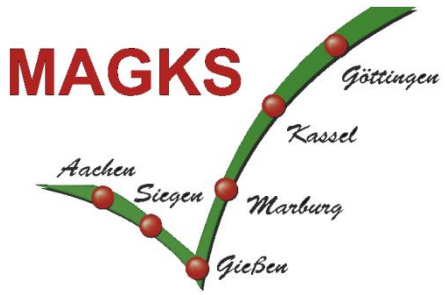

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Japan-Specific Viewpoints for Bridging City Planning and the Industry of Agriculture

Noriko Ashiya†‡

Abstract

Japan has experience reviving its real estate market through the introduction of securitization, and this could work for farmland even though farmland in Japan operates under different property regulations than office buildings and residences. However, such application is not so simple. To include farmland in real estate portfolios, we need to triple the farmland's estimated return of 1.3% (Ashiya, 2020; Shiozawa and Ashiya, 2019). This triple magnification is almost the same as the productivity difference between Japan and The Netherlands (FAO, 2019a; 2019b), therefore, can be seen as a parallel to the Food Valley creation. So, as an initial step towards activating Japanese agriculture, this paper sets replicating the Netherlands' successful Food Valley in at least one municipality as Japan's preliminary goal. Michael E. Porter's (1990) insights on The Netherlands' agriculture will suggest that Miura is a prominent candidate city for the Japanese Food Valley, and also suggest that we need to modify our ways of thinking, which, in the paper's context, can bridge city planning and the industry of agriculture. Specifically, this would be the collaboration between the city planning side and the agricultural side at the administrative level with regard to both farmland preservation and farmland activation. It would include strengthening the current infrastructure. The reason comes directly from what Miura doesn't have, namely transportation infrastructure that can bring products to metropolitan markets.

JEL Classification: Q15, K12, R14
Keywords: Japanese farmland management, city planning, agricultural policy

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1. Introduction

Japan has experience reviving its real estate market through the introduction of securitization, and this could work for farmland even though farmland in Japan operates under different property regulations than office buildings and residences. However, attempts to activate agriculture have not been effective, which creates a hurdle for Japanese farmland to be recognized as a type of real estate that promises a sufficient return to investors like office buildings, hotels, residences, etc., which have constantly produced approximately 4% return (ARES, 2023).

To include farmland in real estate portfolios, we need to triple the farmland's estimated return of 1.3% (Ashiya, 2020; Shiozawa and Ashiya, 2019). This magnification is almost the same as the productivity difference between Japan and The Netherlands (FAO, 2019a; 2019b), therefore, can be seen as a parallel to the Food Valley creation. This farmland data (1.3% return) is the most recently available as of 2023, and it stands for our nearly 10-year failure to recreate a Food Valley in Japan, in line with the low level of farmland use over the past 30 years.

So, as an initial step towards activating Japanese agriculture, this paper sets as Japan's preliminary goal replicating the Netherlands' successful Food Valley in at least one municipality to begin. But our past 10 years of experience towards that shows that the way of recreating it needs modifications, which follow from changes in ways of thinking. This is why this paper provides a new viewpoint for the present agricultural debates, something which has not been explicitly considered before.

Concretely, the key intention of this study is to promote the activation of agriculture through bridging city planning and the industry of agriculture. As a prominent candidate city for this modified practice, we choose Miura city, located in Kanagawa prefecture about 80 kilometers south of Tokyo, similar to the distance of the Food Valley from Amsterdam. It has plenty of farmland, although, like The Netherlands, is not concentrated in greenhouse usage.

The suitability of Miura as the candidate city for the Japanese Food Valley will be examined in Section 2 of this paper, which we will do by extending Michael E. Porter's (1990) insights into The Netherlands' agriculture, with data comparison results among 29

municipalities [1] covering 98.3% of Kanagawa's 33 municipalities. Then, Section 3 provides the modification of the approach to the problem, the ways of thinking, to arrive at the conclusion on how to activate Japanese agriculture. Section 4 provides concluding remarks to address our future study.

2. Why is Miura a Prominent Candidate City for the Japanese Food Valley?

Porter's Insights and Other Related Studies and Findings

First and of all, Miura's current vegetable production resembles the characteristics of Porter's (1990) example of The Netherlands' flower production, especially as Miura has a research institute. Moreover, especially at this point, Miura's open-ground agriculture approaches the characteristics of The Netherlands' successful vegetable production in Food Valley. The Netherlands' scholars mentioned one different cluster for each above-mentioned product, flower and vegetable, and assessed them separately in Porter's cluster chat (Jacobs and DE JONG, 1992), however, as the Food Valley's history shows, production know-how in each field is based on prominent research and development. This can work as Miura's core value towards Japanese Food Valley.

To confirm, Porter's notion of cluster is the geographical concentration of similar activities, which emphasizes that productivity depends on methods of production, advanced technology and intensive knowledge (see, e.g., Porter, 1998). The Netherlands' continuous accumulation of agricultural activities as a result verifies this, which, with the core center of premier research institutes, has formed the successful Food Valley.

In other words, it has been demonstrated that research and development should be located in the same area or reasonably close to production. As we have pointed out above, this characteristic is in line with Miura city. Moreover, contrary to our thinking on the borderless economy, Porter, in a series of studies, demonstrated that location plays an important role in the growth of industry. This implies that physical proximity among factors of production, such as the production site and the research institute can improve communication and the skills of personnel, thus improve product quality.

[1] 4 of the 33 municipalities are omitted due to lack of data.

Miura's Physical Characteristics

Then, the question emerges, why is Miura, a city with plenty of farmland, not being considered as a major candidate for the Japanese Food Valley? Or, which factor besides research and development should Miura ideally be equipped with?

Despite the scarce attention to Miura in the context of Japanese Food Valley, the city has a research institute as we've already motioned, and has plenty of farmland, which, according to statistics, occupies more than one third (35.6%) of its total area (Exhibit 2). The approximately 80-kilometer trip from central Tokyo takes an hour and 10 minutes by car, which is nearly the same as Amsterdam to Wageningen. The local government's attitude towards agriculture is reflected also in the statistics, which show that 63.5% of the area is intended for agriculture (Exhibit 2).

At a glance, Miura's farmland size and percentage of the city area seem to fulfill the necessary conditions to create a Food Valley. However, it is not a candidate. Why not?

The answer to questions of this sort seem to always mention the rigidity of farmland laws and property rights that are unique not only to Miura, but to Japan. These constrain those who can own farmland and those who can cultivate it, deterring people, companies, and institutions from utilizing farmland.

The problem with this common answer is that it only suggests that the hurdle is too high and never provides solutions (Shiozawa and Ashiya, 2016 and 2019; Ashiya, 2020). To tackle this problem realistically, this study aims to alter such previous ways of thinking with a new perspective, which bridges city planning and the industry of agriculture.

This is the key point, specifically bridging aspects of city planning and agricultural activity so that they are working in collaboration with each other. The reason comes directly from what Miura doesn't have, namely transportation infrastructure, as indicated in Porter's (1990) example. Travels throughout Miura show a lack of highways (Exhibit 1). In the present institutional framework, this reflects the scope of city planning, not farming. So a collaboration is needed.

Data Comparison among Municipalities, Kanagawa Prefecture

Exhibits 2 and 4-7 present the agricultural land usage in Kanagawa prefecture. Definitions of the land usage headings, titles, and labels in these Exhibits are summarized in the Appendix with an image.

Exhibit 2 is sorted by Total Area from most to least. It summarizes the statistics of each municipality, as do Exhibits 4-7, which provide the same information according to different sort criteria with different visuals, to find Miura's advantage.

Data on Intended Areas and Primary Cultivated Areas were not available for 4 municipalities, which are omitted in Exhibits 4-7. The four municipalities are Zushi, Hayama, Kiyokawa, and Hakone. They are presented in Exhibit 2 for the purpose of overviewing all Kanagawa's 33 municipalities, to make clear the geographical state of administration and planning (Exhibit 3).

As shown in Exhibit 4, Intended Areas for Agriculture range from 115 hectares to 6,827 hectares, which are consistent with the original minimum and maximum values found in Exhibit 2. Just be reminded that the mean of Total Area obtained by using all 33 municipalities is 19,261 hectares, 9.3% less than the number in Exhibit 4 using 29 municipalities; the standard deviation, 75,429.65 hectares, is 6.2% less. In general, the sample 29 municipalities based on data availability is in no way less representative of the characteristics of Kanagawa's land usage.

Miura's advantage is confirmed as follows. Exhibit 5 presents the ratio of Primary Cultivated Area to Total Area in the diagram. This shows the level of governmental commitment to cultivation in each municipality. By sorting the full profile in Exhibit 1, Miura is found to have the second largest primary cultivated area among the 29 municipalities, at 1,140 hectares, less than Odawara (1,207) by 67 hectares.

Miura's ranking of Intended Area for Agriculture is 8th (Exhibit 6), however, this area occupies more than 63.5 percent of the total area. Moreover, its primary cultivated area occupies more than 56.0 percent of the Intended Area for Agriculture, whose percentage is the 4th largest among 29 municipalities (Exhibit 6). Visuals in the Appendix help us find insights from this (Exhibit A.1). We can also confirm Miura's dominance by seeing the above 56.0 percent as presented in Exhibit 7. Miura will be plotted in the top-half of

this graph within the municipalities with relatively small areas intended for agriculture. Its dominance is shown by the slope of the line which connects the origin and Miura's coordinate.

As a reference, Kanagawa constitutes Japan's largest industrial area, Keihin Industrial Area, whose Chinese character "Kei"（京）represents Tokyo and "Hin"（浜） which represents Yokohama, together symbolizing the original geographical location of industrial activity ranging along the coastline from Tokyo to Yokohama. The main industries are metal, machinery, and chemical, and therefore almost no image of agriculture exists there. In fact, Kanagawa ranks as 45th in Japan in area used for farmland (18,200 hectare), and the number of farms rank 39th (21,290 families), among which about 20 % of the families do not mainly engage in agriculture. However, Miura's location near Tokyo, but outside the industrial area, can work for agriculture as this site in general satisfies the location requirement for any industry to get a competitive advantage (Porter, 1998).

3. The Modification of the Approach to the Problem, the New Ways of Thinking

What We Learned from Food Valley Debates

Thanks to the policy debates and national debates, and also with many scholars advocating the creation of a Japanese Food Valley, now the perception of Food Valley has been widely accepted, however, Japan's attempt to replicate The Netherlands' Food Valley in the last 10 years has not been effective. There has been no change to the long-term decline of the agricultural industry (Exhibit 8 and 9).

In contrast, The Netherlands' continuous geographic concentration of agricultural activity has obviously been successful. Our experience shows that the way of creating it needs modifications. Specifically, for Japan to establish a successful Food Valley, we need a collaboration, as mentioned in Section 2, to introduce new ways of thinking. But that reminds us of another problem regarding Japanese farmland management.

Simply put, the city planning side focuses on a conflict between the two opposing uses of land, those of agriculture and construction. Moreover, in the case of ambiguity in city planning policy regarding land usage, an originally biased preference for construction

exists. This is in contrast with the farming side arguments. Instead of the power of law, subsidies are expected to work as a tool to preserve cultivation and as a result preserve farmland. This focus on subsidies tied to the land is intended to improve irrigation or other infrastructure needed for efficient farming.

The key point is that these two sides are explicitly working in opposite directions, however, implicitly even the farming side can be seen as relinquishing land for housing development and other uses. And this naturally makes it difficult to activate Japanese agriculture.

How We Unbind Complexities of Japanese Farmland Utilization

The complexity of Japanese farmland utilization is often mentioned as being a result of the vagueness that is created from exceptional clauses that exist in zoning laws, which regulate the use of land in general (see, e.g., Horiguchi, 2002). Therefore, to unbind such complexities, we need to sort out the current byproduct of these exceptional clauses.

Under the present rules, subsidies for farmland, which can be thought to have the effect of binding farmers to cultivation, are not 100 percent effective in preserving active farmland. Zoning in Japan sometimes can be changed in 5 or 10 years (see, e.g., Horiuchi, 2002), and this means farmland will not be preserved, even though they don't refer to the exceptional clauses. Instead, housing development continues to increase, which now is bringing about piles of ruins or vacant housing, particularly in some peripheral areas of Tokyo (see, e.g., Nozawa, 2017; Capitanio, 2018).

To improve land allocation, the idea of refraining from development has been presented in Japan by an influential scholar in the city planning area, which consequently secures sites for cultivation (Yokohari, 2017; 2018). However, the reality shows that the law of demand works for the development of cheap rural land, especially given the fact that even an area secured for agriculture could be developed due to the formerly mentioned zoning exceptions.

Another idea from the city planning side intends to harmonize development with farming sites. For this, they introduced a new category of zoning several years ago with the name 'garden' or 'rural' attached to the usual zoning name for housing districts (see, Ministry of Land, Infrastructure, Transport and Tourism, 2019). However, this seems only focused

on development that is aesthetically pleasing without the intention to preserve farmland. The result is that cheap rural sites continue facing increasing pressure towards development, with exceptional clauses in city planning law making this more of a possibility.

The farming side introduced their own zoning rules for farmland in 1969, one year after the amendment of the city planning law, and this sequence of reform has been said to symbolize the conflict regarding the same plot facing two opposing usages, housing development and farmland preservation (see, e.g., Horiuchi, 2002). Under Japan's present agricultural rules, the governor of each prefecture secures the particular area for agriculture, based on the discussions between the governor and the minister of agriculture, forestry and fisheries. This subsequently requires municipalities to set a concrete agricultural plan and maintain the cultivating areas with subsidies. The zoning for the farmland works top to bottom, but the increase of housing in the agricultural areas shows a serious policy failure (Exhibit 10).

Answers based on Economics

Economic thought asserts that the distance from centers of employment is set as a determinant of rent, and subsequently, the rent determines the position of farmland. Dipasquale and Wheaton mathematically demonstrated this idea (Exhibit 11, *Urban Economics and Real Estate Markets*, 1995). Their logic focuses on the cost of commuting which increases as the distance gets longer, and therefore the affordable rents get lower until they are equivalent to the cost of construction, called the edge of development, at which point the land is used for agriculture. Empirical evidence showing the negative relationship between distance and rents presented by Wilson and Frew (2012) coincides with this (Exhibit 12). Such negative relationship is assumed in the examples in *Economics* by Acemoglu, Laibson, and List (2017), to illustrate the concept of optimization in our locational choice of housing. To summarize, economic theory rationally explains why the location of farmland is not near the city center. In other words, the farmland far from centers of employment remains cultivated. However, this does not work without the power of zoning as the case of Japan verifies.

Cheap land is always a candidate for housing, and this is why development in green areas should be strictly controlled. City planning needs to include preservation if they want preservation. They need to get rid of the incentives to choose cheaper sites in rural areas

instead of expensive suburbs.

At this point, in parts of Western Europe there is an established harmony of development and green area preservation. The zoning system works properly, ensuring that, although the same site faces conflict between preservation and development, land designations are upheld.

To summarize, Economics justifies the power of zoning, which is in line with Europe's city planning but not in line with Japanese city planning. Therefore, it's possible that we cannot arrive at the answer which would secure effective Japanese farmland utilization. Realistically, we need to take the current law framework as given, so we need to change our ways of thinking regarding farmland preservation.
As presented, city side debates in some parts are inclining towards preservation, so to enhance collaboration between the city planning side and the agricultural side at the administrative level might be a realistic solution.

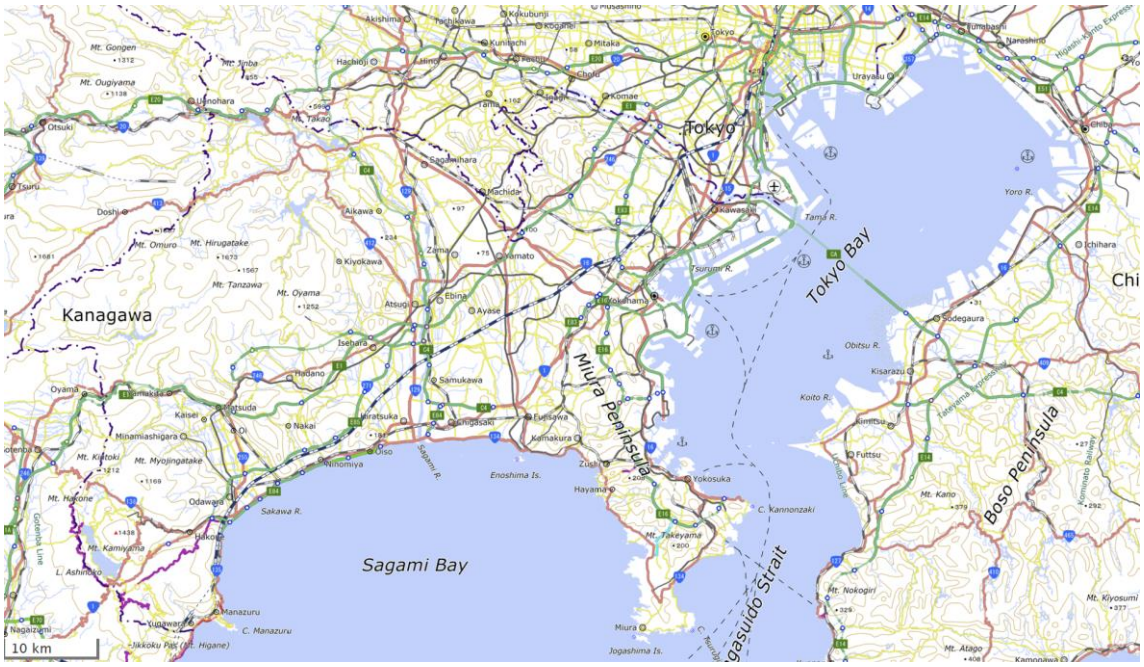
4. Concluding remarks for future study

Returning to the goal of this paper, our conclusion will be clarified with an illustration of Miura's case. To become Japan's Food Valley, although Miura has potential in strengthening production through research and development, it requires a highway that goes to the tip of the peninsula (Exhibit 1). Collaboration in this case means a wider scope of road planning which secures benefits both on the city side and the agricultural side. Collaboration in practice doubles the driving force towards equipping highways, however, for the plan to double the budget, the agriculture itself should be established as equally important. From the point of view of economics, the industry's growth with the benefit of funding is of interest.

Our study in general is based on our understanding of the developed Japanese economy. Because of property right issues, we can no longer aggregate new farming sites to have metropolitan areas utilize locational advantage of farmland. We must naturally arrive at the improvement of the existing agricultural practice, to make them closer to The Netherlands' Food Valley.

Exhibit 1

Access To Miura City



Source: Geographical Information Authority of Japan (2023).

Notes:

a. Highways are indicated in green.

b. National roads are indicated in red.

Exhibit 2
Agricultural Land Usage in Kanagawa: 2022

Municipality	Total Area (Hectares)	Intended Area for Agriculture (Hectares)	Primary Cultivated Area (Hectares)	Ratio of Primary Cultivated Area to Intended Area	Ratio of Intended Area to Total Area	Ratio of Primary Cultivated Area to Total Area
Yokohama	437,778	4,644	995	21.4%	1.1%	0.2%
Sagamihara	32,891	6,827	778	11.4%	20.8%	2.4%
Yamakita	22,461	6,823	222	3.3%	30.4%	1.0%
Kawasaki	14,296	281	91	32.4%	2.0%	0.6%
Odawara	11,360	5,531	1,207	21.8%	48.7%	10.6%
Hatano	10,376	3,439	716	20.8%	33.1%	6.9%
Yokosuka	10,082	565	332	58.8%	5.6%	3.3%
Atsugi	9,384	3,631	420	11.6%	38.7%	4.5%
Hakone	9,286	-	-	-	-	-
Minamiashigara	7,712	1,878	632	33.7%	24.4%	8.2%
Kiyokawa	7,124	-	-	-	-	-
Fujisawa	6,956	1,734	588	33.9%	24.9%	8.5%
Hiratsuka	6,782	2,668	1,080	40.5%	39.3%	15.9%
Isehara	5,556	1,816	636	35.0%	32.7%	11.4%
Yugawara	4,097	437	157	35.9%	10.7%	3.8%
Kamakura	3,966	115	47	40.9%	2.9%	1.2%
Matsuda	3,775	427	129	30.2%	11.3%	3.4%
Chigasaki	3,570	124	85	68.5%	3.5%	2.4%
Aikawa	3,428	615	249	40.5%	17.9%	7.3%
Miura	3,205	2,036	1,140	56.0%	63.5%	35.6%
Yamato	2,709	287	27	9.4%	10.6%	1.0%
Ebina	2,659	837	90	10.8%	31.5%	3.4%
Ayase	2,214	711	148	20.8%	32.1%	6.7%
Nakai	1,999	1,562	308	19.7%	78.1%	15.4%
Zama	1,757	433	166	38.3%	24.6%	9.4%
Zushi	1,728	-	-	-	-	-
Ohiso	1,718	718	249	34.7%	41.8%	14.5%
Hayama	1,704	-	-	-	-	-
Ohi	1,438	908	236	26.0%	63.1%	16.4%
Samukawa	1,334	408	131	32.1%	30.6%	9.8%
Ninomiya	908	341	96	28.2%	37.6%	10.6%
Manazuru	705	238	44	18.5%	33.8%	6.2%
Kaisei	655	183	104	56.8%	27.9%	15.9%

Source: Kanagawa Prefecture (2022).

Note: Exhibit 1 presents all related macro data of Kanagawa's 33 municipalities, which are administered for planning.

Exhibit 3
Kanagawa's 33 municipalities

Source: Craft MAP（http://www.craftmap.box-i.net/）

Note: Map of Kanagawa prefecture with borders of 33 municipalities.

Exhibit 4

Descriptive Statistics for 29 municipalities

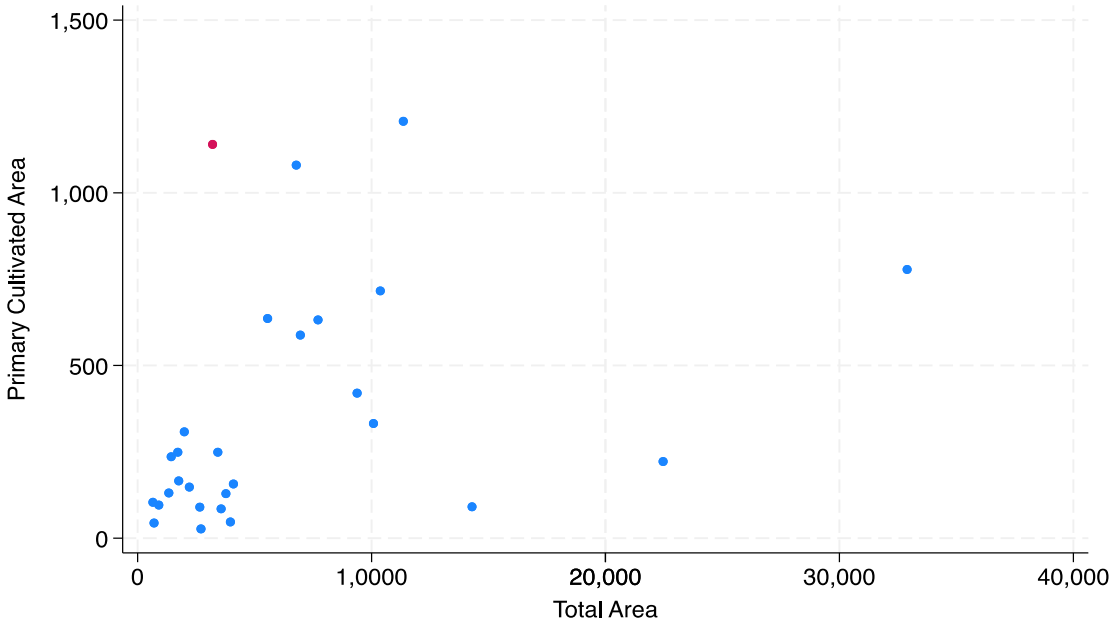
Variable	Mean	Std. dev.	Min	Max
Total Area (Hectares)	21,233.48	80,421.42	655	437,778
Intended Area for Agriculture (Hectares)	1,731.62	1,993.53	115	6,827
Primary Cultivated Area (Hectares)	382.86	363.34	27	1,207
Ratio of Primary Cultivated Area to Intended Area for Agriculture	30.75%	15.79%	3.25%	68.55%
Ratio of Intended Area to Total Area	28.38%	19.17%	1.06%	78.14%
Ratio of Primary Cultivated Area to Total Area	8.16%	7.34%	0.23%	35.57%

Source: Kanagawa Prefecture (2022).

Note: Number of observations is 29; 4 of the 33 municipalities are omitted due to lack of data.

Exhibit 5

Ratio of Primary Cultivated Area to Total Area: 2021



Source: Kanagawa Prefecture (2022).

Notes:

a. Number of observations is 29; 4 of the 33 municipalities are omitted due to lack of data.

b. Miura is highlighted in red.

Exhibit 6

Focusing on the Intended Area for Agriculture: 2021

Municipality	Total Area (Hectares)	Intended Area for Agriculture (Hectares)	Primary Cultivated Area (Hectares)	Ratio of Primary Cultivated Area to Intended Area	Ratio of Intended Area to Total Area	Ratio of Primary Cultivated Area to Total Area
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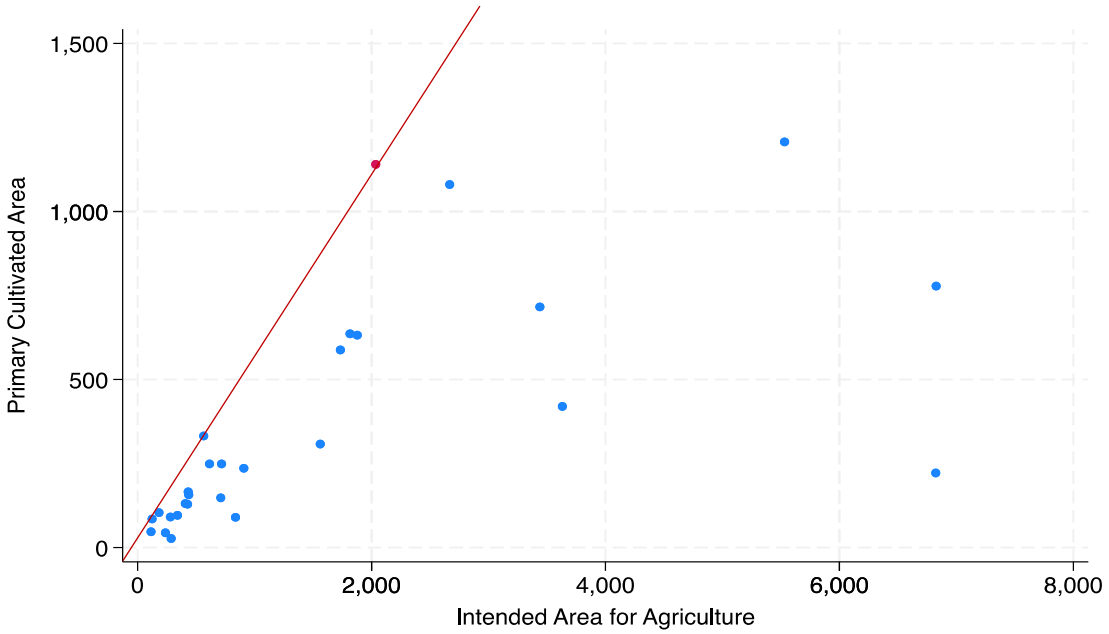
Chigasaki	3,570	124	85	68.5%	3.5%	2.4%
Kamakura	3,966	115	47	40.9%	2.9%	1.2%

Source: Kanagawa Prefecture (2022).

Exhibit 7

Ratio of Primary Cultivated Area to Intended Area: 2021



Source: Kanagawa Prefecture (2022).

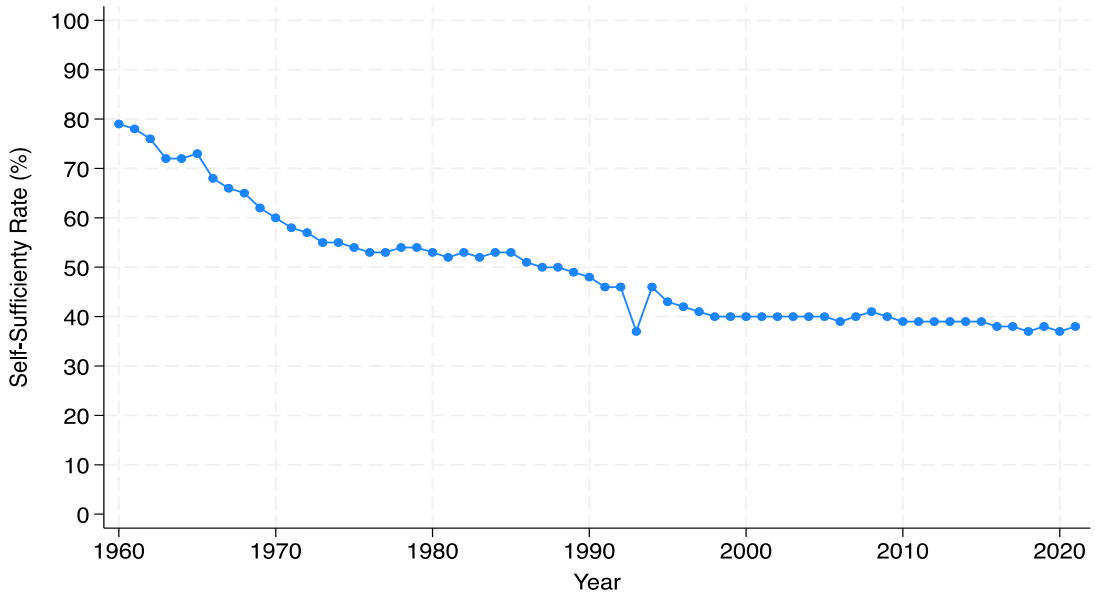
Notes:

a. Miura is highlighted in red.

b. The four coordinates in blue near the line are Yokosuka, Kaisei, Chigasaki, and Kamakura, which are not focused on in this paper since the Intended Areas for Agriculture and Primary Cultivated Areas are small.

Exhibit 8

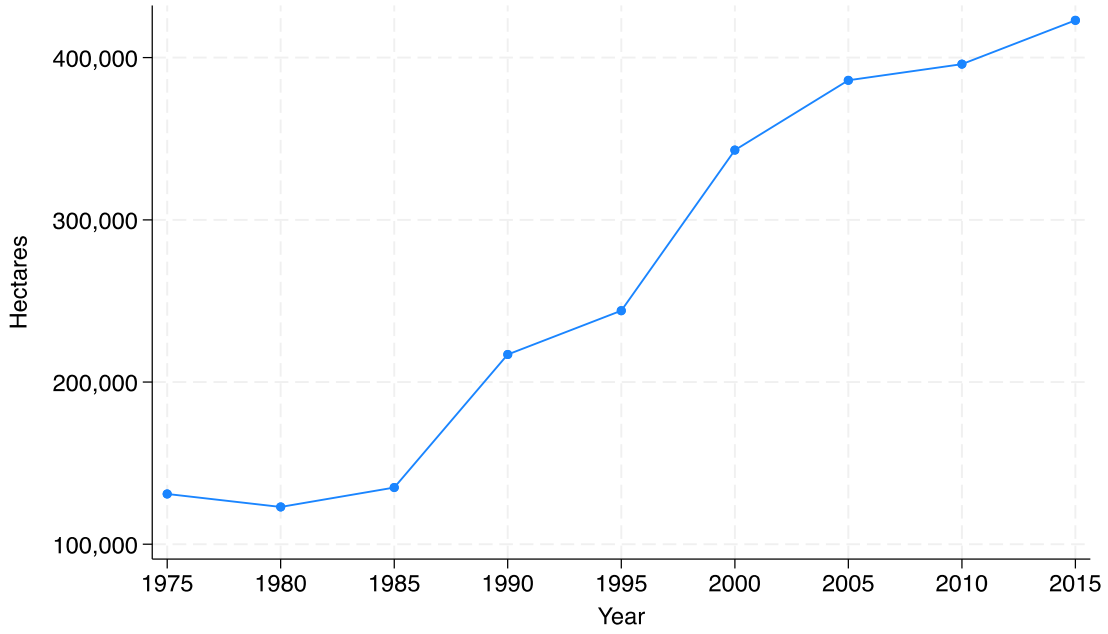
Trend of Self-Sufficiency Rate, 1960-2021



Source: Ministry of Agriculture, Forestry and Fisheries of Japan (2023b).

Note: In 1993, due to cold weather, Japan's rice production dropped below national demand.

Exhibit 9
Deserted Farmland: 1975-2015



Source: Ministry of Agriculture, Forestry and Fisheries of Japan (2016).

Notes:

a. Data is not available from the 2020 survey on agriculture due to the change in the method of capturing the state of farmland use.

b. The deserted area in 2015 is approximately 1.8 times larger than the total area of Kanagawa Prefecture, 132 times larger than that of Miura.

Exhibit 10

Farmland Conversions: Preservation Area vs Development Area

1970- 2020

	Farmland Conversion in Areas Designated for Preservation		Comparison of Farmland Conversion in Preservation and Development Areas		Percentage of Conversion		
Year	Number of Conversions	Total Area of All Conversions (Hectares)	Times more than the Development Area's Conversion	Times more than the Total Conversions in the Development	Preservation Area	Development Area	Undetermined
1970	543,391	44,363	16.0 times more	20.6 times more	77.6%	3.8%	18.6%
1973	350,950	36,290	1.4 times more	2.2 times more	53.6%	24.0%	22.4%
1975	218,464	17,970	1.3 times more	2.4 times more	51.9%	21.8%	26.3%
1980	189,913	14,427	1.3 times more	2.1 times more	46.9%	22.6%	30.5%
1985	150,030	12,448	1.2 times more	2.1 times more	45.5%	21.7%	32.8%
1990	181,783	19,810	1.3 times more	2.7 times more	56.3%	20.5%	23.3%
1993	156,083	16,847	1.3 times more	2.6 times more	53.7%	20.6%	25.7%
1998	128,214	13,246	1.4 times more	2.8 times more	54.6%	19.6%	25.8%
2003	98,246	9,339	1.2 times more	2.2 times more	51.9%	23.8%	24.3%
2008	78,340	7,453	1.1 times more	2.0 times more	47.0%	23.8%	29.2%
2009	66,865	6,002	1.1 times more	2.0 times more	43.8%	22.2%	34.0%
2010	65,146	5,761	1.0 times more	1.8 times more	46.9%	25.6%	27.5%
2011	62,978	5,284	1.0 times more	1.6 times more	46.8%	28.8%	24.5%
2012	66,146	5,696	0.9 times more	1.5 times more	47.5%	30.7%	21.8%
2013	75,130	6,794	1.0 times more	1.7 times more	49.2%	29.4%	21.4%
2014	75,538	7,780	1.1 times more	2.1 times more	51.0%	24.6%	24.4%
2015	76,256	7,791	1.1 times more	2.0 times more	47.1%	23.1%	29.8%
2016	76,677	7,796	1.1 times more	2.1 times more	47.3%	22.9%	29.8%
2017	76,003	7,701	1.1 times more	2.1 times more	43.5%	20.8%	35.7%
2018	76,492	7,966	1.1 times more	2.2 times more	46.0%	21.3%	32.8%
2019	78,889	8,307	1.2 times more	2.5 times more	49.4%	20.2%	30.4%
2020	74,686	7,583	1.4 times more	2.7 times more	47.2%	17.6%	35.2%

Source: Ministry of Agriculture, Forestry and Fisheries of Japan (2023a).

Notes:

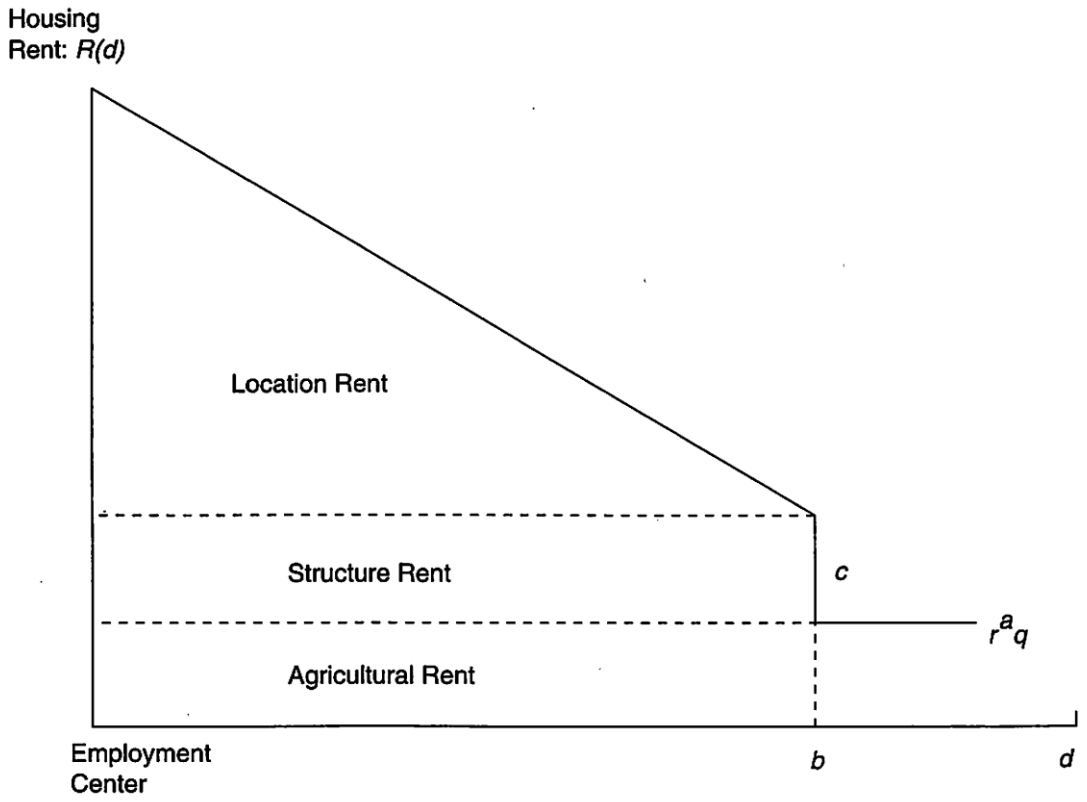
a. The original data is labelled differently from this table, but the data is the same. "Farmland Conversion in Areas Designated for Preservation" in this exhibit is labelled as "Permitted (by the governor or mayors or village chiefs of the designated cities)" in the original data, and "Farmland Conversion in Areas Designated for Development" is labelled as "Notified" in the original data.

b. Japanese farmland law does not require the farmers to get permission to convert their farmland if the farmland is located in an area designated for development. They need to notify the governor or mayors or village chiefs about any conversion if it is in an area designated for preservation. Therefore "Permission" automatically means the farmland converted is in a preservation area, and "Notification" means the farmland is in a development area. Given this regulatory framework around farmland, and with an

intention to express the real meaning of these two original labels, the labels, "Farmland Conversion in Areas Designated for Development" and "Farmland Conversion in Areas Designated for Preservation" are used in this exhibit.

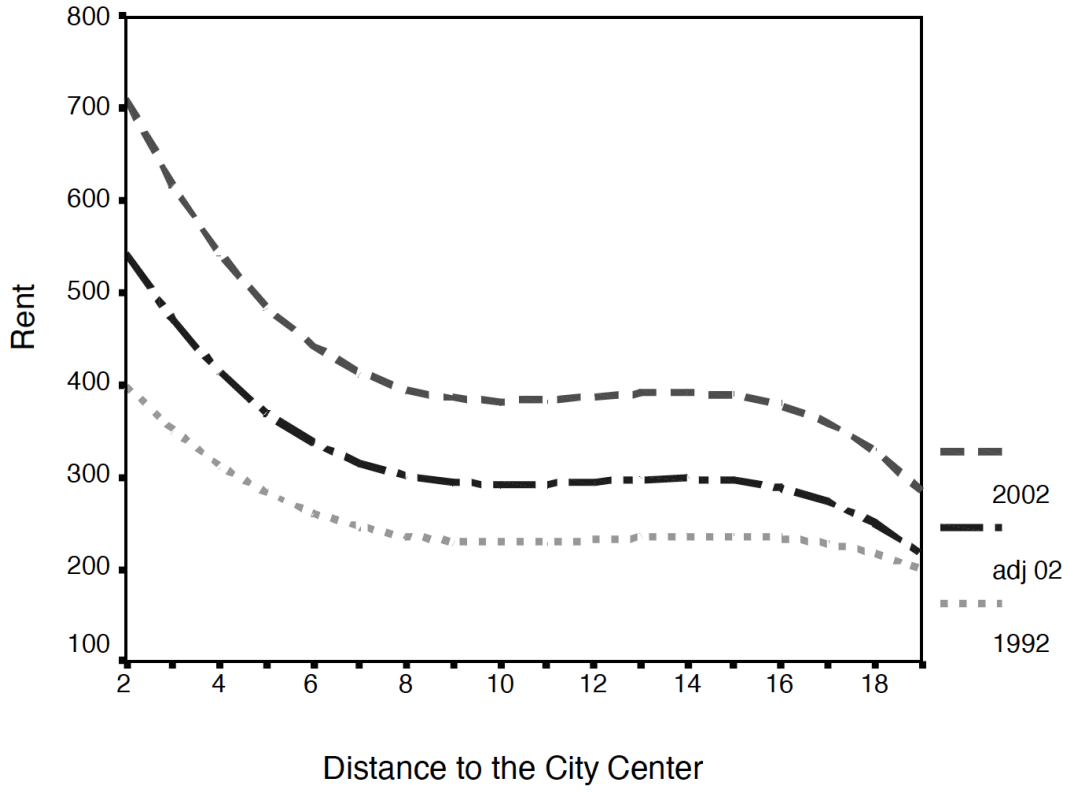
Exhibit 11

The Distance as a Determinant of Rent



Source: Figure 3.1 in Dipasquale and Wheaton (1996).

Exhibit 12
Empirical Evidence on Negative Relationship
between Distance and Rent



Source: Exhibit 8, Real and Inflationary Changes in Rents, in Wilson and Frew (2012).

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Appendix 1. Technical Terms in Administrative Usage - The government uses this classification to determine where to give subsidies for farming.

Intended Area for Agriculture:
This is the area set by the governor of each prefecture as part of their agricultural plan based on the discussions between the governor and the minister of agriculture, forestry and fisheries.

Primary Cultivated Area:
This is the area set by the municipality that is actually cultivated with high productivity and recognized as high quality farmland.

Ratio of Primary Cultivated Area to Intended Area:
The ratio of the Primary Cultivated Area to the Intended Area for Agriculture, shown as a percentage.

Ratio of Intended Area to Total Area:
The ratio of the Intended Area to the Intended Area for Agriculture, shown as a percentage.

Ratio of Primary Cultivated Area to Total Area:
The ratio of the Primary Cultivated Area to the Intended Area for Agriculture, shown as a percentage.

Appendix 2. Relationships among Total Area, Intended Area for Agriculture, and Primary Cultivated Area – Miura, Yokohama, and Average of Kanagawa's land-use situation in 2021.

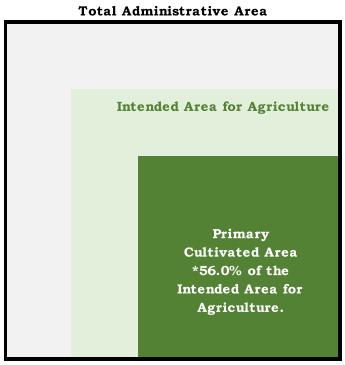
Exhibit A.1 shows the state of agricultural land usage in Miura and Yokohama, and Kanagawa's average, by classifying the area into three types using three colors: Total Area, Intended Area for Agriculture, and Primary Cultivated Area. The two municipalities and the average have different total areas, but to make it easier to compare, we standardize the areas and color code them according to the percentages of the land usages for the three. The left diagram delineates the percentage of each area, and the right presents a realistic view by showing the scattered areas of farmland within the intended area.

Exhibit A.1
Percentage of Land Usage

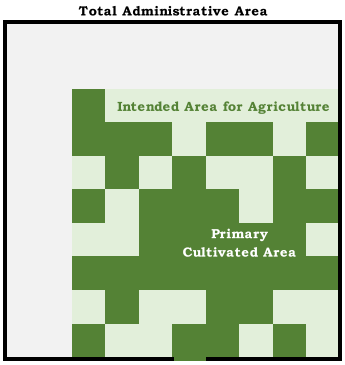
Miura

Total Area>Intended Area>Primary Area
100% 63.5% 35.6%.

(Basic Percentage)



(Approximate Distribution)



Yokohama

Total Area>Intended Area>Primary Area
100% 1.1%. 0.2%

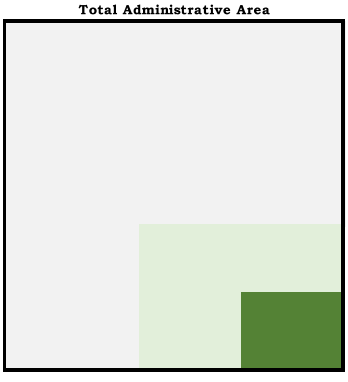
(Basic Percentage)

(Approximate Distribution)

Average

Total Area>Intended Area>Primary Area
100% 28.38%.
8.16%

(Basic Percentage)



(Approximate Distribution)