

THE CHANGING AGRICULTURE IN AREAS UNDERGOING  
URBANIZATION IN JAPAN  
—A CASE STUDY IN KANAGAWA PREFECTURE\*—

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The term “agriculture in areas undergoing urbanization” seems to be self-contradictory, or, at least, seems to imply a meaningless argument if “urbanization” is intended, in the proper sense of the word, to mean expansion of built-up areas and replacement of the rural activities of a population (i.e., agriculture and commerce domiciliated in the country), by the urban activities of a population (i.e., the manufacturing industry, wholesale and retail services, etc.).<sup>1</sup> If “urbanization” were understood to mean just this, the question of agriculture in urbanized areas might be reduced simply to the question of farming in the process of extinction or decadence. But if we consider urbanization to be the socio-economic effect of expanding influences of urban activities, its influences on agriculture are then not merely of a destructive nature. Generally speaking, besides the restraining or destructive factors for agriculture which undoubtedly exist in the urbanized areas, we have also to take into account, in this connection, the propitious factors for the development of certain forms of agriculture. This development means, theoretically, an intensification in any way whatsoever, of the farm management and land use; and neither the growing opportunities for non-agricultural employment nor the rising prices of farm land should divert the peasant’s interest from farming, on behalf of this intensification.

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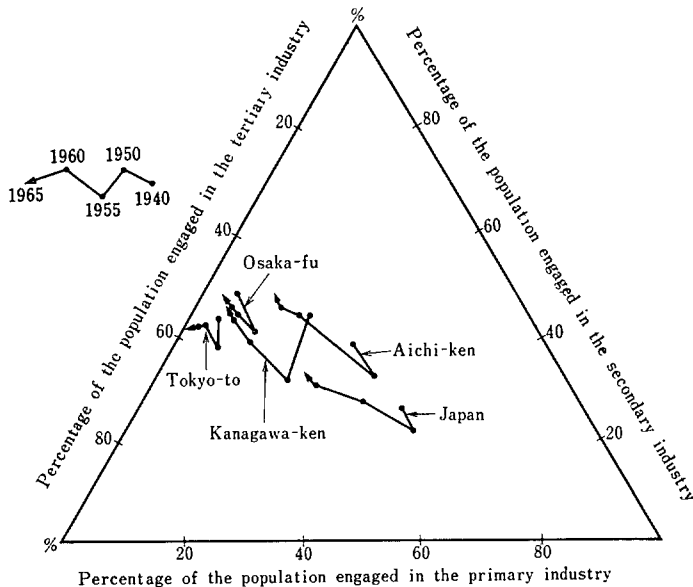
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<sup>1</sup> In Japanese writings, the term “*toshika*”, which is the literal translation of “urbanization” is used rather confusedly. From the viewpoint of city planning, urbanization is interpreted in a physical or concrete sense: it means the formation and development of a built-up area. But the demarcation in this sense of urban areas or areas undergoing urbanization is difficult especially in Japan, where expansion of the built-up area, or rather the gradual increase of building density in the so-called urbanizing area, is chaotic and sprawling. Some kind of sociological or economic criterion is therefore necessary to define urbanization, but in this case, according to the choice of criteria whether this be from that of density to the professional structure or the diffusion of the TV apparatus or something similar, the “urbanized area” or the “area undergoing urbanization” can shift from being the immediate adjacent zone of the city to include the whole territory of Japan.

Actually, the development of certain forms of agriculture in urbanized areas owes economically, in most cases, to the appropriation of profits derived from social overhead capital or the external economies of urban areas. There are many instances where truck farming was developed after the improvement of the transportation system or where the increasing demand in cities made practicable a new type of commercial farming in the zones influenced by the cities. Agriculture in urbanized areas can be said, therefore, to be characterized by two sorts of approaches: one is the measuring and the qualification, according to the criteria of deterioration, of farming activities in an area; and the other is the recognition of suitable conditions for the realization of specialized (and/or intensified) farming in the same area.

As confirmed by many statistical indexes, the transformation of the industrial structure of Japan is remarkable after World War II and especially since 1960, with the introduction of a series of new politico-economic measures aimed at the realization of a high rate of economic growth for the nation. It is besides the purpose of this paper to discuss the nature and effects of these economic policies or to point out the achievement of the modernization of Japanese agriculture during this process. Here we only note the regional differences of these changes in order to confirm the phenomena of urbanization. In Fig. 1,

FIG. 1. CHANGES IN THE INDUSTRIAL STRUCTURE (1940-1965)

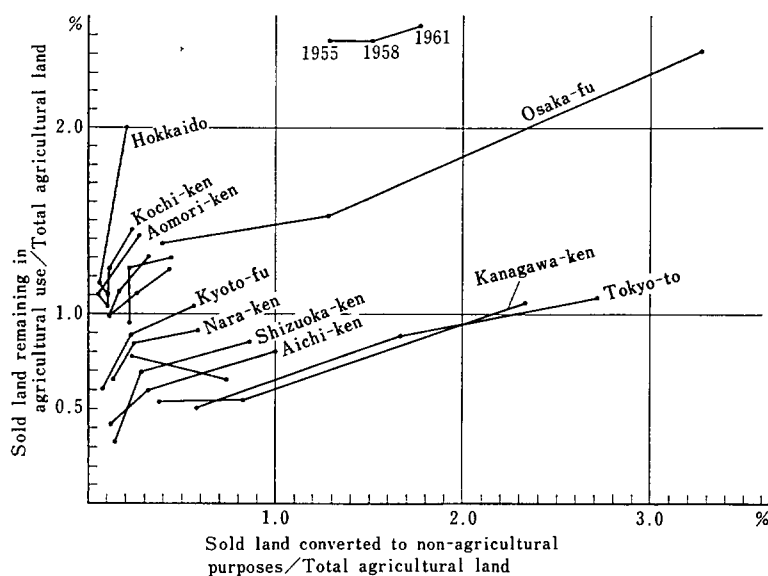


Sources: *Population Censuses of the Statistics Bureau.*

shifts of the occupational structure of four prefectures which represent three main metropolitan areas of Japan (i.e., Tokyo-to, Kanagawa-ken of the Tokyo metropolitan area, Aichi-ken of the Nagoya metropolitan area, Osaka-fu of the Kyoto-Osaka-Kobe metropolitan area) are shown in comparison with the national average. Here we can find that, among the four prefectures where the percentage of those who are employed in the secondary industry has reached an almost uniform level, the decrease of the agricultural population has been very

rapid in Kanagawa-ken and in Aichi-ken. The agricultural population had already been reduced, excepting in the immediate postwar period, to under 6 per cent by 1940, in Osaka-fu and Tokyo-to. The higher percentage of the tertiary industry in Tokyo-to in contrast to Kanagawa-ken and Osaka-fu is due mainly to the political and social character of Tokyo-to in its capacity as capital of an extremely centralized state; which fact, however, does not play an important part in the diminution of the agricultural population. Rapid decrease of the population engaged in the primary industry in Kanagawa-ken and Aichi-ken is a result of the absolute diminution of the agricultural population and the inflow of a non-agricultural population into these prefectures. This indicates nothing but the growing opportunity of employment in urban activities in these prefectures. The impact on the deterioration of farming activities is seen from a more physical aspect, that is, the converting of agricultural land for non-agricultural purposes.<sup>2</sup> Such conversion was particularly marked during 1955-61 in these

FIG. 2. RELATION OF THE AGRICULTURAL LAND SOLD FOR AGRICULTURAL PURPOSES TO THE AGRICULTURAL LAND SOLD FOR NON-AGRICULTURAL PURPOSES



Source: T. Isobe: *Kogyoka to Nochitenyo* (Industrialization and the Conversion of Agricultural Land) Kanagawa-ken, 1963 p. 33.

<sup>2</sup> The rising price of farm land, when it exceeds a certain level with regard to land productivity, brings about the possibility that the Japanese farmers, who are mostly owner-cultivators created after the Land Reform after World War II, invest their property in sectors other than agriculture. This has a direct destroying effect on the agriculture when the farm land of an area has become the object of trade for the construction of factories and houses or merely for land speculation. But, at the same time, the rising price of farm land on sale augments the estimated value of farm land that is liable for property tax and inheritance duty. This upsets the stability of agricultural work at the time when the farm passes to the next generation of ownership.

prefectures, as shown in Fig. 2.<sup>3</sup>

It is very natural that, in the areas undergoing urbanization where agriculture is more or less intensive, the acreage handled by an agricultural household is relatively small. But,

TABLE 1. DISTRIBUTION OF FARM HOUSEHOLDS ACCORDING TO THE SCALE OF THE CULTIVATED AREAS

	Years	Total	Below 50 acres	50 are -1 ha	1~2 ha	2~3 ha	3~5 ha	Over 5 ha	Excep- tional type
Japan	1941	5,411,661	1,783,033	1,622,790	1,461,228	333,300	117,639	69,855	23,816
	1950	6,176,419	2,522,341	1,972,925	1,339,536	207,845	76,928	48,442	8,402
	1960	6,056,534	2,302,090	1,922,576	1,430,423	232,655	91,178	60,031	17,581
	'41~'50	764,758	739,308	350,135	△121,692	△125,455	△40,711	△21,413	△15,414
	'50~'60	△151,241	△238,997	△59,159	87,427	24,596	14,237	11,588	9,067
Tokyo	1941	53,690	22,989	14,419	12,645	2,150	496	69	922
	1950	64,368	35,898	17,514	9,900	633	44	12	367
	1960	51,741	25,993	15,570	9,237	599	30	1	311
	'41~'50	10,678	12,909	3,095	△ 2,745	△ 1,517	△ 452	△ 57	△ 555
	'50~'60	△ 12,627	△ 9,905	△ 1,944	△ 663	△ 34	△ 14	△ 11	△ 56
Kanagawa	1941	69,940	22,758	20,725	22,297	3,334	310	25	491
	1950	86,027	39,715	27,007	18,330	628	19	1	327
	1960	73,873	29,072	24,695	19,163	616	15	3	309
	'41~'50	16,087	16,957	6,282	△ 3,967	△ 2,706	△ 291	△ 24	△ 164
	'50~'60	△ 12,154	△ 10,643	△ 2,312	833	△ 12	△ 4	△ 2	△ 18
Osaka	1941	76,236	33,720	27,333	13,303	710	155	49	957
	1950	92,090	62,234	25,826	3,811	20	3	—	196
	1960	84,649	56,787	23,388	3,613	82	2	—	777
	'41~'50	15,854	28,514	△ 1,507	9,492	△ 699	△ 152	△ 49	△ 761
	'50~'60	△ 7,441	△ 5,447	△ 2,438	198	62	△ 1	—	581

Source: Norinsho (Ministry of Agriculture & Forestry): *Nihon no Nogyo* (Agriculture in Japan) 1961.

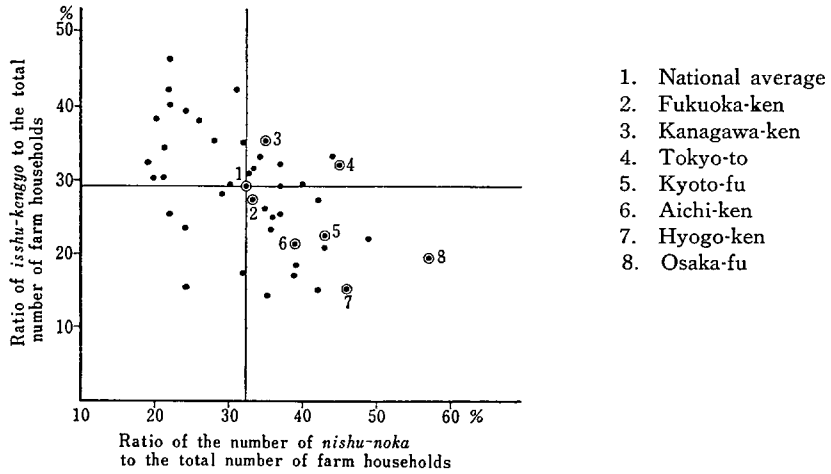
<sup>3</sup> According to the Agricultural Land Law which was promulgated in 1952 for the purpose of stabilizing the achievements of the Land Reform, the transfer of property and the change in land category concerning agricultural areas are subject to official permission. The total reclassified area for non-agricultural purposes which is the subject of regulation in Articles 4 and 5 of the Agricultural Land Law in Japan has steadily increasing. But as shown here in the table, the share of prefectures adjacent to big metropolises in this increase has become relatively lower since 1960. This means that, regarding the decrease of agricultural land, the phenomenon is spreading over a vaster zone in Japan.

Regional Distribution of Reclassified Agricultural Land  
(Concerning Articles 4 and 5)

	Japan	Tokyo	Kanagawa	Aichi	Osaka	Hyogo
1960 (in percentage)	100	6.4	7.1	5.9	7.5	2.4
1964 ( " )	100	3.1	4.8	4.4	4.7	2.1
Indice of 1964 (1960=100)	192	94	130	143	121	162

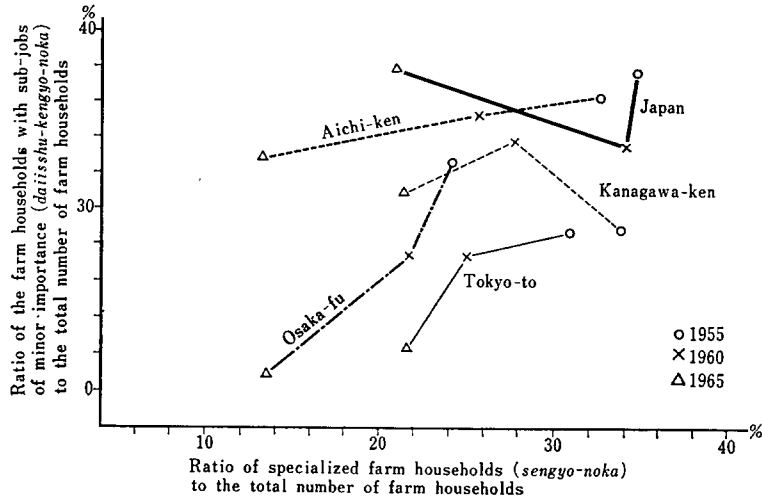
Source: *Nihon Nogyo Nempo XV* (Annals of the Japanese Agriculture XV) 1966, p. 77.

FIG. 3. RELATIONS OF THE TWO TYPES OF FARM HOUSEHOLDS PARTLY ENGAGED IN AGRICULTURE (by prefecture)



Source: *Agricultural Census of 1965.*

FIG. 4. CHANGES IN THE RELATIONS OF THE FARM HOUSEHOLDS PARTLY ENGAGED IN FARMING TO THE FARMHOUSEHOLDS ENGAGED ONLY IN FARMING



Sources: *Agricultural Censuses of the Ministry of Agriculture and Forestry.*

analyzing in Table 1 the changes in scale of cultivated areas under farmers in two metropolitan areas during the years 1941-60, we can find a difference between the changes in the hierarchical structures of the two major metropolitan areas. Also in evidence is a tendency conforming to that of the national average, i.e., the drop in the number of the farmers of large-scale areas of cultivated land between 1941-50, and the particular diminution of the number of farmers of small-scale areas of cultivated land. From Table 1, we also observe that, while in the Tokyo metropolitan area the diminution in the number of agricultural households having less than fifty ares of land and the increase of households having fifty ares to two hectares are notable between 1950-60, there are hardly any changes to be observed in the hierarchical structure for this period in Osaka-fu. From Figs. 3 and 4, we can see that the farmers having the smallest-scale cultivated land in Osaka-fu and who comprise more than two-thirds of the total number of agricultural households in the prefecture are, for the most part, those who earn their living mainly from non-agricultural occupations (*nishu noka*)

TABLE 2. CHANGES IN LAND USE

Prefecture	Year	Total cropped acreage (in ha.)	Indexes (in percentage)							
			Total cropped area	Rice (paddy)	Wheat, barley oats and rye	Cucumbers	Tomatoes	Pears	Grapes	Mandarin oranges
Japan	1950	7,697,320	100%	39.45%	24.59%	0.28%	0.15%	0.08%	0.05%	0.42%
	1955	8,087,714	100	38.43	21.90	0.31	0.15	0.14	0.01	0.49
	1960	8,150,975	100	40.93	18.81	0.33	0.16	0.21	0.19	0.78
	1965	7,367,000	100	44.18	13.04	0.47	0.26	0.26	0.31	1.56
Tokyo	1950	63,870	100	20.48	36.02	1.50	1.32	0.08	—	—
	1955	62,969	100	24.87	31.14	1.59	0.87	0.13	0.014	0.003
	1960	51,342	100	26.68	26.88	1.69	0.82	0.29	0.06	0.004
	1965	33,200	100	24.49	18.37	2.04	0.81	0.60	0.11	—
Kanagawa	1950	102,223	100	25.76	32.92	0.71	0.46	0.07	0.02	1.86
	1955	100,338	100	27.56	29.80	1.15	0.67	0.19	0.050	2.32
	1960	96,418	100	28.31	26.34	1.77	0.54	0.31	0.12	2.30
	1965	68,500	100	28.76	16.50	1.78	0.77	0.49	0.18	4.80
Osaka	1950	73,492	100	43.93	30.02	0.63	0.44	0.06	0.73	1.65
	1955	66,694	100	45.93	19.16	1.21	0.75	0.05	1.154	1.87
	1960	64,073	100	52.91	12.35	0.66	0.62	0.23	1.31	2.81
	1965	45,600	100	57.46	2.39	0.83	0.86	0.23	2.39	5.46
Aichi	1950	244,643	100	36.50	30.93	0.24	0.25	0.06	0.02	0.36
	1955	247,380	100	36.10	27.64	0.30	0.39	0.18	0.07	0.46
	1960	223,771	100	41.34	25.20	0.27	0.30	0.33	0.11	0.82
	1965	176,600	100	47.28	14.95	0.58	0.47	0.40	0.18	1.48

Sources: *Agricultural Censuses*.

or *dainishu kengyo*).<sup>4</sup> The percentage of the *nishu noka*, that is to say, the farmers who practice farming only as a sub-job or for the purpose of self-supply, is higher than the national average also in Tokyo-to and in Kanagawa-ken. But what characterizes the agriculture in Tokyo-to and Kanagawa-ken is the stable existence of the specialized farmers, whose percentage in the total number of farm households is higher than the national average for these two prefectures.

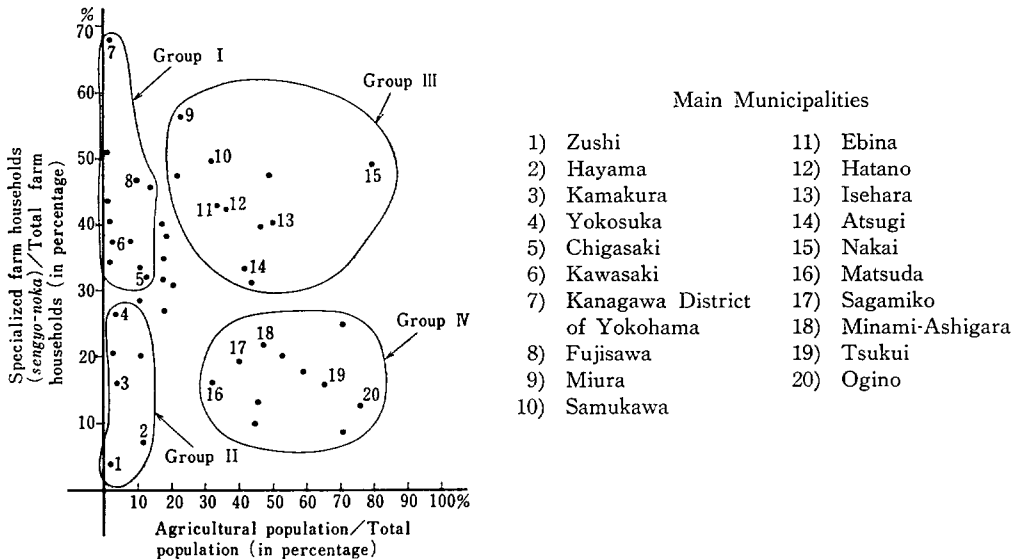
The predominance of the *nishu noka* in Osaka-fu is explained partly by the general tendency in the Kinki region to a preponderance of farm households with very small acreage, and partly by the extension of paddy fields which can very easily become the resources of self-supplying agriculture for Sunday farmers in the urbanized areas. (The percentage of paddy fields in the total cultivated acreage in Osaka-fu was 83.4 per cent in 1960, while being 21.3 per cent in Tokyo-to, 32 per cent in Kanagawa-ken and 55.7 per cent in Japan.) But, on the other hand, we cannot fail to observe in Table 2 that the development of some types of specialized farming such as the cultivation of cucumbers or of grapes and peas is more accelerated in Tokyo-to and Kanagawa-ken than in Osaka-fu. This fact is not irrelevant in regards to the relatively high percentage of specialized farmers in the Tokyo metropolitan area.

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Kanagawa-ken is one of the prefectures constituting the Tokyo metropolitan region. It comprises the heavy industrial agglomeration of Yokohama and Kawasaki in the eastern part and the hilly and mountainous agriculture belts in the northern and western parts; in the southern part along the coast, where the main railroads and routes pass, stretch the residential zones and an extension of the Tokyo-Yokohama industrial district. The characteristics of agriculture in this area, especially the effects of the influence of urbanization on it, are therefore very manifold, representing varied forms of agriculture under urbanization. If the percentage of the population engaged in farming compared with the total population shows the degree of urbanization in the sense of the recession of agriculture, and if the percentage of specialized farmers (*sengyo noka*) shows the degree of stability of agriculture in an area, we obtain some regional types of agriculture as shown in Fig. 5. In the municipalities of Group I remains only a small number of farmers who are highly specialized in commercial

<sup>4</sup> In the Japanese Agricultural Census farm household units are classified in three categories according to the size of income from agricultural activities; the *sengyo noka*, the specialist-farmer whose family members are engaged exclusively or almost exclusively in agriculture, *daiisshu kengyo noka*, the farmer with a subsidiary business the subsidiary income from which is, however, less than that from agricultural activities; and the *dainishu kengyo noka* who practices farming but whose income from activities other than agriculture comprises the main part of the family budget. Since the Agricultural Census of 1965 the system of the farm household classification has been revised, taking more into account the scale of agricultural management and the quality of the farming. The three new categories of the farm households of the Agricultural Census of 1965, *isshu sengyo* (specialist farmer of Category I), *isshu kengyo* (farmer with sub-jobs of Category I), *nishu noka* (farmer of Category II) has been introduced, besides the *sengyo noka*, *daiisshu kengyo*, *dainishu kengyo* of the former occupational classification; but strictly speaking we are compelled to admit that there is some disagreement between the two classifications, especially in the case of *sengyo noka* and *daiisshu sengyo* in the suburban areas.

FIG. 5. URBANIZATION AND PERSISTENCE OF AGRICULTURE (1965)



Source: *Agricultural Census of 1965.*

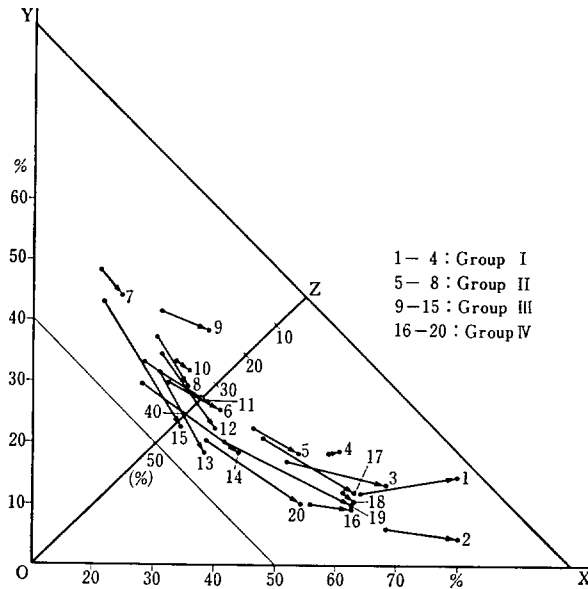
agriculture such as glasshouse and dairy farming. These are the forms of agriculture in the industrial zones or in the zones immediately adjacent to the factory districts of Yokohama and Kawasaki, where most of the farmers have completely given up farming during the past forty years of urbanization, to become employed in the secondary and tertiary industries. The municipalities of Group II, in which agriculture can be defined as an occupation in the process of becoming completely extinct, consist of high class residential districts on the Miura Peninsula (Kamakura, Zushi, Hayama, Yokosuka, the Kanazawa district of Yokohama, etc.). Group III and IV represent the zone having a relative preponderance of agriculture; but here we must note the contrast between these two groups. The municipalities of Group IV are mostly in the western and northern parts of the prefecture, i.e., the fringe areas or the farthest zones of the Tokyo-Yokohama metropolitan area; the municipalities belonging to Group III are in the central part of the prefecture which is the intermediate zone between the fringe areas and the industrial and residential districts. Groups III and IV correspond geographically to the "contiguous suburban zone" (*kinsetsu kinko chitai*) and the "outer suburban zone" (*gaiko kinko chitai*), respectively, in the agricultural regionalization of Kanto by the Institute for Agricultural Technology (*Nogyo gijutsu kenkyusho*).<sup>5</sup>

The nature of the regional difference amongst these four groups is explained also by its pertinence to the development of the proportion of the farm households which actually practice farming for self-consumption (*dainishu kengyo*). In Fig. 6, we can observe the changes in the occupational structure during the years 1960-65: (1) In the zones of Group I, the increase

<sup>5</sup> T. Onuki: Keizaiseicho ni tomonau Kanto Nogyo no Chiikikubun to Chitaihikaku (Regionalization of Kanto District According to the Recent Economic Growth), *The Bulletin of the National Institute of Agricultural Sciences*, Series A, No. 14 (1967) pp. 123-159.



FIG. 6. CHANGES IN THE OCCUPATIONAL STRUCTURE (1960-1965)



OX: Ratio of the number of farm households depending mainly on non-agricultural activities to the total number of farm households

OY: Ratio of the number of specialized farm households to the total number of farm households

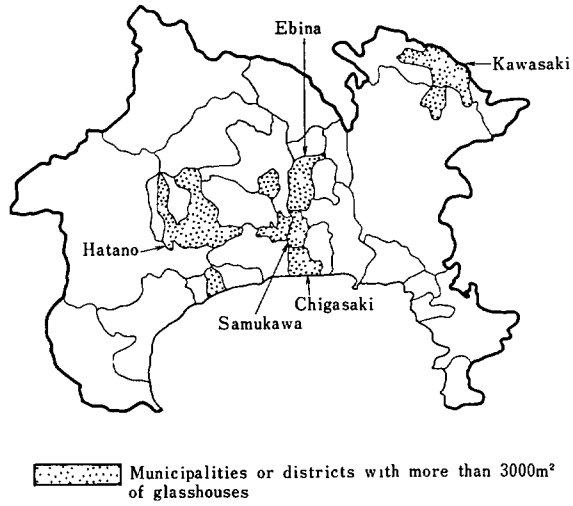
OZ: Ratio of the number of the farm households with sub-jobs of minor importance to the total number of farm households

Sources: *Statistical Yearbooks of Kanagawa-ken.*

of income from non-agricultural activities in the budget of farmers who had already taken sub-jobs in a previous period; this tendency can be considered as the polarizing differentiation in the stratal structure of farmers in the urbanized area; (2) further advance of this stratal differentiation in the zones of Group II; (3) relatively little change with slight decrease in percentage of specialized farm households (*sengyo noka*) concerned in the Group III zone; (4) rapid increase of *dainishu kengyo* in the Group IV zone, which phenomenon derives mainly from the change in the importance of the sub-job income, which shifts from a complementary to the main role in the farmer's budget (i.e., a shift from *daiisshu kengyo* to *dainishu kengyo*).

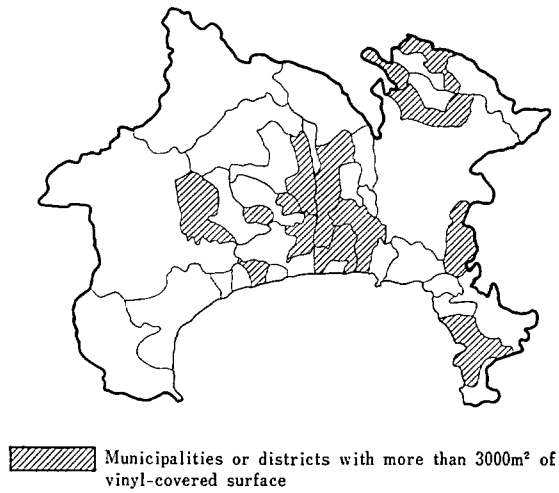
In the central part of the prefecture we can thus see the firm resistance of agriculture against the influence of urbanization or, more exactly, the existence of the growing opportunity to take advantage of urbanized conditions and to practice more intensive farming. The basis of this intensive farming varies from one municipality to another. But we can point out the relative concentration of glasshouses, garden farming involving the use of vinyl covers, dairy farming and hog-raising in this zone, as shown in Figs. 7-10. Garden farming at large is not specifically located in this zone, but is rather concentrated in the zones of Groups I and II (Fig. 11).

FIG. 7. DISTRIBUTION OF GLASSHOUSES IN KANAGAWA PREFECTURE



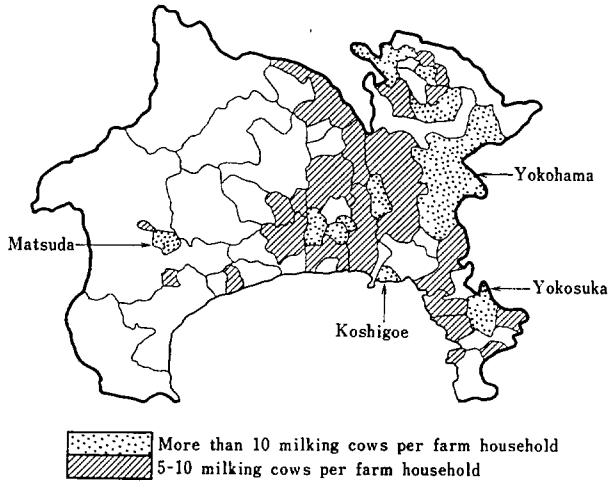
Source: *Agricultural Census of 1965.*

FIG. 8. DISTRIBUTION OF VINYL-COVERED AREAS FOR HORTICULTURE IN KANAGAWA PREFECTURE



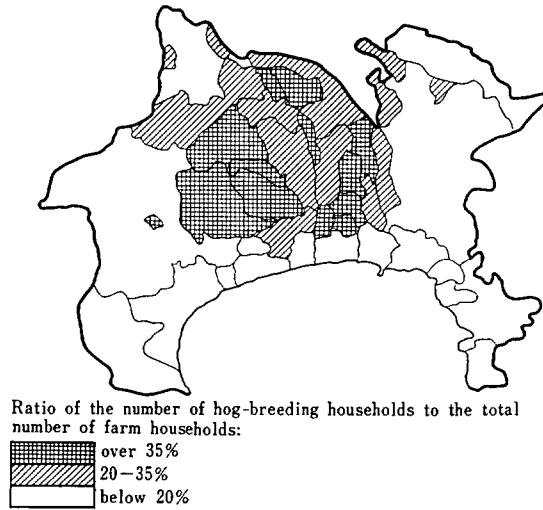
Source: *Agricultural Census of 1965.*

FIG. 9. DAIRY ZONES IN KANAGAWA PREFECTURE



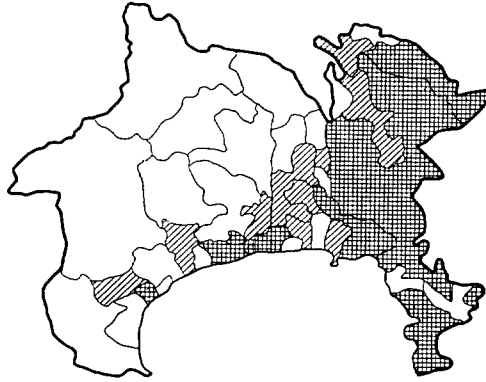
Source: *Agricultural Census of 1965.*

FIG. 10. DIFFUSION OF HOG-RAISING IN KANAGAWA PREFECTURE

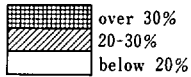


Source: *Agricultural Census of 1965.*

FIG. 11. DIFFUSION OF HORTICULTURE IN KANAGAWA PREFECUTURE

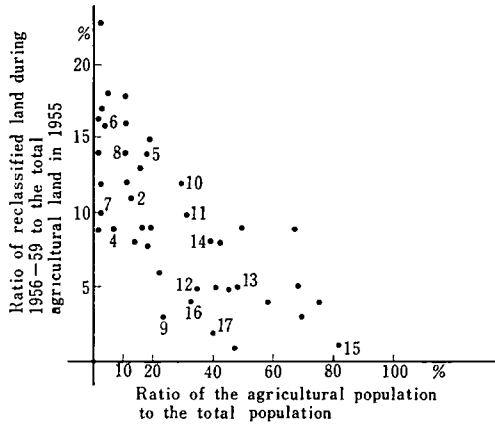


Ratio of garden cultivation area to the total cultivated area:



Source: *Agricultural Census of 1965.*

FIG. 12. CONVERSION OF AGRICULTURAL LAND IN RELATION TO THE AGRICULTURAL POPULATION

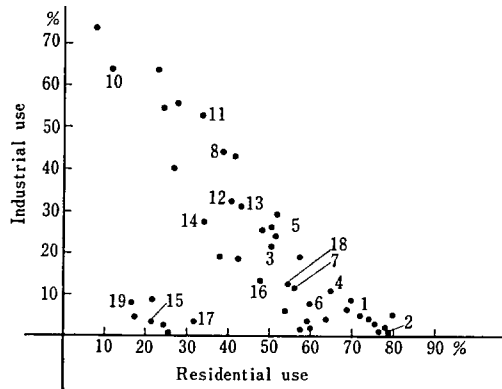


(The numbers of municipalities correspond to those in Fig. 5)

Sources: Kanagawaken Noseibu (Kanagawa Prefectural Government): *Kanagawa-ken Nogyo no Chiiki-kozo* (Regional Structure of Agriculture in Kanagawa Prefecture) 1967 p. 10. *Population Census of 1955.*

In Kanagawa Prefecture, during the years 1955-59,<sup>6</sup> the ratio of the agricultural population to the total population was relative to the diminution of agricultural land as shown in Fig. 12. In this graph, we cannot find any regional tendency in connection with the above-examined grouping of municipalities, besides the contrast of Groups I and II to Groups III and IV. But when the proportions of housing land and factory land in these reclassified agricultural areas are examined in Fig. 13, we can find (1) the high percentage of land for factory use

FIG. 13. RELATION OF INDUSTRIAL AND RESIDENTIAL USES OF RECLASSIFIED AGRICULTURAL LAND IN 1956-1959



(The numbers of municipalities correspond to those in Fig. 5)

Source: *Kanagawa-ken: Kanagawa Nogyo no Chiiki Kozo, op. cit.*, p. 10.

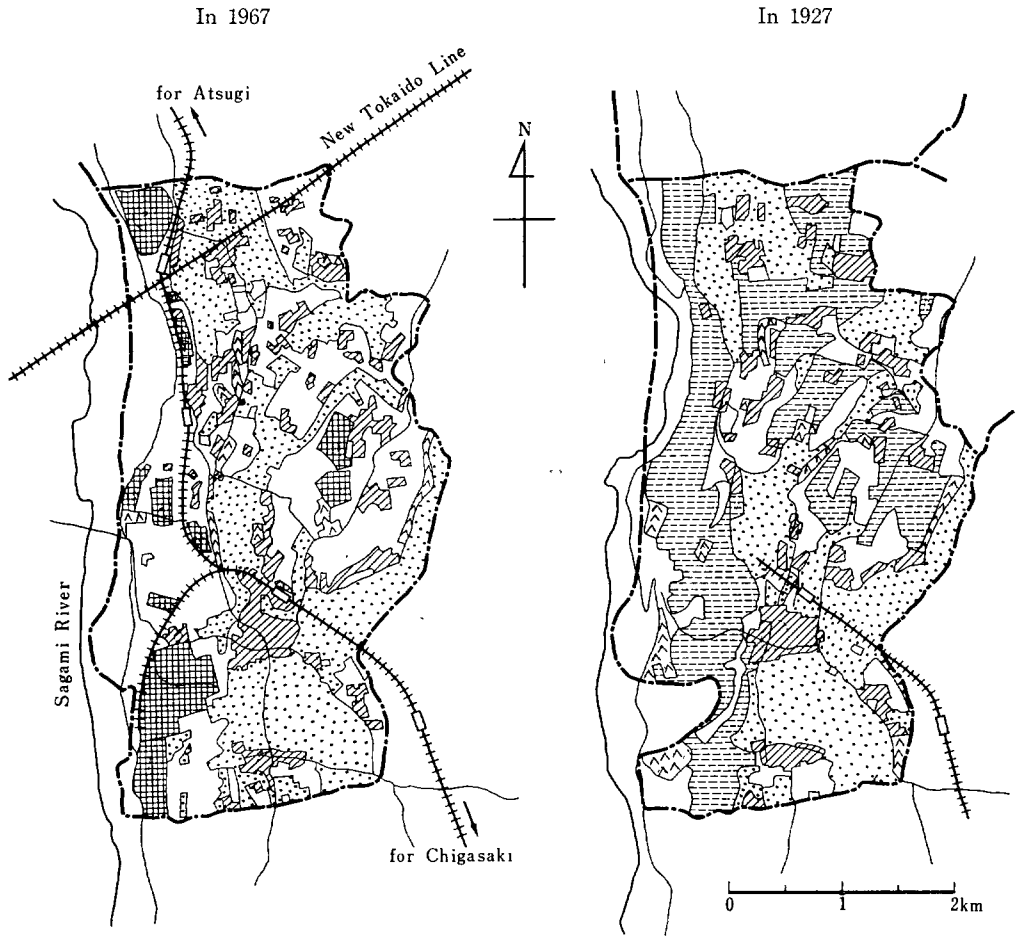
in the Group III zone, (2) predominance of reclassified land, not for factory or housing use but mainly for forests, in the Group IV zone, and (3) the high percentage of land for housing in the zones of Groups I and II. In other words, where the centrifugally extending industries of the metropolitan zone find their new location, agriculture most shows a persistent tendency towards specialization in the intensive forms of farming; and with the large-scale transformation of agricultural land to residential land, agriculture enters into a new phase of its regression. We can see this process of change in our case study in Samukawa.

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Samukawa is a small municipality in the central part of Kanagawa Prefecture, with a population of 18,365 (4,236 households) in an area of 13.22 km<sup>2</sup> in 1967. As we can see from the preceding figures, it is a municipality belonging to Group III approaching the characteristics of Group I. Its location covers the southwestern margin of the Sagami deluvial plateau, which is covered by a thick brown loam formation, and the alluvial plains on the left bank of the Sagami River and along its affluents, which encroach into the deluvial land.

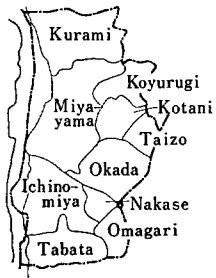
<sup>6</sup> Since 1960, the ratio of reclassified agricultural land to the total agricultural land has dropped remarkably in the highly urbanized areas of Kawasaki and Yokohama where the percentage of the agricultural population is below 10%.

FIG. 14. SAMUKAWA IN 1927 AND 1967



- Paddy fields
- Settlements
- Normal dry fields
- Factory land
- Mulberry fields
- Forests
- Railroads

Buraku division



As usual, in the central part of the prefecture, the deluvial plateau and the natural levees of the Sagami River are utilized as dry fields and the lower alluvial land as paddy fields. The history of human settlement in Samukawa can be traced back to a period of more than 1,000 years ago. In the Tokugawa era many of the village names, which now indicate the fractions (*buraku*) of the municipality, appeared in many documents.<sup>7</sup> In particular, Ichinomiya was cited in many writings for its consequence as the site of a crossroads and also for the Samukawa Shrine, the most important in Sagami Province.

TABLE 3. MAIN AGRICULTURAL PRODUCTS IN SAMUKAWA BEFORE WORLD WAR II (in percentage)

	Rice	Wheat & Barley	Garden Farming	Cocoons	Hogs	Milk	Total
1935	38.47	10.81	7.68	20.61	1.20	3.56	100
1940	27.32	12.15	12.13	22.15	1.11	4.64	100

Sources: *Statistical Yearbooks of Kanagawa-ken.*

TABLE 4. FARM HOUSEHOLDS IN SAMUKAWA BEFORE WORLD WAR II

	Number of households	Number of farm households	Occupational classifications			Distinction on land possession		
			Specialized (Sengyo)	With minor Sub-jobs (isshu kengyo)	Mainly non-agricultural (nishu kengyo)	Owner-cultivator	Tenant farmer	Tenant-owner-cultivator
1935	1060	713	565	71	77	194	217	302
1940	1110	759	508	121	130	203	207	349

Sources: *Statistical Yearbooks of Kanagawa-ken.*

In 1899, the municipality of Samukawa was established, having been formed of an amalgamation of ten former villages, Tabata, Ichinomiya, Nakanose, Omagari, Okada, Taizo, Koya, Koyurugi, Miyayama and Kurami. Until the 1930's, Samukawa remained a purely agricultural village with a population of less than 7,000, giving up about 25 per cent of its surface to paddies and about 35 per cent to other dry fields. The grain in the dry fields was combined with sweet potatoes in summer as was common in the Kanto area. Sericulture was the most important cash crop of this period, but the proximity to Tokyo (60 km from the centre of Tokyo or a two-hours trip via Chigasaki) enabled some other types of commercial farming to be set up. In 1912, the first cooperative society for garden farming and pomiculture was founded,<sup>8,9</sup> and, in 1921, a railroad between Chigasaki and Samukawa was constructed to facilitate the connecting of Samukawa with the Tokyo-Yokohama area. In 1919, the first framed bed for melons was made by a young farmer and, after 1921, melons and sweet peas

<sup>7</sup> For historical information regarding Samukawa, see: Okanosuke Kato: *Samukawa, Fujisawa*, 1947.

<sup>8</sup> It comprised the pertinent farmers of Chigasaki, Fujisawa, Koide and Samukawa. In this year an experimental station for horticulture was founded in Chigasaki with the sponsorship of these municipalities.

<sup>9</sup> Here the historical data on the development of agriculture after 1899 have been gained from the documents in the archives of the municipal assembly of Samukawa.

came to be cultivated in glasshouses by a few farmers.<sup>10</sup> Though these young pioneers of intensive commercial farming numbered so few, they succeeded so well that they came to form the nucleus of the development of the new tendencies after the 1930's. These early commercial farmers, who are now the leaders of Samukawa<sup>11</sup> were, however, not of the richest class nor were they farmers of large-scale cultivated lands, which depend on sources derived from both farming activities and land-ownership.<sup>12</sup> They were the sons of families which belonged rather to the middle class or, more precisely, to the upper stratum of the middle class of the village.<sup>13</sup>

Another aspect, which had first emerged around 1930, in the agriculture of Samukawa is that of stock-raising, namely, hog- and poultry-raising and dairy farming. The introduction of dairy farming by four farmers of Tabata (the southern most *buraku* of Samukawa), can be considered parallel to the introduction of glasshouses and strawberry beds in the Okada and Kurami *buraku*, where the economic conditions and the intentions of the introducers are concerned. Hog-breeding and poultry-raising became very widespread among small- and middle-scale farmers, especially with the advent of the economic depression. The glasshouse farmers, the cultivators of forced strawberries or the dairy farmers were, from the first, in direct contact with the Tokyo market or with the milk-processing factories, in order to ensure the success of their business transactions. The hog-breeder and the poultry-raiser, however, were under the control of middlemen or brokers. In the case of hog-breeding, many small farmers without sufficient capital to buy their own animals were compelled to raise pigs (famed under the name of *koza buta*) consigned to them by the brokers for the purpose of rearing; but this system did not bring about gainful results because of the wide margin of profit obtained by the brokers.

The agriculture of Samukawa before World War II was, in any case, based mainly on rice cultivation and sericulture as shown in Table 3 and in Fig. 15. But here we should also note the growing proportion of garden farming and dairy farming during the second half of the 1930's. What contributed so much toward these changes in agriculture was the construction of factories in Samukawa which commenced in 1933 with the establishment of a 250,000 m<sup>2</sup> powder plant on the alluvial lowland of Tabata. In 1940, another munitions works bought about 330,000 m<sup>2</sup> of dry field (mainly mulberry fields) to which to move from Tokyo. The construction of these factories, which was involved with the militarization the Japanese economy, was also a distinct mark of the outward expansion of the Tokyo-Yokohama

<sup>10</sup> The pebbles, heated by the rays of sun, gave off sufficient heat to force the growth of strawberries. This method was first adopted at the experimental station of Chigasaki. The name "Fukuda strawberries" is commonly used for this product, after H. Fukuba who created this species based on one of French origin at the beginning of this century.

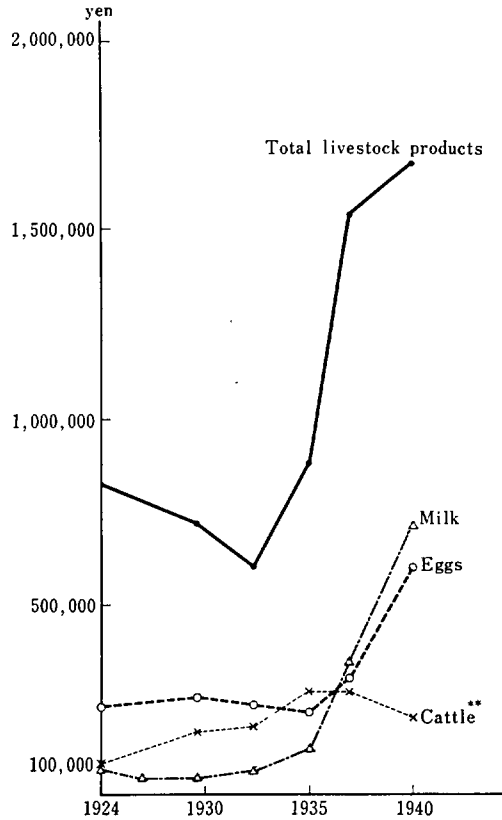
<sup>11</sup> Now they are the mayor, chairman or members of the municipal assembly, leaders of the cooperatives, etc.

<sup>12</sup> It is remarkable that in Samukawa there were no absentee landowners. Under the Land Reform after World War II 156 hectares of dry field and 100 hectares of paddy field belonging to 385 landowners in all were redistributed, but none of these landowners was absentee. Some of them had to give up more than ten hectares under the Land Reform but none of the farmers who had initially introduced the glasshouses or the framed strawberry beds belonged to this big landowner group.

<sup>13</sup> We have no data on the distribution of the cultivated lands by farm households at the end of the Taisho period and in the beginning of the Showa period. But in the local tax lists we can see that, while twenty farmers of Samukawa paid more than 100 *yen* annually in 1930, the duty paid by the pioneer farm households was from fifty to 100 *yen*.



FIG. 15. AMOUNT OF LIVESTOCK PRODUCTS IN KOZA-GUN\* (1924-1940)



\* Koza-gun is a sub-district of Kanagawa Prefecture situated in the central part of the prefecture including Samukawa.

\*\* In Koza-gun, more than 90% of the cattle consists of hogs.

Sources: *Statistical Yearbooks of Kanagawa-ken.*

industrial district. These factories in Samukawa did not employ, at least in the beginning, workers of local origin. The purchases of agricultural land by the industries, though this land consisted of the worst soil of Samukawa, forced many farmers either to reduce the scale of their lands<sup>14</sup> or to intensify land use. The immigration of industrial workers with their families to Samukawa, on the other hand, offered to the farming population of Samukawa either the opportunity of non-agricultural employment or a market for garden farming or other commercialized farming products. It was indeed the beginning of urbanization in the physical and economic sense and also brought about the socio-psychological impact of urbanization on

<sup>14</sup> The factory site chosen in 1933 consisted mainly of a vast land on the flood plain of Sagami River; this land was national property, and, therefore, in this instance there was no direct influence on the agriculture of Samukawa. The area purchased in 1940 had been owned by only a few, notably a buddhist temple and one private owner. Irregularly parcelled fields were generally managed in Samukawa by many tenant farmers and the conversion of 82 acres of field to factory land resulted in the reduction of the cultivating acreage for about 70 farmers of Taizo and Okada.

the traditional rural community of Samukawa with its increasing number of people engaged in non-agricultural activities.

\* \* \* \* \*

The complete extinction of mulberry trees and glasshouses as a result of wartime policies pertaining to measures for food control, the closure of the munitions factories, the accomplishment of the Land Reform, which transformed all tenant farmers into owner-cultivators—these were the main changes that occurred in Samukawa, as in other parts of Japan, in the course of the years during and immediately after World War II. Toward 1950, with the revival of the Japanese economy, there commenced a new era: on factory lots appeared new industries, such as rubber and machinery; glasshouse farming, strawberry cultivation and other specialized commercial farming resumed important roles in Samukawa agriculture. But we should note in this development some new characteristics as distinguished from those of the commercial farming of the 1930's. The size of the non-agricultural population consistently increased after 1940, Samukawa having been enrolled into the commuting circle of the Tokyo-Yokohama industrial district by means of the developing transport facilities. These facilities also afforded the lower stratum of Samukawa farmers the opportunities of looking for sources of income outside agriculture. This tendency was further also when the factories established in Samukawa after the war employed relatively large numbers of local workers.<sup>15</sup> Specialized or intensive commercial farmings have been adopted on a large scale by the middle and upper strata of farmers. These latter, in addition to becoming stable landed farmers, were enriched by underhand transactions involving agricultural products in the post bellum confusion.<sup>16</sup> Thus they accumulated sufficient capital to introduce further intensive specialized farmings. These aspects, especially the differentiation of the farm households specializing in farming activities and those depending mainly on non-agricultural sources (Table 5) and the growing

TABLE 5. CHANGES IN NUMBER OF FARM HOUSEHOLDS IN SAMUKAWA

	Population	Number of households	Number of farm households				Total acreage of agricultural land
			Total	Specialized	With minor sub-jobs	Mainly non-agricultural	
1950	11,206	2,077	846	506	164	176	691
1955	11,183	2,086	811	439	235	137	660
1960	11,564	2,221	831	284	265	282	674
1965	16,229	3,484	772	379	170	223	616
1967	18,461	4,277	765	383	56	326	585*

\* In 1968.

Sources: *Population Censuses*, *Agricultural Censuses* and the *Inquiry* made by the Municipal Office of Samukawa (for 1967).

<sup>15</sup> In 1965, according to the inquiry made by Prof. D. Nishikawa, (*Nihon nogyo no chiikisei ni kansuru keizaichirigaku-teki kenkyu*, (Economic Geographical Studies on the Regional Characteristics of Japanese Agriculture, Preliminary Report), 1966, p. 78), among 2,325 industrial workers employed in Samukawa 844 were of Samukawa.

<sup>16</sup> In this respect, the villages near the big consumption centers such as Samukawa were in a most advantageous position.

importance of specialized commercial farming, have been accelerated since 1955.

The diminution of the number of farm households and the increase of the number of farm households depending mainly on non-agricultural activities (*dainishu kengyo*) have been stimulated by the enlargement, on the one hand, of employment opportunities in Samukawa, Chigasaki, Fujisawa or other cities undergoing industrial development in this period; and, on the other hand, by the decrease of the acreage of agricultural land resulting from the construction of factories and houses. The differentiation of farm households is apparent also in the distribution

TABLE 6. CLASSIFICATION OF FARM HOUSEHOLDS OF SAMUKAWA (in 1965)

Management scale	Number of farm households			
	Specialized	With minor subjobs	Mainly non-agricultural	Total
over 200 are	9			9
150~199	58	1		59
100~149	176	32		208
70~ 99	84	52		136
50~ 69	35	75		110
30~ 49	13	6	103	122
below 30	4	4	120	128
	379	170	223	772

Source: *Agricultural Census*.

of the scales of cultivated areas (Table 6). Though the protagonists of Samukawa agriculture comprise farm households handling more than seventy acres of land, there exists a large number of households holding less than fifty acres of farm land mainly for the purpose of self-supply. In these households, generally the main work force of the family, that of husband and adult sons, has already been completely absorbed into non-agricultural employment. Agricultural work is done by the older generation or by the women of the family, which

TABLE 7. ACREAGE OF CONVERTED AGRICULTURAL LANDS FOR NON-AGRICULTURAL PURPOSES (in hectar)

1958	1.25
1959	1.48
1960	3.05
1961	15.7
1962	28.4
1963	11.9
1964	20.0
1965	5.32
1966	6.63
1967	29.65

Source: Agricultural Land Section, Municipal Office of Samukawa.

fact inevitably brings about the deterioration of land use.<sup>17</sup> The purchase of agriculture land for the construction of factories and houses after 1958 is shown in Table 7. In 1962, about twenty hectares was purchased for the construction of the New Tokaido Line by the Japanese National Railways, which passes through the northern part of Samukawa. In 1964, eighteen hectares was purchased by the Housing Corporation (*Jutaku Kodan*) for the creation of an industrial estate in Tabata. We have also to take into account the fact that, according to our inquiry, a small part of the proceeds from land sales has been invested for the intensification of agriculture or for repurchase of farm lands. The effects of the increase of non-agricultural land use have always been destructive for the agriculture here. Until 1966, most of these reclassified lands were for industrial use, but their abrupt increase in 1967 was not due to one particular case but to the sale of many small lots converted for housing purposes. As shown in Fig. 16, the prices of agricultural land have already almost reached the prohibitive

TABLE 8. CLASSIFICATIONS OF FARM HOUSEHOLDS ACCORDING TO THE IMPORTANCE OF AGRICULTURAL INCOME (in percentage of the agricultural income in the farm household budget)

1960 \ 1968	below 10%	10—50%	50—90%	over 90%
below 10%	17 (3)	1		
10—50%	13 (2)	5	2	
50—90%	5 (3)	4 (2)	5	6
over 90%	5 (4)	6 (3)	17 (1)	26

The data are based on our inquiry in June, 1968. The numbers in parentheses are the numbers of the farm households having incomes from rental houses.

TABEL 9. DEVELOPMENT OF GLASSHOUSE FARMING AND THE FORCING CULTIVATION OF STRAWBERRIES IN KURAMI BURAKU

	Glasshouses		Strawberries	
	Number of farm households	Acreage (m <sup>2</sup> )	Number of farm households	Number of strawberry plants
1939	2	330	100	330,000
1948	2	383	3	6,000
1952	12	3,623	60	300,000
1955	20	6,996	43	120,000
1960	25	11,537	44	116,400
1963	29	14,804	22	150,000
1967	37	20,761	33	160,000

Sources: Economic Section, Municipal Office of Samukawa, Kanagawa-ken: *Sokusei-ichigo no biniru-hausu saibai* (Vinyl-house cultivation of forced strawberries) 1965. Kanagawa-ken No-jishikenjo (Agricultural Experimental Station of Kanagawa Prefecture): *Kigyoteki Onshittsu Keiei ni okeru Seisantan-i no Kenkyu* (Studies on the management units of commercial glasshouse farming) 1965.

<sup>17</sup> For instance, the mean production per unit of a paddy, which these self-supplying farmers are willing to hold, has, in contrast to the general tendency in Japan, been decreasing year by year since 1960.

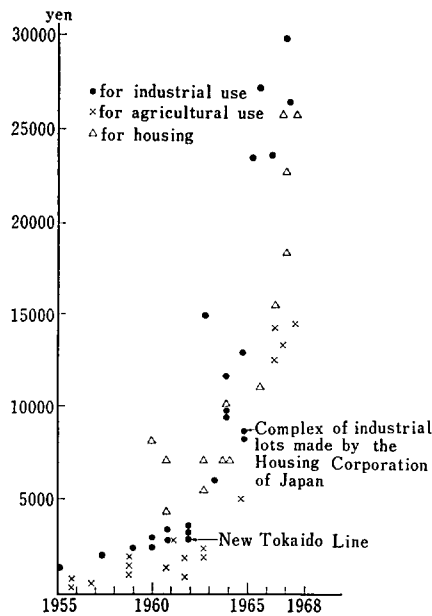
limit for industry. Some farmers have begun to construct rental houses in their fields. In Table 8, which clearly shows the general decrease in the importance of agricultural incomes, we can see that the possession of rental houses constitutes the main reason for this change, for many farmers. This is another more advanced phase of the urbanization of rural areas, which is common in the suburbs of Tokyo, where a farmer becomes a *rentier* on an income

TABLE 10. DISTRIBUTION OF SPECIALIZED COMMERCIAL FARMING IN *BURAKU* (in 1967)

	Glasshouse farming	Cultivation of tomatoes in vinyl-house	Cultivation of forced strawberries	Pear plantation	Dairy farming	Hograising	Poultry-raising
Kurami	37	5	20	0	3	15	0
Koyurugi	0	7	4	0	3	0	0
Taizo	0	3	0	0	2	6	2
Miyayama	28	42	7	14	3	5	6
Kotani	1	0	2	0	7	2	1
Okada	8	3	0	0	2	7	3
Ichinomiya	6	2	0	0	3	2	5
Nakase	3	0	0	0	0	0	0
Omagari	3	0	0	0	0	0	1
Tabata	1	1	0	0	17	2	1

Sources: Economic Section, Municipal Office of Samukawa.

FIG. 16. PURCHASE PRICES OF AGRICULTURAL LANDS IN SAMUKAWA



(The data before 1964 were gathered mainly by Prof. D. Nishikawa and the other data by K. Takeuchi.)

from immovables.

Most of the farm households which live exclusively on proceeds from agriculture have become specialized, at least since 1960, in every kind of intensive commercial farming. Rice production which was most important in the agriculture of prewar Samukawa, comprised only 17 per cent of the gross agricultural products of 1965, and this percentage is less than that produced in specialized farm households (*sengyo noka*).

Sericulture, in second place in Samukawa's prewar agriculture, never revived after 1943 except for two instances in Kurami, which continued this work until 1952. Dry fields have seen, in place of mulberry trees, the expansion of forced strawberries (on the framed stone walls called *ishigaki* before 1960, and in vinyl houses in recent years), tomatoes (mainly under semicircular vinyl covers or in vinyl houses), cucumbers and other vegetables. Vegetables, along with strawberries, comprise 22 per cent of Samukawa's gross agricultural products for 1965. But the most striking development in Samukawa's postwar agriculture has been achieved by glasshouse farming. Glasshouse with a total area of 4.2 hectares, or eighty-six farm households specializing in glasshouse farming (in 1967) put Samukawa in first place in this type of farming among the municipalities of Kanagawa Prefecture. Reconstruction of the glasshouses was carried out in around 1950 with the cultivation of carnations and sweet peas by the farmers who had had experience of this sort of farming before the war; subsequently, flower cultivation in glasshouses expanded very rapidly among the farmers who were eager for a cash crop.

Because it requires a great deal of labor during the period from December to June, glasshouse farming is not compatible with forced garden farming in Samukawa. Chiefly for this reason, the glasshouse has been diffused on paddy lands, particularly in the Kurami *buraku*, where strawberry (*Fukuba ichigo*) cultivation has also been partly replaced by glasshouse farming (Table 9). The most common flowers cultivated in glasshouses are the carnation and the sweet pea, but a few places specialize in the cultivation of tropical and potted plants which require the highest of cultivation techniques and a huge capital investment.

Another form of commercial farming on which the specialized farmers (*sengyo noka*) of Samukawa depend is livestock farming which brought in about 30 per cent of the gross agricultural product of the municipality in 1965. But the current method of livestock farming is very different from those of the prewar period. A livestock farming is now carried out as a specialized form of farming; it is no longer a supplementary means for gaining money and is, therefore, realized on a certain scale, that is, ten or more milch-cows for dairy farming, for instance, fifty or more pigs or hundreds of fowls. The form of commercial farming each farm household choose to specialize in depends on a variety of circumstances: the natural conditions of the fields, the situations conditioned by the preceding farm management, the acquisition of new farming techniques learnt through personal contacts, etc. As with the above-mentioned concentration of glasshouses in Kurami, there exists a certain regionality or zoning in the distribution of the specialized farmings shown in Table 10; but it would be better to recognize the juxtaposition of the diversified commercial farming units as being more accurate a description of the characteristics of agriculture in the urbanized area. The future development of each form of farming must differ from one to another, and we cannot prophesy the results with perfect certainty. To cite one example, in a certain case in the area under study, where residential buildings have greatly increased, livestock farming cannot be continued at its present site for sanitary reasons. It will either have to be given up or moved to other

parts.<sup>18</sup> Glasshouse farming, however, will resist more firmly against the increasing tendency to urbanization. Some farmers are preparing, in fact, new types of farming which might be called “drive-in farming” or “tourism farming” and which involve glasshouses and pear plantations. Here we see the existence of opposed factors which affect the agriculture, of manifold forms of farm management and, finally, of variable possibilities of future development. The ground for these factors lie in the individualism, in the economic and social sense, which we latent or precluded in the traditional rural community of Japan.

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<sup>18</sup> Some of the cattle-breeders of Samukawa turn over in their minds projects to buy land in remoter parts of the prefecture or in other corners of Kanto, such as Gumma or Ibaraki Prefecture, to which to move their farmings.