handed over to the Ministry of Agriculture when the project has been over at the end of 2019. The staff of TTM informed that there would be a possibility to extend the activity after the project.

They hoped that farmers in Lembang, Parongpong and Cisarua Sub Districts could be more advanced experiences or way of thinking of the agribusiness. They agreed that agent farmers play important roles in helping farmers. Agent farmers have competitive advantages compared to ordinary farmers.

3.3 Type of Agent Farmers

This study classified farmers into several types, first is a farmer without the role of middleman, second, those who play the role as a small collector and third, those who play as big collector in traditional SC or supplier in modern SC as type A. They have distinctive features based on certain criteria as listed in Table 3.4.

We classified the respondents based on their roles of marketing and the acreage of farmland (see Table 3.4). Based on their marketing role, farmers can be identified as big collectors with their big capacity of trade. Small collectors could trade with small capacity (less than 100 kg per delivery) from farmers to certain buyers. However, some ordinary farmers have no role as middleman.

Table 3.4 List of Leader Farmer Respondents Based on the Role as Middleman

No	Type		FO	Education	Farm land (m2)	Age (year)	Sub District
	t	m					
A-As Big Collector (who produces in > 5,600 m ²)					18,662	47	
1		A-m	FG	Junior High School	40,000	42	Lembang
2		A-m	FG	Elementary	30,000	46	Lembang
3		A-m	Cooperative	Junior High School	30,000	51	Cisarua
4		A-m	FG	Senior High School	30,000	51	Cisarua
5		A-m	FG	Senior High School	21,000	47	Lembang
6		A-m	Cooperative and FGU	Bachelor	20,000	39	Lembang
7		A-m	FG	Bachelor	12,000	52	Cisarua
8	A-t		FGU	Elementary	12,000	66	Parongpong
9		A-m	FG	Bachelor	10,000	37	Cisarua
10		A-m	FG	Senior High School	10,000	40	Cisarua
11		A-m	FG	Senior High School	10,000	41	Lembang
12		A-m	FG	Elementary	9,600	48	Lembang
13		A-m	Cooperative and FG	Senior High School	8,000	47	Lembang
B-As Big Collector (who produces in ≤ 5,600 m2)					3,240	46	
1		B-m	FG	Junior High School	5,600	37	Lembang
2		B-m	FGU and FG	Senior High School	4,200	51	Lembang
3		B-m	FG	Senior High School	4,200	41	Lembang
4		B-m	FG	Bachelor	3,000	47	Lembang
5		B-m	FG	Elementary	2,800	61	Parongpong
6		B-m	FG	Junior High School	2,520	35	Lembang
7	B-t		FG	Elementary	2,100	51	Lembang
8		B-m	Cooperative and FG	Elementary	1,500	48	Lembang
C-As Small Collector (who produces in > 5,600 m2)					12,394	43	
1		C-m	FG	Senior High School	15,000	35	Lembang
2		C-m	FG	Junior High School	15,000	46	Lembang
3		C-m	FG	Elementary	10,000	47	Lembang
4		C-m	FG	Junior High School	9,575	44	Lembang
D-As Small Collector (who produces in ≤ 5,600 m2)					5,600	51	
1	D-t		FG	Junior High School	5,600	51	Parongpong
E-With no role (who produces in > 5,600 m2)					16,725	58	
1		E-m	FG	Elementary	24,000	63	Lembang
2		E-m	Cooperative and FG	Senior High School	9,450	53	Lembang
F-With no role (who produces in ≤ 5,600 m2)					3,489	49	
1	F-t		FG	Junior High School	5,600	51	Lembang
2	F-t		FG	Junior High School	5,000	49	Lembang
3	F-t		FG	Elementary	4,200	68	Lembang
4	F-t		FG	Elementary	4,200	48	Parongpong
5	F-t		FG	Elementary	4,200	50	Lembang
6	F-t		FG	Elementary	3,500	46	Lembang
7		F-m	FG	Junior High School	2,000	40	Lembang
8		F-m	FG	Junior High School	2,000	51	Lembang
9	F-t		FG	Bachelor	700	37	Lembang

Source: Field Survey, 2016-2019.

Furthermore, based on the acreage of farmland, they are divided based on more than and less than 5,600 m². The respondents answered that on average the farmland of farmers in their

surroundings is around 400 ‘*tumbak*’ (a measurement unit by the respondents, where 400 ‘*tumbak*’ is equal to 5,600 m², because 1 ‘*tumbak*’ is 14m²).

Table 3.5 Farmland Size and Trade Size of Leader Farmer Respondents

Trade Size	Farmland Size	
	Small	Big
Big Collector / Supplier	B (8)	A (13)
Small collector	D (1)	C (4)
No role	F (9)	E (2)

Source: Field Survey, 2016-2019.

Eventually, thinking of the role of marketing and acreage of farmland, respondents are divided into 6 groups (A, B, C, D, E and F). If a respondent A type sells to the buyer in traditional SC it is marked with ‘t’ or in modern SC with ‘m’ like A-t or A-m.

We marked the respondents in traditional SC with shadowed on the row (A-t, B-t, C-t, D-t, E-t and F-t), while the respondents in modern SC have no shadow and signed ‘-m’ (A-m, B-m, C-m, D-m and F-m). On Table 3.6 to 3.8 in appendices page, there are listed some distinctive features of respondents based on their production, marketing and assets. In addition, the farmer respondents in modern SC has bigger farmland, younger age and higher educational background than those in traditional SC (as shown in Fig. 3.5, 3.6 and 3.7 in appendices page).

We found that 13 agent farmers (type A) who can make trading with huge volume of trade and they manage large production area (e.g. more than 5.600 m²). Meanwhile, 8 agent farmers (type B) who play the role as a big collector manage smaller production area. They put bigger attention on the marketing activity and organize production from member farmers’ production area.

There are also 4 agent farmers who play the role as a small collector and manage big farmland (type C). We found 1 agent farmer (type D) who play the role as a small collector who manages the smaller size of farmland. We also found 2 leader farmers (type E) who have no role as middleman and manage big farmland. Meanwhile, 9 farmers (type F) without the role of middleman and manage small farmland.

We pay attention to the difference between A type and B type. Both make a big trade but A type can secure the source of vegetable supply from their own farm. On the other hand, B type is dependent on other farmers and the management of FO is more important than A type. This distinctive features informed that some farmers had changed the farming and marketing

behaviors. We categorized the number of respondents according to the farm size and trade size on a matrix as shown in Table 3.5.

The matrix indicates changes in the vegetable economy. Some agent farmers have been transformed to manage big farmland successfully, have been able to play the role as a middleman and grab the access into particular market, i.e., known as the closed-access market. Meanwhile, there are some farmers still cannot play those roles, cannot manage big production area and access certain markets.

In addition, the interview result shows that respondents who play the role as a middleman are younger than those farmers who do not play the role as a middleman (see Table 3.4). This indicates that young farmers can transfer to modern SC faster than older farmers.

Modern SC allows a part of farmers to develop their business. From 37 leaders of FOs, 26 play a role of middleman and especially 21 farmers run their business as a big collector, who has the post-harvest facility. Most of them (19 farmers) sell vegetable through modern SC.

We pay attention to the difference between A type and B type. Both make a big trade but A type can secure the source of vegetable supply from their own farm. On the other hand, B type is dependent on other farmers and the management of FO is more important than A type.

When new players like the above appear in vegetable SC, how are the behavior of powerful farmers? The target of the next discussion is agent farmers who sell vegetable to buyers.

A type

Agent farmers of A-m type, in general, become more specialized into certain type of exclusive vegetables and can decide the business orientation. Exclusive means that the number of producers and buyer or market are still limited, for example, from the case of A-m-No. 6 in Lembang Sub District grows Kenya beans.

Previously he was a supplier to supermarket and supplier companies. He was tired of supplying to the supermarket because it made him as a trader who has to supply more than 30 various kinds of vegetables in a very limited volume for each type in one time of delivery. Therefore he decided to change his business orientation into more focus to a small number of variety of vegetables but in a huge volume of order.

Then in 2010, he was introduced by an extension official to A-m-No. 2 who already started supplying Kenya beans to exporter company. At that time he supplied 20 kg until 300 kg/day

for one day to the agent farmer. Then in 2013 he finally made direct trading to two exporter companies with total supplies are 500 kg in a day.

The seed of Kenya beans is limited and mostly provided by exporter companies. The limited availability of seed gives advantage for the exporter company to tie agent farmers' partners and also to control the continuity of supply.

His average supply was 1.5 ton per week in 2 or 4 times of deliveries. He set the production plan program 1 or 2 kg of seed for every two weeks, with total around 100 kg of seed and it could be increased the number of seed adjusted to the order from the buyers. He measured that in 1 kg of seed, it could be 2,000 of plants. Meanwhile, in 1 ha it could be planted 20,000 plants of beans and produce around 5 or 8 ton of harvest.

He managed the production schedule based on the characteristic of the beans. Kenya beans needs 2 months for the first harvest and then every day until another 1 month, so in total, one production cycle took 3 months.

The production cost of Kenya beans was around Rp7,000/kg and the farm gate selling price was Rp14,000/kg. Therefore a farmer could get Rp14,000/kg as the income for 3 months. Meanwhile, A-m-No.6 will sell again to exporter company with Rp19,000/kg. So the agent farmer had Rp5,000/kg as the margin of trade. He decided the margin based on his profit around Rp2,000/kg and expenses Rp3,000/kg.

In brief, the production cost of Kenya beans, is mostly generated from labor, post-harvest handling and seed costs. Kenya beans is labor intensive for harvesting. One worker maximum could harvest 20 kg per day. A-m-No.6 informed that the labor cost for harvesting was Rp50,000/day for male and Rp35,000/day for female labor (where the working hours starts from 9 A.M. until 12 noon).

Meanwhile, the labor for doing the post-harvest handling was Rp100,000/day for male and Rp75,000/day for female (where the working hours starts from 7 A.M. until 4 P.M.). He hired 9 female and 5 male labors in the post-harvest handling unit. Also, the seed cost was Rp300,000/kg.

Similar to other supplier companies, he knows the bad commitment of farmer. Therefore, he prepares his own production to prevent any bad condition (weather, pest and disease attacks and bad commitment). He will observe the condition of every farmer partners and adjust his own production area to prevent lack of supply or increasing of order. The A-m-No.6 was the

leader of FGU-No.3 with 200 member farmers and FG-No.6 with total of 40 members. However, only 20 until 40 farmers actively joined his production and marketing program.

He needs other farmers to produce in order to manage the condition of the soil through rotation planting and ensure continuity. He offers the trade of Kenya beans mostly to member farmers to support their welfare by shifting to modern SC and released from a middleman in traditional SC. He has the responsibility as the leader of the FOs and wants to give changes to farmers in his surrounding area.

The agent farmers received payment every 5 weeks; meanwhile, he paid the farmers every 1 or 2 weeks. This indicates that agent farmers should have a strong cash flow. He sometimes had to take a loan from the bank to support his business role. Until 2019, he has been able to manage 70 farmers (members and non-members) into his production and marketing program

B type

An agent farmer B type is different from A type based on the farmland size. B type does not have big farmland to support his marketing roles. He seeks supplies from member farmers, non-member farmers or even big collectors in traditional SC. B-m-No. 5, for example, only has 2,800 m² in Parongpong Sub District.

In 1999, Bimandiri asked him to organized supplies 200 kg of leek every day and provided fund supports of Rp16 million that distributed to 8 farmers. Then until 2019, the supplier company asked him to supply 100 kg of leek, 20 kg of basil, 15 kg of beetroot, 20 kg of celery and 25 kg of red spinach for every day. He also supplies to another supplier company with a smaller volume of supply 20 kg of leek and 5 kg of basil for every day.

He managed 20% of his supplies are from his own farm, 20% from member-farmers, 60% from other sources. He provided support to any farmers who would like to join his marketing program. He gave the suggestion of production plan schedule and farm gate selling price to his partners. He managed the production plan schedule mainly for red spinach and basil because other commodities were available from many sources. He did not want to have big farmland because he could get mostly leek from farmers and big collectors in the surrounding area. Other reasons were his age already 61 years old and very limited farmland were still available.

He was a leader of an FG with 10 members. He had 3 member-farmers join to produce 40 kg of red spinach and 2 other member-farmers to produce 20 kg of basil. The member farmers agreed to join the agent farmer's program because red spinach was a short-production cycle vegetable, i.e., 30 to 50 days.

The agent farmer took around Rp6,000/kg as the margin of trade. For examples, he bought leek from farmers with Rp10,000/kg and then sold to Bimandiri Rp16,000/kg, he bought basil with Rp8,000/kg and sold again with Rp13,000/kg, he bought beetroot with Rp8,000/kg and sold again with Rp12,000/kg, he bought celery with Rp9,000/kg and he bought red spinach with Rp5,000/kg and sold again with Rp12,000.

There are several factors that he used to set the margin. First is weight losses for example, from 100 kg supply of leek there was 15 kg as not useful parts or scraps that resulted from cleaning, grading and packing as required by Bimandiri and other costs. Second, the agent farmer paid the farmer higher (e.g. Rp1,000/kg) than that paid by a big collector to farmers who supplies to a trader at the wholesale market in traditional SC. Third, Bimandiri paid to him in a long of time more than 2 weeks, while he had to provide faster payment to his sources. The fourth is expenses, e.g. transportation costs, post-harvest handling costs, and the fourth was his own profit (around Rp2,000/kg).

He had flat of selling price agreement with Bimandiri for every 2 weeks for leek. Meanwhile, other commodities were also relatively stable because the demand and supply were relatively stable every day. Agent farmers A and B types typically chose the type of vegetables as the business based on stable trade.

The production cost for leek, basil, beetroot, celery and red spinach was around Rp4,000/kg, Rp5,000/kg Rp750/kg, Rp4,000/kg and Rp500/kg respectively. The production cycle for every commodity in respectively is 75 days, 60 days, 75 days, 75 days, 90 days and 30 days. Those commodities are grown in the open field and can be combined with other vegetables for the multi-cropping system in the same soil.

He had post-harvest handling facility and the cost for a female worker was Rp40,000 and a male worker was Rp100,000 and 1 driver was Rp60,000 in a day. He paid 1 female labor with Rp35,000 and 2 male labors with Rp140,000 for every day (starts from 7 A.M. – 12 noon).

His role gives advantages for farmers because the farmers' partners can access into supplier company, get a stable business schedule, the certainty of selling price and higher of selling price. The agent farmer has transformed from a driver and ordinary farmer (F-t) become B-m agent farmer and also influence the other farmers' partners from ordinary farmers who supply to traditional SC (F-t) to modern SC (F-m).

C type

There is also an agent farmer who can sell other farmers' product to an agent farmer A-m or supplier company. From the previous respondent of A-m-No. 6, we interviewed agent farmer of C-m-No. 3 in Lembang Sub District. He had been transformed from E type of ordinary farmer to be agent farmer C-m since participating in the TTM training programs from 2016 to 2019. He learned about modern SC from the training and met the key agent farmers who participate in the same training's program.

He then joined the A-m-No. 6's production and marketing plan program and organize 4 of his member farmers to produce Kenya beans. He produces mainly tomato for 5 ton and chili 1 ton in 1 ha farmland, and then after joining the Kenya beans program, he uses a part of the farmland for 1,200m² to plant 3,000 plants and can get around 800 kg of Kenya beans. He still supplies chili and tomato to big collector in traditional SC and has debt-bondage with the big collector. He has the plan to enhance the production of Kenya beans after he could understand the business and shift to modern SC.

A-m-No. 6 asked him to set a production schedule of 2 kg for every week and then he arranged 4 farmers from 30 member farmers in his FG. He received the seed from A-m-No. 6 and then the seed should be paid from the revenue. He took of Rp1,000/kg from A-m-No. 6 as his role as small collector. He considered Rp500/kg as transportation cost and Rp500/kg as his profit. He had no post-harvest handling facilities or '*gudang*' and therefore his role is just transporting the product by motorcycle to the A-m-No. 6's storage.

D type

There is also agent farmer of D-type as we interviewed one respondent in Parongpong Sub District. He had transformed from ordinary farmer of F-t type to D-t type of agent farmer.

He did not have a rigid relationship with farmers' partners, the other farmers respected him because he was the leader of the FG and could communicate with other people. He produced various type of vegetables, e.g. broccoli, local beans, lettuce and others. He could transport 200 kg of vegetable by motorcycle to big collector's place. He took the margin of trade around Rp1,000 /kg only for covering the transportation cost and his own profit. He adjusted the margin of a trader based on the payment from the big collector.

He had no '*gudang*' and no production schedule. He provided debt-bondage for any farmers. He had no stable order and selling price from big collector, so that his role just transporting the products from his surrounding area to the big collector's place. He had no plan yet to supply to buyers in modern SC because he did not know about supplying to modern SC.

He had no intention to enlarge his farmland because he did not have enough capacity to produce in big farmland.

The existence of D-t type of agent farmers cannot trigger the modernization of farm business of the member farmers. The farmers were still stuck in the traditional farming system that has no production plan reference and unclear selling price. However, those farmers, in the area where it is difficult to be reached out, were fully relied on the role of the agent farmers D-t type and also as the typical in traditional SC, farmers can get faster payment, i.e. only one day after the delivery to the wholesale market.

E type

There are two types of an ordinary farmer who does not have the role as a middleman, E and F types. E type can produce in large farmland while F type cannot produce in a large farm. However, there are E-m type who could supply to supplier company in modern SC. It means there has been an improvement of farm business applied by the E-m type.

E-m-No. 1 had knowledge about modern SC because of his experiences working in the production division of a supplier company from 1991 to 1998. He then was supported by the owner of a supplier company to be an independent farmer for supplying to the supplier company. He then started growing *Momotaro* tomato in 2,800 m².

In 2019, he could produce vegetables in 24,000 m² farmland. He produced the beef tomato and chili pepper in 2 units of GH (i.e., size of 1,400 m² and 1,600 m²) and other vegetables in open field. He supplied to B-m-No. 6 and other supplier companies and also to other big collectors in traditional SC. However, he did not want to be an agent farmer of A or B type, because he felt more comfortable to be a farmer rather than to be an agent farmer.

He could organize some farmers into FG and received an acknowledgement from other stakeholders so that he could receive many supports from government and other organizations through the FG. Supports from government, such as a full set of post-harvest handling facilities unit worth of Rp725 million in 2010 and 2011, were given to a young farmer who operated a supplier company because he did not want to be an agent farmer.

His existence had been influencing the member farmers about modernizing the farm business by introducing access to modern SC. He had been familiar with the production schedule to ensure the continuity, GH production system and late of payment from the buyers. He used both the existence of traditional and modern SC as alternative buyers.

He joined the program of B-m-No. 6 that has a production schedule of 4 kg of beef tomato for every week and a fixed of selling price. The production cost for beef tomato was around Rp4,000/kg, where 1 tree could produce 2 until 3 kg of harvest. The farm gate of selling price was Rp11,000/kg. It took around 5 months for one cycle of production.

F type

Ordinary farmer with F type is the most basic type of farmers that can be recognized from the limited capacity to produce in larger farmland, lack of ability to trade directly with the buyer and lack of knowledge about the production schedule and no capacity to build post-harvest handling facilities unit or *`gudang`*.

Farmers of F-t type sell their products to any small or big collector and therefore no specific target of order and production. Meanwhile, farmers of F-m sell their products to supplier companies or agent farmers of B-m. Consequently, they already familiar with the selection of a type of vegetables and production schedule.

Ordinary farmers of F-t type have no influences to transform member farmers or non-member farmers in his surrounding area from traditional farming to modernized farming. Meanwhile, the F-m has been able to introduce the production schedule, selection of a type of vegetables and payment mechanism from buyers in modern SC.

Agent farmer respondents informed that after transforming into modern SC, they still face the problems of instability. However, they were used to deal with the problems through several strategies. Thus, the next discussion is about several strategies that the agent farmers had done to deal with the problems.

3.4 Farmers` Behaviors to Sell Vegetables

There are several distinctive behaviors of farmers to sell vegetables. We found that the existence of modern SC could give farmers more opportunities to sell vegetable to alternative buyers or through supplementary SC. However, there are some conditions that make farmers adjust their behaviors to sell their products, especially based on the farm management.

Ordinary Farmers

Ordinary farmers, who have no role as middleman, focus on the production as the main resource of income. This type of farmers is represented by E and F types of farmer. Debt-bondage is the biggest factor to affect the decision of ordinary farmer to sell their products.

(a) With a debt-bondage

Farmers who have debt-bondage or loan from middleman in traditional SC (F-t No. 1 until F-t No.6 and No 9 types) have no power to sell to other buyers and to decide the farm gate selling price. F type farmers, who have less farmland and limited access to market information and capital, depend fully on the middleman who provides debt. Those farmers are trapped in such condition and it is difficult to improve the farm business unless there is a strong role of FO and agent farmers to take them into modern SC.

Meanwhile, F-m No. 7 and No. 8 could manage production and marketing based on the agent farmers' plan that they joined. In addition, they supply only to the agent farmer because they have an agreement with the agent farmer and they only have small farmland, so that, they can not divide the farmland to supply to other buyers.

(b) Without a debt-bondage

There are ordinary farmers who have no debt-bondage from certain middleman. Thus, they could decide the buyers, farm gate selling price and type of vegetables they want to produce. Those farmers are represented by E-m No. 1 and No. 2 who could access to modern SC. They could manage their production and adjust the farmland to supply various buyers. They could join into other agent farmers' production and marketing plan and also supply to other buyers in the traditional SC.

Table 3.6 A Case of Farm Business Behavior of Ordinary Farmer

Total farmland (m2)	7,000					
Farmland based on commodity (m2)	450	900	200			5,450
Commodity	Green chili pepper	Spinach	Romain lettuce	Broccoli	Head lettuce	Tomato
Production area	Greenhouse			Open field		
Cropping system	Single-cropping			Multi-cropping		
Production cycle (days)	240	45	45	60	45	120
[a] Production (kg)	5,400	200	800	3,000	2,000	20,000
[b] Production cost (Rp/kg)	7,000	1,000	1,000	2,000	500	2,000
[c = a x b] Total cost (Rp thousand)	37,800	200	800	6,000	1,000	40,000
[d] Farm gate selling price (Rp/kg)	17,000	3,000	3,000	3,000	3,000	4,000
[e = d x a] Revenue (Rp thousand)	91,800	600	2,400	9,000	6,000	80,000
[f = e - c] Profit (Rp thousand)	54,000	400	1,600	3,000	5,000	40,000
Buyer	Agent farmer B-m No.8			Big collectors		
Type of SC	Modern			Traditional		

Source: Field Survey in 2019

We interviewed an ordinary farmer who is a member of FG No. 23 and Cooperative No. 3 in Lembang Sub District (see Table 3.6). The farmer managed his farmland to produce six types of vegetables and sold to various buyers. He had no debt-bondage therefore he could decide the buyer and bargain a farm gate selling price. The partnership between the cooperative and a fast-food company could give him an opportunity to access to modern SC, improvement

of exclusive vegetables production and higher of profit. Meanwhile, he sold to big collectors in traditional SC because he could get faster and cash payment.

Nevertheless, this study found that all of the agent farmers (A, B, C and D types) previously were ordinary farmers. They could change the behavior to sell the vegetables based on the capability to make changes of trade business orientation. The existence of agent farmers as the leader of FO spread out the knowledge and ability to access the modern SC.

Agent Farmers

(a) As a collector in traditional SC

An agent farmer like D-t No.1 or a small collector in traditional SC has a role of only transporting the products to big collector's place. He gains additional income from the profit as a small collector, e.g. Rp1,000/kg as the margin of transaction. D-t No.1 had dependency on a big collector because he received debt. He also distributed certain debts to some farmers to manage the supply.

Meanwhile, A-t No.8 and B-t No.7 could sell directly to traders at wholesale markets. The relationship between agent farmers and the traders are not permanent and can be changed easily. A-t No.8 and B-t No.7 did not want to supply to modern SC because the high requirements, flat selling price and long payment from the buyers.

(b) As a supplier in modern SC

Agent farmers of A-m, B-m and C-m are farmers who play a role as a supplier in modern SC. Their focus is on the business to supply to buyers in modern SC, e.g. supplier companies, supermarket, exporter companies and fast-food companies. Therefore they adjust the production plan based on the order from the buyers. They manage the supplies from their own farmland and also from other sources. They gain additional income from the role as a supplier. Agent farmers in modern SC have an ability to access and fulfill the requirements from buyers in modern SC and utilize the traditional SC as reference to decide the selling price contract agreement. Thus, agent farmers have more concerns on ensuring the supplies to the buyers in modern SC and use the traditional SC as an alternative sources of supplies when lack of supplies and alternative buyers in a condition of over supplies and low grade quality products.

We interviewed C-m No. 3, an agent farmer, who is a leader of FG No. 18 in Lembang Sub District (see Table 3.7). He was one of the participants of TTM training program since 2015 and there he could meet A-m No.6, an agent farmer, during the training program.

Previously, he was an ordinary farmer who had debt-bondage provided by two big collectors to produce tomato and chili in 1 ha farmland. In 2018 an agent farmer, A-m No. 6, encouraged him to be a small collector supplying Kenya beans and managed his FG in order to supply 1 ton of Kenya Beans in a week with 3 other member farmers.

Table 3.7 A Case of Farm Business Behavior of Agent Farmer (C-m No. 3)

Total farmland (m ²)	10,000		
Farmland based on commodity (m ²)	1,200	8,800	
Commodity	Kenya beans	Tomato	Chili
Production area	Open field		
Cropping system	Single-cropping	Multi-cropping	
Production cycle (days)	90	120	180
[a] Production (kg)	800	5,000	1,000
[b] Production cost (Rp/kg)	3,000	5,000	7,000
[c = a x b] Total cost (Rp thousand)	2,400	25,000	7,000
[d] Farm gate selling price (Rp/kg)	14,000	5,000	9,000
[e= d x a] Revenue (Rp thousand)	11,200	25,000	9,000
[f= e-c] Profit (Rp thousand)	8,800	0	2,000
Buyer	Agent farmer A-m No.6	Big collectors	
Type of SC	Modern	Traditional	

Source: Field Survey in 2018

He gained additional income Rp1,000/kg after becoming a small collector. He informed that the access to modern SC, e.g. export orientation, give better profit than that to big collectors in traditional SC. He could improve the farm business to be scheduled production, exclusive vegetables, learn about grading practices and flat selling price after transforming as an agent farmer. He gained support from, an agent farmer, A-m No.6 to ensure the continuity of supply. However, at the same time he was still an ordinary farmer who had debt-bondage with certain big collectors to produce tomato and chili. He could get cash money and faster payment in traditional SC to adjust with daily expenses and maintenance cost of other plants.

Our study found that farmers will adjust the type of SC based on the buyers. Agent farmers who play the role as a middleman in modern SC provided access to get in the scheduled production and marketing program. Agent farmers who are also a leader of FO play a crucial role to disseminate the knowledge and strategy to shift into modern SC. However, there are some threats found after shifting to modern SC, e.g. instability.

3.5 Strategy to Deal with Instability

In vegetable SC there are instability problems, e.g. instable continuity of products caused by weather or pest and disease attacks (supply side) and changeable of market information (demand side). Vegetable production is easy to be influenced by weather conditions. The

instability problems are found mostly in traditional SC, where incompleteness of information amplifies the difficultness to adjust the demand-supply gap.

In traditional SC there are many small farmers, small collectors and small buyers. It has a loose relationship, spot trade, and price-fluctuation. In modern SC trade volume becomes bigger, fixed quantity, scheduled supply, based on contract, fixed price, a guarantee of quality and production plan with organized members.

However, the problem of instability becomes more serious in modern SC. Conflict among members and between leader and members creates instability of production plan program. As transferring from traditional SC to modern SC, instability of procurement of vegetables has become more serious because modern SC requires a scheduled supply. We want to investigate how do agent farmers deal with the problem of instability?

Agent farmers have applied several strategies to solve the instability problems. They are improving the farming system and trade management (See Fig.3.2). Understanding the demand sides is their first step to making changes is started with and then adjusted the production.

There are several key actions done by the agent farmers dealing with instability to transfer from traditional to modern SC. First is the production plan, the second is FO management, third is utilizing the existence of traditional SC.

Agent farmers manage the existence of modern and traditional SC as alternative buyers in a condition of over and lack of production. Meanwhile, for buyers in modern SC, e.g. Bimandiri, the existence of traditional SC can be an alternative source of supplies when there is lack condition of supply from his supplier partners.

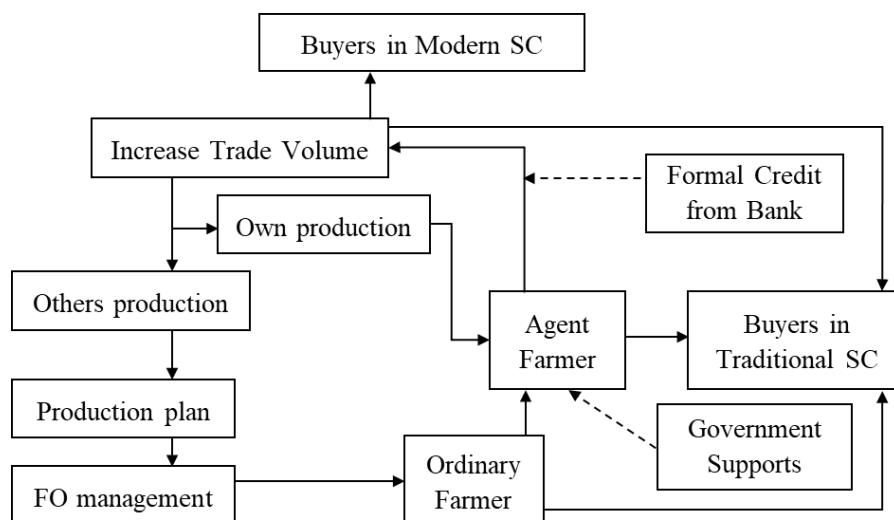


Fig. 3.2 Transferring to Modern SC through Agent Farmer's Role,
Source: Field Survey, 2016-2019

Original Condition	Empty hole		Empty hole		Empty hole
		Empty hole		Empty hole	
	Empty hole		Empty hole		Empty hole
(Day 1) Planting Horenso spinach	Horenso		Horenso		Horenso
		Empty hole		Empty hole	
	Horenso		Horenso		Horenso
(Day 15 to 20) Planting Beef Tomato	Horenso		Horenso		Horenso
		Beef tomato		Beef tomato	
	Horenso		Horenso		Horenso
(Day 28) Harvesting Horenso spinach	harvested		harvested		harvested
		Beef tomato		Beef tomato	
	harvested		harvested		harvested
(Day 29) Planting Beet root	Beet root		Beet root		Beet root
		Beef tomato		Beef tomato	
	Beet root		Beet root		Beet root
(Day 85) Harvesting Beef tomato	Beet root		Beet root		Beet root
		harvested		harvested	
	Beet root		Beet root		Beet root

Fig. 3.3 Multi-cropping schedule in plastic covered-soil, Source: Field Survey, 2016 – 2019.

(1) Production plan

This study found that an agent farmer in modern SC has applied the production plan. The production plan is the most basic strategy to realize continuous supply to buyers.

Some supplier companies spread the knowledge about production plan to their farmer partners. Bimandiri and Momenta Agrikultura, for example, advised their agent farmers to make a production plan to ensure the continuous supply. The farmers should maximize the availability of farmland with a precise production schedule. Bimandiri advised agent farmers to organize farmers to adopt the planting schedule to control the supply collectively. For example, in one ha they have to plant gradually at a particular time, e.g. $\frac{1}{4}$ ha in the first week, $\frac{1}{4}$ ha in the third week, $\frac{1}{4}$ ha in the fifth week and $\frac{1}{4}$ in the 7th week.

A production plan is made based on the traits of the plant and the order from the buyer. The agent farmer of B-m-No. 6 informed that he would adjust the timing and location by planting different vegetables. He combined the planting schedule based on the characteristic of the period of the production cycle of every vegetable. There are known as short-production cycle vegetables like horenso spinach and long-production cycle vegetables like beef tomato. This system helps farmers to make continuous production for two or three years before replacing the plastic cover (see Fig. 3.3). In addition, the agent farmer of A-m-No. 12, set the planting of 2,000 plants of lettuce every two weeks to supply 30 kg in a day to a supplier company. Lettuce needs 50 days to harvest and from two plants could get 1 kg of harvest.

Farmers in traditional SC do not have this program because the traders at the wholesale market do not require scheduled supply. Therefore it is a spot trade and it seems like a gambling business.

(2) Farmers` organization management

Manage sources from others' production

Agent farmers then ensure the continuity of supply not only from his production but also from other production, e.g. member-farmers (see Fig. 3.4). They will increase the number of member farmers to offer more farmers the production and marketing plan, as done by agent farmers A-m-No. 6.

Fixed selling price

In modern SC the selling price is fixed. Therefore, it is already transformed a new selling price certainty compared to that in traditional SC that is fluctuating and spot trade. The fixed of selling price can also be done after the target of order and supply has been agreed by agent farmers and buyers.

Pooling price

Therefore, some agent farmers, e.g. A-m-No. 3 and A-m-No. 4 were familiar with a pooling price system. It is an accumulation of total trades in a month and the average from all trades will be used as the base for deciding the farm gate selling price. Meanwhile, other agent-farmers used the trade record, from the result of final acceptance of quantity and selling price for everyday trade.

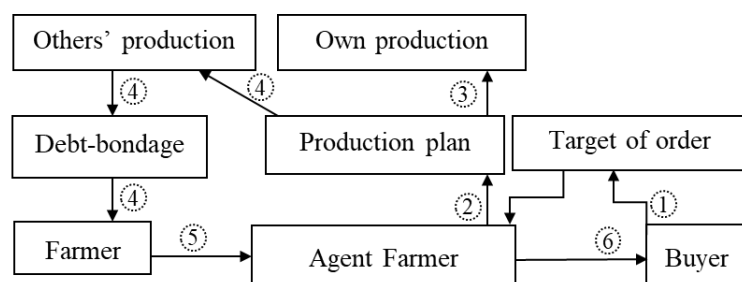


Fig. 3.4 Flow of Order and Supply through Agent Farmer,
Source: Field Survey, 2016-2019

Informal credit

To maintain the relationship between agent farmer and farmer partners, debt-bondage practice is still applied. The debt-bondage indicates that the relationship is still the same as that in the traditional SC. This practice is commonly used by the middlemen to control the supply

or availability of products (see Fig. 3.4). However, this study found notable differences between practices in traditional SC and modern SC.

In traditional SC, an agent farmer provides supports, e.g. money or production inputs (for example, seeds, pesticides, production facilities and others) without production plan. It is a tool for the middleman merely to tie up farmers to sell their products to the middleman. This support can also be known as an interlinked-transaction in rural informal credit (Jay, 1998). Farmer, as a debtor, does not have to pay the interest and the debt will be deducted from the payment of their products.

Debt-bondage practices weaken their bargaining power on the selling price decision. The middleman makes the final decision of the farm gate selling price. Debtor farmers should accept the payment to the middleman in any condition. Then the middleman will set the margin by his own calculation. This margin includes hidden interest on a debt. The worst situation happens when there is a fall in selling price at the wholesale market, then the farmer has more burdens.

In addition, middlemen monopolize the marketing of debtor's products. The middlemen will be offended if debtor farmer sells the products to others. Sanctions can be a compensation for an advance of money by asking profit sharing from the income of the farmer and also by blacklisting the farmer. Big collector respondents informed that they all have experiences of bad commitment by debtor farmers and also other default cases. Middleman thus will select carefully the debtor farmers based on his past production performance, land asset and additional information from others.

On the other hand, debt-bondage is also distributed in modern SC based on the production plan program. This practice was applied by agent farmers. Agent farmers provide mainly seeds to control the production plan program to manage the continuity of supply and other production inputs and facilities. For example, agent farmer of A-m-No. 11 provided the seed of Kenya beans to member farmers who join his program. Also, agent farmer of B-m-No. 6 provided a full package of GH program and also production inputs of beef tomato, worth estimated at Rp27 million to member farmers who join his program supplying to supplier companies. The costs for such supports then will be deducted from the revenue.

This practice is similar to that on the partnership between a fast-food company and 2 cooperatives in Lembang Sub District. The company invested GH, with a size of 450 m² worth

Rp44 million per unit, for five farmers who grow chili peppers and three farmers who grow tomato in those cooperatives.

Formal credit

This study found that agent farmers give advantages to farmers. Bank will approach the agent farmers who have a good reputation in the business. For example, BJB bank would like to provide credit (value of Rp15 to 20 million) for member farmers who join the program of agent farmer of B-m-No. 6, i.e. GH program through the FG. Also, BTN Bank would like to give huge loan of Rp2 billion for member farmers who join the A-m-No. 3's program in a cooperative. Thus, formal credit solves the shortage of capital to apply advanced production technology and makes farmers disciplined to return the loan.

Agent farmers have the experiences getting credit from a bank (e.g. BRI¹, Mandiri, BPR, Agrobank, Artha Graha, BJB² and others). A bank could provide significant amount of loan, e.g. Rp2 billion in the case of a cooperative in Cisarua Sub District, based on its trading performances. This opportunity gave the agent farmer of A-m-No. 3 can build extra GH or support the cash flow to pay in advance and provide production inputs to the farmers.

Thus, the roles of agent farmers are crucial in modernizing the farm business of farmers who join the production and marketing program. Empowering the role of agent farmers and increasing the training about production plan, post-harvest handling practices, trading skills and direct meeting facilitation with buyers in modern SC, bank and other organizations are still needed to improve farm business of farmers.

(3) Use the traditional SC

Agent farmers could manage the supplies from other agents in traditional SC, as explained as interlinkage of SC. An agent farmer utilized the existence of traditional SC to get supplies when there was a lack of supplies from his partners. On the other hand, he sold overproduction and rejected product in modern SC to agents in traditional SC.

¹ It is a state-own bank known as Bank Rakyat Indonesia

² It is owned by the Provincial Government of Jawa Barat Province and Banten Province and known as Bank Jawa Barat-Banten, The new scheme offered by BJB bank is the payment of installment that will be paid after harvest. This scheme is new and very suitable for the condition of farmers. This practice was applied by the agent farmers of B-m-No. 6 when the interview was conducted in February 2019.

Appendices

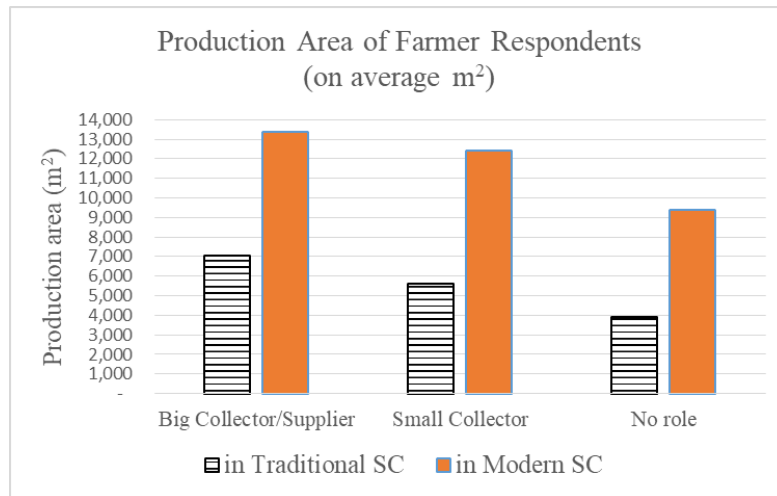


Fig. 3.5 Production Area of Farmer Respondents, Field Survey, 2016 – 2019.

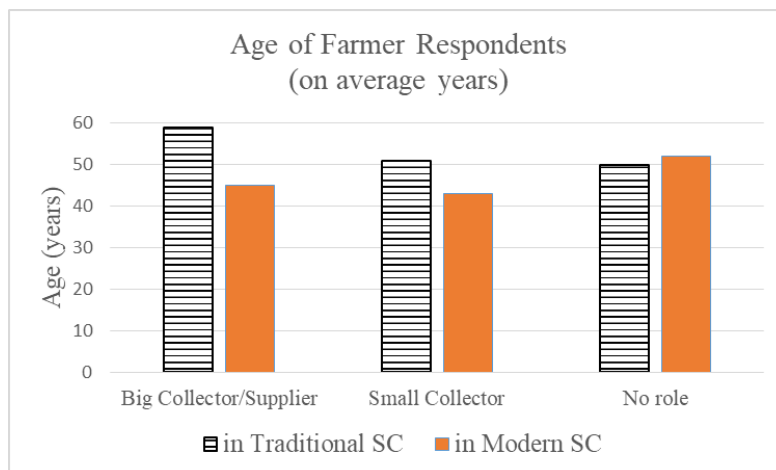


Fig. 3.6 Age of Farmer Respondents, Field Survey, 2016 – 2019.

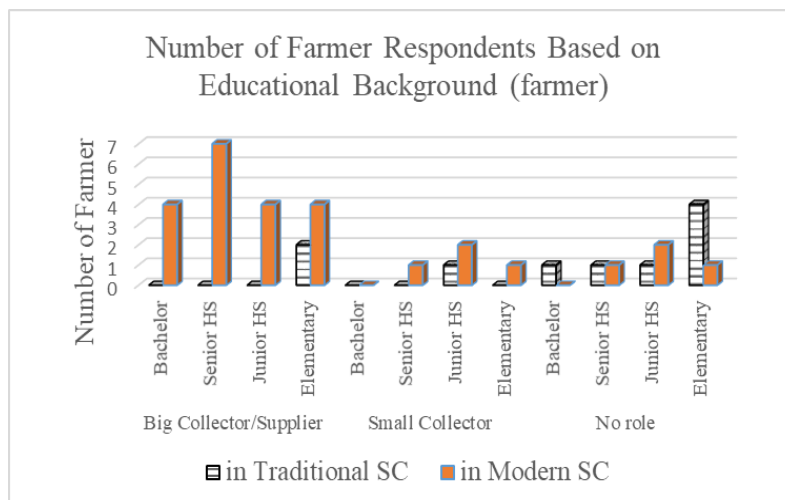


Fig. 3.7 Educational Background of Farmer Respondents, Field Survey, 2016 – 2019.

Table 3.8 Production Profile of Farmer Respondents

No	Main Vegetable	Annual Production (ton)	Production Area		Production Plan		Farming Experience (year)
			Green House	Open Field	yes	no	
A		36					19
1	Kenya beans	16		o	o		14
2	Kenya beans	13		o	o		27
3	Chili pepper	140	o		o		24
4	Chili pepper	210	o		o		21
5	Kenya beans and Horenso spinach	10	o		o		20
6	Kenya beans	15		o	o		10
7	Organic vegetables	8		o	o		9
8	Broccoli, Cauli flower and Lettuce	10		o		o	40
9	Baby beans and Edamame	10		o	o		5
10	Chili pepper	6	o		o		17
11	Kenya beans	8		o	o		21
12	Horenso spinach and romain lettuce	9	o	o	o		25
13	Chili pepper, Aspharagus, Romain lettuce and Beef tomato	9	o	o	o		18
B		6					19
1	Kenya Beans	7		o	o		15
2	Romain lettuce and Horenso spinach	2	o	o	o		27
3	Baby cabbage, Beef tomato, Kyuri and Head lettuce	8	o	o	o		13
4	Chili pepper						19
5	Leek, Basil, Beet root, Celery and Red spinach	8		o	o		30
6	Beef tomato and Beet root	5	o	o	o		5
7	Tomato, Cabbage, Broccoli and Cauli flower	3		o		o	30
8	Chili pepper, romain lettuce and horenso spinach	8	o	o	o		12
C		10					29
1	Head lettuce, Broccoli, Kyuri and Zucchini	8		o		o	19
2	Zucchini, Cherry tomato, Chili pepper and Broccoli	15		o		o	35
3	Kenya beans, Chili and Tomato	10		o	o		25
4	Broccoli, Chili, Long beans and Tomato	7		o		o	38
D		12	-				29
1	Local beans, Broccoli and Squash	12		o		o	29
E		13					19
1	Beef tomato and Chili pepper	20	o	o	o		21
2	Chili pepper, Romain lettuce and Horenso spinach	6	o	o	o		17
F		4					22
1	Chili, Cabbage, Tomato and Lettuce	7		o		o	30
2	Tomato, Chili	3.5		o		o	22
3	Broccoli, Lettuce and Horenso spinach	3		o		o	50
4	Shallot and Lettuce	8		o		o	30
5	Tomato and Chili	3		o		o	23
6	Spinach and Tomato	2		o		o	21
7	Head lettuce, Chinese cabbage, Cauli flower, Broccoli, Chili, Beef tomato, Horenso and Chili pepper	3	o	o		o	10
8	Horenso spinach, Romain lettuce, Cauli flower and Head lettuce	3		o	o		3
9	Broccoli	1.5		o		-	5

Source: Field Survey, 2016-2019.

Table 3.9 Marketing Profile of Farmer Respondents

No	Buyer	Annual Sales		Contract		Margin of Transaction	Marketing Experience (year)
		Ton	Rp Million	yes	no	Rp/kg	
A		241	2,302			6,123	20
1	Exporter company	200	1,600	o		3,000	13
2	Exporter company	180	1,500	o		3,000	30
3	Supermarket	180	4,500	o		20,000	33
4	Fast-food company and Supermarket	261	6,525	o		10,000	32
5	Exporter company	140	1,300	o		3,000	22
6	Exporter Company	240	3,840	o		5,000	12
7	Supplier Company	250	1,600	o		1,600	9
8	Trade at wholesale market in Yogyakarta and Solo	800	780		o	3,000	45
9	Exporter company and Supermarket	100	1,400	o		8,000	5
10	Supplier company	63	1,877	o		8,000	12
11	Exporter company	150	1,400	o		4,000	10
12	Supplier company and restaurant	200	1,600	o		3,000	11
13	Supermarket	365	2,000	o		8,000	26
B		99	1,836			4,188	12
1	Exporter company	110	11,000	o		4,000	12
2	Supermarket	73	170	o		9,000	6
3	Supplier company	75	750	o		3,000	4
4	Supplier	5	140	o		1,500	9
5	Supplier company	80	960	o		5,000	25
6	Supplier company	130	1,200	o		5,000	5
7	Trade at local market in Jakarta	300	350		o	2,000	30
8	Fast-food company and supplier company	19	120	o		4,000	5
C		17	120			1,500	4
1	Supplier	15	110		o	1,500	4
2	Supplier	20	150		o	1,500	4
3	Supplier	17	120		o	1,500	4
4	Supplier	15	100		o	1,500	4
D		15	150			1,000	7
1	Big collector	15	150			1,000	7
E							-
1	Supplier	20	160			-	-
2	Supplier and fast-food company	6	150			-	-
F		4	20			-	-
1	Collector	7	7			-	-
2	Collector	3.5	3.5			-	-
3	Collector	3	3			-	-
4	Collector	8	8				-
5	Collector	3	3				-
6	Collector	2	2			-	-
7	Supplier	3	75			-	-
8	Supplier	3	75			-	-
9	Collector	1.5	1.5			-	-

Source: Field Survey, 2016-2019.

Table 3.10 Assets and Experiences of Loan of Farmer Respondents

No	Post harvest handling facilities		Transportation (unit)			Loan from bank	
	Have	Do not have	Truck	Car	Motorcycle	Yes	Not Yet
A							
1	o		-	2	3	o	
2	o		0	2	1	o	
3	o		0	4	5	o	
4	o		0	3	5	o	
5	o		0	2	7	o	
6	o		0	2	1	o	
7	o		0	1	1	o	
8		o	1	3	1		o
9	o		0	2	1	o	
10	o		0	2	1	o	
11	o		0	1	2	o	
12	o		0	2	3	o	
13	o		0	1	1	o	
B							
1	o		0	2	2	o	
2	o		0	1	1	o	
3	o		0	1	1	o	
4	o		0	0	2	o	
5	o		0	2	1	o	
6	o		0	1	1	o	
7		o	1	0	1		o
8	o		0	0	1	o	
C							
1		o	0	0	1		o
2		o	0	0	1		o
3		o	0	0	1		o
4		o	0	0	1	o	
D							
1		o	0	0	1		o
E							
1		o	0	1	1		o
2		o	0	1	1		o
F							
1		o	0	1	1		o
2		o	0	0	1		o
3		o	0	0	1		o
4		o	0	0	1		o
5		o	0	0	1		o
6		o	0	0	1		o
7		o	0	0	1		o
8		o	0	0	1		o
9		o	0	0	1		o

Source: Field Survey, 2016-2019.

Chapter 4

Relation Between Farmers` Organization and Leader`s Business

The condition of a supply chain (SC) is another factor that contributes to the creation of disparity between selling price at the consumer level and at the farmer level. Farmers in a long SC are suffering from weak bargaining power to decide the selling price, compared to middlemen and traders. Also, vegetable farmers received the smallest profit than that gained by other agents. This situation is a result of the dependency of farmer on a middleman to approach the consumer. Farmers need to be organized into FO to increase the bargaining power (Natawidjaja et al., 2007 Prastowo et al., 2008).

It will be difficult for individual farmers to sell directly to the consumer. Farmers need to know about the characteristic of the consumers, the preference of the consumers, how to make a transaction and how to ensure the relationship with the buyers. Those organizing activities create costs that identified as a transaction cost. Hobbs (1996), referring to Coase` classification, listed that the transaction costs are information, negotiation and monitoring costs.

Collective action is a strategy to increase the bargaining power, reduce the transaction costs and opportunity to access modern SC (Klein, P. G., 1999; King, et al., 2010; Blandon, 2016). Moreover, strategic alliance or coordination among farmers, who have the same objectives, is needed to organize those economic activities (Hobbs, 1996; Schwabe, 2013).

The collective action among vegetable farmers creates a farmers` organization (FO). Hellin, et al. (2007) found that vegetable farmers can get advantages from farmer`s organization by decreasing transaction cost and market access. Bienabe and Sautier (2005) found that agriculture cooperative gives stable prices and certain market for all of the members` products.

In Chapter 3 We have discussed agent farmers who are organizing certain FOs and play a role as a middleman. Thus, this chapter would like to discuss more the features of vegetable FO, including paying attention to the characteristic of the leaders. We have several research questions to guide the study. First, is the situation of FO stable or instable? Second, what are the reasons that make FO are so fluctuate? Third, how does FO influence the businesses of non-leader farmers? and Fourth, how does a leader`s business connect with FO?

We conducted interview and observation on several FOs in Lembang, Cisarua and Parongpong Sub Districts. There are three types of FO in West Bandung District that have activities in production and marketing of vegetables (see Table 4.1). We selected the FO respondents based on its ability on managing the production and marketing of vegetables and

also the connection to other FOs. We furthermore choose randomly FOs that cannot access to modern channel for a comparative investigation about the dynamics of FOs and the relation between FOs and leaders' business.

The study selected several FOs in the sub-districts to get several cases that could represent the condition of FOs and the leaders' roles. For example, a case of a cooperative in Cisarua Sub District because chili pepper firstly developed in Pasir Langu Village, Cisarua Sub District in 1994 by nine youth villagers. Moreover, we selected several FGs in the surrounding areas to get a description about the condition of FOs and how a leader farmer has been utilizing the FO for his business.

Table 4.1 Number of FOs' Respondents

Sub District	FG	FGU	Cooperative
Lembang	25	3	3
Parongpong	3	1	0
Cisarua	4	0	1
Total	32	4	4

Source: Field Survey, 2016-2019.

In addition, a case of FG in Parongpong Sub District that historically has an exclusive partnership and memorable mutual supports. The leader of the FG was encouraging to the starting business of Bimandiri Supplier Company in 1994. We added 3 other FOs for a further investigation about the features of FOs and the benefits of FOs for farmers.

In Lembang Sub District, we could find more FOs that have a reputation in vegetables SC. Also there are some connections among FOs for the creation of other types of FO, for example, some FGs establish a FGU and then also create a cooperative. We investigated the creation of a cooperative encouraged by Taiwan Technical Mission (TTM) and the Ministry of Agriculture as informed in Chapter 3. This study also searched for other FOs that can explain the dynamics of FOs and the advantages from the existence of FOs for farmers and the leader farmers.

This chapter analyzes the structure of FO and also observes the condition of FO. Furthermore, this study investigates the relations between the existence of FO and leaders' business. The discussion is inspired based on our observations during the field surveys questioning about the utilizing of FO to support the business of the leader.

We then classified the respondents based on the type of SC and the role of leader farmers as a middleman. This classification is made to make a general description of how the existence of the leader can drive SC to member farmers.

4.1 Types of Farmers' Organization

This study found that there are three types of farmers' organization (FOs) related to the vegetable economy. There are farmers' group (FG), farmers' groups union (FGU) and cooperative³. Based on our observation on four cooperatives, four FGUs and 32 FGs, there are distinctive features among them, i.e. the organizational structure.

(1) Single-layered structure

We observed there are two types of structure organization based on the layers. First is the single-layered structure (see Fig. 4.1). That is the most basic and typical FO found in the respondents that is called FG. The structure layer describes only about the relationship between leader and member farmers. There are secretary and treasurer on the structure. However, the only position that have the dominant function or decision power is the leader.

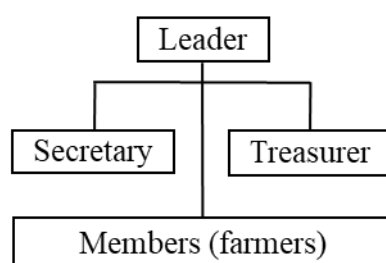


Fig. 4.1 Structure of FG

A leader in FG chooses the secretary and treasurer who have closer relationship. In the first case, the secretary and the treasurer are from the family members, e.g. the wife, the son, the daughter, or other family relatives. The second case, they are selected from member farmers who are neighbor, classmate or from religion organization and other factors. The leader has that decision because he or she could minimize the complaining or disagreement on utilizing the supports received by governments or other organizations.

(2) Multi-layered structure

Another type is the multi-layered structure of FO (see Fig 4.2) that resulted from the enhancement of the single-layered structure of FG. There are FGUs that is formed as the result

³ According to Ministerial Decree of Agriculture number 18 in 2018, farmers' group is a set of farmers that is formed based on the same interest, same social, economic and resources environment, the same commodity and friendship to increase and develop the member's business. FGU is a set of FGs to increase the scale of economy and efficiency of the business. Farmers economical organization is an organization that runs the farm business made by, from and for the farmers to increase the productivity and efficiency of farmings and the organization can be formed in a legal entity or not. An example of farmers' economical organization is cooperative.

of a merger from several FGs. Meanwhile, the other is cooperative that is created as the result of an agreement to make another type of FO shifting from FGs.

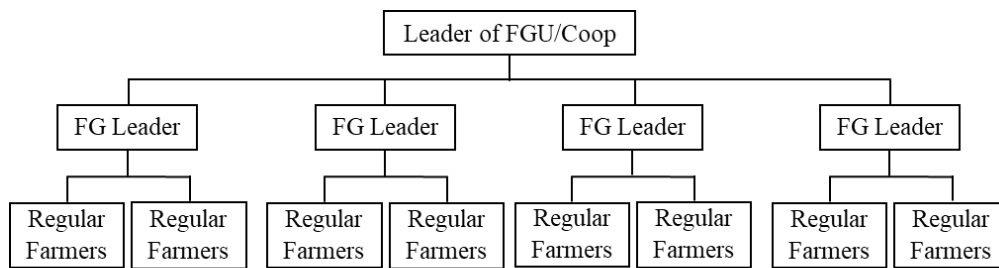


Fig. 4.2 Developed Structure of FO

(a) FGU

FGU is the union of several FGs. The government encourages that in the same village every FG that plays different functions should form one FGU. FGU then can increase the farm business of farmers because the function of every FG, e.g. FG of seed grower, FG of production and FG of marketing can support each other and organize all the members into one organization. The government provides a program of PUAP (*Pengembangan Usaha Agribisnis Perdesaan*) Rural Agribusiness Development Program that provides Rp100 million for one FGU. The fund then should be organized by the FGU to support the farm business of all member farmers.

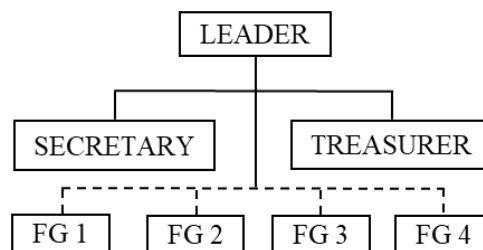


Fig. 4.3 Structure of FGU

The structure of FGU is similar to FG, where it consists of a leader, secretary, treasurer and members (see Fig.4.3). All leaders of every FGs that agreed to form the FGU decide who will be leader, secretary and treasurer. However, it does not delete the structure of FG, so that it multiplies the layer by adding the single-layered of FG into FGU.

All FGU respondents have a similarity. The leaders have a reputable social status for their able to sell the products in huge volume and also ability to communicate with government or other agencies or have extensive network to other organizations. Meanwhile, the secretary can be the representative of every leader of FGs as the members.

(b) Cooperative

Another type of multi-layered of FO is known as cooperative. Cooperative has the similarity of formation process to FGUs, where it is developed from the single-layered structure of FG. However, there are some differences from FGU. Four cooperatives have a notarial deed that shows the legal aspect of the establishment of an organization. They have to pay the cost that is collectively paid by all founding farmers for the registration into a notarial office.

This legal aspect registration supports the organization to make a business agreement with buyers or other agencies. Therefore, cooperative is a business entity organized by farmers. The structure of the organization should follow the regulation of cooperative managed by the government regulations⁴. So there is a standard of the organizational structure of cooperative (see Fig. 4.4).

A cooperative is called as the multi-layered organization because it is developed from FG and also FGU. However, not all members of the previous FO are the member of the cooperative. The members of cooperative are selected by the reputable farmers who have dominant influences for organizing the cooperative.

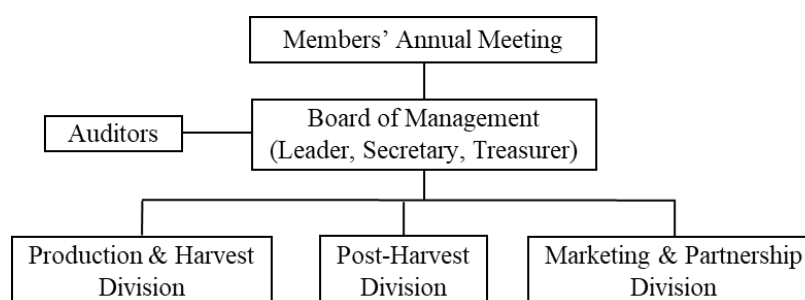


Fig. 4.4 Structure of Cooperative

The structure consists of members` annual meeting, a board of management, auditors and divisions. The highest position is the members` annual meeting. It means that all members should agree the decision of the organization. They will decide who will be the leader, secretary and the treasurer.

Similar to those leaders in FGU, the board of management`s members are farmers who have strong influences and have the well-known abilities. Thus, those farmers will be chosen by other farmers to be the board of management to manage the role of the cooperative. They will select independent outsider as the observer to advice to the board of management. The board of management will manage the activity of workers in every division.

⁴ The Ministerial of Cooperative and Small-Medium Enterprises number 10 in 2015 about Cooperative.

The cooperative has distinctive features than those other types of FOs. They have division units, e.g. production, harvest, post-harvest, marketing and partnership that are similar to a supplier company. Also, two cooperatives already provided a monthly salary for the board of management staffs, e.g. Rp3 million for every person. There are also saving and loan services provided by the cooperatives for the members.

The cooperatives have been able to make direct trade with buyer, e.g. fast-food company, supermarket and other supplier companies. It describes that cooperative has more advanced roles, which are not only seeking some supports but also organizing farmers to supply to closed-markets that have high requirements of quality, quantity, continuity and payment method. The cooperatives set the production plan schedule, post-harvest handling practices and delivery schedule.

The existence of cooperative shows the strategy for improving the farm business of farmers through organizing the farmers into FO to replace the dependency of middleman (Freddy and Yanagimura, 2018). The member farmers gain the benefit of improving the farming and marketing of the products.

However, there are 2 from 4 cooperatives found to be dissolved. The first one is the oldest of cooperative and the other is the youngest cooperative. It means that disunity has also become a big problem when developing from single-layered to multi-layered of FO.

4.2 Characteristics of FOs based on Leaders' Roles

Every FO typically has one marketing business lead by the leader's role. However, different conditions are found in FG-No 12 and FG-No.13. There are 2 leaders, the leader and the secretary, run their own business marketing. In FG-No.12, they both run the business in modern SC, while in FG-No.13 the leader played the role as a big collector in traditional SC and the secretary played the role as a supplier to PT Momenta Agrikultura Supplier Company.

The agent farmers in FG-No. 12 agreed to manage the member farmers and support each other business. They make a clear zone of business where the leader focused on the selling of Kenya beans to exporter company. Meanwhile, the secretary sold several exclusive vegetables to supplier companies. Both of them were joining each other production and marketing program.

Unlike in FG-No. 12, the leader and the secretary FG-No. 13 have a different business orientation. Therefore the leader who has the business orientation into traditional SC has no power to control the member farmers. Meanwhile, the secretary has the power to control because he provides support, post-harvest handling facilities and sets the production schedule. This indicates that any farmer can run the business role and took over the dominant power in

FO. All of them informed that the existence of agent farmers in FO could give alternative buyers.

Table 4.2. Characteristic of FOs in Modernising the Farm Business Based on Leader's Roles in 2019

FO	Leader	Sub District	Strategy to modernised farm business							
			SC		Production plan		Post- Harvest Unit		Provide Supports	
			T	M	No	Yes	No	Yes	No	Yes
Cooperative										
1	A-m no 3	Cisarua		o		o		o		o
2	B-m no 4	Lembang		o		o		o		o
3	B-m no 8	Lembang		o		o		o		o
4	A-m no 6	Lembang		o		o		o		o
Farmers' Groups Union (FGU)										
1	B-m no 2	Lembang		o		o		o		o
2	A-m no 2	Lembang		o		o		o		o
3	A-m no 6	Lembang		o		o		o		o
4	A-t no 8	Parongpong	o		o		o			o
Farmers' Group (FG)										
1	A-m no 4	Cisarua		o		o		o		o
2	B-m no 5	Parongpong			o	o		o		o
3	A-m no 2	Lembang		o		o		o		o
4	B-m no 1	Lembang		o		o		o		o
5	A-m no 1	Lembang		o		o		o		o
6	A-m no 6	Lembang		o		o		o		o
7	B-m no 4	Lembang		o		o		o		o
8	A-m no 7	Cisarua		o		o		o		o
9	B-m no 2	Lembang		o		o		o		o
10	A-m no 12	Lembang		o		o		o		o
11	B-m no 3	Lembang		o	o			o		o
12	A-m no 11 and	Lembang		o		o		o		o
	B-m no 6			o		o		o		o
13	B-t no 7 and	Lembang	o		o		o		o	
	A-m no 5			o		o		o		o
14	A-m no 9	Cisarua		o		o		o		o
15	A-m no 10	Cisarua		o		o		o		o
16	C-m no 2	Lembang		o	o		o		o	
17	C-m no 4	Lembang		o	o		o		o	
18	C-m no 3	Lembang		o	o		o			o
19	D-t no 1	Parongpong	o		o		o			o
20	C-m no 1	Lembang		o	o		o			o
21	F-t no 2	Lembang	o		o		o		o	
22	E-m no 2	Lembang		o	o		o			o
23	E-m no 2	Lembang		o	o		o			o
24	F-t no 5	Lembang	o		o		o		o	
25	F-t no 3	Lembang	o		o		o		o	
26	F-m no 8	Lembang		o		o	o			o
27	F-t no 9	Lembang	o		o		o		o	
28	F-t no 1	Lembang	o		o		o		o	
29	F-t no 6	Lembang	o		o		o		o	
30	A-m no 13	Lembang	o		o		o		o	
31	F-t no 4	Parongpong	o		o		o		o	
32	F-m no7	Lembang		o	o		o			o

Source: Field Survey, 2016-2019.

Leader farmers who play the role as agent farmer in the type of A-m and B-m have a stronger position because they own the post-harvest facilities and access to the buyers in

modern SC. They own the margin of trade that sell through the FO. Meanwhile, other types of leader have no strong position. There are also leaders of FO who have no role as a middleman as marked as E and F in Chapter 3. The modernization of farm business in FOs in which the leaders are classified as F-t cannot be applied, because the leaders themselves still depend on the collector and have not changed the farm business. However, E-m and F-m can spread the knowledge to other member farmers about accessing modern SC from their activity.

This will affect the role of FO furthermore. As discussed in Chapter 2, Cooperatives could organize member, apply the production plan schedule and marketing through the FO. Meanwhile, in FGU and FG, the role of FO is just organizing member to participate in some training or receive other supports from the government. FGs in which the leaders are categorized as F-t type, have the role only for sharing information and proposing some supports to the government.

4.3 Condition of FOs

In general, not all member farmers join the leader's production plan and marketing program. In modern SC there is a scheduled target of supply and limited volume of trade in one delivery. Meanwhile, in the wholesale market, there is an unlimited volume of supply.

Participation of member farmers

The leaders in modern SC decide the number of members who can join his program. There are several reasons why the number of members is not fixed. First, because it depends on the volume of order. The leader can increase the number of members when he could get additional buyers or get additional order from the buyer. Also, it can decrease when there is a decreasing volume of order from the buyer. Second, as discussed in Chapter 3, that rotation plant mechanism, to prepare the soil for the next production phase, e.g. one month, makes not all farmer could join continuously. Third, member farmers already aware of using some parts of the soil to produce short-cycle of production of vegetables and utilize the existence of both traditional and modern SC, in combining the cash flow.

Commitment

There are 14 FOs that have a fix number of member who join the leader's program. The relationship between leader and members affects the participation of the members into the leader's program. The leaders maintain the trust to the member farmers through providing supports, paying the revenue faster, giving higher of farm gate selling price, helping to search buyers in a condition of overproduction and seeking support from government or other organizations.

Table 4.3. FOs Condition

FO	Number of Members (farmer)		Commitment of members		Condition
	Join the program	Total	Weak	Strong	
Cooperative					
1	3	50	o		Dissolved
2	not fix	200	o		Active
3	7	7		o	Active
4	not fix	20	o		Dissolved
Farmers' Groups Union (FGU)					
1	6	220	o		Inactive
2	not fix	100	o		Inactive
3	not fix	200	o		Inactive
4	not fix	90	o		Inactive
Farmers' Group (FG)					
1	6	6		o	Active
2	not fix	26		o	Active
3	not fix	26		o	Active
4	not fix	20		o	Active
5	not fix	40		o	Active
6	not fix	31	o		Inactive
7	5	5		o	Active
8	6	31		o	Active
9	6	6		o	Active
10	not fix	9	o		Inactive
11	40	40		o	Active
12	not fix	10	o		Inactive
	4	10		o	
13	6	6		o	Active
14	14	14		o	Active
15	not fix	31	o		Inactive
16	not fix	31	o		Inactive
17	4	31		o	Active
18	not fix	7		o	Inactive
19	not fix	31	o		Inactive
20	o	31	o		Inactive
21	0	15	o		Inactive
22	0	13	o		Active
23	4	10		o	Inactive
24	0	15	o		Inactive
25	0	9	o		Dissolved
26	2	10		o	Inactive
27	0	32	o		Inactive
28	0	31	o		Inactive
29	0	31	o		Inactive
30	not fix	0	o		Dissolved
31	0	10	o		Inactive
32	not fix	10	o		Active

Source: Field Survey, 2016-2019.

In addition, the partnership between a fast-food company with two cooperatives in Lembang Sub District creates a strong commitment for member farmers. The investment

supports to build production facilities such as GH and also access to modern SC makes the bonding between farmers and the FO stronger.

FG-No. 12 has an advantage where all the member farmers are coming from weak farmers and respect each other. Those factors strengthen the commitment. Two agent farmers in FG-No 12 creates controlling power through the production and marketing program. Also, specific market, e.g. Kenya beans that is suitable to sell for export, creates member farmers who join the leader's program become fully committed because buyers in traditional channel have no demand for that kind of beans from their consumers.

Changes in FO

FOs is so fragile for changes. As discussed in Chapter 2, there are 4 dissolved FOs, 20 inactive FO and 16 active FOs. Weak commitment and conflict among member farmers are the main factors for creating changes in FO condition.

Thus, through FO, collective action for production and marketing plan program can be done. However, many problems have to be dealt with to maintain the unity of the FO.

4.4 Case Studies of Reorganization of FO

(1) FGU-No. 2

FGU-No. 2 has shown a change of FO. It was started by the initiative of a key agent farmer to change his business orientation from being a driver of a big collector to a wholesale market in Jakarta to be a supplier to an exporter company. Then, to supply 300 kg of beans in a day, he organized some farmers in his surrounding area to supply beans to the exporter company. He set the production schedule and build post-harvest handling facilities to support his role as an agent farmer.

He then formed a single-layered of FG, as FG-No 3, consisted of 35 members. He was able to develop the trade capacity by supplying to other exporter companies. His ability to organize the continuity of supply invited more exporter companies wanted to make a partnership with him. Another exporter company introduced to him a new type of Kenya beans that was accepted by Singaporean consumers. Then, he has successfully produced Kenya beans and supplied 500 kg in a day to that exporter company.

After that in 2005, among members in the FG, there had been a conflict, where there were 2 members left out and ran their own business to supply to different exporter companies. This situation gave advantages to the exporter company because the farmers' bargaining power had been divided. The two new agent farmers then organized several farmers to be their member farmers and join each own's production and marketing program.

In 2010, the initiator farmer (the agent farmer A-m-No. 2) encouraged his elder brother (A-m-No. 12) to run his own business and form his own FG (FG-No. 10). He encouraged more neighbor farmers, who are agent farmer B-t number 7 and A-m-No. 5, to create FG-No. 13 in 2010.

Table 4.4 Process of Reorganization of FGU-No. 2 in Lembang Sub District

Year	Progress
2013-2019	Disharmonies among FGU members has been emerged, FGU has been inactive and every leader focus on his or her own business and did give attention to the condition of FGU; the number of member in all 5 FGs also has been changes.
2012	FGU received a full packaged of post-harvest handling facilities and 1 cold storage box-mini truck.
2010	He invited all the 5 FGs to form a FGU (FGU-No. 2).
2010	He suggested his elder brother (who become agent farmer A-m number 12) to form an FG (FG-No. 10, consisted of 10 members) and ran a business to supply Horenso spinach to supplier companies and his neighbours (who become agent farmer B-t number 7 and A-m number 5) to form an FG (FG-No. 13, consisted of 8 members) to supply kenya beans and horenso spinach to an exporter company.
2005	His ex-wife (who become agent farmer A-m number 1) ran her own business to supply to an exporter company and created a new FG (FG-No. 5 consisted of 30 members); another member (who become agent farmer number 4) also got out and ran his own business and formed a different FG (FG-No. 4, consisted of 26 members) to supply Kenya beans to different exporter company.
2005	Introduced a new type of Kenya Beans by another exporter company and make with total 3 exporter companies.
2004	Created a FG-No. 3, consisted of 35 members.
2003	Met a staff of an exporter company and make agreement to supply beans.
1999 - 2003	A driver to Wholesale Market of Kramad Djati.

Source: Field Survey, 2016 - 2019.

He noticed that to increase bargaining position dealing with exporter companies then he invited the leaders of the 4 FGs to join into an FGU (FGU-No. 2). They all agreed to form and then the FGU-No. 2 was officially established in 2010. He was the leader of the FGU and all members were from 5 FGs. Thus there has been a creation of a multi-layered organization, where every leader still manages his or her own FG.

After establishing the FGU, he received support from the Ministry of Agriculture in 2012 a full set of post-harvest handling facilities and one cold-storage box-mini truck. There had been several trainings and other reward given to him as the leader of the FGU. However, the domination of the leader creates dislikes from other leaders of each FGs and it creates

disharmony among members. Every leader of each FG wanted to focus on his or her own business so that they do not actively participate in the FGU activity.

Therefore, creating multi-layered of FO, e.g. FGU, creates new problems. It needs the innovation of FO managerial to maintain the trust and commitment among members.

The increasing number of members creates more risks of conflict and bad commitment. Member farmers will return to find any buyers who would like to give the best trade with the member farmers. Especially the unification of agent farmers who already have settle business will have a conflict of interest in the multi-layered organization.

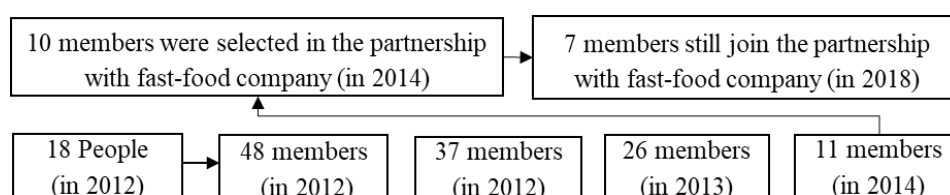


Fig. 4.5 Changes of the number of members in Cooperative-No. 3,
Source: Field Survey, 2016-2019.

(2) Cooperative-No. 3

Similar to the trigger factor of forming an FO, Cooperative-No. 3, the formation of the cooperative was inspired by the initiation of key farmers (agent farmer A-m-No. 13 and E-m-No. 2) to improve the farm business of the farmers in the surrounding area to make a partnership with a buyer in modern SC. Both agent farmers were the leaders of different FGs (FG-No.30 and FG-No. 23).

So that the cooperative is also a multi-layered organization but with selected members. The selected members were active to their own FGs and also in the same time as the member of cooperative (see Fig. 4.3). This is a different form of multi-layered of FGU. In cooperative there are two dominant key farmers; meanwhile, in FGU, there is only one dominant farmer. Also, the cooperative had registered into the notarial office and thus convinced buyers in modern channel that the organization as a legal business entity.

In 2013, the staff of a fast-food company came and proposed a 5-year partnership with the cooperative under its CSR program. In 2014 the partnership document was officially signed. The leaders selected 10 member farmers who have good commitment and could be trusted into the agreement.

However, similar to the case of previous FGU, there is also a problem in maintaining the number of farmers. The number of members in Cooperative-No. 3 had been decreasing (see Fig. 4.2) because two member farmers had pest and disease attacks, some farmers changed

their jobs farming and the others would like to do farming and sell their products to other buyers. They, therefore, left out of the membership in the cooperative.

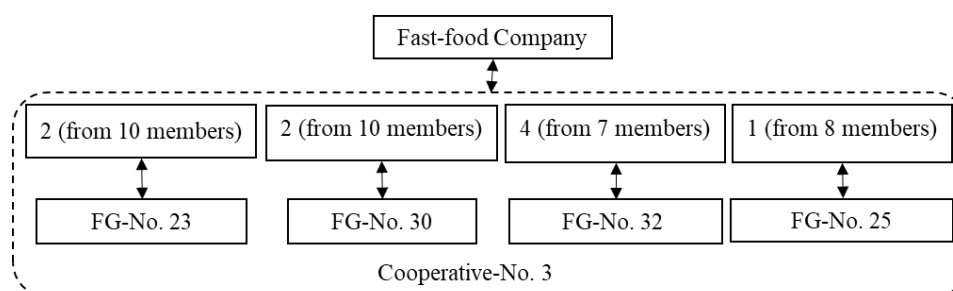


Fig. 4.6 Partnership in Cooperative-No. 3, Source: Field Survey, 2016- 2019.

There was also a conflict of interest where the leader, A-m-No. 13 ran his own business and loose his farmland. So that he reduced his interest to manage the partnership with the fast-food company. The other leader, E-m-No.2 was busy with his political organization activities. Therefore since 2018, the business of supplying to the fast-food company was handed over to a member who then become agent farmer B-m-No. 8.

The agent farmer of B-m-No. 8 would like to continue the partnership because he could get additional margin of trade (e.g. Rp4,000/kg) as the supplier and also alternative buyer. He initiatively wanted to keep the good reputation of the cooperative by took over the partnership. He managed the production plan and coordination with a technical staff sent by the company.

The formation of multi-layered type of cooperative gives better circumstances to improve the farm business of the member farmers. However, it shows that multi-layered of FO in the form of FGU and cooperative still has the risk of changes. Thus, the role of leaders in maintaining the FO is vital.

(3) Cooperative-No.1

There was a reputable cooperative as the producer and supplier of chili pepper or ‘paprika’ in Cisarua Sub District. The Agriculture Office of West Bandung District Government promoted the cooperative as a reference of a successful FO. It was started by the same spirit of 11 youth villager to supplied paprika as a new type of commodity that could be sold to a supermarket, then in 1994 they agreed to form an FG. After successfully producing chili pepper in the village, then in 1996, they could organized until 100 farmers to produce chili pepper and to support the increasing target of supply to more supplier companies.

However, a little conflict had appeared when the number of members had been increased. One of the members (who then become agent farmer A-m-No. 4) got out from the membership

and then ran his own business supplying to supplier company and fast-food company. This A-m-No. 4 then formed a new FG-No. 1.

Table 4.5. Process of Reorganization of Cooperative-No. 1 in Cisarua Sub District

2019	agent farmer no. 3 invited 2 ex-member farmers into his individual business to supermarket
2018	the FO was dissolved, the assets and trade were taken over by the secretary, who was agent farmer number 3
2017	there had been conflicts between leaders caused by the default of loan from a bank
2012	created partnership with a supermarket and an exporter company
2006	the number of member decreased to 25 farmers
1999	the number of member decreased to 90 farmers
1999	transformed to cooperative
1997	one of the member separated and form FG-No. 1
1996	the number of member increased to 100 farmers
1994	11 young people formed an FG

Source: Field survey, 2016-2019.

Then in 1998, an extension official suggested the FG transformed into a cooperative to make a direct trade with supermarkets. They officially registered the new form of FO, i.e., Cooperative-No. 1.

The cooperative had advanced managerial of an organization as a supplier company with an excellent performance of a business. They had been able to book the annual trade sales worth of Rp3 billion. They could produce 30 ton in a month from production schedule of 20,000 trees every month. They applied the monthly pooling price system and provided loan and saving services. They could get a loan of Rp2 billion from a bank through the cooperative in 2008.

However, the conflict among members then was started becoming bigger; thus, the number of members had been decreasing until 25 members were still left in 2006 and it kept decreasing until only 5 members in 2017 and finally being dissolved in 2019. Most of them become independent farmers and run their own FGs.

Previous ex-members ran their own production and this situation has created uncontrolled of supply and fluctuation of selling price for chili pepper in the village. The flat of selling price had many times lower than the selling price from the buyers in traditional SC and it affected more and more member farmers to be not committed into the cooperative and took granted from the higher of selling price offered by other buyers rather than to the cooperative.

There had been three times of changes in the board of management and it created more conflicts because most of the founders disrespect with the management style of the new board

of management. Previously some member farmers left out of the cooperative because they had been unsatisfied run by with the transparency of transaction by the new board of management.

There was only 1 founder (as agent farmer A-m-No. 3) still stayed as the secretary and he had been successfully increased his business and farmland until 30 GHs that could produce 240 ton in a year.

In addition, we witnessed how a cooperative that had been formed for more than 20 years had to be dissolved because of conflict among members. Cooperative-No. 1 in Cisarua Sub District had been dissolved in 2018, because there was a conflict between the leader and the secretary caused by the default of the loan from the leader and he was being escaped.

The secretary who operated the dominant production took over the assets and the supply to the supermarket and other buyers as his own business because he took the responsibility for all the unpaid loan to the bank.

This case emphasizes that problems in the managerial of the FO can emerge in any FO. Factors of trust and maintaining the commitment among members is the key strategy to maintain the FO. However, they could facilitate access for member farmers into modern SC and thus creates changes in farm business for farmers through FO.

(4) Cooperative-No. 4

Cooperative-No. 4 is one of the examples of how an FO can be dissolved only less than a year. There had been bad transaction records made by the board of management, so that TTM and Ministry of Agriculture, who are the initiator of the formation of the cooperative, agreed to dissolve the cooperative and change to an independent organization to run the vegetable business.

TTM and MoA would like to enhance the purpose of the 5-year training program by creating a cooperative that could play the role as a supplier company to modern SC. They had been able to invite 30 key leader farmers from Lembang, Parongpong and Cisarua Sub Districts. In 2017 we witnessed the first meeting of the key leader farmers in agreeing to form a cooperative.

Then 20 leader farmers agreed to be the members and thus they registered the cooperative to a notarial office in 2018. However, since 2017, the business of supply to several supplier companies had been done for several times managed by agent farmer B-m-No 4. He just organized the production from participants of the programs and then sold to several supplier companies. There was no production schedule program yet, but they already used the post-harvest handling facilities provided by the TTM.

In early of 2018, there had been distrust from the TTM to the management staffs lead by agent farmer of B-m-No. 4. They could not explained some trade payment from several buyers. Since February 2018, TTM asked agent farmer of A-m-No. 6 to take over the activities. He was officially appointed as the leader in the board of management in the notarial deed document.

Finally, in the last of 2018, TTM and MoA agreed to dissolve the cooperative and then in 2019 they created LAIC (Lembang Agribusiness Incubation Center), an independent supplier business unit managed by professional, or not a farmer, under supervision of TTM and MoA. They hired a professional marketing agent who was used to sell to a supermarket and other buyers. LAIC is now trying to find the best format as a supplier company and prepare to make a partnership with farmers who had been participating in the training programs.

The main factor that hampered to run a big FO composed by key leader farmers was because the leader farmers have their own business and therefore, it triggered a conflict of interest. They already busy and have no time to handle so huge number of farmers. Also, they had no preparation for running a huge FO because they only knew for participating in a training program. Thus they had no same vision and understanding in running the cooperative. Therefore, this case shows the difficultness of forming a strong multi-layered of FO composed by many leader farmers. A leader is not easy to be dealt with, handling many numbers of members.

However, FO could deliver the changes in the mindset and knowledge of member farmers about access to modern SC. For example, agent farmer C-m-No. 3, he could transform from ordinary farmer into agent farmer C-m and therefore he could spread the knowledge and access to his member farmers in his FG-No. 13. Leader farmers have the key position to maintain the FO and creates the modernization of farm business of member farmers.

Finally, leader farmers who are agent farmers will ensure his profit and choose to handle several farmers who would like to participate in their production and marketing plan. Forming a multi-layered FO create more problematics in FO management. A leader who is agent farmer takes granted from the existence of FO.

4.5 The Relationship between FO and Leader's Business

This study found that a leader of FG has a dominant power in FO that is supported by their competitive advantages as a middleman. A leader influences positively to other farmers to change the farm business orientation become modernized. The leader farmer who can access modern SC needs other farmers to ensure the continuity of supply. The main advantage that a leader can get from the role of a supplier is the margin of trade. The trust and commitment of

member farmers into the leader's direction depends on the ability of the leader to share the profit and give support to the member farmers.

Therefore, a leader would like to share the profit from the margin of trade to the member farmers. This character is different from the traditional middleman who only takes benefit and has less concern about profit sharing to the farmers.

The modern SC has produced the existence of leader farmers as agent farmers who play the role as a modernized middleman. They could transform traditional farm business to modernized farm business that could give better profit for farmers.

Modernized middleman can get bigger of profit with a stable and continuous trade in a big volume, e.g. agent farmers type A-m supplying to exporter companies. Meanwhile, traditional middlemen tend to take a smaller profit in a big volume of trade without stable supply. This can be explained because, from the post-harvest handling practices done by the modernized middleman, they could comply with the quality standard requirements and continuity of supply. Therefore they could earn more significant profit.

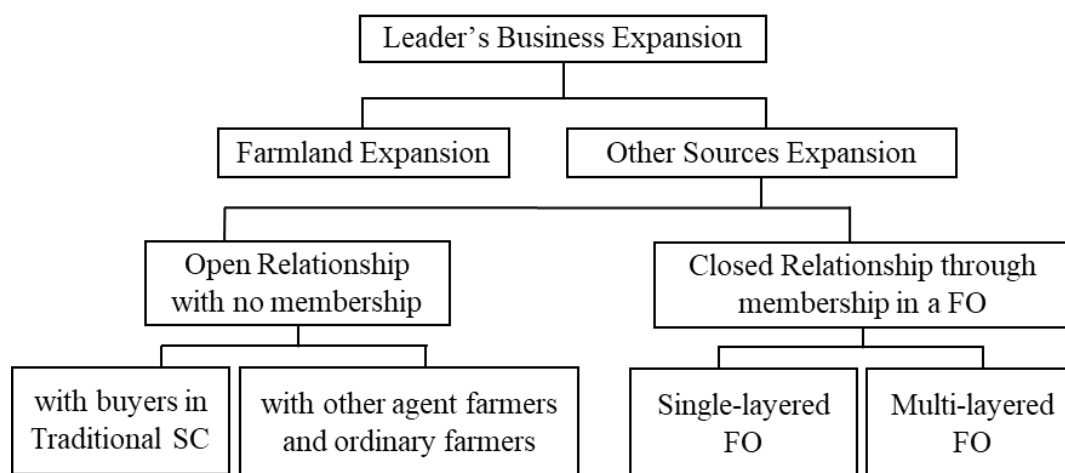


Fig. 4.7 Leader's Strategy in Managing the Business

A leader who is an agent farmer will adjust the business expansion by expanding his own production and other sources (see Fig. 4.7). Dependence on other sources expansion needs collective action such as scheduled supply, consideration to rotation planting and continuity. Such collective actions are often done with traditional way of distributing supports, e.g. seeds, fertilizer, and cash money that is similar to debt-bondage practices.

A leader can institutionalize the business relationship into certain FO (i.e. single-layered FO (FG) and multi-layered FO (FGU and cooperative). This is known as closed relationship that based on membership (FO management). Meanwhile, some leaders like to maintain an open relationship without membership with other agents in traditional SC and even with other

agent farmers of different FO and other ordinary farmers to adjust the conditions of production from the member farmers and his own production.

Our study found a similar characteristic in all FO respondents where FO is strongly related to the leader's business. Thus the ability of the leader to manage the trust and commitment among members will differentiate the condition of the FO. Almost all of the FOs had been experiencing conflicts among members. However, there was one FO that could represent a good condition of FO management adjusted to the business orientation of the leaders.

A case of a FG-No.12 in Lembang Sub District

This study found an example of organizing an FO that can optimize the benefit from collective action and maintain the harmony among agent farmers in the same FG. FG-No 12 have 2 agent farmers (A-m no 11 and B-m no 6). A-m-No. 11 focuses on supplying Kenya beans to exporter company, meanwhile, B-m-No. 6 focuses on supplying exclusive vegetables to supplier companies. They agreed to organize 40 member farmers into their production and marketing programs. Both agent farmers also joined each other programs to get alternative buyers.

FG-No. 12 is a single-layered one and operated with the collaboration of two agent farmers: A-m-No. 11 as a leader and B-m-No. 6. as a secretary. A-m-No. 11 grows vegetable in 1 ha of farmland, while agent farmer of B-m-No. 6 has 2,520 m² of farmland. Both of them are suppliers to buyer agents in modern SC. A-m-No. 11 focused on a single commodity of Kenya beans supply to exporter companies. Meanwhile, B-m-No. 6 focused on several exclusive vegetables, e.g. beef tomato and kale to supplier companies to supermarkets.

Agent farmer A-m-No. 11 in 2019 has a total capacity of supply of 500 kg a day to 3 exporter companies. Meanwhile, agent farmer B-m-No. 6 has total capacity of supply 50 types of vegetable in total 500 kg a day to 5 supplier companies. Both of them have their own post-harvest facilities.

B-m-No. 6 learned farm business from A-m-No. 11 and they agreed to form FG-No. 11 to manage weak farmers in their surrounding areas. B-m-No. 6 had been able to invite three investors to manage the business. They wanted to improve the condition of weak farmers by changing into modern SC. They are able to organize 40 member-farmers and 170 non-member farmers into their production and marketing programs. We need to pay attention to such collaboration of agent farmers to think the way to strengthen FOs.

Farmers who joined their program could get higher profit (as shown in Table 4.6) after modernizing their farm business. For example, a farmer previously only received profit only

Rp2,000/kg (production cost of Rp3,000/kg and farm gate of the selling price of Rp5,000/kg) from producing local tomato and sold to a collector in traditional SC.

Table 4.6 Trade Margin of Leaders in FG-No. 12 in 2019

Criteria	Agent farmer				
	A-m No. 11	B-m No. 6			
	Kenya Beans	Beef Tomato			Kale
Commodity		Grade A	Grade B	Grade C	
Quality standards	14 cm long	200 (gr/fruit)	150 – 200	<150	
Farm Gate selling price (Rp/kg)	11,000	11,000	10,000	6,000	25,000
Producton cost (Rp/kg)	3,000	4,000	4,000	4,000	2,000
Farmers` profit (Rp/kg)	8,000	7,000	6,000	2,000	23,000
Leader`s gate selling price (Rp/kg)	15,000	16,000	14,000	8,000	40,000
Leader`s margin (Rp/kg):	4,000	5,000	4,000	2,000	15,000
1). Expenses	2,000	3,000	3,000	1,500	3,000
2). Profit	2,000	2,000	1,000	500	12,000
Buyer	Exporter Company	Supplier company to supermarket	Restaurant	Collectors	Supplier company to supermarket

Source: Field survey in 2016 - 2019.

Those agent farmers increased the commitment of the member farmers not only from the profit sharing but also from getting supports from other organizations. In 2018 they received Rp218 million from a foundation to support the proposal made by the agent farmers. The proposal was about improving 12 selected poor farmers. They used the funds for renting a 1.5 ha of farmland that was used by the 12 farmers and also supported the role of the FG such as providing the production facilities that can be sold by all member farmers. The agent farmer B-m-No. 6 can ensure the sustainability of his business from that additional production supported by the partnership program.

They managed the fund based on the revolving mechanism. So every selected member farmer should be able to return the fund (e.g. Rp12.3 million to produce Kenya beans and lettuce) in one year. So that the next year the fund could be used for other member-farmers.

They manage the production, post-harvest and marketing of the products. The poor farmers do the production and ensure the condition of the plant. The agent farmers also made a routine meeting that discusses not only about production but also a social activity, e.g. cultural performance and helping local residents.

They did not want to transform their FG into multi-layered FO because they were afraid that it would be more difficult to manage in such structure of the organization. They wanted to manage member farmers in a structure of FO that could give them a dominant position.

Finally, our study is convinced that the leader`s business orientation triggers the formation of FO. Therefore, FO is strongly related to the leader`s business and every leader

who is agent farmer prefers to manage FO with a small number of member that they could anticipate the conflict.

The transformation of the structure of FO into multi-layered of FO will not be effective to be applied. It happens because every leader will try to ensure his or her own business. Also, more number of members into the multi-layered FO gives a higher risk of conflicts. Inadequate commitment will emerge when a leader has weak bargaining power. Thus, a leader should increase bargaining power through farm business and FO management. However, the existence of agent farmers shows evidence of how farmers can shift to modernized farm business by entering modern SC.

Chapter V

Summary and Policy Recommendation

5.1 Summary

The vegetable supply chain (SC) in Indonesia has been changing. This changing is inline with the increasing number of population, consumption pattern and urbanization. The increasing production of vegetables supports the national gross domestic product. Good domestic production has been able to meet the requirements of the export SC. The supplies of vegetables from domestic and import as well affect the inflation and deflation through it's fluctuate selling price.

Transnational supermarket retailers have introduced new procurement system that concerns on quality, quantity, continuity and payment method. Thus, the new procurement system creates new agents, especially suppliers who could meet the characteristic of the buyers. The new type of agents and interaction among them create a modernized SC that is different from traditional SC. Modern SC has scheduled supply, clear demand and agreement between supplier and buyer. Modern SC has new structure and pattern of supplies than that in traditional SC, especially the emerging of agent farmers and buyers.

Government has adapted the policies adjusted to the changes in the characteristic of vegetable trades. Some supports have been delivered through the existence of farmers' organization (FO) to empower collective action among farmers. The government also has produced several regulations that affect the role of every agents and characteristis of agents in the SC. However, some regulations need to be revised because they could impede the improvement of farm business of farmers.

West Bandung District has a competitive advantage as vegetable production area in West Java Province that has various types of SC. Some leader farmers have been transformed as suppliers in the modern SC.

Modern SC has improved the farming system where farmers have been able to modify the farming system. There have been more advanced of production techniques such as soil treatments, greenhouse, and selecting the exclusive kind of vegetables adjusting the order.

The existence of modern SC creates new employment not only for the production but also for post-harvest handling tasks, e.g. cleaning, grading, packaging and labeling. The farmers have been aware of good handling practice when delivering the products to buyers' stores.

Modern SC has been able to transform the role of FO not only for proposing supports from government and other agencies but also for organizing collective action of member farmers to sell the products to buyers, e.g. supermarket, supplier company, exporter company and fast-food company.

Big players in modern SC have introduced various improvements. The existence of big players, e.g. supplier company and exporter company near the farmers' area has been affecting the improvement of farm business of farmers. They spread the production techniques such as production plan, seed growing, selecting exclusive vegetables, greenhouse production and post-harvest handling practices to agent farmers. Also, a fast-food company is found to make a partnership with FOs to make vertical coordination ensuring the supply of several kinds of vegetables that match with the needs for their food stores.

Some international agencies, e.g. JICA and TTM-ICDF, have provided training programs concerning the improvement of production aspect and marketing knowledge to support the farmers accessing modern SC.

Some farmers have been transformed from ordinary farmers into agent farmers, who can produce and sell the products to the buyers directly. Those agent farmers have the distinctive characteristic, especially from the capability to organize the production from their own production and from other sources and also the volume of the trade. In addition, there are some farmers who can organize FO and are chosen as the leader. Thus based on the capability to play the role as an agent farmer, there are 6 types of leader farmer.

First, there are agent farmers who have been able to manage big farm size and big volume of trade. Second, there are agent farmers who have big amount of trade but own small farmland. They could exist in traditional SC and modern SC that are known as big collector.

Third, there are agent farmers who own big farmland but have a small volume of trade. Fourth, there are agent farmers who own small farmland and have a low amount of trade. They could exist in traditional SC and modern SC that are known as a small collector.

Fifth, some ordinary farmers have big farmland but cannot play the role as a middleman. Sixth, some ordinary farmers have small farmland and cannot play the role as a middleman.

The first and second types of leader farmer have big roles in influencing the condition of the farm business of the member farmers. They can organize farmers into FO. The third and fourth types of leader farmer have been able to help farmers to get alternative markets. The fifth and sixth types of leader farmer have not been able to improve the condition of member farmers.

Modern SC has been able to solve the problems found in traditional SC, such as, the improvement of bargaining power to the middleman, the replacement of traditional middleman with the role of leader of FO, the introduction of collective action through FO, the reduction of the length of the chain to sell directly to buyers and dissolution of the unsymmetrical market of information.

However, after being able to modernize the SC, some problems are emerged. The instability of production, caused by the weather and pest and disease attacks, creates leader farmers who play the role as the middleman have to search from other sources. Moreover, the relationship between leader and member farmers is so fracturable and adds the instability of supply for the leader. The fragile relationship is caused by the conflict between the leader and member farmers. This conflict creates contract farming is so sensitive and therefore, they adjust the agreement based on a flexible agreement.

Some agent farmers have several strategies to deal with the instable supply problem. They have introduced the production plan, FO management and utilizing the traditional SC.

In modern SC, agent farmers set the production plan to adjust with targeted order. In the strategy of FO management, agent farmers can adjust the condition of supply from various sources. They set a fixed selling price to get certainty of business compared to spot selling price in traditional SC. Also, Agent farmers get credit from the bank for improving their cash flow and support the production of member farmers. Agent farmers use the traditional SC to manage supplies in a case of short supplies from their partners and also overproduction.

There are various reasons that affect the relationship between member farmers and leader. Member farmers will have bad commitment when the selling price offered by other buyers is higher than the fixed selling price from the leader farmers. Member farmers will have a weak commitment when payment from the leader is too long, e.g. more than 1 month and they will prefer to sell to buyers who could pay in cash. Member farmers have distrust to the leaders who dominate the supports given by the government through the FO. Besides, they distrust to the leader farmers who cannot pay faster the revenue and cannot find alternative buyers in the case of overproduction and fall of selling price at the market.

This condition affects the condition of FO. Some FOs have been able to transform from single-layered of FO, e.g. farmers` groups (FG) to multi-layered of FO, e.g. farmers` groups union (FGU) and cooperative. However, some FOs were found to be dissolved and inactive. FO is fragile because the condition of FO can be changed anytime.

The condition of FO depends on the ability of the leaders. The transformation of FOs created by the leader`s business orientation. Nevertheless, FO that has big number of members

will have more conflict and difficult to be managed. Every leader of FO prefers to manage an FO with small number of members and avoid the risk of conflict.

Finally, our study is convinced that a leader who plays a role as an agent farmer will adjust the trade business expansion by selling the products from his own farm and other sources, e.g. by organizing the collective action of member farmers through certain type of FO.

The extension of modern SC does not mean the reduction of traditional SC and both types of SC are coexisting and connected. Nevertheless, the relationship between a buyer and an agent farmer is built with modernized way, meanwhile the relationship between an agent farmer and member farmers is still built with traditional way. Agent farmers sometimes sell products at traditional market in order to deal with the adjustment to over and short production.

5.2 Policy Recommendation

The vegetable farm business is strongly influenced by the characteristic of supply chain. Meanwhile wholesale markets still play big roles in the fresh vegetable SC, therefore to make improvement in the vegetable economy, the government should improve the procurement system done by the traders at the wholesale market.

Wholesale markets cannot maintain the on-the-spot trade and unscheduled trade. The markets have to adopt the procurement system in modern SC that modernizes the production aspects. Modern SC gives the FO an opportunity to empower its role through the role of the leader as agent farmer. Thus, government should encourage the suitable type of FO, market and utilize the role of leading farmers that could create innovation on production, organization and cash flow management.

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