Research article

Coping Strategies of Japanese Farmers to Recent Challenges in K City, Chiba, Japan

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Abstract Japanese agriculture has been facing various challenges such as increasing population of elderly farmers and lack of successors. Moreover, several environmental and market issues have tested the capability of Japanese farmers to cope. Through a case study approach, this study aims to clarify the coping strategies of farmers in K City, Chiba Prefecture to recent challenges and determine the issues to support and sustain their local agriculture. A series of visits were conducted in 2018 and 2019, and in-depth key-informant interview was conducted in June 2019. In-depth key-informant interview revealed that farmers from K City organized a Farmers' Market at their own initiatives to sustain and support the local agriculture for the next 10 to 20 years. Since the establishment of the Farmers' Market in 2003, the farmers faced pesticide residue reports on turnip and various vegetables in 2008 and 2010, respectively; radiation residue report as an effect of the 2011 Great Tohoku Earthquake and Nuclear Plant Meltdown have brought negative impacts to the farmers as harmful rumors on the safeness of the agricultural products from K City spread to name a few. Farmers have initiated innovative actions and adapted strategies to overcome these challenges. SWOT analysis revealed that the farmers, at their own expense, regularly tested the produce for pesticide and radiation residue to assure its quality and safeness. However, if not continued, misconception among consumers will prevail then lead to distrust. They even provided other services such as restaurant, café, farm tour and seminars. On the other hand, the farmers recently tend to supply to other markets aside from the Farmers' Market, conveying a significant supply issue to be addressed. In general, these strategies and initiatives which reflect the farmers' passion and motivation to achieve sustainability seemed to be the factors that made them resilient to the changing environment.

Keywords resiliency, farmers' market, motivation, adaptation strategies, SWOT analysis

INTRODUCTION

Japanese agriculture has been facing various structural challenges that need to be addressed for the sector to survive. Among these, some of the most important challenges are the increasing population of elderly farmers and lack of successors (Brady, 2016) and decreasing population of newcomers (MAFF Japan, 2018). The average age of farmers in Japan is 66 years old (MAFF Japan, 2018; OECD, 2019) which implies that the sector highly depends its labor on elderly people. The dependence of labor on elderly people can affect the production of the agriculture sector in the long run, in terms of loss in human capital once they are only treated as those who receive social services (Haga, 2018). According to Su et al. (2018), lack of farm successors and insufficient agricultural laborers are some of the factors that contribute to the abandonment of farmland which can have a significant impact on the socio-economic conditions of the farmers as well as on environment in

terms of rural landscape loss. On the other hand, the Organization for Economic Co-operation and Development (OECD, 2019) stated that the number of newcomer farmers is less than the numbers of farmers who are exiting the agriculture sector. One way to support and encourage these farmers is to provide accessible markets.

On a more micro-level, Japanese farmers are often faced with several environmental and market issues which test their capability to cope. Japan is an archipelago located in the Pacific Ring of Fire which makes it vulnerable to earthquakes. The Great Tohoku Earthquake, the strongest recorded earthquake to hit Japan which happened last 2011, left a total of 18,186 areas of damaged agricultural land in prefectures such as Tochigi, Ibaraki, and Chiba among others (MAFF Japan, 2013).

OBJECTIVE

This study aims to clarify the coping strategies of farmers in K City, Chiba Prefecture to recent challenges and determine the issues to support and sustain their local agriculture.

METHODOLOGY

This study gathered primary data through a series of visits conducted in 2018 and 2019 and an in-depth key-informant interview in June 2019. This study interviewed the president of farmer-based corporation (hereafter, A Corp) and K Farmers' Market manager through purposive sampling. In order to further grasp the situation on the ground, impromptu interview of farmers market staff, farmers and consumers were also conducted. The qualitative approach is used as this can reveal the passion and motivation of the farmers in coping with the different challenges that they encounter. The data were analyzed through SWOT analysis since it is descriptive and qualitative in nature. SWOT analysis plays an important role in certain situations in a theoretical, historical, and time frame perspective (Gürel, 2017). This study focused on the practices and experiences of a farmers group in K City, Chiba Prefecture as they have experienced various environmental and market issues that affected their local agriculture and welfare.

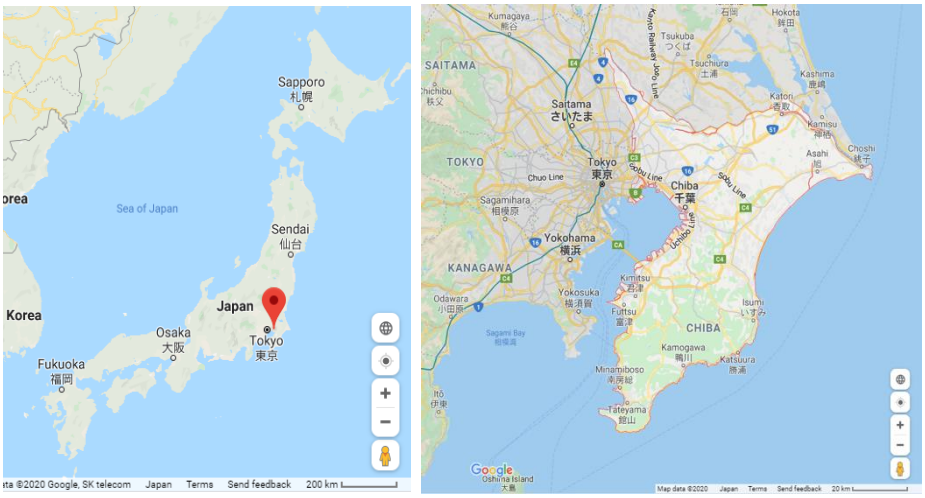

Fig. 1 Map of Chiba, Japan where the K Farmers' Market is located
Source: Google Maps

Located Northwest of Chiba Prefecture, K City is about 40 km, away from Tokyo (Fig. 1). Agriculture land accounts for 1,773 ha, of which rice fields occupy about 1,047 ha, followed by vegetables (663 ha) and fruits (63 ha). In terms of total domestic production volume, K City is considered the major producing area of turnip, leek and spinach. With proximity to Tokyo and good accessibility, it is also a popular bedroom or commuter town. Thus, this city is also experiencing agricultural land conversion to residential.

RESULTS AND DISCUSSION

K Farmers' Market Profile

The group of farmers from K City, Chiba Prefecture established a limited company in 2003, and built the K Farmers' Market at their own initiative in order to sustain and support the local agriculture for the next 10 to 20 years. In 2004, this company was converted to a corporation with 15 stakeholders. These initiatives were triggered by threats from cheap imported leek and were encouraged by the demand of local consumers for freshly harvested local produce.

In the early 2000, Japanese farmers was severely affected by imported vegetables from China (Teramachi, 2002). Harashima (2006) presented the initiatives of the Japanese government and farming communities on significant increase of imported leeks and low market price. During this time, most farmers in the study resorted to keep their harvest in cold storage since their produce could not compete with significantly low-priced imported leeks. This resulted to income losses and decrease in farmer's motivation.

As mentioned earlier, turnip is one of the famous agricultural products of K City. However, local consumers do not have the opportunity to taste freshly harvested turnips since these are commonly shipped to a wholesale market and sold via auction before some are shipped back to local supermarkets or vegetable stores.

K Farmers' Market has four (4) management principles: 1) place of sale, sharing information, and interaction; 2) consideration of consumer satisfaction; 3) promotion of local production – local consumption; and 4) development of the community. Currently, it employs six (6) full-time and 66 part-time workers. Although there were only 150 farmer-members during the early years in 2003, it grew up to 230 farmers in 2019. However, only 150 farmer-members are currently active. Among these farmers, there are only about 50 farmers who are under 40 years old, conveying that young farmers only comprise one-third of the active members. Although majority of farmers produce vegetables, there are also 15 and 10 farmers who produce rice and fruits (e.g. blueberry, strawberry, and grape among others), respectively. Agricultural products such as citrus, apples, dried persimmon, and melon are not available in K City, but these products are sourced from prefectures such as Kagoshima, Aomori, Nagano, and Ibaraki, respectively.

Fig. 2 Sticker tag produced using the label-printer

Source: Market visit, June 2019

Each farmer-member has the control on the time of harvest and the amount and kinds of produce to harvest. They can also decide on the amount per pack or set as well as on the method and place of sorting and packing. In terms of the pricing and labeling of the products, the farmer-members can decide on the price of their produce when they print sticker tags using the official label-printer. Fig. 2 shows the label of the produce which includes farmer name, product name, production area, price, and tax. It is important for them to keep a production history record, which is required to be submitted on a regular in order to be able to issue or print sticker tags for their products. Inside K Farmers' Market, the farmer-members personally display their produce and make placards for promotion. There are also no designated spot or shelf per farmer-member. A sales report is sent to each farmer-

member for five times per day via SMS based on the cashier data. This enables the farmer-members to have the option of harvesting additional produce for the market. However, any unsold products should be picked up by the farmers before the market closes.

The K Farmers' Market uses Teraoka Cashier System which includes production history recording, label printer, semi-automated cashier. In order to increase transparency, the label printer requires submission of production history records and use of farm ID number. This also enables the farmer-members to set their own price. Meanwhile, semi-automated cashier requires one staff per cashier which decreases the cash handling mistakes. Although the market only accepts cash payment, accepting credit card payments is also being considered. Moreover, self-bagging is also implemented.

In terms of information sharing, the market has an official website and Facebook page where products, upcoming events, store schedules, activity reports, recommendations, and reviews are regularly showcased. As the latest initiative, the market engaged in Choku-Buy (https://choku-buy.com) for promotion and information dissemination. This encourages each farmer-member to establish individual pages on the Choku-Buy website to share updates on their farm, and each consumer to give feedbacks directly to farmers and use Choku-Buy Point Card.

Humble Beginnings and Challenges of K Farmers' Market

The K Farmers' Market was established in 2003; however, Table 1 shows the significant events and challenges that tested their capabilities to cope. Five years after the establishment, there was a report about the pesticide residue on turnip. They organized a task force in order to address the situation. They also invited experts and coordinated group studies. They had to conduct their own regular pesticide residue testing at their own expense. All these are done to regain the trust of the consumers.

Table 1 Significant events and challenges in K Farmers' Market

Year	*Challenges*	*Significant events (Farmer responses)*
2003	Sustain and support the local agriculture for the next 10 to 20 years? "All farmers should have dream, charm and pride"	Established a limited company Built the K Farmers' Market
2004		Converted to a corporation
2008	Address pesticide residue report on turnip	Organized task force; Invited experts; Visited farmer's field; Conducted pesticide residue testing
2010	Address pesticide residue report on various vegetables	Closed market; Organized task force; Invited experts; Visited farmer's field; Checked production records; Conducted seminar of safe use of pesticides; Conducted awareness survey on pesticide and its usage; Conducted pesticide residue testing; Re-opened the market
2011	Impact of Great Tohoku Earthquake and nuclear plant meltdown Identified as radiation hotspot city nearest to Tokyo[1]	Focused on farmer empowerment and collective action (e.g. invite experts; conduct training, seminars and experiments, sampling and testing by individual farmers, identify contaminated products; consumer participation; transparency on pesticide and radiation test results)
2016	Need to increase number of market visitors Promote local produce and vegetable consumption and	Established a farmers' restaurant and café

Source: Market visit, June 2019

In 2010, the farmer-members faced another report on pesticide residue concerning various vegetables. They had to close the Farmers' Market to focus on the issue. Another task force was formed and decided to check the production records, visit the farms, and examine the awareness of the farmer-members on pesticides and its usage. As this was the second time to have the incident on pesticide residue report, they resorted to conduct regular testing on all vegetables at own expense. By December 2010, the Farmers' Market re-opened after testing all 150 produce which all had negative results from pesticide residue.

Another challenge that could have destroyed their passion and motivation in sustaining local agriculture was the Great Tohoku Earthquake in March 2011. This also caused the nuclear plant meltdown and reports identified K City as a radiation hotspot nearest Tokyo (Japan Today, 29

November 2011). This started the harmful rumors about the nuclear contamination on the produce of K Farmers' Market which significantly affected their sales. Due to the harmful rumors and low trust on farmers conducting the residue testing, farmer empowerment and collective action were initiated which include inviting experts for training and seminars, conducting sampling and testing, and engaging consumers by letting them observe and understand the safety activities and procedures done to ensure quality of their produce. These gradually increased the number of market visitors.

In 2016, farmers' restaurant and café were established with a concept of traditional Japanese house. They introduced local dishes which are made and served by all female staff including the farmers' wives. This also aids in encouraging the consumers to buy local products and to consume more vegetables (e.g. vegetables in season). The restaurant and café are open every day except on Wednesdays from 11:00 AM to 03:00 PM. They offer a "No Meat, No Fish, All Local Vegetables" kind of buffet with drinks and desserts which utilizes 100 kinds of vegetables. They can serve approximately 100 customers per day. The restaurant and café have also faced challenges such as t limited kinds of local vegetables available and unstable income with only 4 hours of operation. As part of their solution, they started offering the restaurant as an activity space after 3:00 pm.

SWOT Analysis of K Farmers' Market

SWOT analysis (Table 2) revealed three main points. First, farmers conduct regular pesticide and radiation residue testing (SO1), but this incurs additional expenses to each farmer (WO1). If this is not continued, the misconception among consumers that the produce is unsafe will prevail (T1) which will lead to consumers' distrust and eventually prefer other markets (WT1). Since the K Farmers' Market value their loyal customers and those customers who once left them, they have been conducting testing until now.

Table 2 SWOT analysis of K Farmers' Market

	Strengths (S)	*Weaknesses (W)*
Opportunities (O)	1. Conduct pesticide and radiation residue testing 2. Provide alternative marketing channel to local farmers and newcomers 3. Offer different activities, products and services all year round	1. Create additional farmers' expense 2. Experience unstable and unpredictable supply of produce 3. Different thinking, priorities, and interests of farmer-members
Threats (T)	1. Possible misconception may prevail if not continued 2. New marketing channels has emerged 3. Management may not function if one role is unavailable	1. May result to customers distrust and eventually prefer other markets 2. Puts pressure to availability and variety of supply, which may result to costumer dissatisfaction 3. Lack of successors

Source: Market visit, June 2019

Second, the provision of alternative marketing channel to local farmers and newcomers is another strength of K Farmers' Market (SO2). This gave farmer-members to make their own production and marketing decisions. In other words, each farmer-member freely decides on the volume and time of harvest. They are also free to set the amount, condition and price of each package if they are transparent in the production process (e.g. production history). They even have the choice to replenish their produce or not since sales update is sent 5 times a day. However, since farmers need to collect unsold produce before the market closes, most farmer seemed not to be proactive in replenishing their produce. Market observation and key-informant interview revealed that limited choices of vegetables by 12 noon is a common. With this situation, K Farmers' Market experience unstable and unpredictable supply of produce (W2), which is getting alarming with the emergence of new marketing channels (e.g. supermarkets with designated local vegetable area). This puts more pressure to the availability and variety of supply, which may result to customer dissatisfaction (WT2).

In order to address this issue, there is a need to understand the farmers behavior towards K Farmers' Market and determine the impact of ICT to farmers.

Third, K Farmers' Market have been offering different activities (e.g. harvest festival, rice harvesting, potato harvesting), products and services (e.g. restaurant, café) all year round. This served as a "ba" or place of action (i.e. opportunities for various stakeholders to interact, share information and understand one another towards a better community) (SO3). However, with different thinking, priorities and interests of farmer-members, it seemed that all members are not active as mentioned in the previous section (W3). It is expected that management may not function if one role is unavailable (WT3). Key-informant interview clarified that there may be existing differences in values and thinking between original incorporators and current farmer-members. Therefore, aging incorporators have the responsibility to address the possible lack of successors (W3), who will be willing to continue for the next 10-20 years.

CONCLUSION

In general, the strategies and initiatives of K Farmers' Market seemed to clearly reflect the farmers' passion and motivation to achieve sustainability and resiliency under the changing environment. However, SWOT analysis revealed that despite all the strengths it possesses and opportunities it offers, K Farmers' Market needs to address the lack of successors since the original incorporators are aging, and the unstable and unpredictable supply which is further threatened by the recent emergence of new marketing channels.

For further study, there is a need to understand the farmers behavior towards K Farmers' Market and determine the impact of ICT to farmers.

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