

【研究論文】

The Petroleum Industry Entrepreneurs' Network and the Railway in Nagaoka

Nobumichi Watahiki

Nagaoka University of Technology

Abstract

After the Boshin War of 1868-1869, a petroleum industry and industrial cluster were formed in Nagaoka. In the 1880s there were about 400 petroleum firms, and the Hokuetsu railway was established as a petroleum transporter. This railway not only sped up the transmission of information, it also changed the structure of the network of entrepreneurs in this region. This had a larger impact than the transportation along the Shinano River.

1. Introduction

When the oil-drilling industry (which had begun as a farmers' sideline with men digging by hand) changed to mechanization, it led to the establishment of such companies as Niigata Engineering Co., Ltd., a machinery repair plant, Nagaoka Bank, for oil transactions, and the Nagaoka Stock Exchange. The Hokuetsu Railway was one of these developments (Watahiki 2011, Matsumoto 2010), and it created significant change in the entrepreneurs' network. This paper's aim is to clarify that change.

2. Method

2.1. GIS

Geographic Information System (GIS) is "a generic term for a system that manages and processes information about positioning, and analyzes and creates new maps".¹ Generally, a GIS uses a current map and adds data, but for our purposes we are using

¹ Ministry of Land, Infrastructure, Transport and Tourism

Retrieved from http://www.mlit.go.jp/kokudokeikaku/gislguidance/guidance_1.html

old maps and analyzing historical events (Historical GIS). The reason we use old maps is that the borders of various areas differ over time. Current provincial borders are the same as those drawn with the abolition of clans and the establishment of prefectures in 1871, but cities, towns, and villages have been merged or changed many times. First, because many place names and borders have changed, we cannot process data on current maps. Second, the terrain of rivers and coastlines has changed, and weirs and levees have been constructed. For these reasons, we use maps as close as possible to the actual political and geographic conditions of the era being analyzed.

2.2. Data

• Map

We used the map of Niigata Prefecture (1/200,000 scale) that the Army General Staff Land Surveying Unit made in 1889. This map was the result of a fairly accurate survey, which used the latest technology at the time. We confirmed contemporaneous place names with the *Bakumatsu Meiji Nihon Kokusei* map.

• Vector Data

We obtained data on firms and entrepreneurs from the *Nihonzenkoku Shogaisha Yakuinroku*. These books include firms' names, addresses, year of establishment, capital, and firm directors' names and addresses, so we can determine the addresses of both entrepreneurs and their businesses.

2.3. Years of comparison

We needed to select two years for comparison, using two criteria: 1), enough time had to have passed since the start of the oil development for enough entrepreneurs and companies to exist, and 2), it had to be prior to the oil industry merger of 1902.

For this paper, we decided to compare 1895 and 1901. By the year 1895, five years had passed since the development of the Higashiyama oilfield. This satisfies the first criterion, and 1895 also provided the earliest available data from the *Nihonzenkoku Shogaisha Yakuinroku*. Secondly, the year 1901 was the point when Shigenobu Ookuma declared that the petroleum industry should be merged in order to resist the incursion of foreign companies, and at this time the number of Japanese petroleum companies was at its highest. Because the Hokuetsu Railway opened its whole line in 1891, it is reasonable to look at this period 1895-1901.

2.4. Software

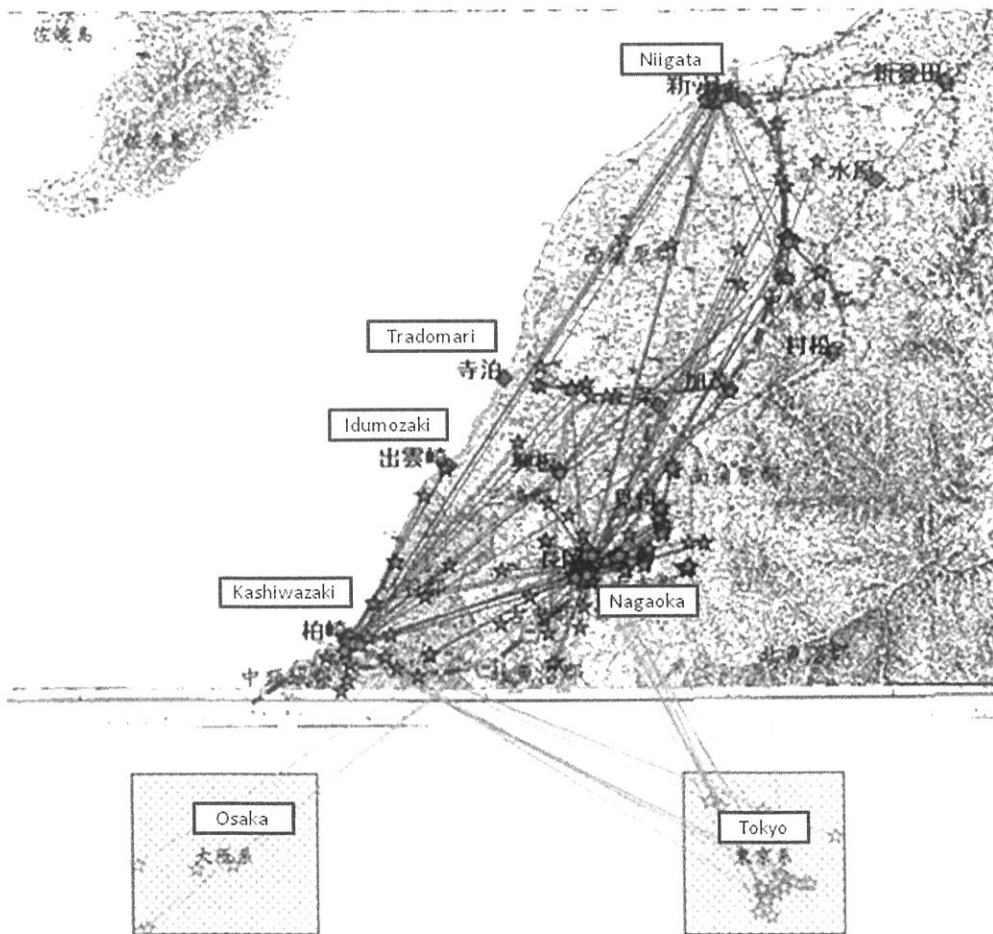
The analysis environment is open-source Quantum GIS Enceladus 1.4.0-1, Windows version, and GNU; the operating environment is Windows XP (SP2).

3. Results

Near the turn of the century, travelling locally was mainly by foot, by steamboat moving upstream and downstream on the Shinano River, by boat crossing the river, and by seagoing ferry through the ports of Kashiwazaki, Teradomari, Izumozaki, and Niigata. Between Nagaoka and Niigata, even though they are both situated along the Shinano River, not many entrepreneurial networks formed. There was seasonal variation in boat fares, and although boat fares were lower than train fares, travel on the river took more time. Even after the Chosei Bridge became free for pedestrians to use, its use from the Kawanishi area, on the opposite bank of the Shinano River as seen from the old town of Nagaoka, was still limited.

The Higashiyama oilfield was about 5 km from old Nagaoka, in the heart of the mountains. Almost all company headquarters were located around the current Nagaoka Station. Nagaoka Station is located on the former grounds of Nagaoka Castle; around this area, samurai and large-scale merchants once lived.

3.1 1895



Some samurai and merchants built the Lamp-Kai group as a cross-class community in Nagaoka, so it is natural that there were many companies and company directors around here. They were gathered within a circle centering on Nagaoka Castle, extending as far as 7 km around it.

Kawanishi is a zone filled with rice paddies, yet it supports a sizable population. Locals had used the ferry for a long

Figure 1. The Entrepreneurs' Network in 1895

time, and when the Chosei Bridge was built in 1876, they could cross the Shinano

River for a fee of ¥0.005. The fare was eliminated in 1891. Many gentry lived in the Kawanishi area, but few of them took part in the entrepreneurial network across the river. In the oilfield in Tochio, which was further back than the Higashiyama oilfield, some entrepreneurs formed a network which was about 3 km in radius. The reason why it was so small was that the Tochio area is in steep mountains, and it was difficult to move about in winter². Some entrepreneurs in Tokyo took part in the Nagaoka network; they included Nagaoka samurai working in Tokyo, the book merchant Sahei Ohashi, and the investor Eiichi Shibusawa.

3.2 1901

In 1901, new oil wells were being dug in Nagaoka, and the number of companies was increasing dramatically nationwide. In Figure 2, the Hokuetsu railway is depicted passing nearby oilfields. Many people who lived along the railway participated as company directors. Furthermore, some Kansai residents participated in local business, influenced by Shuzo Toyama, founder of the Hanshin Group, who was born in Tochio.

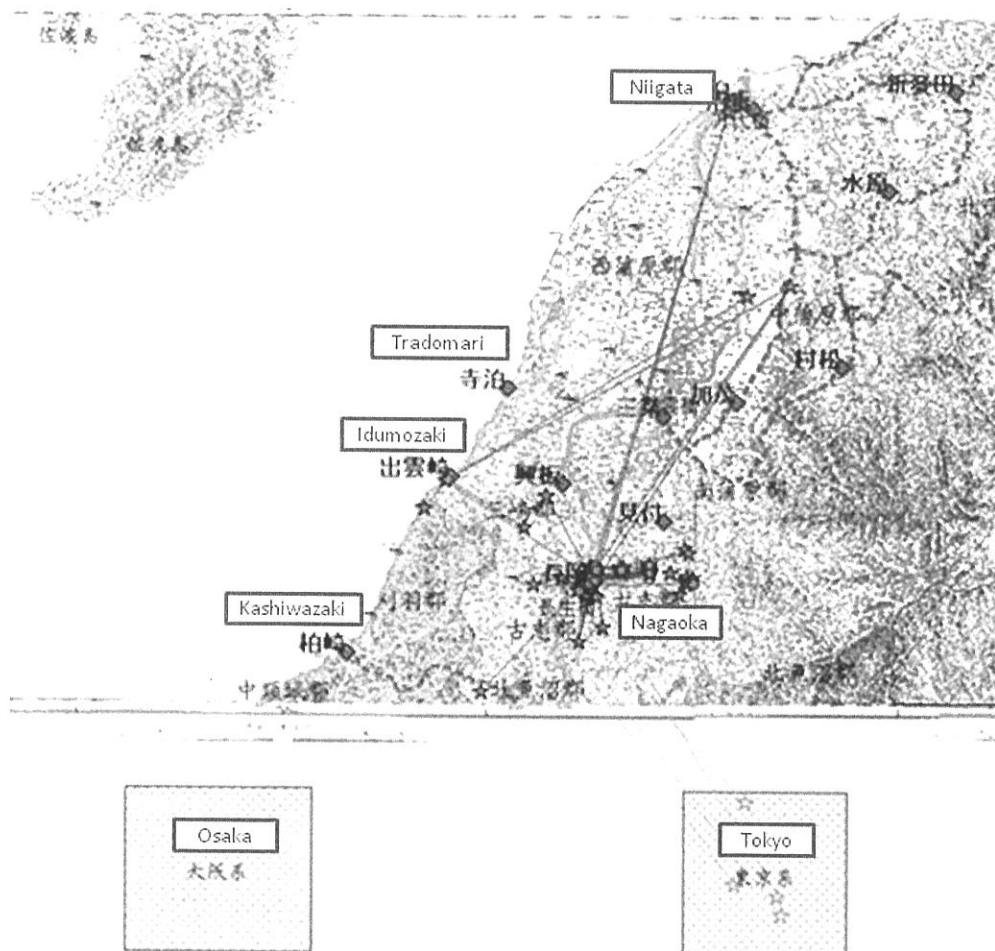


Figure 2. The Entrepreneurs' Network in 1901

² In Niigata Prefecture, it snows more than 2m annually.

4. Discussion

4.1 Historical Background

Nagaoka was the center of the Nagaoka Han (clan), and Tochio was merged into the Nagaoka Han in 1620. Niigata had been merged into Nagaoka in 1616; Niigata was well-developed after the Treaty of Amity and Commerce (1858) between Japan and the United States. Kashiwazaki was directly administered by the Shogunate and prospered as a port, with Kitamae ships landing copper, silver, and gold there from Sado Island for a long time.

4.2 Geographical conditions

As shown in Figs. 1 and 2, there is a broad plain along the Shinano River downstream from Nagaoka. However, Kashiwazaki, Naoetsu, and Nagaoka are surrounded by mountains, with Kashiwazaki and Naoetsu, in particular, having flat land only along the Sea of Japan coast. When the Hokuetsu railway was planned, therefore, because crossing the mountains would be so costly, a route was proposed along the coast. According to documents written in the Edo period, the Shinano River went into flood every two years, with hundreds of people dead. Until the early Showa era, the Shinano River was deep enough for 30-seat steamboats to run.

4.3 Characteristics of climate

Niigata Prefecture is famous around the world for its very heavy snowfall, but just along the coast only about 10~30 centimeters of snow falls. In the mountainous areas the snowfall is greater than two or three meters. Along the coastline, people could not travel by sea in winter, because of the strong prevailing winds and the storms.

4.4 Observed Constraints

- Mountains

There are mountains between Nagaoka and Tochio, and the Kariyata River flows through Tochio, so people living in Tochio found it easier to go to Sanjo or Tsubame than to Nagaoka. They used to go to terakoya schools or to engage in business in Sanjo or Tsubame. The constraints the mountains placed on residents were very strong until a well-constructed national highway appeared in the Showa era.

- The Shinano River

Until the end of the Edo period, the river had played a role as a military line of defense, so bridges had been not built, and people had to cross by ferry. The Nagaoka Han held lands beyond both banks of the Shinano River, and people did not need to pass border checkpoints. They seldom had any perceived need to cross the river, not that

they had any psychological aversion to doing so.

4.5 Impact of transportation

- Crossing the Shinano River, and moving upstream or downstream

Residents moved along the river on boats pulled from the banks by manpower. Steamboat companies started operations in 1873. By steamboat, it cost ¥0.4 and took 11 hours to travel from Niigata to Nagaoka, and ¥0.28 and 7 hours from Nagaoka to Niigata. In 1882, the travel time was reduced to 7 and 5 hours, respectively (Hokuetsushinposha, 1914).

On the other hand, people had to pay ¥0.008 to cross the Chosei Bridge in 1876. After 15 years, Niigata Prefecture bought this bridge and it became toll-free. From the perspectives of cost and time, using the bridge was better than taking a steamboat. Figs. 1 and 2 show that few entrepreneurs crossed the Shinano River.

- Railway

Table 1 shows that on the Hokuetsu line it took about six hours to travel the entire distance from start to finish (Niigatakenshi Kenkyukai, 1963). At that time, tickets were very high-priced, but entrepreneurs used the Hokuetsu line more than the steamboat, for longer distances. In addition, there was a tendency for people to work for companies further down the line than their own immediate vicinity.

Table 1.

Third-class Ticket Prices and Travel Times on the Hokuetsu Railway, 1900

Naoetu	Kasiwazaki	Nagaoka	Kamo	Nuttari
Start	¥0.34	¥0.69	¥0.97	¥1.27
-	36.3km	73km	103.8km	136.3km
-	1h18min	2h40min	3h44min	4h49min

(Travel times do not include time stopped at stations.)

The reason for the railway's popularity may simply be snow. Today, snow on major roads can be handled, but at the time it accumulated to depths of over two- meters. If people wished to use a steamboat, it was often difficult to reach the riverbank. Piers were about 2 km from the center of Nagaoka, and boats were affected by weather, especially by flooding.

5. Conclusion

Steamboats and the Chosei Bridge shortened travel time, but the Hokuetsu line

affected entrepreneurs' activities more than these. Crossing the Shinano River was inexpensive and fast enough, but many entrepreneurs would not cross the river. People used the higher-cost Hokuetsu line rather than the steamboats. We find a suction effect, in that investors and executive-class types, who had previously lived widely dispersed, began to gather to larger towns.

References

- Army General Staff Land Surveying Unit (1893), *Bakumatsu Meiji Nihonkokusei Chizu*, Japanese Army
- Hokuetsushinposha (1941), *Funto no Nagaoka*, Hokuetsushinposha
- Matsumoto, Kazuaki (2010), "Toyama, Shuzo no kigyosha katsudoni kansuru shiryō (1)", *Regional Study*, pp.135-142, No.10, Nagaoka Univ. Regional Study Center
- Niigatakenshi Kenkyukai (1963), *Niigataken 100 nen shi*, Nojima Press
- Shogyokoshinjo (1895-1901), *Nihon Zenkoku Shogaisha Yakuinroku*, Shogyokoshinjo
- Watahiki, Nobumichi (2011), "The Entrepreneurs' Network in the Early Meiji Era: Lamp-Kai in Nagaoka", Japan Academy for Industrial Science, *Industrial Science Review*, pp.115-121