

# Land Use and Development Characteristics of Namekata District, Kanto Region

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## I. Introduction

Regional land use in a given period reflects the stage of economic and technical development, or the way of life of the region at that time. This paper deals with the development of land use during the last 100 years in Namekata district, situated about 70 km northeast of Tokyo, in the eastern part of Kanto region.

The eastern part of Kanto consists of mainly diluvial tablelands with an elevation of 20–40 m. This land has been used traditionally as *heichirin* (level forest land),<sup>1)</sup> because of water shortage. With the recent economic advancement of Japan, however, this tableland offered new opportunities for agricultural, industrial, and urban developments.<sup>2)</sup> Therefore, Namekata is a good example to elucidate the processes of recent developments of Japan, in terms of land use changes.

The region investigated in this study comprises all of Tamatsukuri machi, Kitaura mura, and part of Ogawa, Aso and Hokota machi. It is bounded on the west by Lake Kasumigaura and on the east by Lake Kitaura (Fig. 1).

Data are from the *jinsokuzu*,<sup>3)</sup> the first modern topographical maps of Japan, at a scale of 1:20,000 (1885); topographical maps of late-Meiji<sup>4)</sup> surveyed in 1903 and published in 1906, the same revised in 1929 and published in 1932, revised 1952 maps published in 1953 (all at the scale 1:50,000); land use maps of 1:25,000 scale surveyed by the Geographical Survey Institute of Japan in 1973 and published 1977. In the present research, the author attempts to clarify the land use changes through an analysis of these data.

The height of the tableland in the investigation area is about 30–37 m. The eastern part is eroded by Tomoe River, Takeda River and Yamada River, and western part by Kajinashi River. There are alluvial plains at the mouth of each river. The coastline of Lake Kasumigaura is quite straight and has a low and moist belt with a width 600–800 m. The surface of the tableland is covered with a loamy and acid soil. The average rainfall amounts to about 1,200 mm, but the region suffers from a lack of rain, particularly during the summer. These served as barriers for progress in agricultural use. A firm bank was constructed along the shore of Lake Kasumigaura and the former moist land is now converted to paddy rice fields and carp raising ponds.

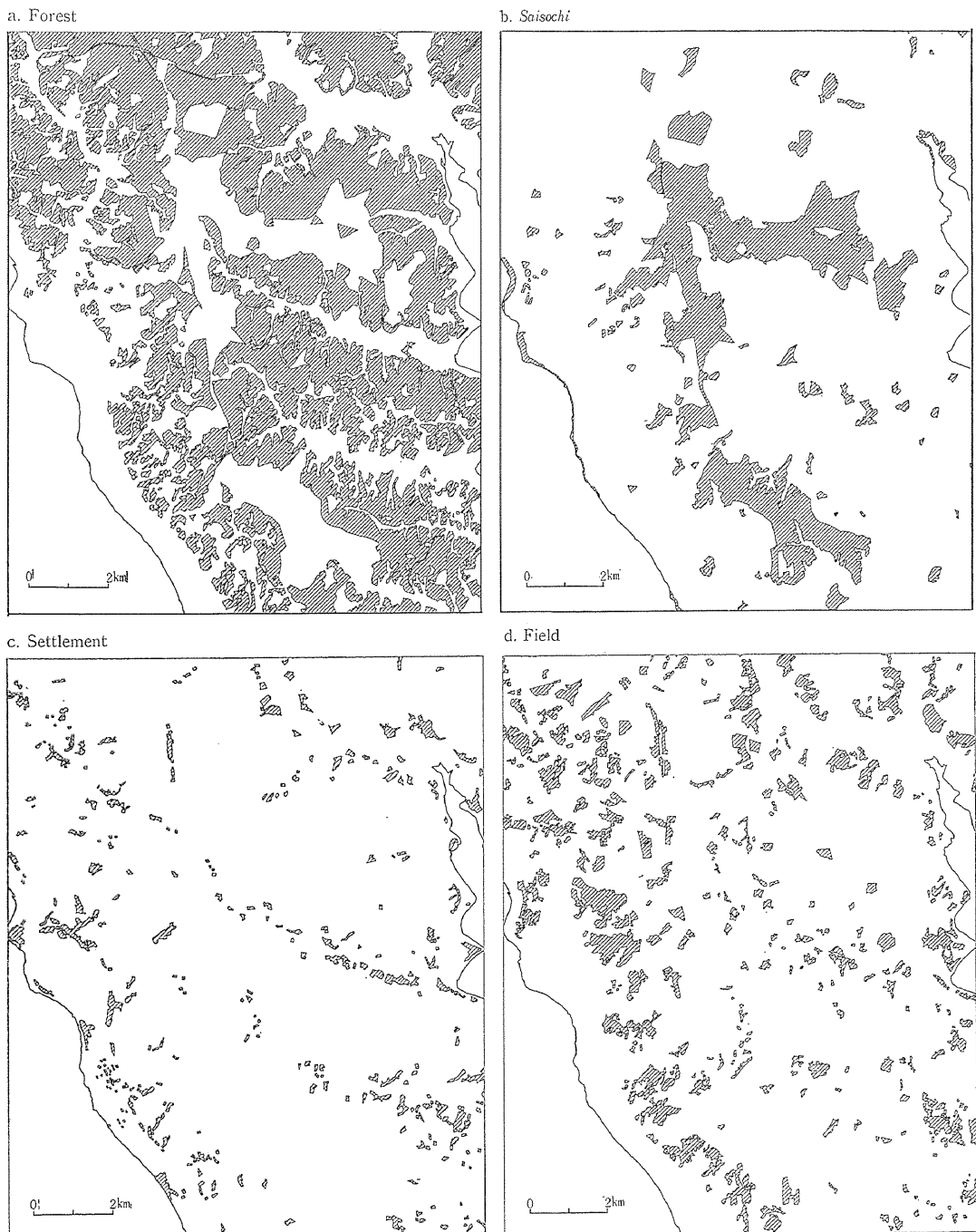


Fig. 1. Study Area.

## II. Land Use Changes of Namekata during the Meiji Period

### II-1. Land Use

The major characteristics of land use in the mid-Meiji period (c. 1875–1885) is the wide distribution of forested land and *saisochi* (grass gathering land). Forestland was distributed over the entire tableland (Fig. 2-a). Mixed broadleaf forests were numerous in the middle, while forests of Japanese red pine were



**Fig. 2.** Land Use in the mid-Meiji.

numerous in the surrounding areas, and in the region along the rivers. The forests of the Kanto region are in the border between the temperate and sub-tropical zones of Japan. In the past, beech trees and evergreen oak were found in mixed stands.<sup>5)</sup> However, for centuries they were used for timber and for slash-and-burn agriculture. As a result, such species retreated northward and southward. In their place,

deciduous trees such as Japanese oak flourished. These trees have long formed the mixed broadleaf forests which have characterized the Kanto region, and it can be surmized that the forests of the central portion of the tableland were of this type.

In contrast, the red pine has been planted. In the Kanto region, during the Edo period (1603–1867), afforestation of red pine for timber was vigorously undertaken in areas where transport, especially by water, was convenient. The Mito *han* (feudal clan), to which part of Namekata region belonged, actively encouraged red pine afforestation.<sup>6)</sup> Further, red pine forests were spontaneously generated in the course of successive fires and deforestation for timber. Eventually, they flourished in the areas surrounding the mixed broadleaf forests, that is, around valleys, which was the principal areas of economic activity.

The grass gathering sites comprised a large portion of the land in the central part of the tableland (Fig. 2-b). Materials for roof thatching, and dried and fresh grass for animal feed and compost were gathered here. In this case, the land was within 6 village boundaries and belonged communally to these villages. When this land was later enclosed for reclamation by outsiders, severe conflicts occurred between them. However, we have now no means of knowing the relationship of the right or the structure of this land. Small-scale *saisochi* were distributed along the borders of the tableland where afforestation had been undertaken, and along the river basin.

Settlements were found to the west of the present-day main road between Ishioka and Itako, along the edge of the tableland and along the Kajinashi River. To the east, they were distributed along the Tomoe, Takeda and Yamada rivers. Reflecting the difference in topography, these two groups of settlements present contrasting patterns (Fig. 2-c). The communities along the edge of the tableland were already in existence in the Heian period.<sup>7)</sup> These facts are supported by findings in shell mounds. Later, villages developed along the road at the foot of tableland. The settlements were cluster shaped. The largest community was Tamatsukuri, while communities such as Takasu, Hama, Funatsu, Arajuku, Gochoda developed along the lakeshore. But there were also exceptions. Typical among them was Tega Shinden, that formed a dispersed settlement. This village was settled in the late Edo period by people from Etchu (present-day Toyama prefecture).<sup>8)</sup> It is said that 13 households originally settled around 1803 and constructed the landscape of dispersed settlement, similar with that of their birthplace. Their numbers increased in the subsequent years, reaching 250 households in settlements such as Kozayama, Sairenji, and Odaka. The settlers from Etchu reclaimed land that had remained uncultivated by the local people, i.e., marshland on the coast of Lake Kasumigaura, and the dry tableland. It can be seen from the maps that other small, new settlements were established on the tableland among the old ones during the Edo era. These include Kariyado Shinden, Namekata Shinden, and others.

Most of the cultivated land consisted of low-lying paddies in the river basin and near the lake shore, and dry fields in the vicinity of the old settlements (Fig. 2-c). But there were also a few dry fields near the new settlements during the Edo period, indicating that development of the tableland was undertaken as small-scale endeavors. Although we cannot know the precise details of agriculture in this period, we can surmise from governmental documents of the late Meiji that the major crops were paddy rice, upland rice, wheat, and barley.<sup>9)</sup> These were combined with cultivation of beans and cereal crops such as corn, millet, and soy beans. Agriculture was of subsistence level.

## II-2. Land Reclamation

Following the abolition of the feudal system, particularly after the abrogation of the hereditary stipend system of *samurai* in 1876, reclamation of waste or grassland was begun in many parts of Japan as a means of providing livelihood for unemployed *samurai*. In 1875 a foreigner called Jones, who came

to Japan, in order to introduce Western agricultural methods wrote as follows, "One third of the eastern Kanto is wasteland, seen from a Western cultural viewpoint."<sup>10</sup> He urged the introduction of Western agricultural methods and commercial farming based on items like tea and sericulture. In Ibaraki prefecture, to which the investigation area belongs, several large-scale reclamation projects were undertaken. Representative among them were the Kaikongisha and Shunosha in Mito, the Hatonosha in Shimodate, Jugeisha in Tsuchiura, Tsudanojo in Inashiki, and Tsuchidanojo in Tsukuba. In the study area, a society called Konosha was established, primarily by *ex-samurai* of the Aso feudal clan.

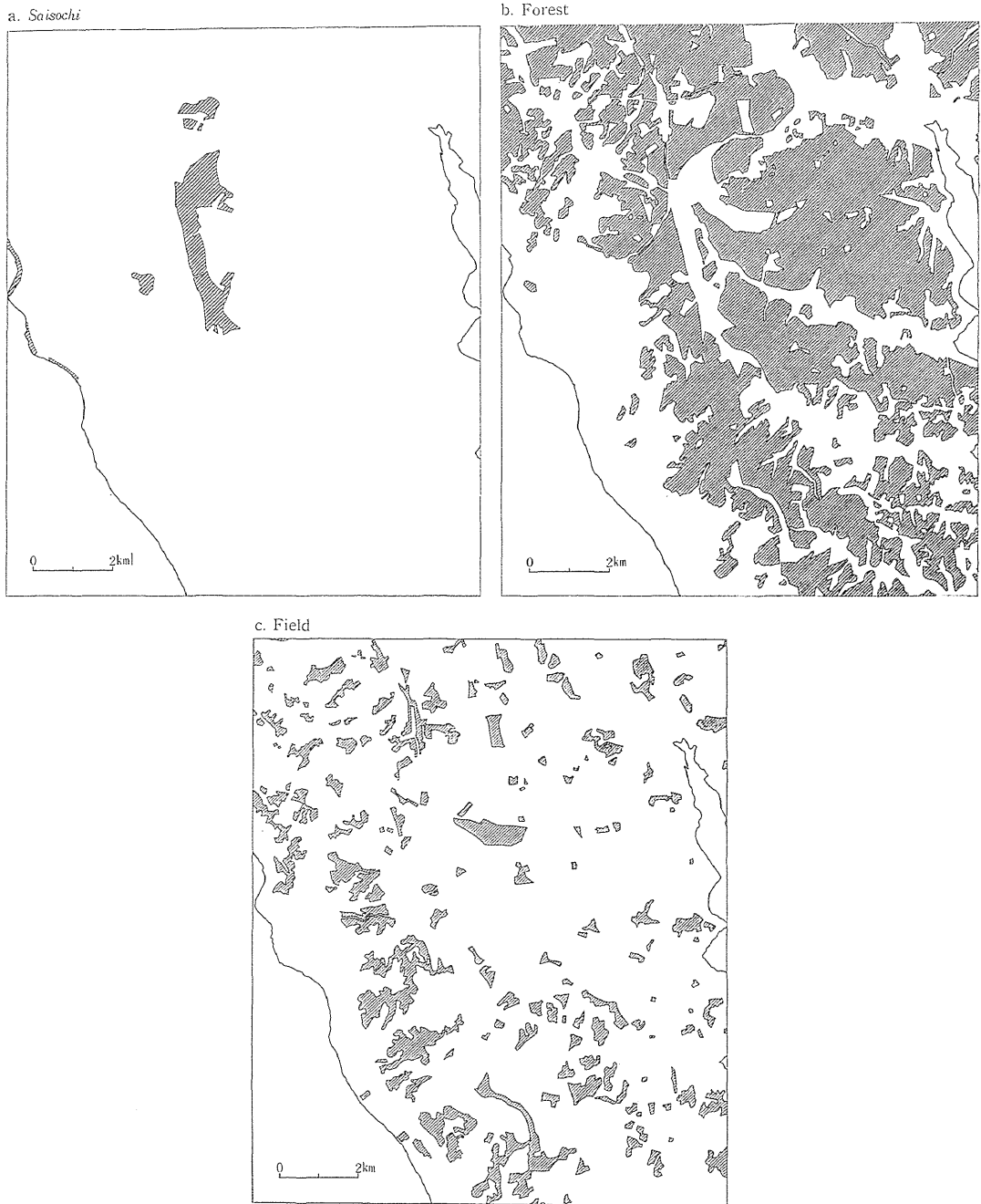
It is recorded in the Ibaraki prefectural documents that "The Konosha was established in 1880 (Meiji 13) by a group of interested persons of Namekata who were given 771 ha of land in Rokujuzuka."<sup>11</sup> In other words, they reclaimed waste or grassland in Namekata and established a large-scale farm, utilizing Western agricultural methods. At first, the land and assets were considered as the communal property of the people of Namekata, and people who were registered residents of Namekata could become stockholders of this society. The president was Miyoshi Takuma, a member of the old *samurai* class of Aso feudal clan. In 1883, according to the proceedings of this society, 5 ha of paddy land and 45 ha of dry fields were under direct management. Aside from rice, 5 ha of barley, 10 ha of wheat, 10 ha of oats, 5 ha of buckwheat and 15 ha of upland rice were in cultivation.

In addition, the society had 45 ha of rented land; 10 ha in barley, 10 ha in wheat, 5 ha in soy beans, 5 ha in buckwheat, and 15 ha in upland rice. Eight hired hands and members farmed the directly managed land. Seven draft horses were used. Further, attempts were made to introduce dairy farming and horse raising, but in both cases, the lack of skilled workers led to failures. Not only was the undertaking difficult from its inception, but there were internal disputes. Like many other reclamation societies for the employment of *ex-samurai*, the Konosha was neither able to attain stability nor to expand its operations.

In 1893 (Meiji 26), about 550 ha of land (paddy, dry field, and forest land) were transferred to stockholder ownership, according to respective stock holdings. The by-laws of the Konosha designated the period of operation as 35 years, starting in 1880. However, aside from strikes with local villagers concerning former communal rights, due to internal disputes and difficulties of operation, the Konosha disbanded in 1895. At the time of this writing, the headquarters of the society said to have been encircled by windbreak forests and embankments have long disappeared. Only a memorial stone remains, half buried among the grasses. A few descendants of the original members of the society still live in the neighboring areas, and we can see the grid-like pattern of broad fields. However, because of the harsh environmental conditions of this area in the past, many have emigrated elsewhere. Perhaps because of the unpleasantness of the internal disputes, little lore has been handed down concerning the Konosha.

Thus, in the Meiji period, the reform of land tax system and the determination of private or governmental ownership, as part of the reform of the civil code, were followed by the incorporation of many communal lands into the public domain. They were in turn lent out as a means of providing economic support for the *ex-samurai*. The establishment of the Konosha was such a case. In other instances, these properties were converted into practice grounds of the army, as seen in the Musashinogahara of this studying area. This land was released in 1908 to native villagers for farming. The changes in land use can be clearly seen by comparing the *jinsokuzu* of the mid-Meiji (1885) with the topographical map of the late Meiji (1903).

In late Meiji, in comparison to mid-Meiji, grasslands or wastelands had greatly decreased (Fig. 3-a). What remained was located around Ueyama, Enokimoto, and Musashinogahara to Nambara and north to Izumi. The *saisochi* (grassland) east of Musashino, the large-scale scrub land near Rokujuzuka where the Konosha headquarters had been located, and the small *saisochi* along the valleys had



**Fig. 3.** Land Use in the late-Meiji.

all been transformed into wooded land or dry fields (Fig. 3-b, c). Precise comparison is difficult, because the scales of the base maps differ, and since dry fields tend to be emphasized on the *jinsokuzu*. Nevertheless, it is clear that the forest areas and dry fields have increased. Generally, they are in the eastern

Table 1. Reclamation of Forest Land in Ibaraki.

Year	Number of Plots	Area (ha)
1903 (Meiji 36)	2,095	728.2
1904	2,028	732.5
1905	3,693	1,134.8
1906	5,711	1,927.5
1907	13,050	5,001.5
1908	13,384	4,827.5
1909	6,563	2,392.0
Total	46,524	16,744.0

Data: *Sangyo Chosasho*, 1911, p. 88.

and southern sections, and dry fields increased primarily in the southeast. On the other hand, along the shore of Lake Kasumigaura, the increase in paddy fields led to a corresponding decrease in forest land.

According to late Meiji government records of industries, and information obtained through interviews, vigorous efforts were made from about 1887 to introduce sericulture, and it in fact did become relatively widespread. However, unlike the western Kanto region, sericulture here failed to become a moving force for the cultivation of this tableland. On the maps, we find only a few traces of sericulture in the western part of the tableland.

The total area of forest land reclaimed throughout Ibaraki prefecture from 1903 to 1909 was approximately 16,744 ha (Table 1).<sup>12)</sup> However, an examination of reclaimed lands revealed the following facts. "The fertility of the reclaimed land was quite high. As a result, good crop yield could be obtained for about 5 years. The principal crops planted after reclamation were upland rice and barley. However, as the farmers lacked the capital to provide sufficient fertilizers, the land was gradually impoverished, and before the tax-exempt period of ten years were up, much of the land reverted to forest or scrub land." Thus, it seems that only 20 to 30% of the land was permanently cultivated. Reclamation of forest land enabled the landlord class to obtain rents from tenant, while the tenants themselves were able to profit, at least for a number of years, from a cultivation of naturally rich land. Reclamation and land use in this district were characterized by *kirikaebata* (a kind of shifting cultivation or *Wechselwirtschaft* with fields and forest) based upon the landlord tenant system.

### III. Development and Use of the Land since the Taisho Period

#### III-1. Land Use before the World War II

Generally speaking, the division of communal land into private individual holdings, or public ownership was completed by the late Meiji and early Taisho periods. The rate of reclamation had also declined considerably. However, after 1919 when the reclamation subsidy act, that would subsidize any reclamation of land over 5 ha, was put into effect, the area of reclaimed land in Japan began to increase again. Between 1933 and 1941, between 1,000–2,000 ha was reclaimed yearly in the Ibaraki prefecture (Table 2). In 1941, the farmland reclamation law also was put into effect, replacing the reclamation subsidy act, but in the face of the increasing pressures of war-time organization, it failed to live up to its promises. Land reclamation subsidy projects were being undertaken around this region in 1942 in 21 districts with a total area of approximately 344 ha.

In this connection we should note that in Ibaraki prefecture, nearly all the reclamation took place in *heichirin* (flat forest land). The total area of land reclaimed since the Meiji period amounts to 70,000–

Table 2. Farmland Expansion and Reclamation in Ibaraki.

Year	Increase of Field Area (ha)	Reclamation Area (ha)
1924		422.5
1925		
1926	838.2	461.8
1927	578.3	435.8
1928		
1929		
1930	833.7	518.4
1931		
1932	949.8	644.8
1933	1,514.1	1,151.1
1934	1,717.0	1,417.0
1935	1,632.1	1,273.3
1936	2,547.9	2,007.0
1937	1,961.5	1,640.3
1938	1,960.5	1,487.4
1939	2,383.0	1,603.9
1940	2,135.0	1,793.1
1941	2,349.0	2,144.7
1942	1,306.0	874.4
1943	416.7	213.2
1944	307.6	260.3
1945	180.4	168.5

Editorial Committee on a History of Ten Years of Reclamation in Ibaraki (1955): A History of Ten Years of Reclamation in Ibaraki.

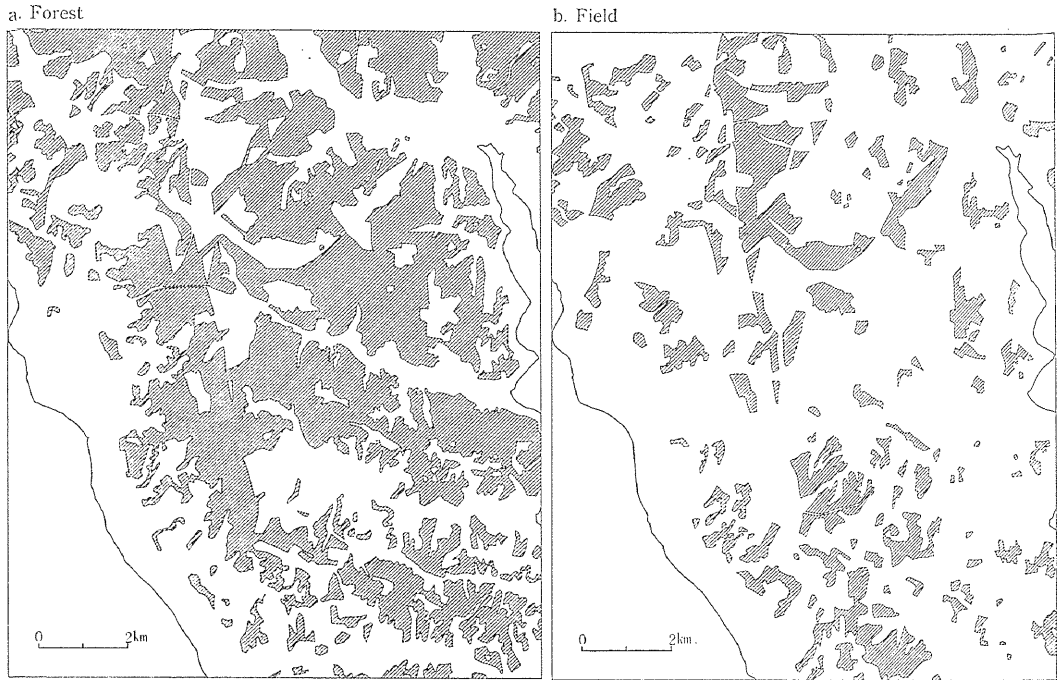
80,000 ha.<sup>13)</sup> Nevertheless, the total forested area itself did not change so much. This suggests that while a considerable area of forest land was put under cultivation, a fair amount of cultivated land was also reverting to forest. The total area of cultivated fields which reverted to forest in the period 1926–1945, though fluctuating by period, seemed to average 49%. One large cause for it was the existence of *kirikaebata* (alternating land use system with forest land and field), which was not so common in Japan.

We should next inquire why this *kirikaebata* system was practised in this district. Many reasons seem plausible. Apart from the advantages to the land owner and the tenant, mentioned above, the gentle slope of the tableland proper and the valleys were opposite, which made the land topographically unsuited for irrigation. Further, soil conditions made cultivation difficult. This inevitably made productivity low. This can also be raised as a reason. The soil on the tableland is acid and its structure is too fine for cultivation. Another major reason is the significance of forest land as a source of fuel and of dried leaves for compost. In this region each farmhouse maintained one or two horses, not for cultivating, but for transporting trees and leaves and as a source of organic fertilizer.

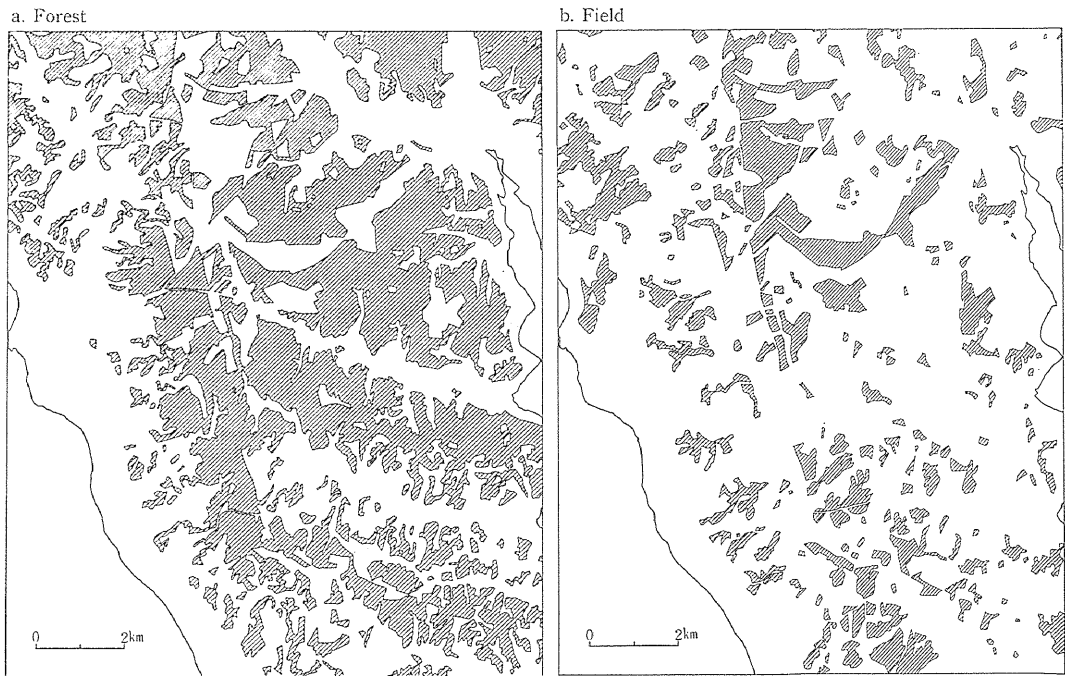
Whatever the reasons for its existence, the characteristic form of *kirikaebata* can be clearly observed by comparing the topographical maps of 1903, 1929 and 1952 (Fig. 3-b, c, Fig. 4-a, b, Fig. 5-a, b). It can be seen also that dry fields increased in the central tableland between the late Meiji and the beginning of the Showa periods. Between 1929 and 1952, there were no large changes. Although there were minor changes in the configuration, as already mentioned, the fundamental pattern remained unaltered.

A similar chronological process of change can be observed for the forest land. In contrast to the





**Fig. 4.** Land Use in the early-Showa.



**Fig. 5.** Land Use around 1952.

fields, the amount of forest land in the center of the tableland decreased considerably from late Meiji to early Showa, but in the western part, the forest land spread toward the lake. From the early Showa, little change can be observed. As for settlements, there were in fact some development of scattered farms

on the tableland, but in part because of map scale, they are not clearly observed. Sericulture began to be practised rather widely on the tableland, but this, too, is not shown on the map. On the tableland, the agricultural operation which combined the cultivation of upland rice, wheat, soy bean, sweet potato, and a variety of cereals, included sericulture and sesame cultivation for commercial purposes. In particular, upland rice and soy beans took the place of paddy rice as payment items for rents, and thus they were of major importance.

### III-2. *Development of the Land in the post-World War II Period*

Land reclamation in the post-World War II period was undertaken as an emergency measure of government to provide work and food for the people, particularly for repatriates, and to provide farm land under the agrarian reform. About 18,140 ha of land was released in the Ibaraki prefecture, between 1946 and 1965, benefitting 5,360 new settler household (repatriates) and 26,769 small farmers who sought to increase their holdings (Table 3). About 750 new settler households soon abandoned the farming. At least 60% of the redistributed land had been privately owned. The rest had been held by governmental land previously used for military purposes. The results of this project were smaller than the planned one, for it was especially difficult to acquire private forest land. It is known that in south Ibaraki, the movement to liberate unreclaimed forest land often resulted in bitter struggles. Much of the acquisition and redistribution of land was completed by 1950. After 1951, emphasis was placed on small-scale reclamation which gave preference to local inhabitants, while after 1953, large-scale land reclamation by drainage was emphasized.

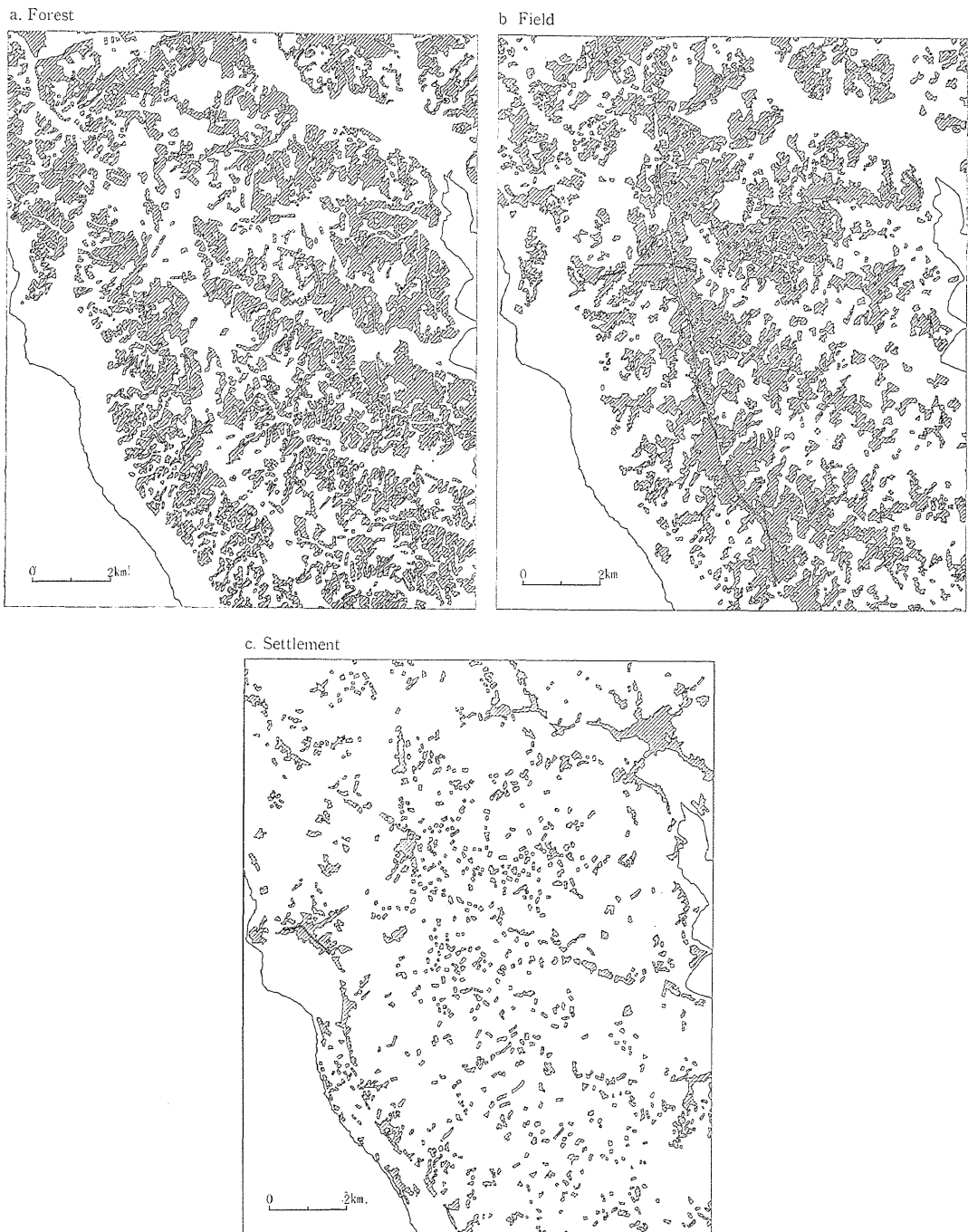
In the study area, 21 sections of land were selected for reclamation, and approximately 540 households settled there. The major reclaimed lands were located in Musashinogahara in Tamatsukuri machi, Takeda in Kitaura mura, and Odaka in Aso machi.

Thus, in the form of the post-war reclamation, development of the tableland proceeded at a swift pace. In both Namekata and Kashima which include the investigation area, the total area of cultivated dry fields increased by 3,300 ha between 1955 and 1968. An examination of present-day land use shows clearly the development of the tablelands (Fig. 6-a, b, c). Dry fields and dispersed settlements increased conspicuously. In contrast, the forest lands are found primarily on the gentle slopes along the valleys. Slowly they are being nibbled away. The encroachment into the forest lands seems to have been brought by the reclamation efforts of new independent farmers and by the diminishing function of the forest lands in the post-war period. It has been mentioned above that the *heichirin* (flat forest land) fulfilled

Table 3. Post-war Reclamation Area, Ibaraki.

Year	Private Land (ha)	Military Park (ha)	National Forest (ha)	Other National Land (ha)	Total
1946-59	10,780	5,225	1,621	286	17,912
1960	24				24
1961	14			8	22
1962	81				81
1963	58			3	61
1964	12				12
1965	3		25		28
Total	10,972	5,225	1,646	297	18,140

Editorial Committee in Celebration of 20th Anniversary of Reclamation in Ibaraki (1967): 20 Years of Reclamation in Ibaraki.



**Fig. 6.** Present Land Use.

vital functions in the agricultural operations and in the life of the farm household. However, with the development of chemical fertilizers and the introduction of new forms of fuels in the post-war period, the value of forest lands diminished rapidly in importance. Moreover, because the use of forest lands

is not so strictly controlled by administrative office as paddy and dry fields, and because each parcel is relatively large, extensive areas have been converted to urban land use in recent years. In the district under investigation, there are fairly large golf courses, housing developments, and industrial parks. The changes are particularly noticeable, when we compare Figure 6 with Figure 2 in the mid-Meiji, as the scale of base map for these figures is similar.

Each of the reclaimed fields, including those of the post-war period, is rather large. Their boundaries often form rectangular patterns. Nevertheless, conditions for agricultural operations were still difficult even in the post-war period. The lack of water during the summer often caused drought conditions. In the post-war period, supported by a government policy to increase food production, major pre-war crops such as upland rice and soy beans, vulnerable to droughts and insect blights, were replaced by sweet potato. Peanuts and tobacco have also been introduced, and they came to characterize this district. Even after the food supply became stabilized, sweet potato continued to be produced. However, the sweet potato variety was changed to that suited to the manufacture of starch. Further, it is well known that hog farming has developed in this region, utilizing sweet potato and starch as feed sources.

From the mid-1960's, since the irrigation system was improved in this region, and since the vegetable cultivation areas around Tokyo was dispersed due to urbanization, various crops, especially vegetables, came to be cultivated on large scale. Not only tobacco and strawberries, but also summer vegetables like melons, tomatoes, cucumbers, carrots, egg plants, and winter vegetables such as trefoil, chinese cabbage, and burdock are widely cultivated.

Let us now examine Midorigaoka of the Musashinogahara reclamation districts as an example



**Fig. 7.** Land Use of Midorigaoka Reclamation District.

of post-war reclamation and land use (Fig. 7). The land in this district was traditionally held in common, but in the early Meiji it became governmental land (military practise ground) and in the early Taisho period it was parcelled out as private holdings. Settlement began in August 1947, and continued until 1950. Settlers were made up by local inhabitants, and repatriates from Manchuria (originally from Yamanashi and Nagano prefectures). The original number of settler households in the Musashinogahara reclamation area was approximately 140, and within Midorigaoka 13. Settlers were provided with 1.5 ha plots for cultivation and 0.5 ha for secondary use (0.1 ha for residence, and 0.4 ha for grass gathering). These plots were laid out in a regular pattern. They provide a great contrast to the small, non-geometric divisions from the middle to the right side of Figure 7. The latter was the land given to small farmers in the neighborhood. When settlement began, most of the land was covered by red pine and mixed broadleaf forests. It is said that some portions had been cultivated by the military, but even that land was covered by turf and bamboo grass. Thus, reclamation was a strenuous activity. The process involved clearing 1 are of forest per day, burning the underbush and stumps after a week, and finally preparing the soil for cultivation.

Upland rice was planted in the newly reclaimed land as a summer crop, and wheat and rapeseed as winter crops. Around 1953, a type of sweet potato used for the manufacture of starch was introduced. This was followed by the introduction of peanuts. Wheat was cultivated as a secondary crop, but many farmers sought seasonal labour in the cities during the winter months.

Hog farming was vigorously promoted after 1960, and vegetable cultivation began to flourish after 1965. In recent years, urban developments have become pronounced in the district. Of the 13 households, only 3 are still engaged in agriculture, practicing sericulture, dairying and gardening, as their primary sources of livelihood. In the remaining households, the heads of the family commute to office jobs, have side jobs, or manage apartments. There are some automobile repair shops in the district, and except for one, they are operated by second or third son of those households. Thus, a system of land use entirely different from that of the past has appeared in recent years.

#### IV. Summary

In this study, the processes of land use changes in the Namekata area of southeast Ibaraki prefecture have been examined from the mid-Meiji period to the present. Namekata is an area representative of eastern Kanto, consisting mainly of diluvial tablelands. The intensification of use of this tablelands has been sought for a long time.

By mid-Meiji, settlements were mostly found on the foot of the tableland and along some small rivers. The edges of the tableland were comprised by red pine forests, and the center by mixed broadleaf forest and communal grasslands.

Beginning in 1880, a reclamation society, whose members were made up primarily by former *samuraï* of the Aso feudal clan, was organized as part of an endeavor to find employment for them. The formerly communal grasslands were provided to this society. Unfortunately, the venture could not be called a success. The society was disbanded in 1895. Nevertheless, it had a significant effect on the development of the tableland.

In the Taisho period, reclamation projects declined in number until 1919, when the reclamation subsidy act was put into effect. However, an alternating land use system with forest land and farmland took place, and the permanent development of forest land was limited. The limitations imposed by nature, including the unsuitability of climate, relief, and soils to agriculture, were believed to be influencing agents. However, we must also consider the strong influence of the tenancy system and the importance in the lives of the farm household that forested land played as a source of compost and fuel.

Until recently, farming remained at the subsistence level.

In the post-World War II period, new developments, stimulated by emergency reclamation measures and farmland reform, were undertaken in earnest. An examination of present-day land use reveals the striking expansion of dry fields, the growth of settlements on the tableland and the decrease of forest land. Reasons for these characteristics are the efforts of new landed farmers to reclaim land and the decline in the traditional function of forest land, due to the growth of technology.

In this period, crops like sweet potato and peanuts, relatively resistant to drought and insect blight, were actively sought. Nevertheless, productivity was low even in the post-war period. However, since about 1960 land conditions have been greatly improved, and vegetable cultivation has increased in this region.

The region is now in the process of transforming into a major agricultural area. At the same time, secondary employments by the farmers, construction of golf courses and factories, are other noticeable factors in recent developments.

#### Acknowledgement

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#### Notes

- 1) According to T. Tateishi, the definition of *heichirin* differs by regions. Generally speaking, however, they are forest land at low altitude (below 100–200 m) of gentle slopes (less than 15°). Wide distribution of *heichirin* is a characteristic feature of eastern Kanto area.
- T. Tateishi (1972): The Distribution of *Heichirin* and its Use in Kanto, *Chiri Shiso* (Nihon Daigaku), **23**, 10–26.
- 2) Sh. Yamamoto and others (1976): The Change of the Tsukuba Academic New Town and its Environs, *Environmental Studies in Tsukuba*, **1**, 88–102.
- 3) In Japanese, *jinsoku* means quickness, and *zu* map. These were the first modern topographical maps of Japan, produced by a national project. This project was interrupted during the execution stage, and maps were completed only for part of Kanto district.
- 4) In this report, the author often uses the Japanese chronological sequences. The name of era, which is often used, is Edo, Meiji, Taisho, and Showa. Each period corresponds to the following years in the Christian era. Edo era, 1603–1867; Meiji, 1868–1912; Taisho, 1912–1926; and Showa, 1926–present.
- 5) M. Yoshino (1968): Distribution of Evergreen Broadleaved Forests in Kanto District, Japan. *Geographical Review*, **41**, 674–692.
- 6) Ibaraki Univ. (1953); *Ibarakiken Kyodo Kenkyu* (Studies on Ibaraki Prefecture) p. 219.
- 7) The Heian period corresponds to the years A.D. 794–1192.
- 8) During the Edo period, Etchu suffered from overpopulation, because the Buddhist sect, *Jodoshinshu*, which most people in this district believed, did not approve the family regulation of that time. And so, a fair amount of people emigrated from this region to Kanto or Tohoku, where there was still large unreclaimed land, though in feudal days it was prohibited.
- S. Takeuchi (1962): Emigration of Farmers in Hokuriku to Kanto and Tohoku, 36–51.
- 9) Society for the Research on the Agricultural History in Ibaraki (1963): The History of Agriculture in Ibaraki, **1**, p. 397.
- 10) Before the Meiji period, the commercial agriculture in dry fields was not so common. The tableland or the slope of mountain were used rather extensively for subsistence agriculture and livelihood.

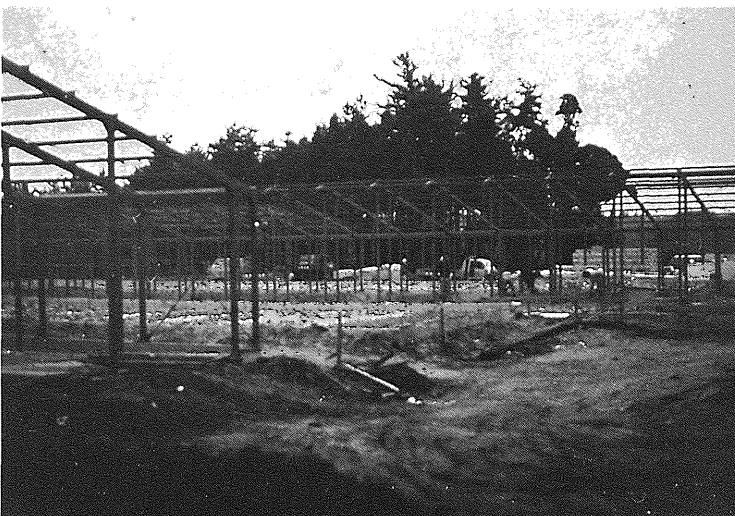
- 11) Ibaraki Ken (1969): Historical Documents on Modern Industry in Ibaraki I, p. 299.
- 12) This figure is too large in comparison to that of the later years. When reclamation was reported, the cultivator would occasionally fill a report for an entire parcel or land when in fact only part had been reclaimed. It is ought that this led to a greatly inflated figure.
- 13) According to T. Kimura, the total area of land reclaimed between 1903 (Meiji 36) and 1954 (Showa 29) is calculated at 71,530 ha. My own calculations yielded the figure of 77,000 ha for the period 1903–1965. These data are not entirely reliable, but the figure gives some indication of the size of reclaimed land.  
T. Kimura (1970): Studies on Forestry in Kanto, *Reports of Forestry Experiment Station of Ibaraki 4*.



**Photo 1.** The headquarters of Kōnosha, the reclamation society in the Meiji period, which contributed to the development of this region, were located here. Now only a monument half buried among the grasses remains.



**Photo 2.** Each parcel of reclaimed land is rather large and whose boundaries form often rectangular pattern. The photo shows the harvest of sweet potato. Sweet potato is invulnerable to drought and has been for a long time a representative crop of this region.



**Photo 3.** In this region the hog farming has developed, at first utilizing sweet potato and starch as feed source. The photo shows a modern pigsty under construction in the reclamation land of *heichirin* (flat forest land).





**Photo 4.** From the mid-1960's vegetables come to be cultivated immensely in this region, partly because the cultivation region of them around Tokyo decentralized. The photo shows the cultivation of strawberries in a greenhouse.



**Photo 5.** The former moist land on the shore of Lake Kasumigaura is converted today to paddy rice field and raising pond of carps by the construction of firm bank. The photo shows landscape of carp raising in Tega Shinden.



**Photo 6.** The photo shows a typical farm house on the diluvial tableland of this region. At the right hand man can see the drying house of tobacco. It has been one of important commercial crops of this region, because the tobacco production in Japan is government monopoly and the price is guaranteed.