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# Horses in Early Modern Japan: Livestock Usage in Asaka and Katsushika Counties

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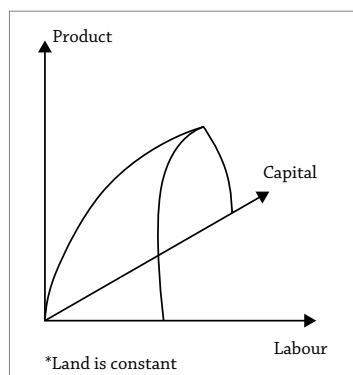


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## Background

Akira Hayami (2016) pointed out that in early modern Japanese agriculture, the relationship between factors of production shifted from the use of livestock (capital) to human labour (figure 1, table 1). He based this on his observation that the number of cattle and horses in Owari Province decreased in contrast to the increase in the local population. This is often referred to as ‘Hayami’s Industrious Revolution’.<sup>1</sup> This means that people chose to practice intensive farming to increase productivity on small areas of arable land using their own labour instead of relying on livestock.



**Figure 1**  
Production Function

- 1 See de Vries (2008). In de Vries’, the meaning of industrious revolution is different from Hayami’s.

Murayama, S., Ž. Lazarević, and A. Panjek, eds. 2024. *Changing Living Spaces: Subsistence and Sustenance in Eurasian Economies from Early Modern Times to the Present*. Koper: University of Primorska Press.

**Table 1** Number of Households, Population, Cattle, and Horses in Owari Province

	Around 1661-73	Around 1790-1820	Rate of change (%)
Number of households	47,822	79,254	+65.7
Population	265,522	331,678	+24.9
Number of cattle and horses	12,986	4,200	-67.7

Source: Adapted from Hayami (2003, 296).

However, Osamu Saito (2004) has already questioned Hayami's reasoning. Saito doubts that the observations from Owari Province can be generalised to the rest of Japan, explaining that the use of horses in agriculture was originally for horse manure rather than tillage. However, only regional studies were conducted on whether the number of livestock increased or decreased in each region and what farmers used them for.

This paper examines whether or not the number of livestock actually decreased over time, and uses available historical documents to show how they were used.

### Setting, Data Sources

The regions mainly concerned in this paper are three agricultural villages (Shimomoriya, Komaya, and Hidenoyama) in Asaka County of Nihonmatsu Domain and villages near Koganemaki, a horse ranch run by the shogunate in Katsushika County in eastern Japan (figure 2).

In Asaka County, 41 villages were divided into three groups, namely Kōriyama-gumi (13 villages), Katahira-gumi (11 villages), and Ōtsuki-gumi (17 villages). Shimomoriya and Komaya belonged to the Ōtsuki-gumi, and Hidenoyama to the Kōriyama-gumi.

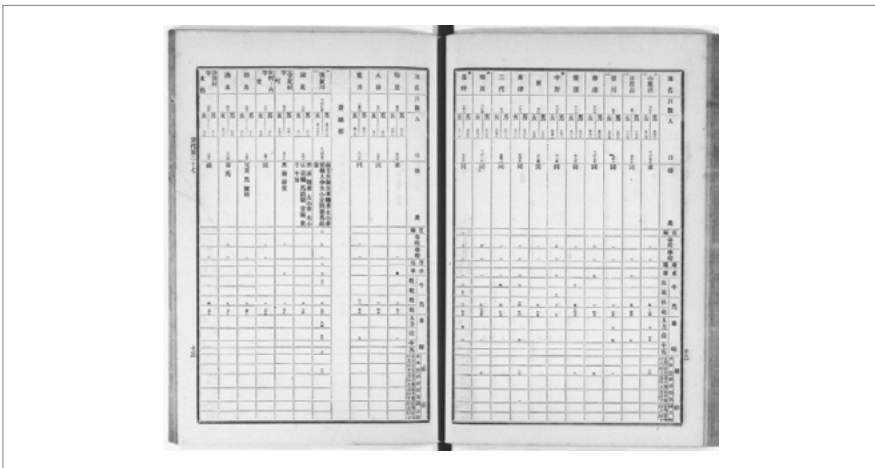
Koganemaki was located in the suburbs of Edo (now Tokyo), where the Shogun lived during the Edo period.

In early modern Japan, the Nihonmatsu Domain was known for its horse production, and many households in agricultural villages raised horses. To what extent did farmers benefit from this development? How was the number of horses raised by each household determined? Based on the *Ninbetsu-aratame-cho* (NAC), a basic source for historical demography, trends in village population and the number of horses raised in each village from the eighteenth to the nineteenth century are determined.

The observations on the distribution of cattle and horses in Japan are based on the *Kyōbuseihyō*, compiled in 1880 at the beginning of the modern era (figure 3). This is a record of military statistics compiled by the



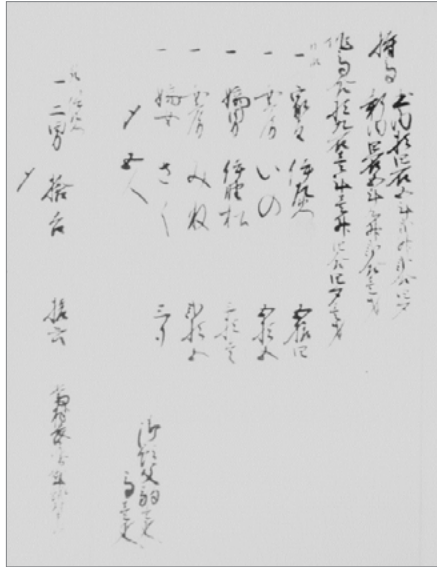
**Figure 2** Regions Studied



**Figure 3** *Kyobuseihyo* (1880a; 1880b)

General Staff Office of the Imperial Japanese Army. It contains county- and village-specific statistics on population, produce, schools, vehicles, and ships, and therefore provides useful information on the distribution of cattle and horses.

Village-specific changes in population and in the number of cattle and horses in the early modern period were determined using the NAC (figure 4). The NAC was essentially compiled each year, recording for each unit



**Figure 4**  
KCHM, *Ninbetsu-aratame-chō*  
of Shimomoriya (1833)



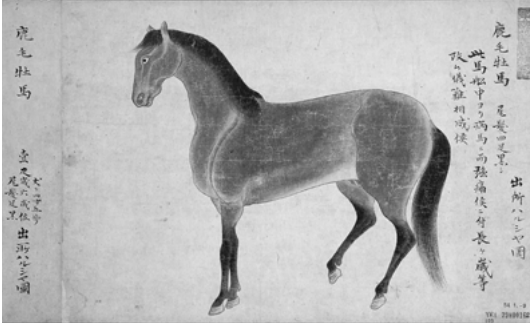
**Figure 5**  
Horse-shaped *Haniwa* Clay Figure  
(Sixth Century) (ColBase)

(presumably a household unit) the head of household and its members, as well as their age and relationship to the head. Although records are missing for some individual years, the records used for Shimomoriya cover the years 1708–1869, for Komaya 1692–1855, and for Hidenoyama 1697–1870. In the figure, the page begins with the amount produced on owned rice paddies and crop fields (*mochidaka*) and the amount produced on cultivated land (*sakudaka*). The writing marked with a box refers to horses.

This paper examines a document (petition) from Katsushika County sent to the authorities by the village of Hananoi in 1724.

### Brief History of Horses in Japan

It is believed that cattle were first domesticated in Japan in the third century and horses in the fourth century (Ichikawa 1981). From the fifth to the sixth century, horse breeding became a widespread practice, as evidenced by the excavation of horse-shaped *haniwa* clay figurines (figure 5). In the seventh century, military use of horses became important, and horses were managed by the *Hyōbu-shō*, the Ministry of War. According to the *Nihonshoki*, many pastures were established in 668. The *Shokunihongi*



**Figure 6**  
NDLDC, *Ikoku sanba zukan*

contains records of the establishment of ranches throughout Japan in 700 for grazing livestock and horses, and the establishment of state-run ranches in 23 countries, including Ise and Settsu in 707 (Keizaisasshisha 1897, 481; Ōmiya and Munemichi 1892a 12; 1892b, 24). In the Nara period (710–794), a new bureaucratic post for the management of horses, the *Meryō*, was established under the *Hyōbu-shō*. In the Heian period (794–1185), *Chokushimaki* ranches were established separately from the state-run ranches to raise horses to be offered to the emperor. They were located in Shinano, Kōzuke, and Musashi provinces, where there were vast estates. The Kamakura period (1186–1333) was a time when the samurai ruled, and in the provincial wars that followed, horses were raised mainly for military use.

When the Warring States period ended and the Edo period (1603–1867) began, the use of horses also became important for peaceful purposes. Samurai raised horses as a symbol of their social status, but sometimes owning good horses could be a financial burden.

In the Edo period, one of the most important uses of horses was to transport baggage and people from one post town to another. In the early modern period, *daimyō* (feudal lords) made a round trip from their territory to Edo every two years as part of the ‘*Sankinkōtai*’ system. Therefore, many people and goods were transported via the main roads. The Tokugawa shogunate required people living along the main roads to keep horses. This was a burden not only on the post towns, but also on the residents of neighbouring villages, who were forced to keep horses to support the post towns.

In the early modern period, it was difficult for Japanese horses (native horses) to pull heavy ploughs because they were small, with a height of only about 130 cm. However, even in the early modern period,

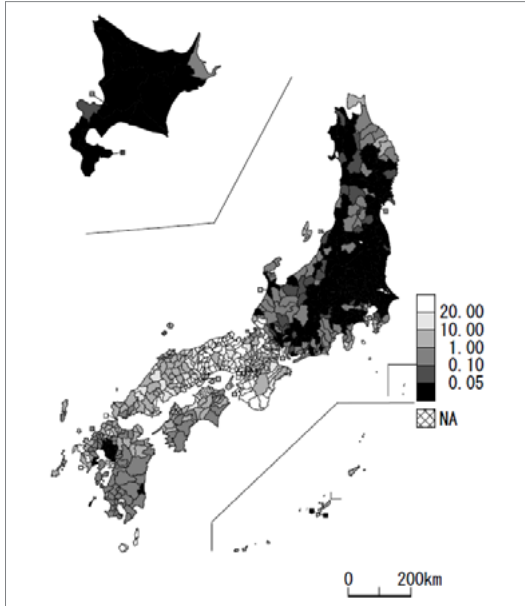


**Figure 7**  
*Aguranabe* (Kanagaki  
 1871-1872, 6-7)

Yoshimune Tokugawa (1684-1751), the eighth shogun of the Tokugawa shogunate, was interested in horse breeding and therefore not only imported Western horses (Persian horses, figure 6), but also invited the horseman Hans Jurgen Keiserling from the Netherlands to train the horses in Western horsemanship. Keiserling first demonstrated his horsemanship at the Edo Palace a year after his arrival in Japan in Kyōho 10 (1725). He occasionally came to Japan to teach horsemanship and knowledge to Matazaemon Tomita and other *umayaku* (horse trainers in samurai households) officials.<sup>2</sup> However, it was not until after the Meiji period (1868-1912) that horse breeding was practised at full scale and Western horses became mainstream.

With developments in horse breeding and changes in agricultural practices, including the shift to dry rice fields, horses became widely used in agriculture in the Meiji period. In addition, the relationship between horses and people changed in the Meiji period with the introduction of European and American culture and technologies. Such trends are depicted in the 1871-72 satire *Aguranabe* by Robun Kanagaki (figure 7). Wealthy-looking cattle are depicted in Western clothing. In the Meiji period, they gradually gained a kind of respect among people. Until then, cattle had been used mainly for carrying loads, but now they were brought to the dinner table as *gyū-nabe* (a dish of beef cooked in a hot pot at the table). The horse is drawn as a rickshaw man. Given the narrow and hilly roads in Japan, horses were not used to pull vehicles. However,

<sup>2</sup> NAJ, *Norikata-kikigaki*.



**Figure 8**  
Distribution  
of Horses and Cattle  
in 1880 (Cattle / Horses)  
(by Miyuki Takahashi,  
Data Source: *Kyōbuseihyō*  
(1880a; 1880b))

in the Meiji period, horse-drawn carriages were imported from overseas, so horses, which traditionally carried loads on their backs, now pulled carriages.

A consideration of the distribution of cattle and horses in 1880 shows that horses were found mainly in the eastern regions of Japan and cattle in the western regions (figure 8). The distribution of ‘eastern horses and western cattle’ was already mentioned in the *Kokugyūjūzu* written by Kawahigashi Bokudoneinonaomaro in 1310.

There are three possible reasons for this distribution: (1) in the eighth century, the government in the Kinai region took the initiative to create pastures, but much of western Japan had already been developed and eastern Japan was selected for extensive pastures; (2) plough cultivation became popular in western Japan, so cattle were used there, while in eastern Japan, where plough cultivation was not as developed and the rice planting season was longer, horses were used because of their flexibility, and (3) in colder regions, it was important to collect horse manure, which was warmer than cattle manure.<sup>3</sup>

3 Details can be found in Ichikawa (2010).

## Peasants and Horses (I): The Case of Asaka County in Nihonmatsu Domain

In the Nihonmatsu Domain, located in the northeastern part of Japan around the Nakadōri area in Fukushima Prefecture, horse breeding was an important industry. Therefore, the domain government encouraged its residents to raise horses, which was one of the few businesses that succeeded in this domain. The domain government appointed two officers to manage the horses, who were called *komabugyō*. The *komabugyō* took care of affairs in each district, assisted by local staff (*komatsuki*). The domain conducted a district-wide survey (*uma-aratame*) every year. Some of the high-quality horses raised in the Nihonmatsu Domain were purchased by samurai; not only the lord of Nihonmatsu Domain but Tokugawa shogun bought them, and sometimes they were taken to the ranch of Koganemaki. Other horses were used to transport passengers and loads between villages and towns, especially on the highway from post town to post town. The Tokugawa shogunate required each post town to maintain a certain number of couriers and horses at all times. Neighbouring farming villages shared the burden (*sukegō* system); therefore, horses were raised in every village and household.

This leads us to ask three questions:

1. Did horse production create income for farmers?
2. What determined the number of horses kept in each village or household?
3. What kind of household was involved in horse production?

Some benefits of producing or using horses would be: (1) carrying loads (both for personal use and for revenue from customers); (2) horse manure (both for personal use and for sale); (3) selling horses in the market; and (4) horse oil, meat, and leather.

Sales at the market were handled by bids. The average price for a horse was about one *ryō*,<sup>4</sup> but high-quality horses sometimes sold for 5.5 *ryō* (Nukazawa 2010). It is assumed that 10 *ryō* would be enough to support the livelihood of one individual for a year. So, if one could raise a good horse, one could make enormous profits.

Next, the author explores the question of what determined the number of horses to be raised. The table shows the number of horses raised in the Nihonmatsu Domain in 1857. We can see that of the three *kumi* of the

4 Units of the monetary system in Japan during the Edo period.

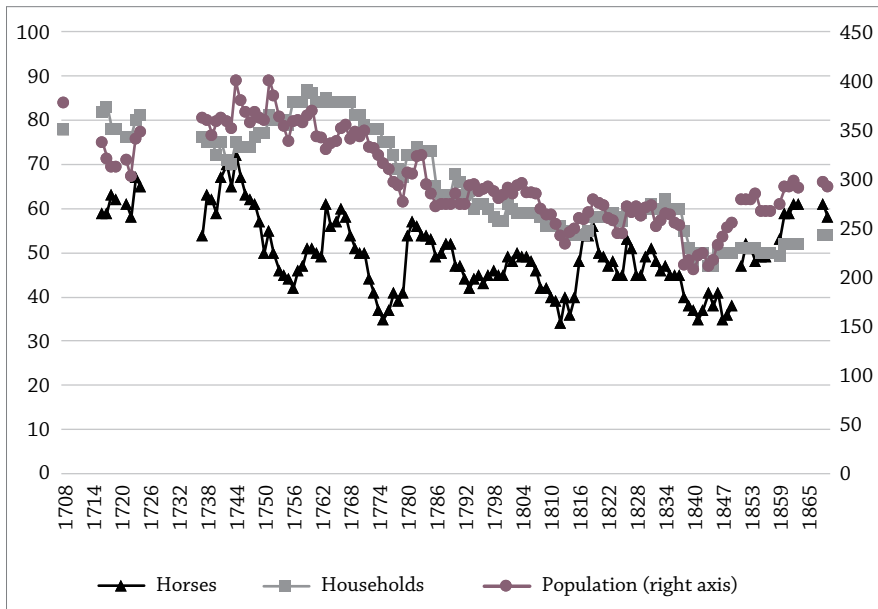
**Table 2** Number of Horses in Nihonmatsu Domain in 1857

County	Group	Horses used to carry goods	Stallions (borrowed)	Horses used to carry goods (leased)	Horses to ride (owned)	Total
Adachi	Shibukawa	127	19	2	110	258
	Harimichi	481	48	54	5	588
	Obama	180	26	15	32	253
	Sugita	135	11	-	-	146
	Tamai	427	4	1	-	432
	Motomiya	588	11	37	7	643
	Nukazawa	311	46	47	-	404
Asaka	Kōriyama	771	7	1	-	779
	Katahira	541	23	72	-	636
	Ôtsuki	883	26	25	-	934

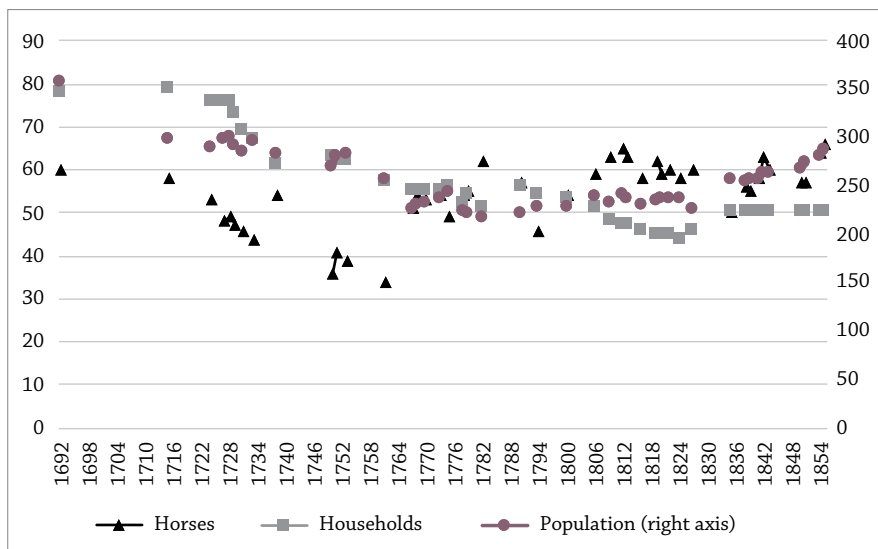
Source Adapted from Nukazawa (2010, 81).

Asaka County, the Ôtsuki-gumi raised the most horses, followed by the Kōriyama-gumi. Using the NAC, we can confirm the change in the number of horses raised and the population in Shimomoriya and Komaya of the Ôtsuki-gumi, and Hidenoyama of the Kōriyama-gumi.

At the beginning of the period, no clear relationship was observed between the development of the human and horse populations in



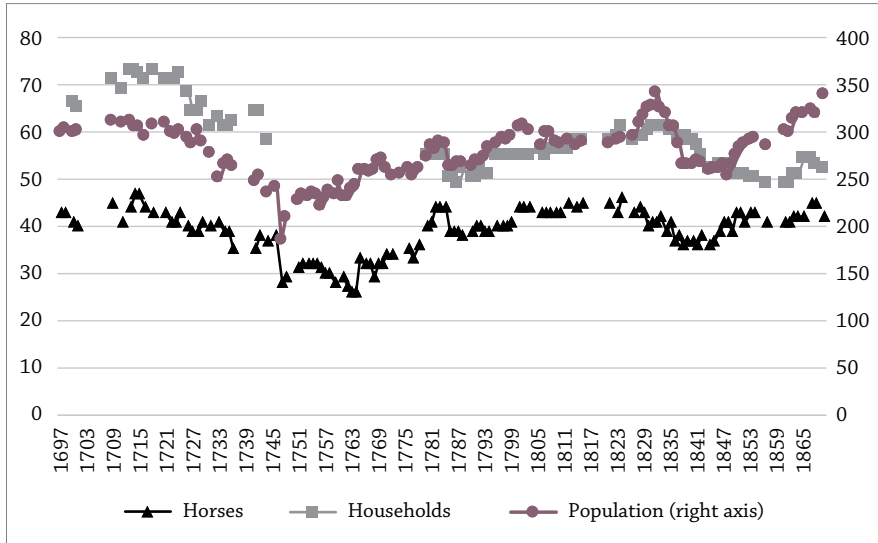
**Figure 9** Population, Households, and Number of Horses (Shimomoriya)



**Figure 10** Population, Households, and Number of Horses (Komaya)

Shimomoriya. However, from about 1760, the number of horses raised began to decline. This is followed, with a slight time lag, by a decline in the human population and the number of households (figure 9). It is likely that when economic difficulties arose, people first sold their horses and households that were not viable were dissolved. The number of horses per household was less than one during most of the observed period, but toward the end the number of horses exceeded the number of households.

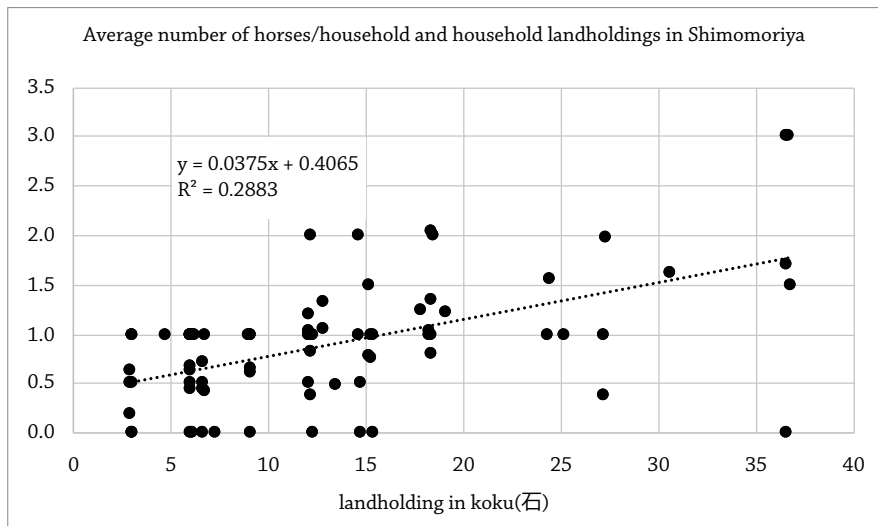
Sources for Komaya are lacking for many individual years. Therefore, it is difficult to understand the relationship between the number of horses and the number of households in a given period. However, from 1800 and beyond, the number of horses exceeded the number of households, and the number of horses per household was more than two. This indicates that horse production gradually became a common practice in the second half of the early modern period (figure 10). This increase in the number of horses was inconsistent with what Hayami called a ‘declining trend in livestock’ from the end of the seventeenth century to the beginning of the eighteenth century. However, a declining number of horses is also observed; thus, it should be noted that different sources from different periods may offer different views.



**Figure 11** Population, Households, and Horses (Hidenoyama)

Cattle were also documented for Komaya in 1775 and 1779. In 1775, the household of a *nanushi* (village head) whose *mochidaka* (the legal amount of rice produced in one's rice field; this index represents the household's socioeconomic status) was 30.553 *koku*<sup>5</sup> owned three horses and two cattle, and a household with a *mochidaka* of 21.65 *koku* owned two horses and two cattle (the average village household produced 6.346 *koku*). There were years when the *nanushi* household owned more than 10 horses. Another household was recorded as owning two cattle in 1775. The same household owned one bull in 1779. The *mochidaka* of this household was 7.171 *koku*, a moderate amount of yield. In 1775, the family consisted of the head of the household, his wife, a son (age 17), a daughter (age 9), and no servants. Records show that in some years they kept a horse. The horse is often referred to as a '*chichikoma*' (literally, 'father horse', i.e. stallion), suggesting that they kept a horse that they leased from the domain to raise good horses. In 1819 and 1820, for example, they kept a *chichikoma*. The family at that time consisted of the head of household, Heizō (age 66-67), who was engaged in *shichimotsu-bōkō* (indentured servitude to pay off the mortgage) in the village, and the three remaining members: his wife Natsu (age 53-54), his daughter (age 37-38), and her husband from Echigo

<sup>5</sup> 1 *koku* is approximately 180 litre.



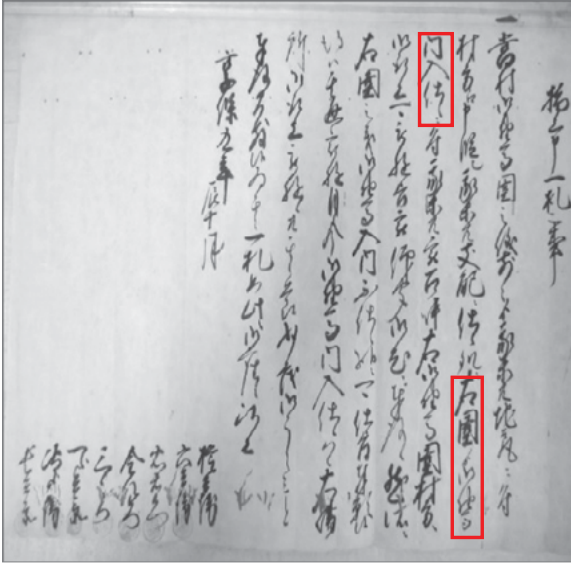
**Figure 12** Household *Kokudaka* Landholdings and Number of Horses (Shimomoriya)

Province (age 39-40). Their *mochidaka* was unchanged at 7.171 *koku*, meaning that they were not wealthy farmers. The households in the village owned a total of 62 horses in 1819 and 59 horses in 1820.

In the case of Hidenoyama, the number of households and the number of horses seem to follow a similar trend, but the number of horses owned per household increased in the second half of the early modern period (figure 11).

Were households that owned horses wealthy? The author will use land ownership represented by *mochidaka* as an economic indicator for households and observe the relationship between *mochidaka* and the number of horses owned (figure 12). The data record household *mochidaka* and the number of horses owned by each household, and divide the total number of horses owned by households with a given *mochidaka* by the total number of households. If a household is documented with the same *mochidaka* for multiple years, it is counted multiple times.

The figure shows a weak positive correlation, or seems to indicate that the richer the household was, the more horses it owned. However, the coefficient of determination is only 0.2883, so such a relationship cannot be established with certainty. It appears that households with less than 10 *koku* owned less than one horse on average, while households with more land ownership owned less than two horses.



**Figure 13**  
KC, *Sashiage mōsu issatsu no koto* (Petition)

The Tokugawa shogunate also showed interest in horse breeding in the Nihnomatsu Domain. A record from 1719 describes that 20 pack horses were sent from the domain to the Koganemaki ranch (Nukazawa 2010). The next section discusses the relationship between horses and local life in Koganemaki.

### Peasants and Horses (II): The Case of Katsushika County

In some farming villages in Katsushika County, Shimousa Province, *goyōuma* (shogunate horses) damaged crops.

In Shimousa Province, horses had been raised on government-run ranches since the tenth century. In the Edo period, there were two government-run ranches in Shimousa Province, namely Koganemaki and Sakuramaki, where the Shogun's horses were raised. Koganemaki consisted of five pastures: Takadadai, Kamino, Nakano, Shimono, and Inzai.

The horses grazed freely in the pastures. Embankments or ditches about 3 metres high or deep were made between the pastures and the crop and rice fields to prevent the horses from running away from the pastures. However, the horses sometimes went into the fields and destroyed the crops.

One document refers to an incident in which horses broke out of the embankment into the village (figure 13). In the area marked in red, it states, 'The Shogun's horses came into the fields from the bank'. Each vil-

**Table 3** Number of Horses by *Mochidaka* in 1813

More than (koku)	Less than (koku)	Number of households	Number of horses	Number of horses per household
<1	1	63	1	0.02
1	5	86	22	0.26
5	9	21	20	0.95
9	13	10	9	0.90
13	>13	8	10	1.25
		188	62	0.33

Source Adapted from Kobayashi (2019).

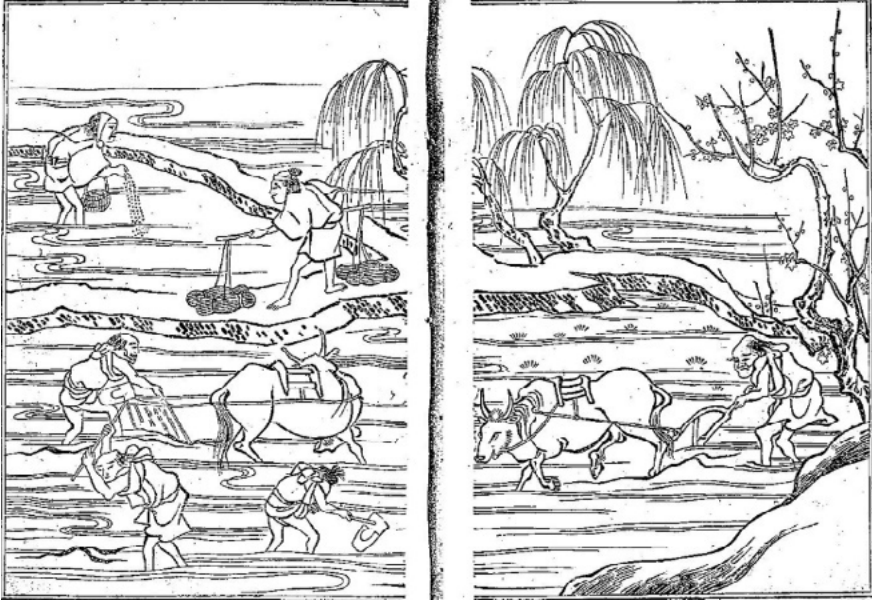
lage adjacent to the pastures (*notsuke* village) had income from the sale of firewood collected from the pastures, but occasionally suffered damage to the fields from invading horses. However, since Edo society was characterised by social stratification, people could not punish the Shogun's horses for destroying crops and rice fields.

In addition, the inhabitants of the *notsuke* villages bore the burden of duties such as patrolling the pastures. The officials who directed the villagers were called '*mokushi*' and had the status of samurai in the social hierarchy. Every two or three years, the grazing horses were driven to a certain place for the selection of the three-year-old horses. This event sometimes had a festive character. The good horses went to the stable of the Edo Palace, and those not selected were sold to farmers. The profit from the sale of the horses also served as a source of income for the Edo shogunate.

The horses sold to the peasants were used in the farming villages to carry loads or to make manure. The number of horses owned by the *mochidaka* category in the village of Fuse, a village in this region, is shown in table 3. Only a quarter of households with less than five *koku* owned horses, but many households with five *koku* or more owned at least one horse.

## Conclusion

An illustration in the *Nōgyō Zensho*, written by Yasusada Miyazaki in 1697, shows cattle being used to till rice paddies, but no horses are being drawn. In addition, Kanehira (2015) presents material from the Meiji period explaining that 'horses were used exclusively for collecting manure, carrying loads, and soil puddling' and that 'horses were rarely used for tilling the soil, which was mainly done by hand'. In other words, as Saito (2004) noted, horses were used only to a limited extent in rice paddies in early modern Japan, and the main industrial use of horses was manure



**Figure 14** NDLDC, Miyazaki Y. *Nōgyō Zensho*

collection. However, in the latter half of the early modern period, farmers also began to buy fertilizers made from dried sardines. Horses, of course, also played an important role in transporting loads. In the Edo period, some peasants lived in *'magariya'*, where houses were connected to the barn in the form of the letter 'L'. Horses were livestock with which they lived under the same roof; therefore, it was considered taboo to eat horse meat. Many households kept one horse, and wealthier households had two or more horses. In Shimomoriya, some households owned five horses.

There are local differences in the number of horses owned. According to Kanehira (2015), in the Morioka Domain (encompassing present-day Iwate and Aomori prefectures), which was also known for horse production, there was an estimated average of 2.4 horses per household, based on the number of horses recorded in a fire incident. However, this figure could include not only horses owned by villagers, but also those that were leased. Kanehira also points out that other documents indicate that one farmer owned at least 10 horses, another farmer owned a maximum of 24 horses, and some farmers without *mochidaka* (their own fields) had horses in their possession.

In the domain of Nihonmatsu, a farmer who successfully raised a good horse could sell it to the warrior class for a high price. It is believed that

this brought some profit. Since there were no major wars in early modern Japan, horses were never used in warfare, but such good horses were purchased by ranches run by the shogunate for a high price to be trained as military horses. The purchased horses were used when the Shogun went on falconry excursions. On the other hand, the farming villages adjacent to the government-operated ranches suffered from crop damage caused by the invasion of these horses. However, it was difficult for farmers to take effective measures against them.

While horses were an important source of income for farmers, they also posed a challenge by destroying their rice and crop fields.

Here I would like to return to my original question. Akira Hayami's 'Industrious Revolution' started from a phenomenon observed at the beginning of the early modern period in Owari Province, where the number of horses declined despite population growth, and led to economic growth in early modern Japanese society driven by an increase in per capita labour output instead of capital, in this context, livestock. However, horses were rarely used for ploughing fields in the early modern period (Saito 2004; Kanehira 2015). Moreover, time-related observations of population (or number of households) and number of horses in Asaka County show that when one variable increased, the other also increased, and likewise when either variable decreased; thus, they fluctuated in direct proportion to each other. Aside from being raised for sale in the market, horses in farming villages were mainly used to transport heavy loads and to obtain manure. Each household often owned a horse, which it raised in a small barn attached to the house where the family lived. Regionally, more horses were raised in eastern Japan than cattle. One of the reasons for this was that horse manure, which fermented at higher temperatures, was preferred in the cold regions of eastern Japan. In the Meiji period, when dry paddy farming was adopted, horses were increasingly used for ploughing and tilling. At the same time, improvements were made to raise larger horses.

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 NDLDC: National Diet Library Digital Collection. <https://dl.ndl.go.jp>.  
 Shimomoriya: Mizuyama family documents.  
 Komaya: Yamaoka family documents.  
 Hidenoyama: Satō family documents, etc.  
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