

The development of the port of Nagoya as the timber complex hub and the formation of its waterfront zone

Focusing on the oversea shipping routes

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Abstract

The purpose of this study is to clarify how the Port of Nagoya waterfront zone was formed focusing on the relationship between the connection of global trading networks and the formation of waterfront zone by timber industry. In the process of Japanese modernization, the timber market expanded due to demand for the construction of industrial infrastructure. The area around Nagoya has had a thriving timber industry since the early modern period, and timber was transported from mountains through rivers by rafts until the 1910s. However, once the first stage of modern port construction was completed, large volumes of timber began to be imported from East Asia and North America. It led to the rapid construction of lumberyards until the 1920s, and simultaneously overseas shipping routes increased. Some timber merchants established land development companies to operate huge marine lumberyards and develop lands around there as an offshoot of the major spatial changes in the waterfront zone. After all, the general form of the Port of Nagoya and principles for the use of the port area were defined by the timber transportation. Capturing these relationships gives an exogenous perspective to explain the formation process of the Port of Nagoya.

Keywords

Port City, Port Planning, Waterfront Zone, Timber Trade Networks, Oversea Shipping Routes,

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INTRODUCTION

After the Meiji Restoration in the mid-19th century, modern ports were built in cities such as Yokohama, Kobe, and Osaka for industrial and economic development throughout Japan. Waterfront zones, modern port and surrounding districts, were formed for the first time at this time. Nagoya, the subject of this study, was a city formed around a castle town about 10 km from the shore, and the waterfront zone of the Port of Nagoya has not developed until the port construction began at the end of the 19th century.

Yamada et al. (2021) point out that there was a plan for sea-land communication for ships and railways, while urban planning was conceived to accommodate logistics such as roads and canals about the Port of Osaka. In Nagoya, on the other hand, the Ministry of Home Affairs did not subsidise the construction of such a large port. When considering logistics links between ports and urban centres, the large volume of timber actively traded in Nagoya was an important factor. Oda et al. (2023) show that urban structures and lumberyards location have been influenced by changes in transport regarding the well-developed timber industry. As shown in our study, lumberyards were built by timber merchants in the waterfront zone of Nagoya in response to increased timber imports. The location and design of these urban areas express relationships spanning the seas, and of local needs in response to global changes (Hein, 2011). In this regard, the perspective of the relationship between the international timber trade and the port construction is essential when we consider the industrialisation at the time.

The purpose of this study is to clarify how the waterfront zone of the Port of Nagoya was formed. We focus on the relationship between the connection of global trading networks and the formation of the waterfront zone by the timber industry in the Port of Nagoya. We describe a dynamic balanced paradigm that the port construction plans controlled private sector's development in response to industrial demand due to exogenous pressures and then made it possible for further development in the waterfront zone.

MODERN PORT CONSTRUCTION AND TIMBER INDUSTRY IN NAGOYA

Nagoya has had a thriving timber industry since the early modern period. Nagoya is in the innermost part of Ise Bay on the Pacific Ocean, where the sea is shallow. Originally, timber was transported from the mountains through the Kisogawa, and then using the Horikawa to Nagoya as assembled rafts using traditional methods. At that time, timber merchants and related facilities such as sawmills and small private lumberyards were located along the Horikawa within the city centre (Figure 1). It was common to moor timber along and on the Horikawa. Timber was shipped to various regions including Edo (Tokyo) and Osaka¹ for building material and as products.

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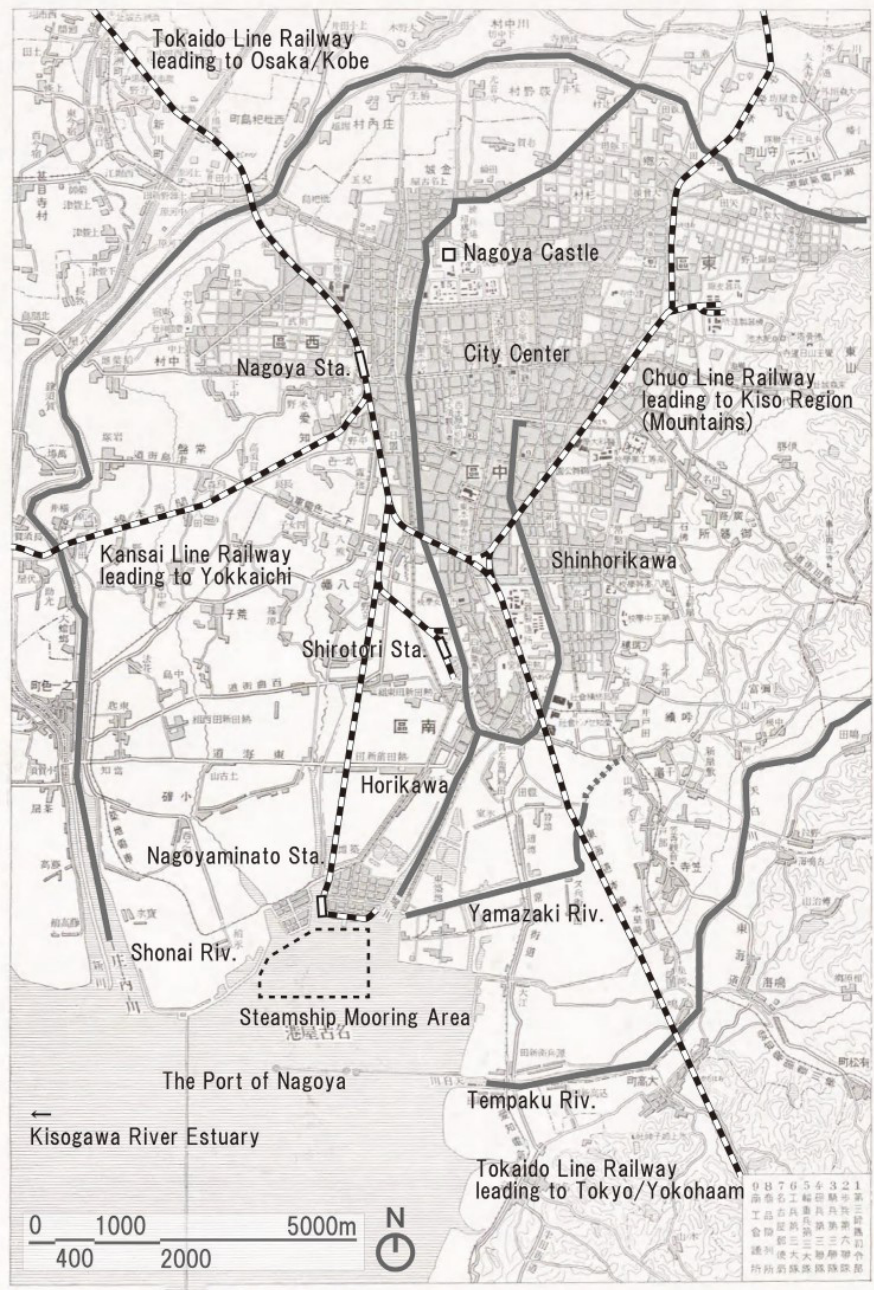


Fig. 1. The main rivers and railways in Nagoya city around 1923. This shows the development of waterfront zone (the area between the Port of Nagoya and city centre) in progress.

In February 1896, the Aichi Prefectural Assembly passed the first construction plan of the Port of Nagoya to enhance transportation function and industries.² However, in 1898, the plan was revised due to the typhoon damages and financial problems. The port area was increased from around 1,520,000m² to 8,694,000m² by changing the shape of the east and west breakwaters but replacing a previously planned lumberyard and not increasing the budget. The concept Prefectural Governor Kazuyuki Egi had was to moor rafts along the shore of the port area.³ That is, he determined that a lumberyard was not necessary by substituting the port area where the breakwaters keep the sea surface calm. “The Port of Nagoya Control Regulation”⁴ shows that mooring rafts for at most five days and passing through canals between reclaimed lands were allowed avoiding ship courses and the steamship mooring area. It means that handling rafts in the port area was possible by considering the arrangement of the port facilities. Eventually, the Port of Nagoya opened in 1907 as an open port, and the Aichi Prefecture Government Port Office (Port Office) completed the first construction in 1910, then started the second construction plan.

During the modernization process, timber demand in Nagoya largely increased as materials for industrial infrastructure and products. In 1927, the total amount of wood boxes, such as for petroleum or ceramics, produced domestically and internationally exceeded 10 million,⁵ which accounted for a large proportion of national production and the most in the nation.⁶ The same year, dispatched timber volume from Nagoya by train was also the most of six cities (Tokyo, Yokohama, Nagoya, Kyoto, Osaka, Kobe). This state indicates that there were strong demands for timber in Nagoya, which was one of the largest timber complex hubs of Japan. According to statistics from Aichi Prefecture, timber ranked second in terms of share of domestic imports from 1919 to 1939, and first to third in terms of foreign imports until 1941 in the Port of Nagoya.⁷ Therefore, merchants procured a large quantity of timber from not only mountains along the Kisogawa, but also other regions.

The merchants could import timber by large steamships after the opening port from remote regions: mainly Hokkaido, Sakhalin, Russian Primorsky Krai, and North America (Figure 2, 3). Hokkaido timber started to be imported around 1907 at first for the construction of the National Exhibition venue held in Nagoya in 1910.⁸ At that time, forestry was economically important and a subject to resource exploitation in Hokkaido, which was being pioneered.⁹ Especially, the demand was high throughout Japan for railway sleepers and as material for pulp. Until 1921, Hokkaido timber constituted most imports that used steamships. After the Russo-Japanese War (1904-5), Japan, which controlled Sakhalin, promoted the pulp industry, and set up a forest management system, led by the Sakhalin Agency. At first, Japanese main pulp cooperations took the lead in the development with factory planning there. However, since forest insect damage by pine caterpillars occurred in 1919, the Sakhalin Agency started a government-run logging project to deal with the damage promptly, which supplied more timber in Sakhalin than its demand there. Eventually, more than 47 million tons of timber was exported to Japanese cities from 1923 to 1927 because the Sakhalin Agency decided to distribute it.¹⁰ The Great Kanto Earthquake of 1 September 1923 (more than 100,000 victims around Tokyo) was also the primary factor to urge exports. It caused extensive damage and required large quantities of reconstruction materials. So, Sakhalin timber was transported to Tokyo via other ports such as Nagoya and Osaka, which were ranked first and second of Japanese ports that imported from Sakhalin in 1927.



Fig. 2. The geographical information in East Asia

The USA also became one of the main timber producing countries for Japan. In the USA, westward expansion continued in the 19th century, when the establishment of railways and ports reached the west coast. Furthermore, forestry in the western region grew dramatically, with Washington, Oregon and Louisiana ranking first to third in production in 1924, instead of the eastern regions of Pennsylvania, New York, and Michigan in 1860. "History of American Lumber in Japan"¹¹ explains that wood demand and sawmilling capacity increased in the USA during the First World War, but on the other hand, surplus workforce and ships caused a sharp fall in maritime transport cost after the war. To adapt to this situation, the US timber industry set Japan as a sale market which was closer than the eastern coast of the USA by sea. In contrast, timber was needed for reconstruction for the Great Kanto Earthquake in the 1920's in Japan. Afterwards, by matching supply and demand, large quantities of timber were imported to Japan. Merchants in Nagoya started importing timber around 1920, a few years after merchants in Tokyo and Osaka started, and set up the Nagoya American Lumber Importers Association in 1924. The increase in supply of American and Sakhalin timber in the Port of Nagoya coincided around the mid-1920's.

LUMBERYARDS CONSTRUCTION BY TIMBER MERCHANTS IN WATERFRONT ZONE

Timber needed large areas of land to storage it close to the Horikawa, where more than one hundred of wholesalers and sawmills were located until 1920's¹², and the Shinhorikawa, which branches off the Horikawa and opened by Nagoya City in 1910. Figure 4 shows the location of

sawmills and main lumberyards. After the opening of the port, more timber passed through the rivers, but they were narrow, impeding other ships and cargo handling.¹³ This had been a consistent problem since then. However, there was no large lumberyard that stakeholders can use as of 1900; there was the Shirotori Lumberyard used only for public timber under administrative control since the early modern period. Moored timber sometimes flooded during storms, causing run-off and damages to urban areas. As a result, timber merchants embarked on the construction and management of lumberyards with the cooperation of landowners and influential businessmen since they didn't own large areas of land in waterfront zone.

The first lumberyard that merchants committed is the Nagoya Lumberyard, which located in the north side of the Shirotori Lumberyard. The Nagoya Lumberyard Co. was established in 1906 with Tsunemitsu Kumagai and Kanshichiro Harada at the helm.¹⁴ The business purpose states to improve usage status of the Horikawa. To prepare budget for the land, they solicited purchase of shares including influential businessmen such as Tominosuke Kadono, who served a member of the Nagoya City Council, then became a member of the board.¹⁵ After the opening of the Shirotori Station on the Shirotori Lumberyard in 1916, which bring timber from mountain regions through the Chuo Line Railway, they also handled timber there.¹⁶ In conclusion, the Nagoya Lumberyard Co. responded immediately after the opening port to ensure proper storage and transport of timber coming through the Horikawa from the port and the Shirotori Station.

Other merchants also considered to establish a lumberyard as a competitor of Nagoya Lumberyard in the early 1910s because its capacity was insufficient. Taichi Miyaji and members of the Nagoya Timber Trade and Industry Association (Timber Association), approached Saikichi Yamada who ran a canning company and leisure facilities on the 5th reclaimed land.¹⁷ They thought that converting the canning company's hatchery into a lumberyard is useful due to its proximity to the steamship mooring area. For co-management of a lumberyard with Yamada, merchants founded the Meiko Land Co. with the participation of other businessmen who wanted to develop waterfront zone in May 1912. The two companies opened the Meiko Lumberyard in October 1913 and completed the canal of the 5th reclaimed land in November which connect to the Yamazaki River on the south side.¹⁸ The Meiko Land Co. expanded the lumberyard until 1921 with design assistance by Sukeshichiro Okuda, who was a port engineer from the Port Office, and then managed land and buildings around the waterfront zone. They first dealt with Kiso timber, then Hokkaido timber and Sakhalin timber, and was said to be the most prosperous until 1925.¹⁹ After all, they ensured the lumberyard in waterfront zone and established stable management structure responding to the increasing timber.

The opening of the port influenced people in arable land behind the waterfront zone, particularly in Kafuku, which is in east of the 6th reclaimed land. The landowners formed the Landowners' Association in June 1920 to discuss development measures in the light of the changes brought about by the opening port and the deterioration in relations with the peasants.²⁰ On the other hand, the Timber Association were looking for a site to build a new lumberyard, as large quantities of timber were being imported since the early 1920's. In August 1922, Miyaji again proposed the Landowners' Association that the Timber Association build a new lumberyard on Kafuku by leasing, purchasing or jointly managing land. But the negotiations were inconclusive. Nevertheless, the landowners continued discussions including land development,

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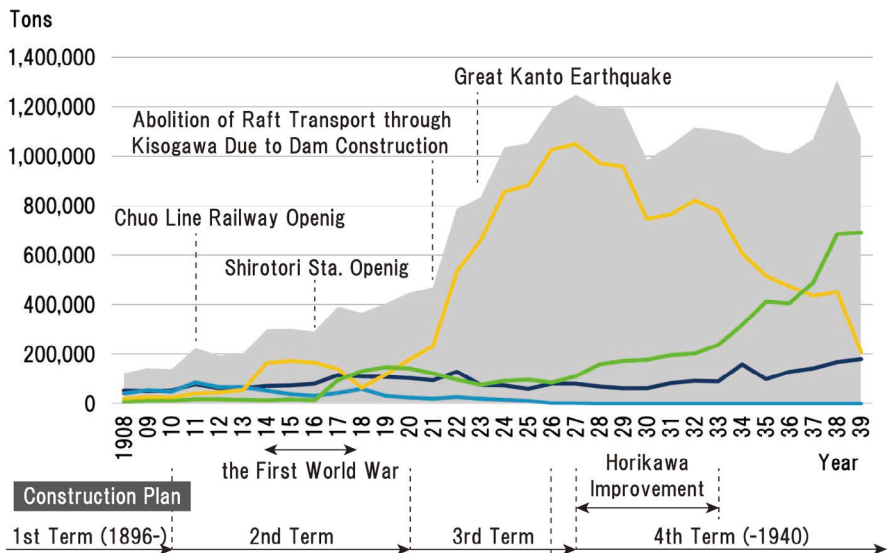
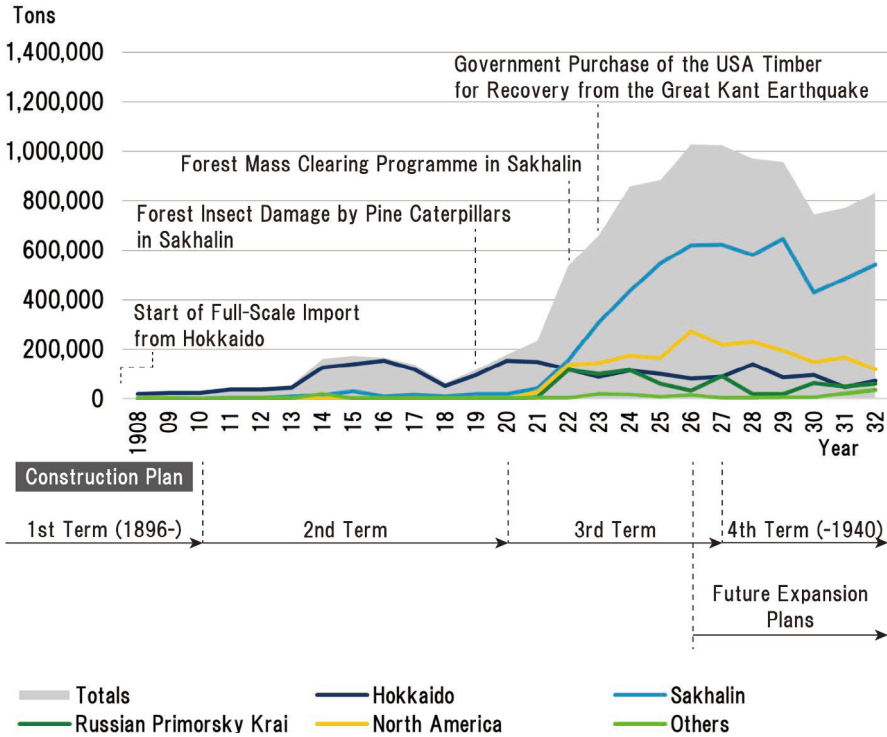


Fig. 3. Timber imports by place of expenditure in the Port of Nagoya (above) and timber imports by mode of transport (below). The figures of "Total" on above (gray filled area) almost matches to the figures of "Steamship" on below (Yellow line).

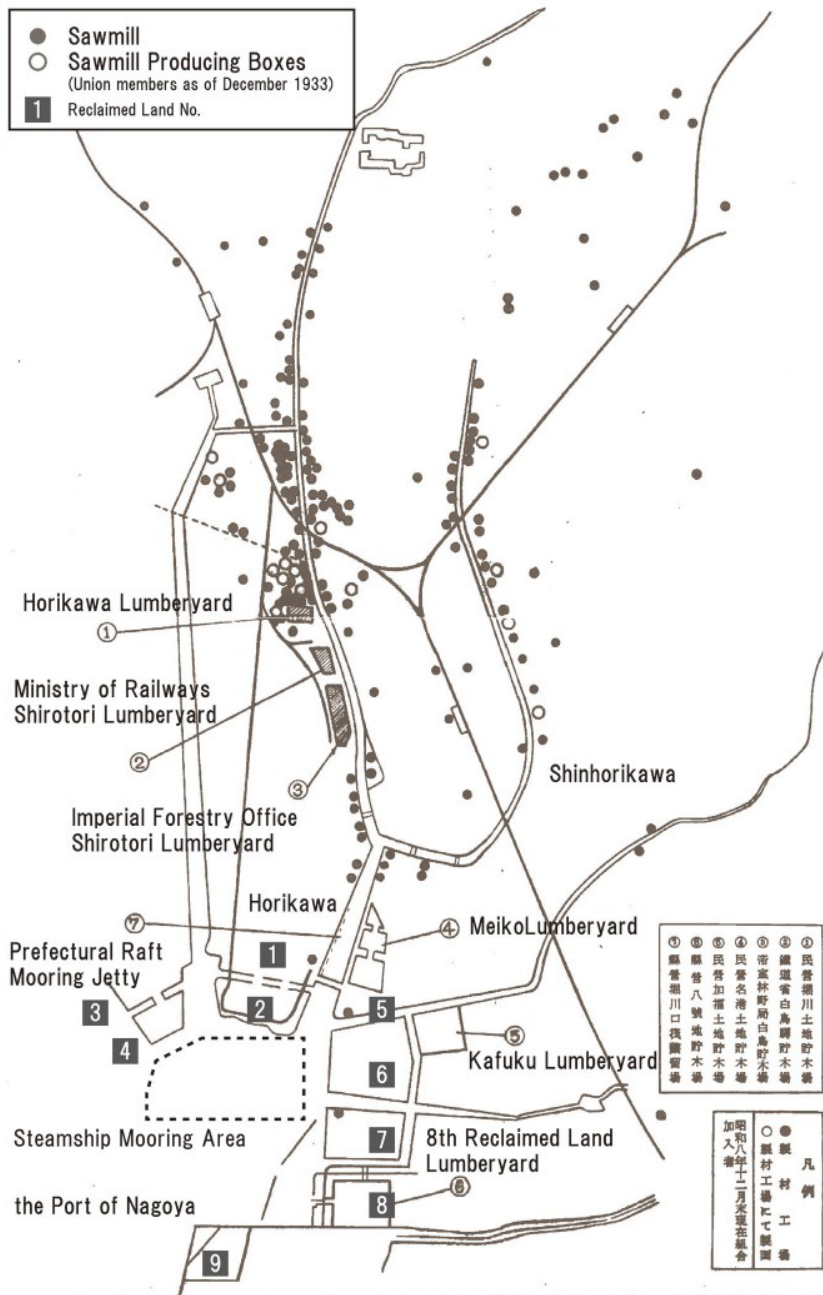


Fig. 4. The location of sawmills and lumberyards in waterfront area in 1933. The Nagoya Lumberyard changed its name to the Horikawa Lumberyard in 1927. Many sawmills were located toward city centre along Horikawa and Shinhorikawa.

led by members who are familiar with timber industry. One is Rinshiro Suzuki, who was also a leading merchant of the Timber Association, and the other is Bunji Yamazaki, who was also a board member of the Meiko Land Co.. They finally established the Kafuku Land Co. in May 1923 to manage a lumberyard by themselves. The Kafuku Lumberyard opened in May 1925 with the lumberyard connecting to the Yamazaki River designed by the Port Office, and an industrial land for sawmills and related functions.²¹ From the above, the opening of the Kafuku Lumberyard was achieved when the timber industry's demand matched the Landowners' Association's plans for the development of land.

From the above, the waterfront zone was gradually developed from the Horikawa towards the Shinhorikawa and the port. Similarly, the lumberyards were newly established in this order. The construction of new lumberyards, which were essential for economic activity, was of a public nature. However, Aichi Prefecture basically left the construction of warehouses related to the port construction plan to the private sector.²² What made such risky company operations possible in the waterfront zone, which still lacks adequate social infrastructure, was that Aichi Prefecture moved forward with a series of the port construction plans, in addition to an ample supply of timber. Namely, the opening port and the completion of the first construction for the Nagoya Lumberyard and the Meiko Lumberyard respectively, and the start of the third plan, which was the first time the Government subsidised the construction, for the Kafuku Lumberyard were important supports to ensure risk.

CONSTRUCTION OF INFRASTRUCTURE BY AICHI PREFECTURE.

Aichi Prefecture organized infrastructure for timber required in waterfront zone objectively based on the plans. Timber being transported (in pieces or as rafts after being unloaded from steamships) and moored (not stored in lumberyards) became obstacles to other ships and cargo handling, which was becoming worse. When Governor Haruki Yamawaki observed the Horikawa by boat in 1924, his group got stuck there.²³ This led to build the raft mooring jetties in the Horikawa estuary and west side of the 8th reclaimed land, which has been being reclaimed, to provide sufficient room for the disparate timbers unloaded from steamships to be assembled into rafts. This was the first time that a fee was charged for timber's use of the jetties and passing through the port area.²⁴ The fee returned to pay for the construction and maintenance of port facilities. Aichi Prefecture commissioned to the Timber Association to operate and manage the jetties, and they set up Nagoya Raft Agency Co. in March 1925, whose board members also includes Rinshiro Suzuki or Taichi Miyaji.²⁵

At the same time, the Port Office had a plan to build a new lumberyard publicly on the 8th reclaimed land. Statistics anticipated that there would not be enough lumber storage capacity 30 year later even if existing lumberyards, including the Kafuku Lumberyard, come into operation because of the exponentially increasing timber.²⁶ However, after the Prefectural Assembly passed the agenda item to build the 8th Reclaimed Land Lumberyard, the Timber Association's leader Kojuro Hattori and some members had a meeting about its design with the Port Office in August 1924.²⁷ Eventually, as well as the raft mooring jetties, the new lumber-

yard was also managed by the Nagoya Raft Agency Co.. Under the contract, the company was supposed to pay a substantial annual incentive fee to the Timber Association.²⁸ In addition, the Nagoya Raft Agency Co. solicited the purchase of shares to all members of the association at the time of its establishment. From the above, the profits from the lumberyard and jetties were schemed to be returned to the members of the association.

CONFIGURATION AND PLANNING OF WATERFRONT ZONE FOR TIMBER TRANSPORTATION

Sukeshichiro Okuda believed that a fundamental basic plan was necessary to strategically consider the future situations to plan following port constructions adapting to the demands of the times.²⁹ Actually, in the year of completion of the first and second constructions, each trade performance exceeded its planned trade capacity, and the same was expected to be true for the third plan.³⁰ The Port of Nagoya Future Expansion Plan (Future Expansion Plan), drawn up by the Port Office with the participation of the Ministry of Home Affairs in July 1926, was an overall plan to envisage the scale of expansion of port facilities and to implement them in sequence. The Port Office also found the necessity to establish a specific area for handling timber in response to the rapid increase of timber as the need for such a plan.³¹ Figure 5 shows the main facilities designed under the Future Expansion Plan. Each facility was completed by 1940 with the third and fourth constructions. Separated from the steamship mooring area, the timber loading shipyard was established on the west side of the 7th and 8th reclaimed lands surrounded by the breakwaters. Overall, facilities were concentrated in the south-east of the port area avoiding docks on the 2nd reclaimed land and the steamship mooring area.

The Future Expansion Plan assumed that 30% of the timber would be landed from the port area, while 70% would be stored once at the lumberyards and later transported towards the Horikawa.³² The improvement of the narrow and shallow Horikawa was long desired by the Nagoya Chamber of Commerce and Industry, which had submitted motions on the river improvement to the Governor at least seven times between 1905 and 1924.³³ The full-scale river improvement project began in 1927 because it was an incidental condition to formulate the Future Expansion Plan.³⁴ The project ranged upstream from the junction as the first phase and then downstream as the second phase from 1933. It consisted of dredging of riverbed, expansion of river width and establishing a raft mooring area (second phase). The improvement itself intended to promote the industrialisation of the waterfront zone by enhancing transport capacity, but it was considered fundamentally necessary to address timber problems because the Future Expansion Plan (1926) envisaged more timber to be transported toward the Horikawa. Thus, Aichi Prefecture, not the private sector, had to take the lead in developing a system to link each infrastructure of the entire waterfront zone and to ensure smooth functioning. In this context, the handling of timber was a central issue.

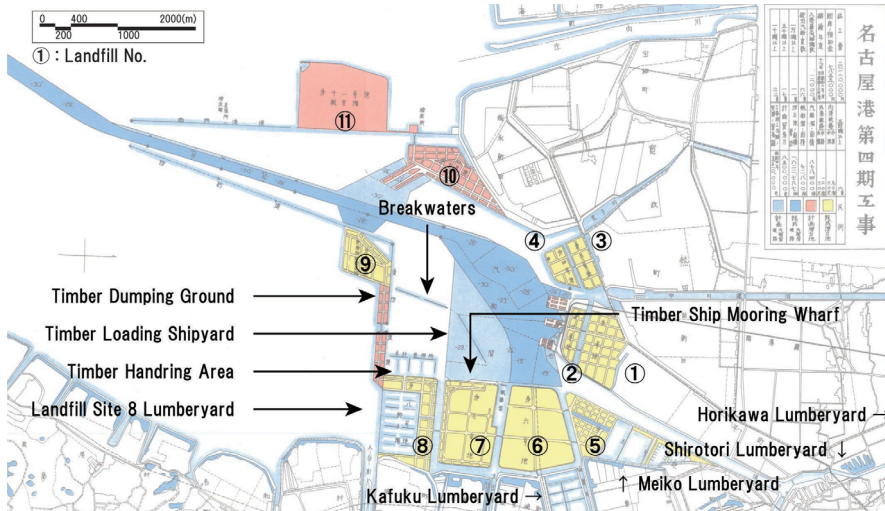


Fig. 5. The location of the main facilities for timber in the port area around 1940.

The primary objective of the port construction was to promote economic and industrial development through international trade. It was hoped to navigate steamships and start overseas shipping routes as a means of achieving development. However, it was not until 1920 that works began on the wharves and quays that were essential for the sea-land communication, and where large ships, for instance over 6,000 tonnes, could berth. As a result, handling cargo was basically carried out by barges in the vicinity of the steamship mooring area, which was progressively extended since the first construction because it costed cheaper than wharves and quays. Correspondingly, between 1908 and 1935, the number of steamships entering the Port of Nagoya increased from 1028 to 4476³⁵. Similarly, between 1927 and 1935, the final destinations of overseas shipping routes which called to the Port of Nagoya expanded their range; the number of European routes increased from 6 to 207 per year and North American routes from 142 to 302.^{36, 37} Namely, the Port of Nagoya was gradually joining the international trade network and moving towards achieving its objectives through the port construction. However, regarding steamships and cargo handling around the expanded steamship mooring area, the timber transportation, which had changed because of the increased imports and timber infrastructure development, could have been an obstacle. Figure 6 shows this influence. The centralised location of the timber infrastructure in the south-eastern part of the port can therefore be seen to be of fundamental importance in avoiding such conflicts.

CONCLUSION

Nagoya developed as a timber complex hub in East Asia during the process of modernisation. After the opening of the Port of Nagoya, more timber was brought in by steamships from remote regions such as Hokkaido. Furthermore, since 1920, large volumes of timber were im-

ported from Sakhalin and the west coast of USA at the same time. The construction of the Port of Nagoya made it possible to conduct a large-scale international timber trade using steamships. Although timber merchants actively dealt with this timber in order to expand, there was no longer enough storage space along the Horikawa. This timber obstructed ship traffic and cargo handling and caused extensive damage during storms.

Merchants of the Timber Association sought lumberyards in the undeveloped waterfront areas, but they could not prepare large lands on their own. Therefore, they involved landowners and businessmen, who were looking to develop the port area, to manage the lumberyards. In addition to the growing timber market, the potential for further developments of the entire waterfront zone through the series of port construction plans led the timber industry to embark on initiatives on the public waterfront.

This background required the plan that balanced competitive international trade ability with flexible timber handling within the port area. The shape of the Port of Nagoya, surrounded by breakwaters, was determined with Governor Egi's intention of mooring and transporting timber when the first construction plan was revised. From then on, imported timber was forced to be transported to the lumberyards and sawmills located along the rivers, avoiding the steamship mooring area. However, when the expansion of the steamship mooring area and the increasing timber made this coexistence difficult, Aichi Prefecture drew up the Future Expansion Plan to solve this fundamental problem and control the entire port area. As a result, new timber infrastructure was centralised in the south-eastern part of the port, and the Horikawa improvement was implemented to facilitate communication between the individually developed infrastructure. In conclusion, the general form and principles for the use of the port area of the Port of Nagoya were defined by the timber industry.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

NOTES ON CONTRIBUTORS

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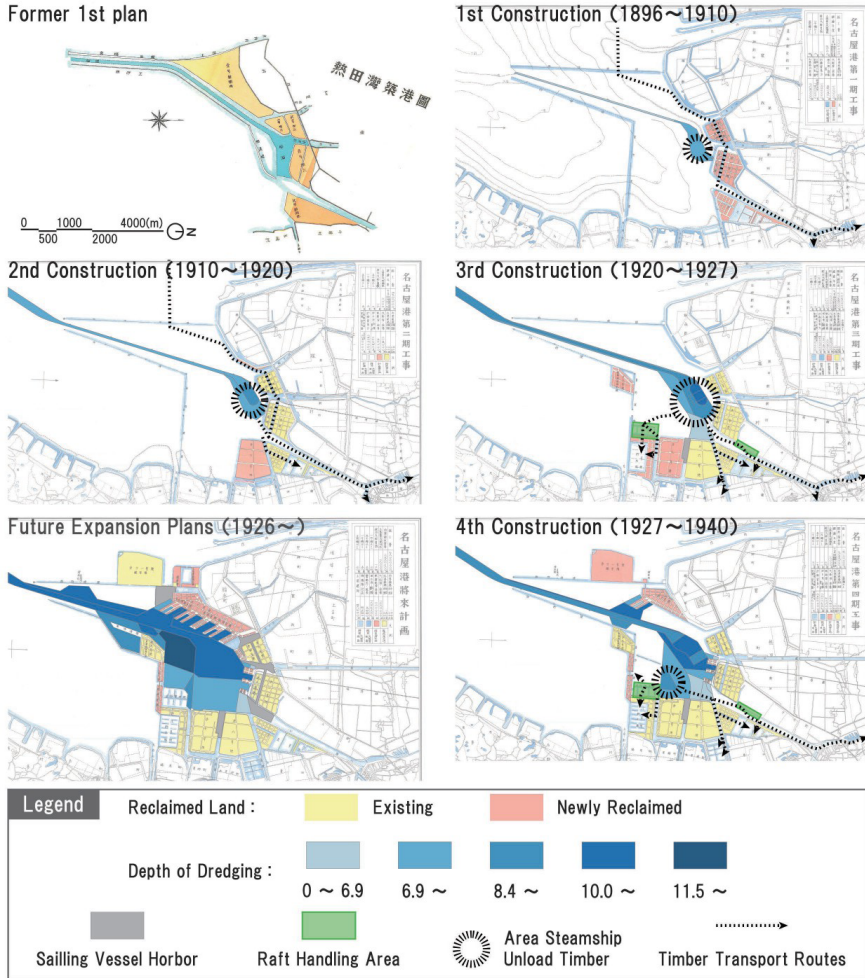


Fig. 6. The transition of the steamship mooring area and timber transport routes in waterfront zone corresponding to the progress of the port construction and timber transport.

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Figure 2 Geospatial Information Authority of Japan, GSI Maps.

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Figure 6 Nagoya port authorities. "Nagoya port construction history", 1953. (all drawings)

