

Mapping of Orange Supply Chain Diversification in Japan

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Abstract. Oranges are the dominant agricultural product for Ehime Prefecture, Japan, and farmers can enjoy optimal added value from their production. One of the government's motives for boosting Japanese agriculture is agricultural diversification, which is a form of value chain restructuring aimed at increasing sustainability in the value chain. The purpose of the study is to map the value chain in Ehime Prefecture, Japan and to understand the characteristics of actors in the chain and its development potential. This research used a qualitative approach through interviews for data collection. The results showed that the actors involved in the value chain were farmers, farmer groups, private companies, retail, cooperatives, and Japanese Agriculture (JA). By integrating some components of the supply chain, farmers might become much more engaged. For decades, Japan Agricultural Cooperatives (JA) have been a vital part of the Japanese agricultural supply chain. By integrating some components of the chain, farmers might become considerably more engaged and profitable. For decades, JA has been a vital part of the Japanese agricultural supply chain, resulting in challenges such as demand-supply mismatches. To address these difficulties, the agricultural diversification recommendation was presented to encourage new value chain integration and restructure the supply chain.

1 Introduction

Increasing profitability and vitality in regional agriculture is one of the most urgent, serious social issues in Japan as well as reducing regional disparity [1]. These two issues are mutually connected because slackening agriculture causes depopulation and aging in many regions and also stagnation of the regional economy that accelerates the degrading vitality of regional agriculture. One architectural problem in Japanese agriculture is said to be an

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excessive division of labor by powerful farmers' cooperatives. With the progress of the division of labor between farmers and farmer's cooperatives in the distribution system of Japanese agriculture, the distance between farmers and consumers became so large that farmers cannot understand market demand. For example, the national demand for foods has shifted from traditional Japanese foods to western foods, from rice to bread/pasta, from family dining to individual dining, from slow foods to fast foods, from cooking at home to using retort pouch, and so forth. Nowadays, Japanese people like cooked food more, and the trend has increased, so it influences the spending on fresh fruit and vegetable.

Many regional farmers could not have been caught up in those market changes and could not have moved on to more profitable products fitting to the market. For local citrus fruit, it is the trend of local citrus production, even though the production is not too low, the quality of the fruit produced is not satisfactory, that besides not uniform it also has a less attractive and dull appearance. Even the condition of this fruit is also exacerbated by the modest post-harvest treatment so that local citrus fruits do not have strong market competitiveness either as import substitution or for export. In terms of institutional farmers, it seems that it is still very weak so in marketing oranges, it does not have a strong bargaining position and tends to often harm farmers. The process of disseminating technology innovation and technology transfer to farmers is very slow [2–4].

The complicated logistic system of Japanese agriculture and the existence of many medium brokers and retailers are decreasing the profit of farmers in the pricing structure. From these points of view, the Japanese government intends to urge farmers to enlarge their business to other fields, including second industries and third industries, as multiple businesses. Another issue is that farmers' mentality cannot be changed so easily because their behavior patterns and consciousness have been formed for a long time in the past. In that sense, in addition to much effort in the form of a supporting system or reforming policy for regional agriculture by the government, growing human resource for changing the reality of the agriculture industry is important [5].

The institutional marketing of village collectors and cooperatives is 80 percent and 72.73 percent, in this case indicating that prices are increasing achieved by the three marketing institutions is not enough well transmitted to the farmer level. As a result, prices at the farm level are low and provide little incentive for better performance of the citrus supply chain. In the process of modernization in Japan, the younger generation moved out of regional agriculture to manufacturing/service industries and thus productivity and profitability of regional agriculture have been gradually degraded by losing the labor force and vitality. Most of the current farmers are senior people and those people are concerned to disappear in the coming couple of decades.

Additionally, the current global situation surrounding Japanese agriculture has been harder and harder as shown by the difficulty of the Trans-Pacific Strategic Economic Partnership Agreement negotiation. Encouraging Japanese regional agriculture is essential not only to assure regional farmers' lives but also to gain a national self-supplying rate for foods in Japan. One issue is that government officers can only make a supporting system or reform laws/regulations, but they cannot make a business itself nor instruct farmers in the real business scenes. The role of what we call entrepreneurs for changes in Japanese agriculture is essentially important in such a current situation. Personality, motivation, and passion to change, the agriculture of such entrepreneurs are very important as well as their capability in business management for earning money [6].

Entrepreneurship is an innovation in the supply chain system. The existence of intangible assets in the supply chain has an important role in the success of the business by integrating the value chain and having a concern to providing benefits to farmers [7]. The corporation should hire "poor as suppliers/producers" for upstream manufacturing and "poor as distributors/retailers" for downstream sales. Because the impoverished lack the

financial wherewithal to become independent entrepreneurs or consumers, they might function as suppliers or distributors in the supply chain, according to this company. It can provide more jobs and income for the underprivileged while also lowering costs and increasing sales for the company [8,9].

According to several studies, social capital aids entrepreneurs in overcoming resource constraints. This is especially crucial in small towns, where market-oriented institutions such as venture capital firms are typically lacking. Club memberships provide entrepreneurs with access to social capital. In addition to the entrepreneurial concept understood in general (individual entrepreneur), there is the concept of cooperative entrepreneurs. To be able to increase the productivity of micro-entrepreneurs, no need to force them to each have an entrepreneurial spirit. Entrepreneurial spirits are related to the ability to capture business opportunities, develop innovation, and at the same time open access to the business [10]. There is another easier mechanism, namely by presenting cooperative entrepreneurs as micro-entrepreneurs.

There are several benefits to implementing cooperative entrepreneurship rather than individual entrepreneurship [11]. First, the entrepreneur can realize his business ideas with the scale of business needed. Second, the entrepreneur does not need to provide large funds for investment and working capital because farmers can provide the resources they have as their contribution to the business, thereby facilitating the control of business risk distribution. Third, the business expansion will be easier to do, namely by inviting more farmers to join. Fourth, farmers get good business opportunities that generate good income because the needs of the export market with a large number of products can provide a good price level. Therefore, cooperative entrepreneurship does not only provide financial benefits, but also social benefits. For this cooperative entrepreneurship to be very important, its presence cannot only be awaited by chance but must be imported programmed (by design) [12]. This research tries to contribute to providing comprehensive information on how cooperative entrepreneurship can be crucial in today's farming systems.

To address Japan's agricultural condition, the Ministry of Agriculture, Fisheries, and Food Safety (MAFF) recently implemented an agricultural diversification policy. The concept is known as "sixth sector industrialization." By reallocating a farm's business resources and assets, the word connotes a combination of primary industry (agricultural production), secondary industry (processed food manufacturing), and tertiary industry (food retail and restaurants). To put it another way, farmers are required to modify their products to market demands and profit by integrating the other services by covering other parts of the food value chain. This is a sort of resource reallocation and new agriculture value chain integration. However, the strategy could not be implemented easily because traditional Japanese farmers were unfamiliar with retail services or processing manufacturing. The majority of them cannot diversify or integrate the value chain. Value chain opportunities require more than just technical solutions but require collective participation from all chains. There is a greater potential benefit in developing the value chain. From a modeling perspective, prospects are with the interaction approach of value chain actors to understand the complexity of the problem [7].

Ehime, Japan become one of the biggest centers of oranges production in Japan. The center for the production of Japanese oranges in Japan in 2016 was dominated by five provinces namely Wakayama (20.01%), Ehime (15.87%), Shizuoka (15.07%), Kumamoto (10.43%), and Nagasaki (6.24%) [13]. This type of orange is unshiu which is called mikan, santuma mandarin, and Japanese oranges. The development of Japanese citrus prices at the consumer level during the period 2002-2015 also tended to increase whereas in 2002 the price of orange consumers was 28.5 yen per 100 g. In 2015 the price increased to 38.47 yen per 100 g. [13]. In Japan, oranges farmers will sell their products to the consumer through

some channels: Japan Agriculture (JA), entrepreneurial cooperative, direct selling place, or contracting with the consumer. This study chose Ehime prefecture as the research location.

The specific objectives of the research are cases of diversification of entrepreneurship in Japan. The purpose of the study is to map the value chain in Ehime Prefecture, Japan and to understand the characteristics of actors in the chain and its development potential. The study focuses on the motivation and business skills of the key person, as well as the relationship collaboration between farmers and the key person. Then there are some additional factors to consider, such as the company's branding/promotion strategy, market categories, market size, market features, and so on. In recent decades, Japanese agriculture has faced numerous challenges, including a low-profit rate, a labor shortage, the abandonment of farmland, the loss of competitive competence due to low prices, imported products, and so on. Agricultural diversification, which is a type of value chain restructuring to increase farmer profitability, is one of the government's efforts for supporting Japanese agriculture. Farmers could be much more activated, and their profits increased by integrating some elements of the food value chain, such as primary industry (agricultural production), secondary industry (processed food manufacturing), tertiary industry (food retails and restaurants), and reallocating farmer business resources.

2 Research methods

The descriptive analysis method was the primary method used in this study. Descriptive analysis is a type of research that is used to identify variables, either one or many, without comparing or connecting them. Its goal is to collect and evaluate data to create a systematic, factual, and correct explanation of facts and features in a certain region. Ehime Prefecture was chosen for this study because it has one of the greatest production rates in Japan. The structure of the orange supply chain relationship was described in descriptive terms using graphics for chain players and tabular form to illustrate each actor's activities. Meanwhile, the management of orange supply chains was examined using the Food Supply Chain Network (FSCN) framework proposed [16], with a focus on partner selection, contractual agreements, transaction systems, government support, and supply chain coordination.

This study will give information about strategy development for agricultural diversification with the relationship of entrepreneurship in the current supply chain system. The purpose of this study is to map the diversification of supply chain management and explain the issues which are affecting it. Also, it gives information on how stakeholders can get the best outcome with the cooperative entrepreneurship approach. The research offers an opportunity that the firm develops new business opportunities that can create new jobs for the poor as producers/distributors. The firm also can develop new initiatives that can help the poor as producers/distributors to reduce costs and improve productivity. Then the study offers increasing farmer share while at the same time contributing to eliminating risk and improving the performance of the orange supply chain. Through the science-policy interface approach, good communication between policymakers, scientists, and the community is expected for developing policies that cost-effectively achieve measurable outcomes. Showing how science-policy interactions work together in practice is essential to developing a sustainable orange supply chain in Japan.

The type of research is exploration research which views study cases with unit analysis (group and individual). The sampling process is purposive sampling and in-depth interviews. Purposive sampling takes respondents directly through considering who is fit to be key informants. The number of key informants is 6 people who understand the details of the case study. The key informant is an owner or an employee. An in-depth interview is used to give a better understanding. Primary data is from an interview, questionnaire,

observation, and literature. The information is also supported by reports, news, and articles as secondary data.

This study examines the function of a particular entrepreneur in the processed food business in the context of regional agriculture. His business traits and the process of building his personality are also examined to determine what types of human resources are required for the development of Japanese agriculture and how we might locate such resources in the future. According to the studies, direct interviewing and hearing from important people were beneficial in clarifying detailed history and conditions for company success in each scenario. Only literature and advertising materials could provide information about a key person's drive for the company and the interaction between the key person and the local community.

They were involved in revolutionizing area agriculture and revitalizing a stagnant regional society, according to the full investigation. They may teach regional farmers and instruct them on how to best meet market demand because they are well-versed in market needs for processed foods made from regional agricultural products. Regional farmers have been revitalized and regional agriculture has altered as a result of their collaboration with the entrepreneur. The entrepreneur has a strong sense of belonging to his or her hometown, as well as a sense of solidarity and commitment to the surrounding community. A close examination of the entrepreneur's development and company history reveals a mutual influence between the entrepreneur and the regional community. Developing a capable entrepreneur who contributes to area industry/society may require regional people to accumulate social capital [6].

The study focuses on the following aspects: key person motivation and capability for the business, collaboration, and other factors such as branding/promotion business plan, market categories, market size, and so on. Some cases are chosen because they are the most famous agricultural businesses in Ehime Prefecture. Then, the consideration of accessible data is important to conduct this research. The cases are classified into six categories by the difference of the key informants for establishing some new business model, as follows.

1. Case of diversification by Muchachaen;
2. Case of diversification by 10 Factories;
3. Case of diversification by Noma - Noma;
4. Case of diversification by News Inc.;
5. Case of diversification by Rakuten Ragri;
6. Case of diversification by Miyamoto Orange Garden Inc.

3 Results and discussion

3.1 Japanese oranges

In March 1946, fruit growers convened in Okitsu, Shizuoka, to form the Japan Fruit Industry, which had been devastated by World War II. Under the Agricultural Co-operative Society Law, it was renamed Japan Fruit Growers Cooperative Association in November 1948. The organization is in charge of domestic fruit distribution, as well as the delivery of growing and packing goods to its members, as well as information and counseling. The association is made up of fruit agricultural cooperative associations from several prefectures, which are made up of city, town, and village co-operatives with fruit growers as members. It is the national association of fruit growers in a nutshell. The group has participated in a variety of initiatives, including the construction of a government loaning and subsidizing system for the modernization of the fruit sector, foreign trade policy, and the building of special co-operatives, among others. These efforts resulted in the significant

consolidation of the Ministry of Agriculture and Forestry's (MAF) administrative machine, including the founding of the Board of Horticulture, the establishment of the Fruit Industry Promotion Law, and so on. In addition, the organization is working on several initiatives to encourage the fruit sector.

Ehime Prefecture is one of Japan's most important citrus-producing regions. In Ehime, up to 20 key citrus kinds are grown each year [14]. The highest oranges production is Wakayama Prefecture and the second is Ehime Prefecture [13]. The Japanese orange name is Gokuwasemikan (very early ripening mandarin oranges) or Citrus unshiu. The orange is in the Tangerine family from Japan originally. The oranges season in December until February. The tree is easy to attach to aphids, scale insects, and spider mites. The orange's characteristics are refreshing sweetness, balanced sugar content, and sourness. It is a pioneer of Japanese oranges. Furthermore, this mandarin orange is made in "Nakajima" which consists of countless islands floating in the citrus-producing area that once shined in Japan, Matsuyama City, Ehime prefecture. The production area surrounded by the sun and the sea that falls in the steep mountains make the citrus store the sweetness and rich flavor. There is no other, than the refreshing taste and smell of real citrus.

The oranges we are currently eating are called "unshu mikan", a fruit of Japanese origin that was born in Kagoshima about 400 years ago. Historically, it is believed that there were old trees over 300 years old in the eastern town of Nagashima in the same prefecture until around 1955. It is said that he was born by chance from a mandarin orange that was originally introduced from China at that time. The place of cultivation was a small part of Kyushu, but mutant species with various characteristics such as those with dark skin color and those with early harvest dates were created. Since these mutants have no species in oranges, they have been bred by using change branches (mutants) that have different properties from their naturally occurring parents. The cultivation gradually spread to the eastern region.

It is small mandarin orange (Kishu mandarin orange) that first spread to Japan as a mandarin orange. Small mandarin orange is transmitted from China to Higo Yatsushiro (now Yatsushiro City, Kumamoto Prefecture), which has prospered since ancient times as a trading port with China, and it is ported to Kishu Arida (now Arita City, Wakayama Prefecture) around the 15th to 16th centuries. In addition, Kinokuniya Bunkaemon, an Edo-era businessman, is also famous for transporting mandarin oranges that soared in Edo from Kishu and gaining wealth. In the Edo period, unshui mankan was hated as "cutting off the seed" because there was no seed, but from the late Edo period onwards it was gradually replaced with small mandarins because of its good taste and convenience without seeds.

The production area of oranges also expanded, and the production volume continued to increase except when it was affected by the 1940s Pacific War, reaching 366,500 tons in 1975, but then by changes in eating habits, etc. The yearly production volume decreased to 906,000 tons in 2008. The period of eating is now available in winter. Japan's production volume in recent years is 79 to 910,000 tons. Ehime Prefecture is one of the nation's best citrus kingdoms in terms of both the amount of harvested citrus fruits and the number of items, which is a mixture of middle suppers (Ponkan and Shiranui) with Wenzhou oranges.

Not to mention that only the fruits grown by farmers in a chakra garden are used as the raw material for juices, of course, adjustments by concentration reduction and addition of flavors and preservatives are not performed, and citrus juice is bottled as it is. Although the difference in taste comes out year by year depending on the condition of the citrus fruits, the fruit's original taste and flavor are taken care of, and it is stuck to the straight juice. The variety of orange juices depends on the variety of oranges, but the limitation of the study will discuss Wenzhou orange. Wenzhou orange juice is 100% straight juice. It is recommended for those who do not like sour tastes, like sweet and bitter juices, and want their children to drink. Wenzhou orange juice is 100% straight juice. There is a moderately

sweet taste, which is a taste of Wenzhou orange. It is recommended for those who like less bitter and sour, easy-to-drink juice, and for small children.

Either it is processed into juice, or marmalade to eat the mandarin oranges made over a year without waste. They give priority to safety, nutrition, and taste and process the products of Akehama at the hands of Akehama. While being grateful for the life of the crop, taste the processed products of the garden, look for food and things in the countryside and look forward to thinking about it.

3.2 Supply chain commonly in Japan

In distribution channels of fruits and vegetables and the main players, the wholesale market has a large weight and Fig. 1 shows the distribution process centered on the wholesale market. Among the partners who ship fruits and vegetables are representative collectors and agricultural cooperatives. In this production area, the collectors were the ones that were once called production merchants, of which distribution route of fruits and vegetables centered on the wholesale market Figure 1. The wholesaler collects agricultural products from producers, etc., and ships them to consumption areas. Usually, producers decide the grade, transactions by cash, carry out shipping and sale to the wholesale market while taking risks, while the agricultural cooperative (agricultural cooperative) is a cooperative formed by local producers, etc. General agricultural cooperatives conduct financial-related business, in addition to business such as purchasing, farming guidance, and sales for specific agricultural products. Two types of specialized agricultural cooperatives purchase production materials, and the sales business of agricultural cooperatives is called joint sales and picks up (consignment pickup) from producers without determining the price and based on the number of sales the fixed fee and picks. It pays producers after deducting expenses such as fares. At that time, the sales amount within a certain period is pooled, the average unit price by equal rank is calculated, and it is paid to each producer according to the amount (joint calculation).

Shipment price collection and distribution of these harvesters, agricultural cooperatives, and other fruits and vegetables are collected, and this is a wholesale market that has been established in various cities throughout the country under the wholesale market law. There are two types of markets: a central beating market, which can be opened by local governments with a population of over 200,000, and a regional wholesale market, which is opened by private companies. It is operated by wholesalers who collect fruits and vegetables from overseas, and middle wholesalers who are in charge of small-scale, primary processing and delivery by purchasing from wholesalers. There is JA –Japan Agriculture, which sells to mass retailers etc. It is operated by a company of the same name established by all agriculture activities. There are three locations (Tokyo Center (Toda), Kanagawa Center (Hitsuka), Osaka Center (Takatsuki) according to the whole country.

This is because there is a large percentage of imported goods. Especially in the case of fruits, orange and apple juice circles have been successively liberalized around 1990, and these imported processed products that do not require the function of the wholesale market have pushed down the wholesale market. On the other hand, although the transit rate of domestic fruits and vegetables decreased from 2002, it remains high in 2015. Joining dispersal, micro-seasonal and seasonal fruit, and vegetable production as well as dispersive and micro-consumption, wholesale prices continue to fall further to form a price, but they were low in 2015 because processed products were imported. This shows that the system is effective and that all wholesale markets are safe, but there is no competition in the wholesale market by mass retailers and so on. The competition between wholesale markets is intensifying due to the selection of wholesale markets by agricultural cooperatives and the like (described later), and the wholesale market is in a severe environment.

The collection method of wholesalers about the price information wholesale market is consignment collection and purchasing collection method, but the collection method is consignment collection (60% in 2016). Agricultural cooperatives also use consignment and collection from producers, and between producers-agricultural cooperatives-sales market (wholesalers), it is a process in which fruits and vegetables are shipped without setting prices. In the sales market, there are two types of price formation (trade) methods in which prices are formed between a wholesaler and a middleman-buyer. Among these, the transaction is to decide the price. The countertrade is to negotiate separately and determine the price between the wholesaler and a specific buyer (such as a middleman). Once in the wholesale market, the proportion of transactions, has dropped rapidly, and now the principle has been abolished for 200 years, and it has stopped at 11% in the central wholesale market and 26% in the regional wholesale market.

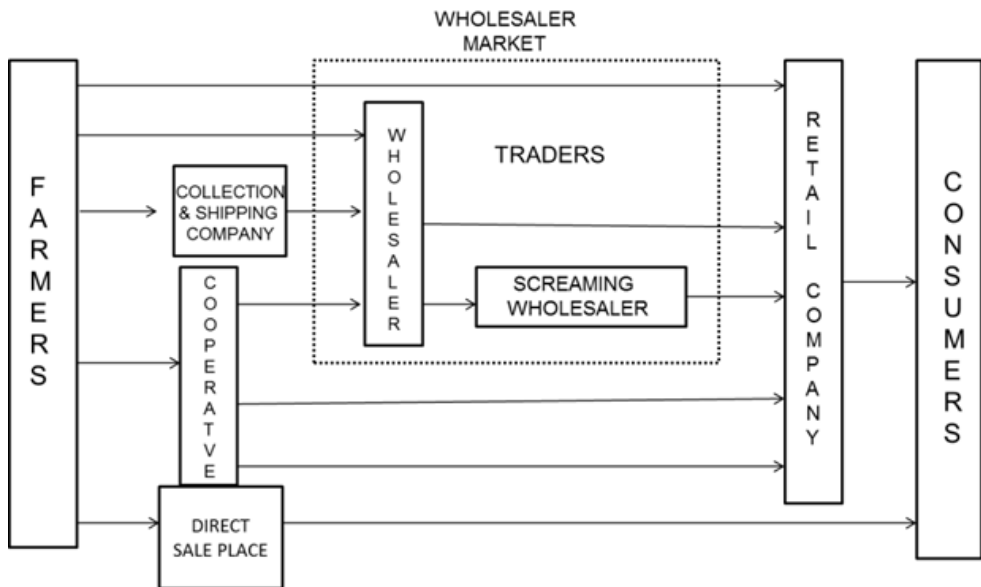


Fig. 1. Distribution Route of Fruits and Vegetables Centering on Wholesaler Market.

Among retailers, specialized retailers such as grocery stores, fruit shops, etc. generally acquire the right to buy and sell and purchase from a wholesaler in the wholesale market. On the other hand, mass-market stores such as supermarkets, co-ops, and agricultural co-ops (A-Coop) generally purchase through middlemen. The delivery process is done by retailers. Purchasing through wholesalers is common. The formation process of delivery price is done by retailers. When purchasing fruits and vegetables, retailers decide the price for the next week (week value determination and orders are generally done the day before). Wholesalers transfer the risk of price fluctuation to a middleman.

Intermediaries say sales and marketing-first, expect the market price for the next week. If the weekly price is determined based on the price including company's gross profit including the two expenses, the market price will fluctuate daily. There is also a market, the market price is higher than the price determined weekly. If the week goes wrong, the middleman delivers in compliance with the weekly price, but in the opposite case, if the market price is lower than the weekly price, the delivery price is revised downward.

Therefore, for wholesalers, even if the average market price was as expected in the previous week, it would be difficult to secure such originally expected gross profit. The vendor takes such a response (must take it) because there is competition for delivery between mass retailers and wholesalers. If the market price soars during the wholesale

market, it is also likely that an upward revision of the delivery price. It will also reduce the order volume from the retailer when the market price falls. It is also the tendency that the volume of orders from retailers tends to increase, and the wholesaler market price as a total rise (if there is a reverse trade in the middle wholesalers). The benefits will be further compressed. Retailers continue to use the wholesale market.

The distribution without direct connection to the production area by the co-op is called wholesale distribution outside the wholesale market. Distribution outside the wholesale market has shown various developments, but one of the representative ones is carried out by the co-op. In consultation with the production area, based on the three direct principles of production, it determines the price based on the production cost before seeding, such as an industrial direct mechanism. It is created to create and distribute safe and secure agricultural products to the producers. In co-op direct production, the price is decided based on the production cost before seeding, but it goes into production, but it is not good as usual if bad harvest due to unseasonable weather, and sometimes rich harvest due to the weather. Bad harvest reduces shipments and prices in the wholesale market soar. Then, retail stores buy a lot from the wholesale market.

The price soars at this time. Consumers look at the catalog of co-ops without store sales (for the price before seeding) and it is relatively cheaper than the retail over-the-counter price and the consumer makes an order to the co-op. In this way, it will be delivered to the production area where it is difficult to secure the shipment volume even if a large number of orders are usually poor and free as usual. Smaller than usual orders are delivered to production areas where fruits and vegetables are abundant. This phenomenon is widely occurring in contract farming in general, and even if it is out of the market, it is affected by wholesale market prices. It indicates that it is difficult to be freed and at the time of the contract, decide the price and quantity together. The quality of the fruits and vegetables sold is better than general. If it is recognized, sales will be possible regardless of the selling market price. Of this, for the former, it is a quality advantage to convince the buyer that it is fixed in advance not only the price but also the quantity.

There are various things such as farm products in direct sale places and agricultural cooperatives. The raw establishment is the producer's own. Although the direct selling place, can be said to be a direct connection between the producer and the consumer, there are many small ones. The number of large-scale direct sales offices is opened by agricultural cooperatives increasing. Outside the group and the factory, the shippers of the direct sales office are the producers of the neighborhood and the goods to be shipped under the name of agricultural cooperatives. Producers themselves decide the price, but there is a difference in sales depending on the quality. The unsold ones must be disposed of by the producers themselves or be taken back by the agricultural co-op. In the case of a direct sales office, sales commissions generally require some distribution. Among the agricultural cooperative sales business, although the fee rate is high, it is about 20%, and the consumer's voice is relatively high for the producer to take care of. In addition, since there is no cost, it is possible to confirm the reaction, so it has the effect of directly listening to the effect of increasing the cost of the producer from the rise of direct sales offices owned by producers and retailers.

The movement to make the direct sales is spreading, and the in-shop which has a part of the sales floor provided to the agricultural cooperative which manages the direct sale place and operated is also spreading. The sales market law was revised in June 2018 (planned to be put into effect in 2020), and the establishment of the wholesale market, which had been accredited before, will be accredited, and will be private. The market was also recognized as a central wholesale market. It was clarified about half of the domestic vegetables are used for processing business use, but a large part of it is also a wholesale market. One-off transactions also include special sale cooperation (low price delivery) and center fee

(delivery center usage fee). These paradoxical conditions are conditional on two conditions: that the fluctuation of production is not local but wide enough to affect the retail price, and that the situation does not change in about one week from the order of the consumer to the shipment

Activities of the citrus agroindustry value chain in Ehime Prefecture, Japan start from nurseries, cultivation, harvesting, upstream processing, downstream processing, and distribution. Value chains have three or more actors, both in the form of organizations or individuals, or both. Actors running individually such as seed suppliers and citrus farmers. The existence of orange farmer groups that run actively causes farmer activities to be more efficient and effective. This farmer group is called Japan Agriculture Cooperatives (JA). JA has a considerable role in Japanese agricultural activities.

3.3 Case of supply chain diversification

3.3.1 Muchachaen

Muchachaen is a cooperative organization with dozens of farmers. Located in Akehama, Muchachaen support > 80 orange farmers to do organic farming certified by JAS and use the method of selling them in cooperation and deducting the necessary expenses and paying the farmers. Figure 2 shows the supply chain in Muchachaen. Figure 2 shows that on the first and second channels. With good packaging and selling directly to consumers or through retailers, the entrepreneur adds value. Different margins between the first and second channels are impacted by variances in value-added, which can alter product selling prices.

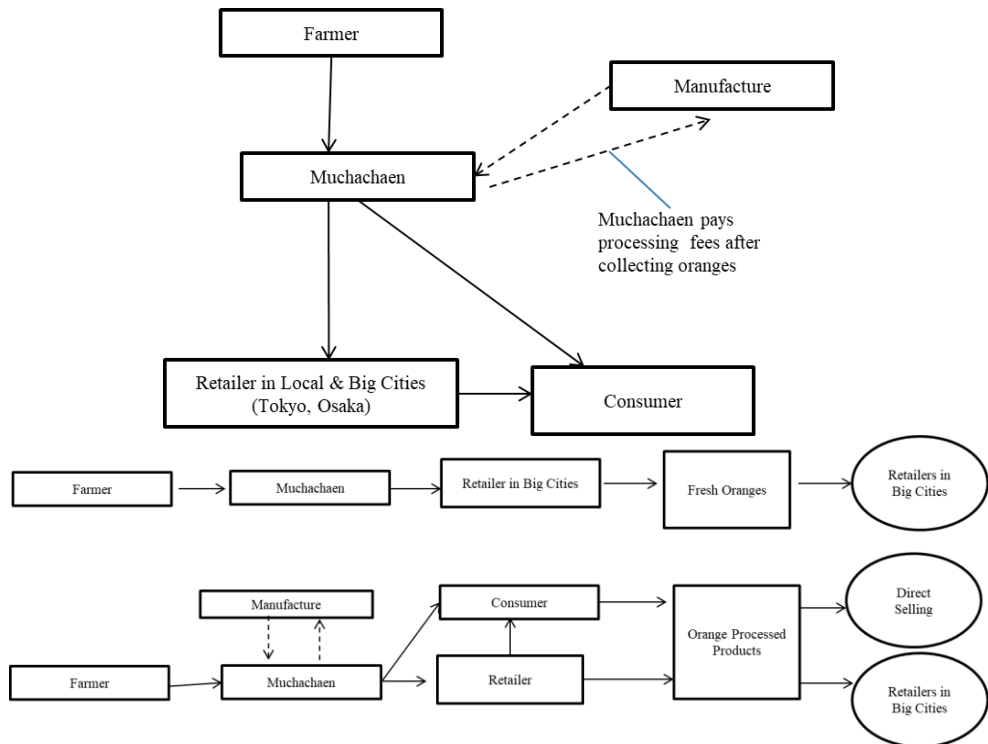


Fig 2. Orange Supply Chain in Muchachaen.

Muchacaen has farms in various places in Ehime Prefecture, and organically grows vegetables, fruit trees, and citrus fruits. The staff is all new farmers. It is a directly managed farm sector that has two organizations of Tenmei-kai and Farmers Union Hojo, which are located within the agricultural association corporation. They aim for large-scale organic farm management by new farmers and practice with standardization of enterprise management in agriculture.

It is said that the Akihama orange is blessed with three suns. The light from the sun, from the sea, and the reflection from the white stone walls of the terraced fields. This terraced field was built by growing up limestone one by one by our ancestors to expand the farmland even while growing rice and wheat self-sufficiently. It is after the war that the making of oranges spreads. The planting was promoted as a suitable area while the increase in production of agricultural products was planned on the background of population growth and economic growth. Muchacaen's farmers have been working to minimize the use of pesticides in the year-round cultivation period. They will create products with a sense of security and vitality in exchange for a good-looking appearance. The producers of the agricultural association corporation in Muchacaen Garden are the 6 villages of Akehama (Tawaruzu, Tano, Tanoe, Karihama, Takayama, Miyano). After 40 years, more than 70% of farmers have joined Karihama, the place of establishment.

It is the typhoon damage in 1991 and 2004 that dropped the shadow of the prospect of citrus cultivation in Akehama. Recovery from salt wind damage takes a long time to recover. Diversification of production areas and products leads to the establishment of relationships with sellers as well as the stabilization of management. At Ehime, with its varied geographical conditions from the warm coastline to the cool plateau, various agricultural products have been produced in the right place. From Akehama to Ehime, they are expanding the range of production and sales.

Direct marketing from close to consumers is the basis of sales activities. In addition to direct delivery to individual customers, they sell products for businesses such as co-ops, courier companies, and retail stores. Fruits and vegetables including citrus fruits are all produced by member farmers and contract farmers. Based on the climate of the year, they identify the production situation and communicate closely with the producers, and they are working as part of the garden farming.

It is accurate handling of production information that enhances the reliability of direct manufacturing. In anticipation of the recent improvement of the communication environment, we have introduced work logs and worked to establish a production management system. Currently, we use the cloud to organize planting and production information. In addition, it is essential to disseminate information to gain a deeper understanding of our business and activities. "Ampo", which is mailed to individual consumers, has been published with the 150th issue and uses the Internet to widely communicate products and initiatives.

They are developing the organic cosmetics and general goods brand "yaetoco" that uses essential oils extracted from citrus peel. This name is taken from "Yaetoko" (a place where a beach is a good place), which is the hail of Ushioni appearing in the Autumn Festival at Karihama. It is a cosmetic brand from the region. Starting with yaetoco, they are also trying to develop products that create new value for the region, outside of the existing framework.

In 2013, it was established as a welfare business centering on elderly care. Launched by members who took home helper courses at Muchan Gardens, the center operates two welfare facilities, "Megumi no Sato" and "Misato", in Aizu area, Akihama Town, Seiyo City. Then, In the direct production business of Muchacaen Garden, they have worked on school lunches by building relationships with dietitians. Not only do they ship their produce, but producers and staff go to school and keep telling children who don't usually touch food production what it is like farming and fishing.

The interaction between producers and consumers where they can see each other's faces is the key to being productive, then enhancing consumer intimacy and the producer reward. Producers go to consumption places and deepen exchanges. If customers come in, they welcome consumers with warm hospitality unique to the area. It is in the face-to-face interaction that they create strong connections.

Tenchoi's farm and Hojo's farm get a leader from the staff of regional corporation Muchanchaen Co., Ltd., Akehama. Then migration to Akehama is progressing through recruitment of new farmers and new business development. Work with producers and actively engage in local events. Along with creating and disseminating new values, they are trying to become a member connecting the local history, culture, and autonomy.

Muchacaen makes oranges without relying on pesticides or chemical fertilizers. This is the start of the idea that is still basic. They grow with the organic matter without using chemical fertilizer. Weed control is all by hand without using any herbicide. If every farmer does not rely on pesticides as much as possible, it considers the environment and prioritizes what is permitted in organic farming when they use it. Under this cultivation policy, more than 80 farmers are making the orange garden without a tea garden.

Akihama-cho, Saiyo-shi, Ehime Prefecture, which has a rural village, is a famous producing area with a warm climate, facing Uwakai south. Ishigaki terraced fields and steep slopes, which are expressed as "plow to the sky", are spreading. Since the fields are steep slopes, drainage is good, and in the gardens facing the sea, there are plenty of minerals that are important for the trees to grow along with the sea breeze.

When there is a serious impact on the harvest, chemical pesticides are sometimes used, but it is also the result of cultivation for over a year. They are working to limit it to the "minimum" in making a year-round annual orange. When shipping citrus fruits, they will send the items (organic cultivation standard) up to "2" of the above cultivation policy. However, at the time of abnormal occurrence of pests, it becomes the standard of "3" (up to three chemical pesticides).

Because the use of pesticides is kept to a minimum, the appearance is not shiny. The appearance gets worse, not least because of disease marks on the skin and small scratches made by insects. In addition, wax, preservatives, and hormones are not used during the harvest period, which makes it easy for the outer skin to shrink and lose weight. However, they will be careful about what is extremely bad in appearance and freshness.

In general, distribution, where good appearance is important, size division is used, but the fruits that can be originally taken from trees are of unequal size. Moreover, the tendency of the size is different depending on the year, and the size is not always the same every time. They will pack in large and small size boxes and send them, except for extremely large ones and small ones. (In Wenzhou oranges, it will be mixed in size per S ~ 2 L of general distribution.).

3.3.2 10 Factories

10 "TEN" is a company with 3 retail stores that target tourists coming after the road. 10 Factory takes a method of buying from contract farmers and the market. The producer's price is determined by referring to the market price and the consumer price of general retailers. 10 "TEN" is directly connected to the production area of oranges, and while accumulating various know-how, by developing processed products that make use of the materials. Entrepreneur gives value-added with good added value and sells directly through their retailers.

10 "TEN" aims to create a world-class brand by proposing original products that make the most attractive product of the number 1 industry in Japan, making it a major goal to connect the industry in Ehime Prefecture to the next generation. Ehime Prefecture ranks

second in the whole country in terms of the harvest of Wenzhou oranges but ranks first in terms of the number of varieties of citrus fruits, and it is the number 1 "Citrus Kingdom" in Japan. Japan is the best in terms of the overall yield of citrus fruits.

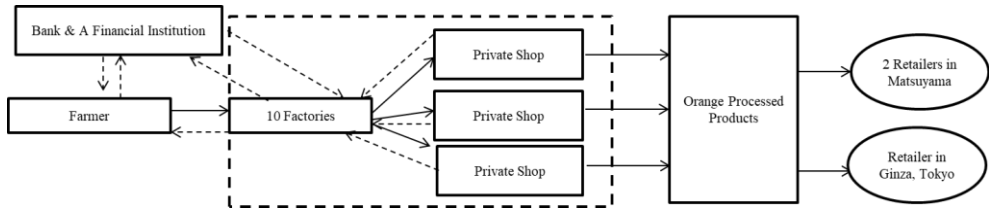


Fig 3. Orange Supply Chain in 10 Factories.

At present, the average age of tangerine farmers in Japan is said to be more than 65 years old, and the aging of tangerine farmers in Ehime Prefecture is a serious problem. In response to such current conditions, 10 “TEN” is directly connected to the production area of oranges, and while accumulating various know-how, by developing processed products that make use of the materials, we would like to enliven the Mikan industry in Ehime Prefecture. In addition, they will comprehensively work on proposals for lifestyles that lead to "a rich living with oranges" through links with processed orange products and orange farmers.

10 Factories have 10 commitments. Firstly, the commitment is to produce delicious and beautiful things. They make processed products that make use of the taste of the material itself. They believe that their commitment to materials and taste will lead to the beauty of nature. Secondly, the commitment is only for those who know how they made it. They make processed products using farmers who visited us directly and talked to them, and materials from certain markets. While carefully taking care of the differences between the production areas and the cultivation methods so they make each product carefully. Thirdly, the commitment is to care about nurturing in nature. Terrain and climate conditions are important factors for the cultivation of oranges.

Then, the commitment is sharing the peace of mind for safety and security. The consideration of the raw material itself, such as reducing agricultural chemicals, non-use of agricultural chemicals, non-use of agricultural fertilizers, and those meeting strict criteria of organic JAS as raw materials, processing by utilizing natural taste is performed. They are trying to deliver safe and secure products to people of all ages.

After that, the commitment is line up according to the cycle of nature. In Ehime Prefecture, where many varieties are grown, consumers can enjoy seasonal citrus fruits depending on the time of the year. They will provide new products every year according to the cycle of varieties being grown. Then the commitment is recipes and packages to bring out the goodness of oranges. They are processed based on the recipe that brings out the taste of each material. The simple, transparent design, like the whole package of oranges, expresses the feelings and commitment of oranges in a straight line.

Then, the commitment is processed by the method of adherence. They make products that make use of the taste of the ingredients for each of the various varieties. By pursuing processing methods from various points of view, they are accumulating their know-how. Then the reasonable price to be responsible for all processes. From the stocking of the materials, they cherish every single process including processing methods and packages. They offer it at a price to keep sticking.

After that, the commitment is a device for inheriting Ehime's oranges industry. The goal is to pass on the Ehime's oranges industry to the next generation by expanding the possibilities of Ehime oranges while working with production areas. To achieve that, by partnership with orange farmers, they will carry out various activities. The last commitment

is being a proposal that leads to a rich life. By imagining everyday life and creating processed products suitable for the modern lifestyle, they will connect to the proposal of a rich life with oranges.

“TEN” offers a variety of original processed products using varied Ehime citrus. In addition, “TEN” processed products offer various gift scenes. In addition, 10 “TEN” aims to connect the Ehime Prefecture's Mikan Industry to the next generation by actively forming tags with such new generation Mikan farmers. 10 Factories have 2 stores in Matsuyama and 1 store in Giza.

3.3.3 Noma – Noma

Noma-Noma is a company that sells mainly citrus fruits. Noma-Noma follows the route of purchasing from contract farmers but bases the producer price on the market price. The largest margin occurs Noma-Noma, as seen in Figure 4. Entrepreneur gives value-added with good added value and sells directly through their retailers. The added value is some processing products, for example, juice and ice cream.

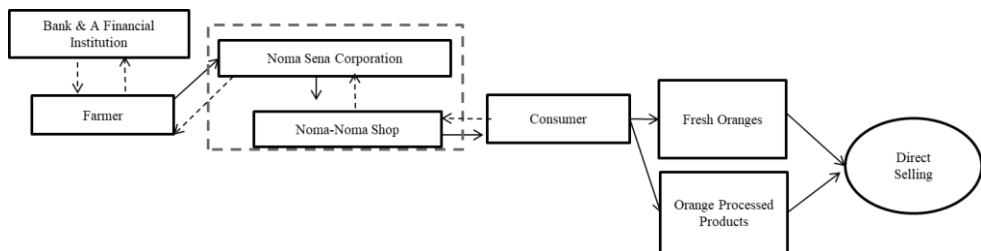


Fig 4. Orange Supply Chain in Noma-Noma.

Opened in June 2008 a shop "noma-noma" where consumers can enjoy the citrus kingdom "Ehime" as a directly managed shop of Noma Orchard. Noma Orchard, the store name is owned by Noman Sena Corporation, which is located in Imabari City, Ehime Prefecture. The corporation was established in August 1955. The business of Noman Sena Corporation contents is the collection of citrus fruits, packing of fruits, and sales (mandarins), collection and sale of other fruits and vegetables, farm management (5ha, exam garden 1ha, greenhouse 30 ha), sales and production guidance of pesticides, fertilizers, materials, seedlings nationwide mail-order of fruits (mail order department), fruit specialty gift shop management (Noma orchard), transportation business. They operate two stores: a gift shop specializing in fruits (Imabari, Ehime) and a store of fresh juice and gifts (Matsuyama, Ehime).

In Imabari city, Ehime Prefecture, it is a fruit specialty store that has been operating since 1990 (Heisei 2). They handle seasonal fruits with a focus on seasonal citrus fruits. Consumers can bring back the assortment of fruits with souvenirs. Of course, it is also possible to use a gift as a direct production route delivery to the whole country. In addition, they deal with our original straight orange juice, jelly "citrus-melon" using orange juice.

In Matsuyama, Ehime Prefecture, a directly managed branch of the citrus fruit specialty store "Noma Orchard" is located in the central area. Seasonal citrus with fresh juice all year round. In addition, because consumers can buy their favorite citrus in one piece, it is also ideal for souvenirs. Nowadays, in the middle of fruit breakup, a fresh juice bar is added to make it easy to taste seasonal fruits. It is possible to purchase one bottle of the fruit consumer-like and drink it as raw juice. In addition, consumers can see the actual products of mail-order products of Noma Orchard, and consumers can sample and taste them, so using them as gifts is at ease. They also propose original fruit gifts tailored to the needs of

each customer. If consumers are in trouble with a gift, or if consumers want to use Ehime's specialty citrus fruits for a gift, consumers can order directly.

Noma-noma has commitments. Firstly, the commitment is to taste and quality carefully selected seasonal fruits. Noma-noma is a fruit shop operated by an orchard in Imabari City. Ehime Prefecture offers unique dishes that can only be tasted in Ehime Prefecture, using carefully selected seasonal ingredients such as orange juice and orange jelly. Secondly, the commitment is melting mouth taste on jelly as "Citrus no Koi". Jelly is made from the extravagant orange juice of Noma Orchard. They kept the original taste of citrus fruits in mind, and consumers stuck to the melting mouth. It is a popular item for souvenirs. Thirdly, the commitment is 100% fresh juice made after order. Noma-noma offers fresh juices freshly squeezed in a cup after ordering.

The gift quality of trust is chosen by fruit professionals. A gift of a higher rank, assembled by hand one by one. Noma's orchard's directly managed fruit specialty store, fruit gift & juice bar "noma-noma". The manager of the "noma-noma" carefully selected an assortment of "seasonal specialty fruit". Because it is a product that is eye-catching with the "professional eyes of fruits" according to the amount of money, focusing on citrus fruits from among seasonal fruits. In addition, the processed orange product is ice cream like Ehime Mikan Parfait.

3.3.4 News Inc.

News Inc. is a company created by farmers, which cultivates and sells oranges. It also sells mandarin oranges produced by neighboring farmers. They do organic farming to produce oranges. They have manufactured products that are guaranteed to be 100% satisfied with customers. They use the method of selling them in cooperation and deducting the necessary expenses and paying the farmers. Figure 5 shows that the highest margin occurs for the farmer. Entrepreneur gives value-added with good added value and sells directly through their retailers. The added value is some processing products, for example, juice.

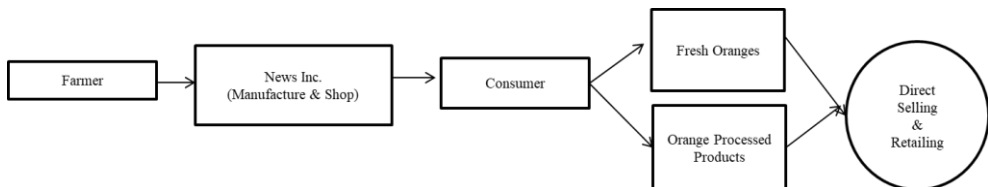


Fig 5. Orange Supply Chain in News Inc.

New Foods, Inc. located in Izu-cho, Nishiwa-gun, Ehime Prefecture, consistently cultivates, sells, and ships citrus fruits based on the business. They believe that their mission given to us is to make all the people involved in the news happy, as in the Honjo they produce with sincerity. They are producers and representative sales. Customers' voices received directly can be reflected in their product development and accompanying cultivation in the company management. They will use the strengths unique to their company to disseminate the culture of Nishi-Uwa, where the citrus fruits grew to the world. Newz Inc. does organic farming to produce oranges. They have manufactured products which are guaranteed to be 100% satisfied with customers.

3.3.5 Rakuten Ragri

Rakuten Ragri is an internet market that sells agricultural products produced by contract farmers. The agricultural products handled by Rakuten Ragri are organic, oranges are a part

of them, and the proportion is low. They use the method of selling them in cooperation and deducting the necessary expenses and paying the farmers. Figure 6 demonstrates that the farmer has the biggest profit margin. Entrepreneurs provide the door for farmers to sell directly to consumers and communicate with them.

Ragri is a service that solves the problems of Japanese agriculture and revitalizes Japan through agriculture. Rakuten Ragri has goals to build a new farming business. Firstly, provide a place to connect farmers and consumers directly with IT, provide new forms of agriculture that realize stable monthly income, and develops and support the next generation of farmers who want to start farming well [15]. Contract cultivation of the internet becomes a new form of agriculture that support farmers by prepayment. Prepaid contract farming can help farmers stabilize their income regardless of crop yields and market prices.

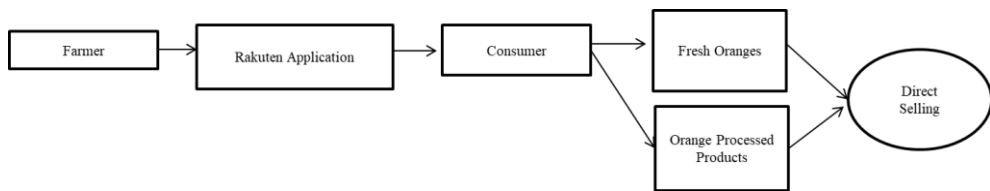


Fig 6. Orange Supply Chain in Rakuten Ragri.

Ragri is a useful platform for the good new form of agriculture. They give good education to children because they can learn while enjoying the process of growing food and reaching home. Then they provide safe and secure food production. It is something that an important family says. They will deliver safe and secure vegetables and fruits with a visible face. After that, playing and connecting are interesting. A farming experience with a game-like feel at the gap time. Ragri can connect directly with the farmer and interact.

The advantages of using Agri for fruit and vegetable consumers are:

1. As farmers harvest at the right time, consumers will receive delicious vegetables and fruits.
2. As farmers ship immediately after harvest, consumers can receive fresh vegetables and fruits sent directly from the field.
3. Consumers can use it with confidence because consumers can see the state of cultivation and the farmer's face.
4. Organic vegetables and expensive fruits can also be obtained in monthly installments.
5. Consumers can support farmers and local agriculture by enjoying Ragri.

The advantages of using Agri for farmers are :

1. A new type of agriculture that brings value to farming work rather than crops, farmers can earn a stable monthly income.
2. Farmers can set their rates regardless of crop yields and market prices.
3. Cultivating crops while interacting with consumers encourages farming.
4. As Ragri can send out state during cultivation, Ragri can convey thought as a farmer.
5. Farmers will be able to connect with members across the country through the Internet

3.3.6 Miyamoto Orange Garden Inc.

Miyamoto Orange Garden Inc. is a company targeting corporate customers including long-established department stores and large companies. They take a method of buying from contract farmers and the market. The producer's price is determined by referring to the market price and the consumer price of general retailers. They are directly connected to the production area of oranges and develop processed products that make use of the materials.

Figure 7 shows the highest margin occurs in the company. They give value-added with good added value and sell directly to the corporate customer.

Miyamoto Orange Garden Inc. is an agricultural company with the original scenery of Miyamoto Orange Garden Inc., terraced fields of Yawatahama. It is a place surrounded by natural gentleness where the bushes sing in clear air and the orange leaves sway in the midst. The warm sunshine shines brightly, it pours into the terraced fields of Ishigaki, and the sea breeze containing a lot of minerals from the Uwa Sea hits it, it is blessed with beautiful nature and delicious citrus fruits grow. This symbol mark is designed with inspiration from the original scenery of Miyamoto Orange Garden, imagining the happy smile of people through delicious oranges.

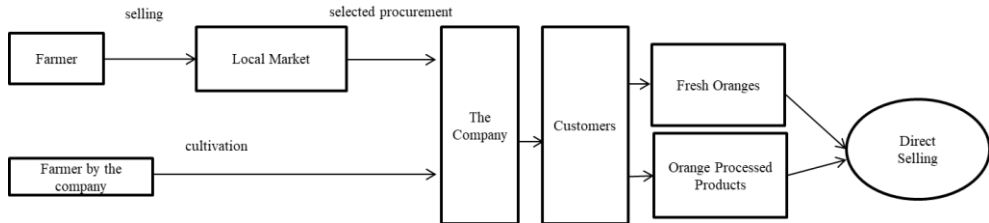


Fig 7. Orange Supply Chain in Miyamoto Orange Garden Inc.

The company has some commitments. Firstly, the company always does research and practices delicious, high-quality, high-value-added mandarin oranges. Then the company also considers the balance between the taste that you want to eat next time and the health of your customers. After that, the company always wants to provide the world's highest quality tangerine and provide a one-stop service for production, processing, and sales. The last, the company is aware of environmental conservation type agriculture that pursues a balance of agriculture and the natural environment. To ensure reliable quality and stable supply, they will be thoroughly managed based on our standard of cultivation standards.

At Miyamoto Orange Garden, cultivation and sales of oranges have the following characteristics: delicious product from field production, rich line-up, select seasonal sales throughout the year, global GAP and ASIA GAP cultivation management system, challenge to new technology, and providing information to convey the goodness of oranges. The company is used by many corporate customers including long-established department stores and large companies. Miyamoto Orange Garden Inc. has been a company employee for 20 years. At Miyamoto Orange Garden Inc., they have some value-added products from oranges for the general public, such as juices, jellies, and seasoning salt oranges. The company wants Japanese customers to eat the oranges in Japan and is actively working on exports. The products are sold in countries all over the world such as America, France, Switzerland, China, Korea, and Australia.

Miyamoto Orange Garden Inc. has used certification of Global GAP and ASIAGAP. Global GAP is a third-party certification system focusing on food safety, environmental protection, labor safety, and labor welfare, with a focus on Europe, as a de facto global standard. ASIAGAP is a scheme that aims to be an international standard approved by GFSI so that JGAP can become a common platform in Asia. Through the acquisition and maintenance of Global GAP and ASIA GAP certifications, the company will strengthen agricultural management and achieve food safety, environmental protection, labor safety, and welfare based on global standards.

In addition, the company has developed the "Global GAP and ASIAGAP certification acquisition and update system utilizing IT cloud". As a result, the burden on preparation for global GAP and ASIA GAP certification acquisition, maintenance, and renewal has been greatly reduced, speeding up the answers at the time of examination, and paperlessness and cost reduction have been achieved. This system aims at a "GAP ecosystem (GAP co-

creation system)" which does not rely on external consultants by utilizing IT and collective knowledge of farmers, sharing cooperation among users, and sharing knowledge.

Low to achieve "food safety, labor safety, environmental conservation, labor welfare", the purpose of Global GAP and ASIA GAP, and reflect all our know-how from the acquisition of our company's certification up to now, and maintenance and renewal, Realized costing. In the future, we will pursue the further enhancement of functions, ease of use, cost reduction, and promotion of global GAP and ASIAGAP.

There is an ingredient called beta-cryptoxanthin in mandarin orange, which is said to have antioxidative action and carcinogenesis suppressive action. In December 2013, as a result of the antioxidants measurement results by Designer Foods Co., Ltd., the company's oranges has superoxide elimination activity and singlet oxygen elimination activity value of 1.8 of the annual average Wenzhou orange This is the highest among the accumulated data. The high antioxidant value is expected to contain more phytochemicals such as beta-cryptoxanthin (chemical constituents contained in plants) compared to common Wenzhou tangerines. The antioxidant is thought to reduce active oxygen, which is one of the causes of aging and to help keep youth and prevent illness.

4 Conclusions and suggestions

In many circumstances, the added value delivered to the product at each tier of the supply chain is quite minor, therefore the price increase is not accompanied by an increase in the products value-added. As a result, there is a significant disparity between the selling prices received by the initial suppliers (farmers) and the purchase price paid by the customer. Furthermore, the integration of stakeholders has not been implemented, resulting in a profit that is not optimal overall. Understanding regional resources, connecting them, and disseminating the results are now the best ways to provide value.

The intermediary partners with relatively low operational or logistics costs are the stakeholders who earn the most in several case studies [16]. The low bargaining power of the initial supplier (farmer) is still a major reason why the profit received is not always worth the effort put in. Profit disparities among stakeholders reveal the supply chain's inefficiencies. Additionally, a value chain analysis can be used to establish which operations are designated as core and support. The level of income distribution in a commodity can be determined using cost parameters analysis. The results of the analysis can be used to develop a strategy for improvement. The government must also play an active role in controlling and guiding this scenario. As a result, the profit distribution and income difference among stakeholders in a specific commodity are not too large.

One of the conclusions drawn from the case study is that the activities of those types of significant individuals are critical in realizing industry reform. For the sake of agriculture's future, the importance of human resources should be reviewed. Another implication is that regional social capital is critical for growing key indicators related to the entrepreneurial concept, collaborating with farmers, and returning earnings to farmers and the regional community. In this view, achieving a form of intangible asset circulation, such as regional social capital, is key to the region's long-term development.

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