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## Assessing the Competitive Advantage of Public Policy Support for Supply Chain Resilience Case of Local Governance in Chiba

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### Abstract

Japanese farmers and fishermen produce and sell their products, receiving 9.4 trillion Japanese yen. At the same time Japan imports raw products of 1.2 trillion JPY and processed food of 5.3 trillion JPY. Then the products move to eat out sectors, processing sectors and consumers in fresh condition through market. Through the process, the value of agricultural products increased and consumers pay 73.5 trillion JPY. It means the value is added at five times. So, the farmers have right to sell at higher price and receive more.

Then, the concept of the 6th industry was invented in around 1980. The definition of 6th is the combination of production process (1st industry ) with 2nd and/or 3rd industry. There are 60 thousands businesses relating to 6th industry in Japan. Within the business, food processing and direct shop share much. Direct shops are operated by a farmer, farmer's group, farmer's company, municipality, cooperative, producers' group and others. And direct shops sell vegetables, fruits, processed food et al.

The 6th industry is supported and enhanced by central and local government. In Chiba prefecture, the movement of eating local food is strongly enhanced. Local food can be purchased at large-sized store, however, local direct shop is more suitable. Direct shop K is located at urban fringe in Chiba prefecture. The location of urban fringe has advantage and disadvantage. Starting from 2004, this direct shop becomes very popular in the region, selling 1 billion JPY (roughly 9 million USD) per year. However, it needs to conquer two crises. One is the effect of the fallen radioactive materials from Fukushima nuclear power plant accident. The farming area of Kashiwa city suffered from radioactive materials. Although the volume fallen is not so much, and the products were mostly safe, however, consumers believed every product is dangerous to health and left from this shop. The manager introduced measuring instrument and showed the real status of the food, then consumers gradually came back.

Another crisis was the residual agricultural chemicals. One member farmer from 120 member farmers used pesticide, which was listed as refrain from. The manager closed the shop and surveyed all member farmers' growing conditions. Checking the safety conditions, the shop opened again, it takes some months to recover the reliance upon the shop. Although the

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manager's contribution is large for the resilience of this direct shop, Japanese agricultural policy supported indirectly and directly.

Keywords: public policy support, 6th industry, direct shop, resilience

## Introduction

In Japan, self-sufficiency ratio of food has been decreased and it is around 40 % in calorie base for recent years. The Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) has the role to increase this ratio in long term and keep to supply from domestic producer constantly.

To keep stable production by farmers, farmers should introduce new technique for increasing productivity and should introduce environmental friendly practices for welcoming by consumers. Farmers also expand their activities from only producing to include process and services.

However, agricultural production is vulnerable, suffering from natural and human disasters often. So, public policy should support local agriculture and if in case of the damage, local government need to recover and renovate local agriculture.

The theme of this paper, supply chain resilience, is usually understood as the issue of traffic after the disaster. That is true. But, it recovers not so late. In case of Kumamoto earthquake in April 2016, people can get at least one traffic route in after a few days. The fallen bridges are not reconstructed yet, however, people can go via detour. On agricultural facilities, many crushed green houses are not recovered. It needs time to recover all green houses. So, my understanding is; to strengthen production conditions leads to quick recovery and ensure the recovery of supply chain.

So, in this paper, the sixth industrialization for enhancing production condition and public policy support will be discussed.

## Food Flow

Fig. 1 shows the food flow in Japan by monetary base. Japanese farmers and fishermen produce agricultural and fishery products. They sell products and receive 9.4 trillion Japanese yen. At the same time Japan imports raw products of 1.2 trillion JPY, semi-processed products of 1.4 trillion JPY and processed products of 3.9 trillion JPY. Then 7% of raw product is sent to eat out sectors, 62% to processing sectors and 31% to consumers in fresh condition through market. Through the market, the value of raw product increases around four times, 3.3 trillion JPY to 13.5 trillion JPY. Food processing system is a little bit complicated as shown in the center area of Fig. 3. At the whole, value of 10.6 trillion JPY plus additional imported processed materials of 5.3 trillion JPY becomes 73.5 trillion JPY as the consumers' cost.

Although this figure is written in price base, not in volume base nor in calorie base, to keep production and stable import in volume base is the role of agricultural sector. To keep

domestic production, farmers should make effort and also farmers should be guided, supported and encouraged to some extent by the government.

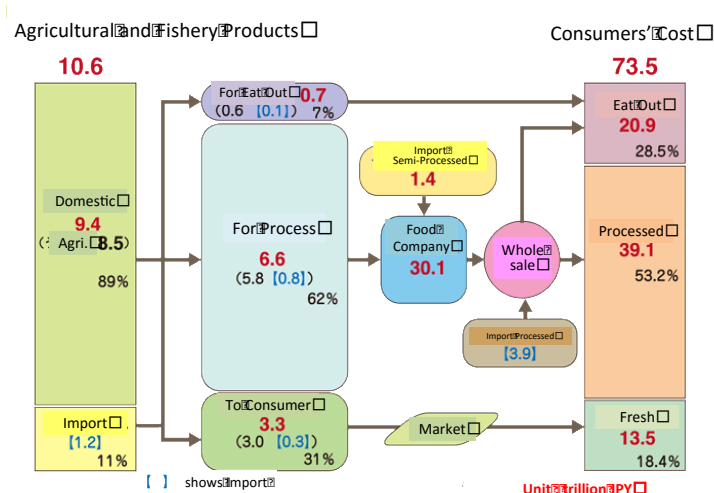


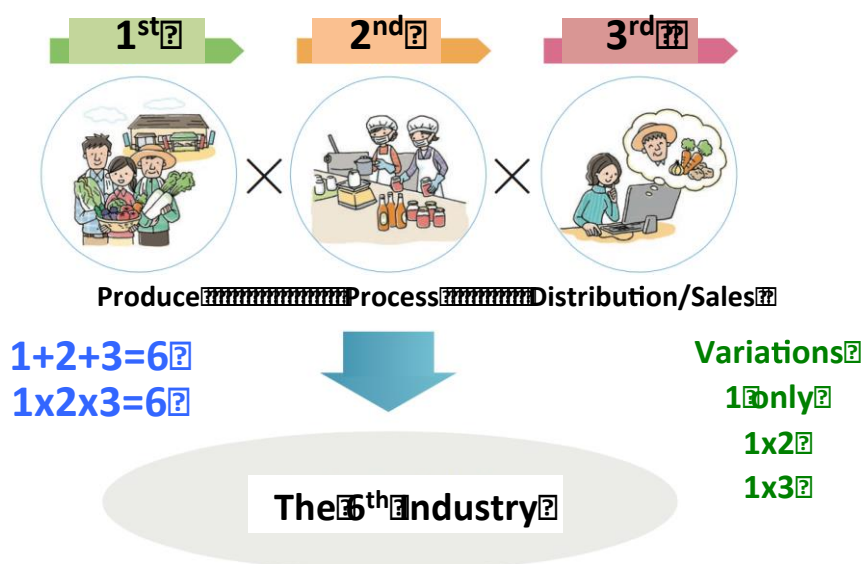
Figure 1. Food Flow in Japan

Source: [EN-NOH 2013]

## The Sixth Industry

### Concept of the Sixth Industry

Fig. 2 shows the concept of the sixth industry or sixth industrialization. The concept was invented by Prof. Imamura in around 1980. The definition of 6th is  $1+2+3$  and  $1 \times 2 \times 3$ . So, the sixth industry needs to include first, second and third industries, however, there are some variations. Even a part of the sixth is OK, e.g.  $1 \times 2$  or  $1 \times 3$  is called as the sixth industry.



## Figure 2 The Sixth Industrialization

Source [Kodaira 2016]

### Present Conditions in Japan

Relating the sixth industry, some data are summarized in tables 1-6. Table 1 shows there are 60 thousands businesses, food processing and direct shop share much. Sales size per one business of fishery processing is the biggest.

Table 2 and 3 show details of direct shop. The number of direct shop by farmer (individual) shares about half. But the size of the sales is small. Direct shop organized by cooperatives is the biggest in sales size. At the shop, vegetables and fruits shares about half, followed by processed food, flowers and nursery of trees, rice, meat et al.

Table 1 6th industry in Japan

	Number	Total sales	sales / body	workers
		million JPY	thousand JPY	Thousand
Food processing	26,660	857,678	32,171	167.5
Direct shop	23,710	935,630	39,461	207.5
Leisure farm	6,690	36,430	5,445	45.7
Farm inn	1,890	5,406	2,860	7.4
Farmer's restaurant	1,440	32,089	22,284	13.4
Fishery processing	1,490	172,388	115,697	18.4
Direct shop	640	33,204	51,881	5.6

Source : statistics of AFF, MAFF, 2016

Table 2 Direct Shop in Japan

	Number of business	Total sales	sales / body	open days
		million JPY	million JPY	days/year
Farmer	11,070	63,332	5.72	145
Farmer's Group	550	15,041	27.40	234
Farmer's Company	1,370	53,077	38.77	231
Municipality	620	69,241	111.86	316
Cooperative	2,060	326,602	158.24	312
Producers' Group	5,130	148,841	28.99	206
Others	2,910	259,495	89.17	293
Total	23,710	935,630	39.46	203

Source : statistics of AFF, MAFF, 2016

Table 3 Sales of Direct Shop in Japan

	Total sales
	million JPY
Rice	53,822
Vegetables	307,350
Fruits	158,413
Mushrooms	23,992
Meat et al	52,189
Other fresh food	25,965
Processed	131,050
Flowers, Trees	73,294
Others	109,553
Total	935,630

Source : statistics of AFF, MAFF, 2016

Table 4 Leisure Farm in Japan

	Number of business	Total sales	sales / body	open days
		million JPY	million JPY	days/year
Farmer	5,820	19,296	3.32	72
Farmer's Group	140	1,490	10.49	112
Company	730	15,645	21.31	123
Total	6,690	36,430	5.44	79

Source : statistics of AFF, MAFF, 2016

Table 4 shows the number of leisure farm in Japan. Leisure farm operated by farmer (individual) shares mostly in number. Every type of leisure farm opens about 100 days. It means leisure farm opens at weekend and holidays. Farm inns are in similar condition as leisure farm. Number of open days is two or three days per week (Table 5).

Table 5 Farm Inn in Japan

	Number of business	Total sales million JPY	sales / body million JPY	open days days/year
Farmer	1,730	4,482	2.59	88
Farmer's Group	40	272	6.48	161
Company	120	652	5.67	156
Total	1,890	5,406	2.86	94

Source : statistics of AFF, MAFF, 2016

Table 6 Farmer's Restaurant in Japan

	Number of business	Total sales million JPY	sales / body million JPY	open days days/year
Farmer	780	5,958	7.66	196
Farmer's Group	90	2,069	23.51	248
Farmer's Company	440	15,062	34.39	251
Cooperative	70	5,829	87.00	323
Company	70	3,171	43.44	298
Total	1,440	935,630	22.22	227

Source : statistics of AFF, MAFF, 2016

There are many types of farmer's restaurants, organized and operated by farmer (individual), farmer's group, farmer's company, agricultural cooperative, and company. They usually open all the year round.

### Strategy and Support of Chiba Prefecture

Chiba prefecture, one of the local governments in Japan is promoting the sixth industry. "The strategy of sixth industrialization in Chiba prefecture" was issued in March 2016 (Chiba prefecture 2016a).

On the document, the targets are shown as below;

1. expand the number of having interest workers of the first industry,
2. give appropriate advice and technical support to workers who have interest,
3. prepare fund to introduce new machines and facilities,
4. keep or expand market of newly developed products,
5. make network for the promotion of the sixth industrialization.

And the target were 1) 100 certified organizations in 2019, which were 34 in 2014 and 2) 100 billion JPY selling amount in 2019, which were 35.7 in 2012.

Adding national level support, Chiba prefecture plans support program as follows;

1. improvement of promotion structure with second industries and financial sectors,
2. provide information of national level subsidy and loan,
3. support by prefecture aided project,
4. consult and support by local administrations,
5. make a list of pioneer projects,
6. provide information of local fund,
7. make a support base.

In August 2016, the list of pioneer projects was issued at the website of Chiba prefecture. 33 projects are shown, covering wide field. All projects established processing unit of agricultural or fishery products, some projects opened restaurants or coffee shops, some projects started participation program with urban people. The agricultural or fishery products are as follows; organic rice, rice cake, local sushi, sweet potato cake, local vegetable pickles, carrot juice, pear sherbet, mandarin orange jam, milk gelato, ice cream, dried fish, organic pork, organic beef, organic egg, et al. Participation programs are, pick up blueberry, pick up mandarin orange, make pizza, make roll-type sushi, et al.

## Cases Study

In this chapter, three cases are adopted and discussed.

### Case A : Rice based 6th Industry

When a big direct shop opened in 2001, organizer of case A started this project. Establish a company, processing only local rice to steamed rice, rice ball, roll-type sushi, rice cake, rice cracker, lunch box are the core work. And bring to that direct shop, supermarket, department store. The unique point of this company is a frequent loading to the shop to provide warm and fresh food to consumers. The company hires 17 people including seasonal workers.

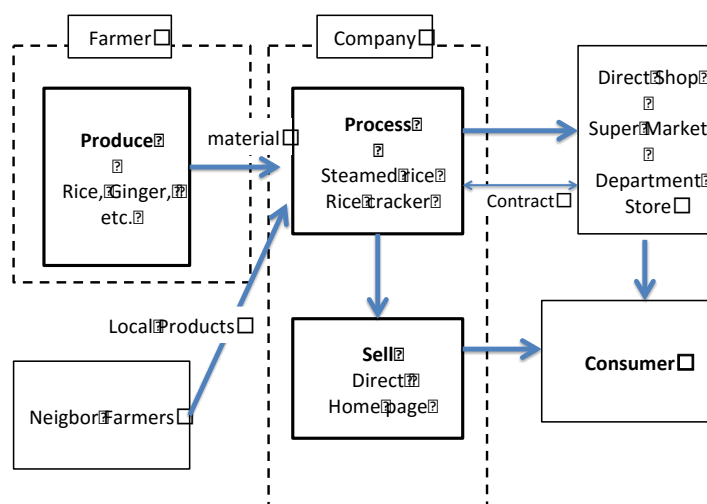


Figure 3 Structure of Case A

Source [Chiba prefecture 2016b, author made]



## Case B : 6th Industry with Harvest Experience

Case B is a family management farmer. They grow rice and mandarin orange mainly. Rice is processed to steamed rice and rice cracker, and brought to direct shop near-by. The unique point of this farm is a harvest experience of mandarin orange. This program becomes popular by visitors.

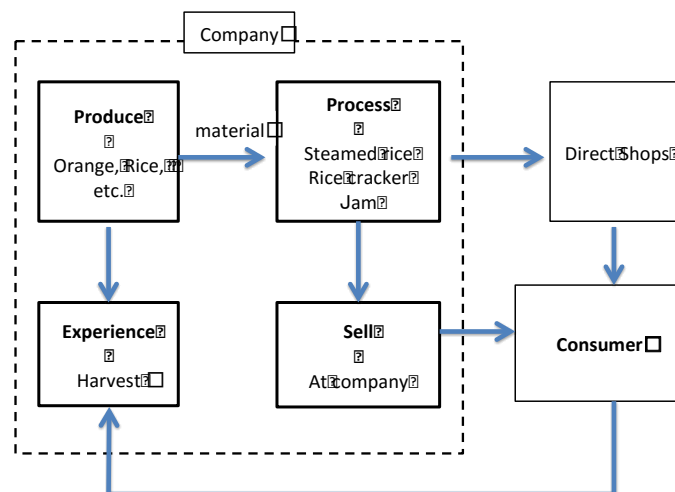


Figure 4 Structure of Case B

Source [Chiba prefecture 2016b, author made]

## Case C: Direct Shop and Restaurant

This case is a big direct shop located in urban fringe. It was established in 2004 by ten farmers group. It deals fresh vegetables, processed dishes, processed food. The concept of the shop is to “Make Sustainable Farming and Activate the Region”. It becomes very popular in the region, selling 1 billion JPY (roughly 8 million USD) per year.

- Est. 2004
- Fresh vegetables, dishes, processed food.
- Purpose : Make sustainable farming and activate the region.
- Selling 1 billion JPY (8 million USD)/ year
- Recent two crises
  - Radioactive materials from Fukushima
  - Residual agricultural chemicals



Figure 5 Basic Information of the Direct Shop

Source [Interview to the Manager]



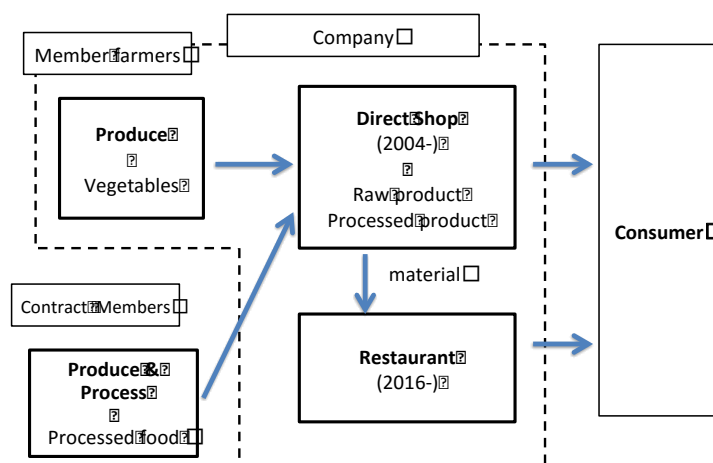


Figure 6 Structure of Case C

Source [Chiba prefecture 2016b, author made]

It started and grown smoothly, through conquering recent two crises. One is the effect of the fallen radioactive materials from Fukushima nuclear power plant accident. The farming area of the direct shop suffered from radioactive materials. The volume fallen is so small, but differs place by place, or field by fields. The products were mostly safe. However, consumers believed every product is in dangerous level to human health and left from this shop. The manager introduced measuring instrument and showed the real status of the food, then consumers came back gradually.

Another crisis was the residual agricultural chemicals. One member farmer from 120 member farmers used pesticide, which was listed as refrain from for member farmers. When the pesticide detected, the manager closed the shop and discussed all the members on the reason and way to recovery. It takes some months to recover the reliance upon the shop.

Recently, this direct shop opened restaurant, providing newly developed dish with fresh vegetables.

## Policy Support

Three cases shown in chapter 4 are success cases. They can keep present conditions and they can improve more. However there are so many cases which cannot to be said as success case. They should try to catch up. To improve situations, public policy support will contribute.

## Increase Productivity through Policy Support

In order to keep sustainable production, agricultural land should be protected. Land use planning and supporting legislation are the key to conserve agricultural land properly. And productivity of agricultural land should be improved.

Land productivity is the indicator of how many tons of products can farmers get. It is decided by weather conditions, soil fertility, irrigation and drainage, fertilization, weed and pest control et al. Labor productivity is the indicator of how many hours is needed to produce in unit area. To increase this indicator, land consolidation is effective and land consolidation project, one of the agricultural improvement project, is usually supported by government based on public policy.

Two elements shown in Fig.7, physical resource improvement and human resource improvement are also supported by government.

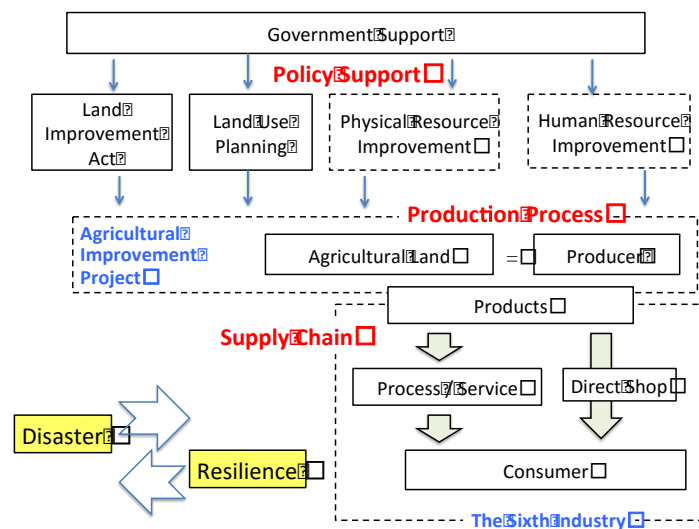


Figure 7. Agricultural Production and Policy Support

Source [the author]

### Increase Value of the Product through Policy Support

When farmers produce high quality agricultural product, then it should be sold in high price, or at least appropriate price. To increase farmers' income, the sixth industrialization is a strong method.

Not a direct connection to farmers' income, there are some other methods for encouraging farmers' motivation to continue agriculture. Use of local product is one of the methods. Kashiwa city, Chiba prefecture started to increase the ratio of local food for school lunch. At school students eat local food and learn local agriculture. This enhances farmers' motivation.

### Increase Resilience through Policy Support

Even in a good conditions of agricultural land, disasters hit suddenly, so agricultural land need to increase resilience.

Disasters of first category are difficult to predict, which are volcano, earthquake and tsunami. Even if it happens, the area is limited within the region, so we can help each other. Municipalities, NGOs, citizens are aware on the importance, and some trainings are already experienced. Second category is the disasters to predict a little before; typhoon, heavy rain, strong wind, coldness are in this category. We can make a enough preparation for these. Third category is the disasters, which can be reduced or stopped. Global warming, water pollution, soil contamination, land subsidence by pumping, flood, landslide et al belong this category. Many disasters of this category can be reduced by puplic policy support, such as appropriate land use planning or legal restriction.

Facilities needed for disaster prevention in village are; 1) landslide prevention facilities, 2) wind and snow damage, 3) fire prevention facilities, 4) storm water drainage facility, 5) waterway and pond safety facilities, 6) traffic safety facilities, 7) crime prevention facilities and 8) disaster prevention radio facilities.

So, MAFF execute disaster prevention projects for agricultural and rural infrastructures.

As noted, we have been making effort to reduce or stop the disasters. However, the disaster surely happens. So, we have the system of mutual aid. Financial mutual aid is the insurance within farmers. And this mutual aid system is supported by national government.

### **Conclusion**

As said in 5.1, agricultural improvement project is effective. In paddy field, land consolidation for rennovating paddy field structure and facilties is recommended (Yamaji 2013). In upland crop field and orchard, land consolidation is also recommended and agricultural water service is needed where no irrigation.

Agriculture should be strengthened, however, we should remember the non production effect of agriculture. Agricultural field and cultivation method should be environmental friendly.

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