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## A Study on Strengthening of Market Functions of Local Distribution Markets in Eastern Shizuoka

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This paper presents the results of investigation on various efforts which aimed to strengthen the functions of local distribution markets in eastern Shizuoka. Collecting: Efforts for more efficient collecting operations, including the adoption of so-called “milk-run” system, the wide use of returnable containers and so on, are underway. Distributing: Sorting, delivery, and packing by wholesalers themselves are becoming common because the sales to mass sales stores are increasing. This fact shows the enhancements to sorting/shipping/processing functions of the markets. The relocation and redevelopment of wholesale markets have led to strengthening of collecting/distribution/storage/processing functions.

**Keywords:** horticultural production areas, local distribution markets, strengthening of functions, market relocation, market redevelopment

### 1. Introduction

The recent distribution environment surrounding the production of fruits and vegetables in Japan has been characterized, particularly in terms of production, with the aging and retirement of producers who are the shippers for the wholesale market. Distribution has also simultaneously changed; while large-scale chain supermarkets are expanding their stores, relatively small-scale general retail outlets and small- and medium-sized supermarkets are decreasing. Furthermore, such trends are becoming increasingly problematic in the “regional distribution markets,” which collect relatively large quantities of locally produced fruits and vegetables and have a strong tendency to meet consumer demands within the same area that their very existence is being affected. On the other hand, such markets perform the important function of supplying fresh, locally grown produce to local residents, besides being a sales destination for producers near these markets. Thus, their survival and continued existence face urgent challenges. In an effort to ensure the survival of markets in actual distribution sites, initiatives to improve the convenience of mass-sales stores and shippers are being developed by strengthening market functions.

Fujishima and Yamamoto [1], Fujita [2], Fujita [3], and

Naito [4] have conducted prior research regarding local distribution of fruits and vegetables through the mediation of wholesale markets. These studies have analyzed the utilization of returnable containers and adoption of the “milk-run” system in markets; however, few studies have focused on strengthening collection- and distribution-related market functions. Thus, accumulation of further research results in this field is desirable.

Therefore, within the context of the changing distribution environment for fresh produce because of the theory of agricultural markets, this study aims to explain the actual status of collection and distribution conditions in local distribution markets and initiatives to strengthen their functions while simultaneously examining the significance of such initiatives. The study is based on the results of an interview survey conducted from July to September 2015, targeting six local distribution markets in the eastern areas of Shizuoka Prefecture. For clarification, in this study, “strengthening functions” represent the various functions that are directly associated with the collection and distribution of products in markets. Furthermore, as these areas are typical metropolitan fresh produce production regions, it is possible to generalize the results of this study to a certain extent for markets with similar conditions.

### 2. Overview of Eastern Shizuoka and Markets Targeted for Study

## 1) Overview of Eastern Shizuoka

Eastern Shizuoka is one of the three regions comprising Shizuoka Prefecture and is located in the prefecture's easternmost part. (Note 1).

There are 11,272 hectares of farmland in this region: partly owing to its warm weather, horticultural production of various items is conducted throughout the year (Note 2). Furthermore, joint sales by farm cooperatives and individual shipments of fresh produce both flourish in local markets.

The area has a population of 1.21 million, as of 2014, and convenient transportation links (Tokaido Shinkansen and Tokaido Line). There contribute toward a consistent demand for the consumption of fresh produce (Note 3).

Given these points, and as the region's wholesale markets have a strong presence as local distribution markets supplying local products to residents, eastern Shizuoka is considered a valid subject for a case study on this topic.

## 2) Overview of Markets Targeted for Study

This region has seven wholesale fresh produce markets, and the total transactions in 2013 reached 19.935 billion yen (Note 4). Six of these markets were surveyed; Table 1 presents a summary outline ordered by scale of transactions. Each market can be described as follows.

Company A, located in Hara, Numazu City, relocated to its present location from Numazu City in 2014. It is the region's largest market, with annual transactions totalling 9.298 billion yen.

Company B, located in Ichiyama Nitta, Mishima City, handles transactions totalling 7.273 billion yen. It was

established in 1931 and relocated to its present location in 2013.

Company C, located in Tajima, Fuji City, was established through a merger of multiple existing markets when the Municipal Public Wholesale Market was established in 1976. In 2012, however, it was privatized and transitioned into a single market. In 2012, transactions amounted to 4.127 billion yen.

Company D, located in Ogi, Itou City, conducts annual transactions worth 771 million yen. It was established in 1918 and shifted to the present location in 2011.

Company E, located in Yunoki, Fuji City, has been operating in the same location since 1927, with its annual turnover reaching 634 million yen.

Lastly, Company F, located in Tsukamoto, Kannami-cho and handles an annual transaction amount of 499 million yen.

The above is an overview of the markets surveyed. Although the three companies D, E, and F are small in scale compared with A, B, and C, all of them function as centers for collection and distribution of products in local regions, and their continued existence is considered desirable.

## 3. Overview of Market Collections and Strengthening of their Functions

### 1) Overview of Market Collections

This section reviews the surveyed market collections based on Table 2 and examines various initiatives posited for strengthening collection-related functions. First, the configuration of the collection destinations' business conditions is discussed.

Considering market shippers, the collection rates from organizations, such as agricultural cooperatives, is high for Companies A and B, which have relatively large-scale transactions and high collection capacities. Company D also shows a high collection rate from such organizations because direct collections from the Hokkaido Federation of Agricultural Cooperative Associations and those from local single cooperatives are included. Company C has a relatively high collection rate from shipping cooperatives,

Table 1 Overview of Markets Targeted for Study

Unit : Million Yen, Year				
	Location	Amount	Estd.	Remarks
Co.A	Hara, Numazu City	9,298	1931	Relocated to current location in 2014
Co.B	Mishima City, Ichiyama Nitta	7,273	1931	Relocated to current location in 2012
Co.C	Tajima, Fuji City	4,127	1976	Established as a public market, privatized in
Co.D	Ogi, Itou City	771	1918	Relocated to current location in 2011
Co.E	Funoki, Fuji City	634	1927	
Co.F	Tsukamoto, Kannami-cho	499	1967	

Source: Created using Shizuoka Prefecture materials and interview survey (2015).

Note : Transaction amounts are for 2013 performance.

Table 2 Overview of Collections of Markets Surveyed (2014)

Unit : %

	Composition of Shippers					Prefecture Rate	Use of Containers	Milk-Run System	Remarks
	Individual	Commercial	Organizations	Other	Total				
Co.A	20	28	50	2	100	55	Yes	Yes	Established 14 collection points within the prefecture.
Co.B	20	18	44	18	100	45	Yes	Yes	
Co.C	50	5	30	15	100	35	Yes	Yes	Milk-run system used only in the summer
Co.D	10	3	50	37	100	50	No	No	
Co.E	25	0	0	75	100	25	Yes	No	
Co.F	30	20	0	60	100	30	Yes	Yes	Milk-run system used only in the summer

Source: Created using the interview survey (2015).

Note 1) Percentages are approximate values.

2) Individuals are in substantial numbers.

including individuals; the comparatively small scale Companies E and F have high collection rates from other markets and display a marked tendency of reliance for transportation.

Furthermore, personal shipments by producers from neighbouring markets can be a substantial 10–50% and the collection rate of prefectural products is 25–55%, thus both are significant with respect to each market's collections.

For strengthening the collection-related functions, implementing the “milk-run” system, and utilizing returnable containers, four companies, namely Companies A, B, C, and F, conduct a “milk-run” system while five companies, namely Companies A, B, C, E, and F, utilize returnable containers. The following sections examine how such initiatives can strengthen market functions.

## 2) Strengthening Functions through the “Milk-Run” System

The following is observed on examining the “milk-run” system implemented by the surveyed markets.

Company A has established a collection point within the prefecture more than 20 years ago, and the company's collection procedure promotes collection from individuals. Furthermore, following its relocation in 2014, it has increased its number of collection points to four to cope with the increased distance between shippers and the market; thus, it offers convenience to shippers. At the time of the survey, 14 collection points had been established, ranging from Fuji City to the southern part of the Izu Peninsula, and the “milk-run” system comprised 15% of

the individual shipments.

Company B's “milk-run” system targets remote individual shippers; however, the quantity is nominal.

Company C's “milk-run” system aims to ensure the collection of local specialty items, such as peanuts and sweet potatoes, between August and October when they are harvested.

Company F implements a “milk-run” system for summer tangerines shipped in large quantities per shipper; however, given the short harvesting period, it is limited to April–June.

Therefore, in this region, although the “milk-run” system is not actively implemented, excluding Company A, it plays a certain role in facilitating market collections from individuals.

## 3) Strengthening Functions through Use of Returnable Containers

In this section, we examine how market functions regarding collections can be strengthened by utilizing returnable containers.

The usage rate of returnable containers is 20–40% for locally produced fruits and vegetables. However, within this, the usage rate can sometimes reach 90%, as for locally grown vegetables in Company B's case. As mentioned above, this may be attributed to the flourishing horticultural production in this region; furthermore, it also reflects the fact that eastern Shizuoka, with its concentrated consumption demand, has an environment suitable for the use of returnable containers.

According to Company B, the following advantages

arise from using returnable containers (Note 5). For shippers, with being a) less expensive than shipment cases such as cardboard boxes, they are b) water resistant and do not require water discharging, and c) save labor as farm-packaged products can be directly shipped to the market. For the market, meanwhile, they offer d) high loading capacity and consume limited space, e) are convenient to handle, particularly for small scale retailers, and f) eliminate need to dispose of cardboard boxes.

Such utilization of returnable containers proves increasingly advantageous for local distribution markets with a flourishing “self-contained community” type of distribution system and strengthens the market’s collection functions.

#### 4. Overview of Delivery to Markets and Strengthening of Functions

##### 1) Overview of Delivery to Markets

This section, after examining the delivery of fresh produce in the surveyed markets and based on Table 3, examines how market functions are strengthened following the countermeasures employed by mass-sales stores.

Concerning market sales destinations, the relatively large-scale companies A and B mainly sell to mass-sales and general retail stores. Both companies sell to local mass-sales stores. Company C makes 65% of sales to intermediate wholesalers, who subsequently sell to local mass-sales stores. Therefore, the final delivery destination for the entire amount is also within the prefecture. Company D’s sales to mass-sales stores is high at 67%,

and it mainly supplies stores in Izu peninsula’s eastern region. In contrast, the relatively small-scale companies E and F sell their entire inventory to local general retail stores.

Thus, the final delivery destinations for the fruits and vegetables sold by these markets are almost entirely within Shizuoka Prefecture.

##### 2) Strengthening of Functions following Mass-Sales Stores’ Countermeasures

This section examines Companies A, B, and D, who sell directly to mass-sales stores, as case studies, along with the strengthening of market functions following mass-sales stores’ countermeasures.

For quite a long time, Company A has handled each store’s sorting, packing, and bag-filling in response to mass-sales stores’ demands as it believes such efforts to be indispensable for wholesalers to sell to mass-sales stores.

Company B has been selling to mass-sales stores since around 1980; however, it was determined before the transaction began that the company would handle sorting, packing, and delivery.

Company D also similarly handles sorting, packing, and delivery for mass-sales stores that require it. Furthermore, it is indicated that if these tasks are not handled, transactions with mass-sales stores will be difficult.

Thus, all three companies engaged in direct transactions with mass-sales stores handle various tasks such as packing, confirming that, like intermediate wholesalers, local-market wholesalers have also strengthened delivery and processing functions with mass-sales stores.

Table 3 Overview of Distribution of Markets Surveyed (2014)

	Composition of Sales Destinations						Rate of Collection within Prefecture
	Intermediate Wholesalers	Mass Sales Stores	General Retail Stores	Other Markets	Related Companies	Total	
Co.A	0	40	35	25	0	100	100
Co.B	0	30	20	0	0	100	100
Co.C	65	0	35	0	0	100	100
Co.D	0	67	28	3	2	100	100
Co.E	0	0	100	0	0	100	100
Co.F	0	0	100	0	0	100	100

Source: Created based on interview survey (2015).

Note 1) Percentages are approximate values.

2) General retail stores include delivery and food service industry.

Table 4 Strengthening of Functions Following Market Relocation

Unit: m<sup>2</sup>

	Changes in Scale of Facilities			B/A	Strengthening of Functions Following Relocation of Markets
		Before relocation (A)	After relocation (B)		
Co. A	Site area	21,191	23,200	1.09	Ensuring low-temperature sales floor and expansion of cold storage
	Wholesale area	4,976	3,210	0.65	Enhancing task efficiency including trucks
	Parking area	5,932	14,489	2.44	Expanding parking area
Co. B	Site area	5,699	10,707	1.88	Securing collections through relocation to production areas
	Wholesale area	2,110	3,313	1.57	Expansion of wholesale areas, parking areas
	Parking area	4,853	6,347	1.31	Expansion of cold storage warehouses and packaging buildings
Co. D	Site area	5,651	2,071	0.37	Expansion of cold-storage warehouses
	Wholesale area	2,391	1,136	0.48	Enhancing task efficiency through trucks
	Parking area	2,496	526	0.21	

Source: Created using Shizuoka Prefecture materials and interview survey (2015).

## 5. Strengthening of Functions due to Market Relocation

### 1) Case of Company A

In this section, based on Table 4, we examine the strengthening of functions owing to market relocations and restructuring of facilities.

Due to deterioration of market facilities within Numazu City and poor truck routes including site constraints such as lack of parking space, Company A relocated in 2014 to its present location in the northwest, at a direct distance of 9 km from the old market. For relocation, the company is buying mass-sales stores' physical distribution facilities, which are no longer in use.

By relocating, this company reduced its wholesale area by 0.65 times and ensured a low-temperature selling area of 1,880m<sup>2</sup>; it also installed refrigerators, turning it into a facility for cold chains. Furthermore, regarding distribution, it established a platform for wholesale stores and had a height identical to the truck cargo stand, thus the market's cargo handling efficiency was enhanced. Moreover, physical distribution aspects were improved for convenience, such as acquiring a 2.44 times greater area for parking.

### 2) Case of Company B

Company B relocated in 2012 from its old market in the downtown area near Mishima station. A narrow, one-way road faced the market and many issues arose due to its location. It was also an aging facility and at one time the

situation warranted a decision regarding closing the business. However, relocation was found as a solution as leasehold land could be secured in Hakone Seiroku, 5 km northeast from the old market. The relocation site reduced the transportation burden on shippers and so it was selected as the market's main collection area.

On relocation, the company expanded to a site 1.88 times its previous location, while the wholesale store and parking area are both 1.57 times larger. Furthermore, the move enabled the installation of refrigerators over a 188.3m<sup>2</sup> floor area and the integration of two buildings to establish packaging buildings of 626.6m<sup>2</sup>. Thus, freshness was maintained and processing concerning the market was strengthened. Moreover, the relocation meant that collections from individual shippers in the neighbourhood could also be expanded, leading to improvements in collection capacity.

### 3) Case of Company D

Company D had its former facility in Ito City; however, it was deteriorating and using asbestos had become problematic. Furthermore, the building's inadequacy in terms of earthquake-resistance manifested itself. Therefore, the company relocated to the current location 2 km southwest of the old market in 2011.

The new facility that Company D purchased had been previously used by a cooperative as a collection site, which was considerably smaller in size, including wholesale store and parking areas. However, by expanding facilities, such as cooling box facilities, and

establishing a platform in the wholesale area, the ability to maintain product freshness and physical distribution functions were improved.

This section examined the strengthening of market functions owing to market relocation and restructuring; it identified that because of such moves, the collection, storage, processing, and distribution functions necessary to maintain local distribution were strengthened.

## 6. Conclusions

In this study, the eastern Shizuoka area was examined as a case study to understand the collection and distribution of fresh produce in local distribution markets, particularly in terms of initiatives for strengthening market functions.

Regarding the strengthening of collection-related market functions, most markets enhanced their collection functions by implementing a “milk-run” system, and collection from various shippers was ensured by establishing numerous collection points. This study also indicated that returnable containers were used extensively in this region with a highly “self-contained community” type of distribution system. Thus, initiatives to strengthen collection functions in this region’s markets were observed.

Next, with respect to strengthening distribution functions, wholesalers handled sorting, delivery, and packing in sales to mass-sales stores, thus expanding these markets’ distribution and processing functions. Furthermore, although this study could not provide additional analysis, this kind of strengthening of functions is very likely to decrease costs for shippers and also expand future contract transactions.

In conclusion, relocation and restructuring of wholesale markets in this region have expanded collection, distribution, storage, and processing capabilities, thereby leading to enhanced user convenience.

These findings indicate that various initiatives have

been undertaken to strengthen the various collection and distribution functions of local distribution markets in the eastern Shizuoka region; furthermore, markets can use such measures advantageously to maintain local distribution.

(Note 1) Eastern areas of Shizuoka include Fuji City, Numazu City, Gotenba City, Fujinomiya City, Susono City, and Suntou District of the former Suruga Province, and Atami City, Mishima City, Ito City, Shimoda City, Izu City, Kamo District, and Tagata District of the former Izu Province.

(Note2) The farm area is as per [The Shizuoka Agricultural, Forestry, and Fishery Statistics Annual Report 2014].

(Note 3) As per Shizuoka Prefectural Government office documents.

(Note 4) As per Shizuoka Prefectural Government office documents. Furthermore, total transaction amount of the surveyed markets was 19.602 billion yen, comprising 98.3% of the region’s market transactions.

(Note 5) Advantages of returnable containers have also been examined in Fujita [2], p51.

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