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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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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 agent and characteristic 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 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.

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.