

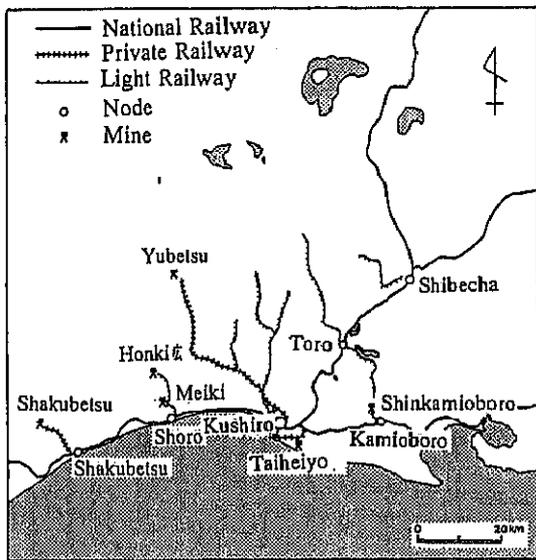
## Chapter 3

### Port Hinterland and Port Space in the Era of Railway Dominance

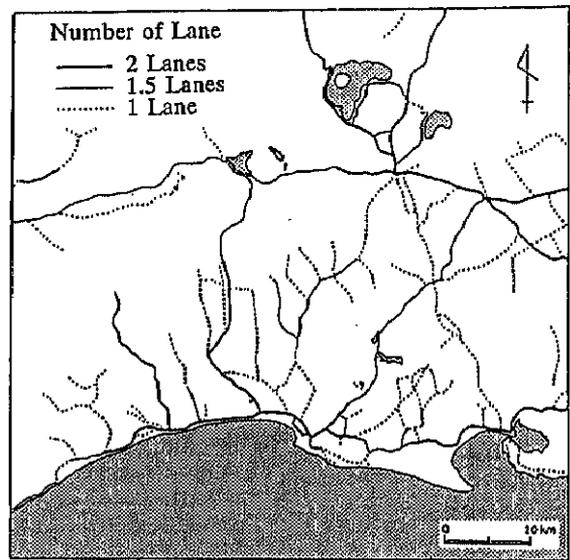
#### 3.1. Characteristics of the Transport Network in the Era of Railway Dominance

As discussed in the preceding chapter, the transport network whose main transportation means was a railway was formed at the beginning of the Showa era. After World War II, agriculture, the coal mining industry and forestry had developed through the Urgent Reclamation Age (1945-1951) and the First Comprehensive Development Plan Age (1952-1962). Transport networks whose main transportation means was a railway had developed further. Figure 12 (a) shows the rail network in 1961 when rail transport was superior. Trunk lines which linked main cities with the port were national railway. And feeder lines which linked nodes on the trunk lines with reclaimed lands, coal mines, and transfer points of wood were light railway.

Figure 12 (b) shows the road network in 1961. At that time, roads with two lanes were limited to regions such as Kushiro city and Teshikaga town. And cities were not connected by two-lane roads. For instance, the route between Obihiro and Kushiro is very important, but the road had only one lane between Onbetsu and Urahoro and 1.5 lanes



(a) Rail Network



(b) Road Network

**Figure 12 Rail and Road Networks in the Era of Rail Dominance (1961)**

Source: Compiled from Landform Map (Scale, 1-200,000).

beyond Urahoro. That is, transport between cities depended on railway.

As for the local transport, the improvement of roads was delayed at the region which has rail service. For instance, Kushiro city and the downtown of Tsurui village was connected by Hokkaido Takushoku Railway, and the road along this railway had only one lane. However, roads were widened into 1.5 lanes beyond the downtown of Tsurui village. And some roads went to ruin by the construction of light railway. Roads connecting Toro with Kuchoro and Arekinai opened in the latter term of the Meiji era and Taisho era (Figure 12 (b)). These roads had not been used because of the opening of light railway and had gone to ruin. And the terminal station of this light railway became the arrival and departure point of trucks connecting with agricultural reclaimed lands or cut-over areas, and also became collecting points of woods carried by river flow.

## **3.2. Port Hinterland in the Era of Railway Dominance**

### **3.2.1. Characteristics of Cargo**

The amount of cargo of the Kushiro port in the 1966 fiscal year was 6,122,469 tons and was next to the Muroran port (20,248,778 tons) in Hokkaido. Cargo in the Kushiro port accounted for 13.2% of the total amount of cargo in Hokkaido. Especially the Kushiro port accounted for 83.6% of the total cargo of five major ports (the Kushiro port, the

Tokachi port, the Nemuro port, the Abashiri port, and the Monbetsu port), so it had a superior position in the eastern part of Hokkaido. And four ports except Kushiro port heightened the color of fishing port<sup>17)</sup>. Export cargo of the Kushiro port accounted for 70.2% of the total cargo and the Kushiro port had an excess of export (Table 1, Table 2).

For the commodity group, percentage of mining goods and light industrial goods for the exports was high and total of both goods accounted for 90.8% of the exports. 100.0% of the mining goods were coal and they accounted for 43.6% of total import and export cargo of the Kushiro port. Of light industrial goods, paper and pulp accounted for 69.5%, other food industrial goods accounted for 18.1%, and sugar accounted for 12.4%. Material wood of forest products, heavy oil of chemical industrial goods, and rice, cereals, and beans of agricultural goods also had a large amount of export.

Percentage of chemical industrial goods for the imports was high and accounted for 54.9% of the imports. Next to this, the percentage of agricultural and fishery goods, and forest products were high. Of chemical industrial goods, oil products accounted for 39.7%, cement accounted for 19.8%, and chemical fertilizer accounted for 9.1%. Fishery goods accounted for 92.2% of agricultural and fishery goods and material wood accounted for 100.0% of forest products. 95.8% of material wood were imported<sup>18)</sup>.

As compared with total cargo in Hokkaido, the Kushiro port had a high percentage of export, especially light industrial goods (paper and pulp). And as for import, the percentage of chemical industrial goods

**Table 1 Amount of Export Cargo of the Major Ports in the Eastern Part of Hokkaido, by Commodity Groups in 1966**

(tons)

Port Name	Agricultural Goods	Fishery Goods	Forestry Goods	Mining Goods	Metal, Mechanical Goods	Chemical Industrial Goods	Light Industrial Goods	Others	Total
Kushiro Port	59,150 (1.4)	13,626 (0.3)	132,791 (3.1)	2,670,376 (62.1)	5,872 (0.1)	78,060 (1.8)	1,234,738 (28.7)	105,489 (2.5)	4,300,233 (100.0)
Nemuro Port	902 (0.8)	17,616 (15.1)	244 (0.2)	94 (0.1)	715 (0.6)	30,905 (26.4)	58,852 (50.3)	7,582 (6.5)	116,910 (100.0)
Abashiri Port	11,623 (8.9)	15,370 (11.9)	6,333 (4.9)	17,200 (13.3)	230 (0.2)	15,378 (11.9)	40,122 (31.0)	23,200 (17.9)	129,456 (100.0)
Monbetsu Port	0 (0)	83,449 (43.7)	7,513 (4.0)	0 (0)	0 (0)	19,719 (10.3)	18,956 (9.9)	61,267 (32.1)	190,904 (100.0)
Tokachi Port	13,554 (5.4)	134 (0.1)	119,439 (47.5)	2,839 (1.1)	11,583 (4.6)	8,687 (3.5)	81,571 (32.4)	13,649 (5.4)	251,456 (100.0)

Note: Number in parentheses indicates the share of commodity for the total exports.

Source: *Port Statistics Annual Report*.

**Table 2 Amount of Import Cargo of the Major Ports in the Eastern Part of Hokkaido, by Commodity Groups in 1966**

(tons)

Port Name	Agricultural Goods	Fishery Goods	Forestry Goods	Mining Goods	Metal, Mechanical Goods	Chemical Industrial Goods	Light Industrial Goods	Others	Total
Kushiro Port	19,583 (1.1)	230,051 (12.6)	210,471 (11.6)	73,114 (4.0)	187,137 (10.3)	1,000,883 (54.9)	34,061 (1.9)	65,812 (3.6)	1,822,236 (100.0)
Nemuro Port	6 (0.0)	72,084 (60.2)	0 (0)	600 (0.5)	631 (0.5)	19,470 (16.3)	19,275 (16.1)	7,620 (6.4)	119,686 (100.0)
Abashiri Port	1,965 (1.3)	117,700 (75.0)	12,700 (8.1)	0 (0)	300 (0.2)	23,510 (15.0)	0 (0)	600 (0.4)	156,775 (100.0)
Monbetsu Port	672 (0.4)	152,050 (89.8)	16,659 (9.8)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	169,381 (100.0)
Tokachi Port	2,398 (3.6)	29,173 (44.2)	186 (0.3)	2,247 (3.4)	1,145 (1.7)	29,168 (44.2)	1,247 (1.9)	494 (0.7)	66,059 (100.0)

Note: Number in parentheses indicates the share of commodity for the total imports.

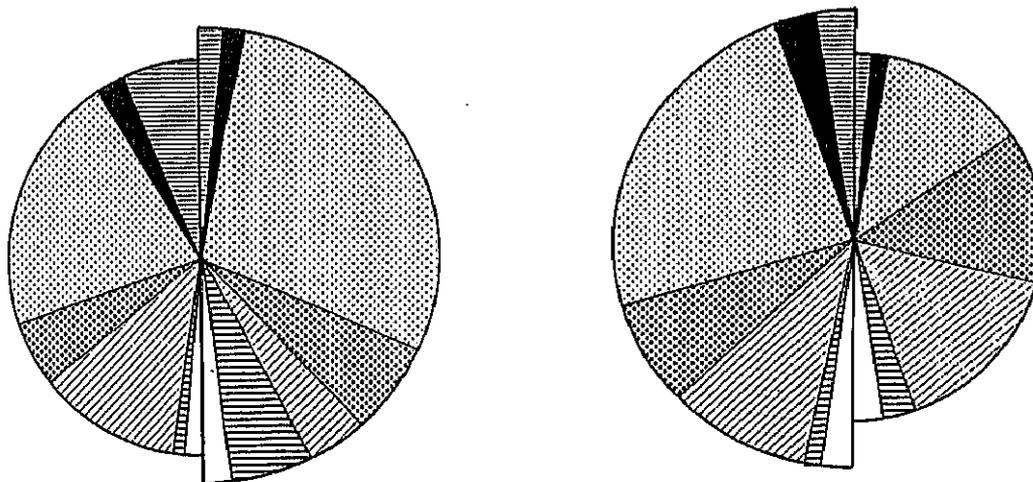
Source: *Port Statistics Annual Report*.

(oil products, heavy oil, cement, and chemical fertilizer) was high, while mining goods (iron ore, coal, and heavy oil) was low (Figure 13 (a)). As compared with total cargo of Japan (Figure 13 (b)), the Kushiro port had characteristics such as an excess of export and specialization to specific cargoes. These tendencies can be seen even in total cargo in Hokkaido, but it is more remarkable in the Kushiro port.

Also comparing cargo of 1966 with that of 1932 (Figure 9), export cargo decreased for forest goods, agricultural and fishery goods, and the increase of light industrial goods are remarkable. And as for import cargo, the decrease of agricultural and fishery goods and increase of light industrial goods are remarkable. The exports had increased by 7.8 times and the imports had increased by 7.9 times from 1932 to 1966.

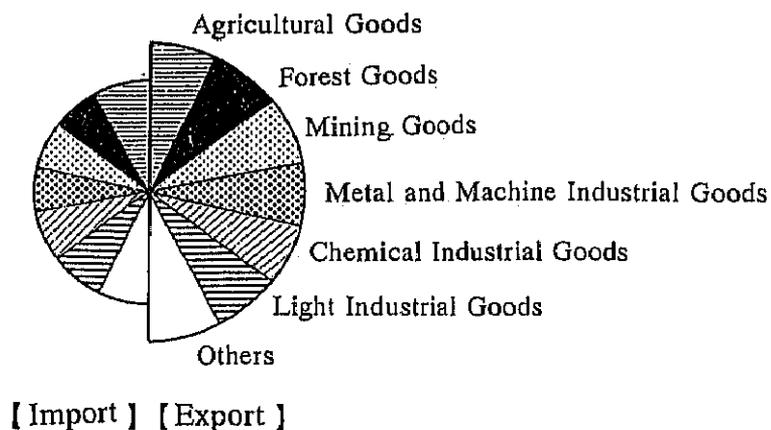
### **3.2.2. Spatial Characteristics of the Port Hinterland**

In this paragraph, the main export cargo (coal, paper and pulp, material wood, rice and cereals and beans, and food industrial goods) and the main import cargo (oil products, heavy oil, cement, chemical fertilizer, and material wood) are taken up and the hinterlands of each goods are shown. The Tokachi port, the Nemuro port, the Abashiri port, and the Monbetsu port were not investigated in "Research Data of Port Hinterland" in 1966. The hinterlands of the four ports are presumed from "Statistics of Port".



(a) Hokkaido  
 Export 26,367,187 tons  
 Import 19,946,263 tons

(b) Japan  
 Export 367,191,288 tons  
 Import 570,500,370 tons



**Figure 13 Share of Cargo by Commodity Group in Hokkaido and Japan in 1966**

(Note): Semicircle area shows the ratio of the import and the export

Source: Compiled from data in *Port Statistics Annual Report*.

### a. Exports

99.9% of the export cargo of the Kushiro port were transported from the eastern part of Hokkaido. Especially, many cargoes are transported from Kushiro district and accounted for 92.2% of total exports<sup>19)</sup>. Truck accounted for 30.8%, railway accounted for 68.7%, and other transportation means accounted for 0.5% of cargoes transported to the Kushiro port (Figure 14 (a)).

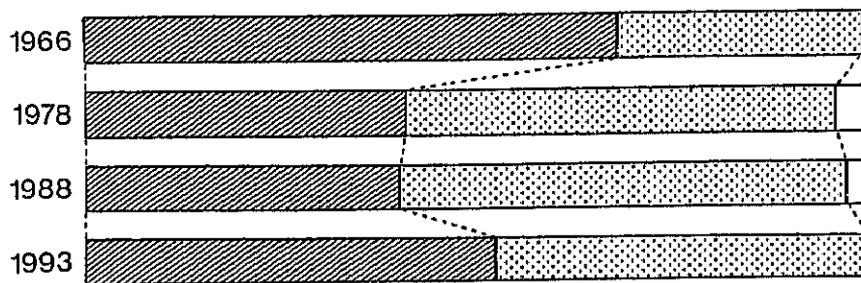
- Coal

The largest amount of cargoes handled in the Kushiro port were coal. 59.3% of coal was transported from Kushiro city and 40.7% was transported from the Kushiro district except Kushiro city. Coal produced in Kushiro district was not transported to ports other than the Kushiro port. Coal was not transported from other districts in the eastern part of Hokkaido, because coal was not produced there. Therefore, only Kushiro district was within the hinterland of the Kushiro port. And coal was not exported from four major ports in the eastern part of Hokkaido other than from the Kushiro port. So hinterlands of four ports were not formed.

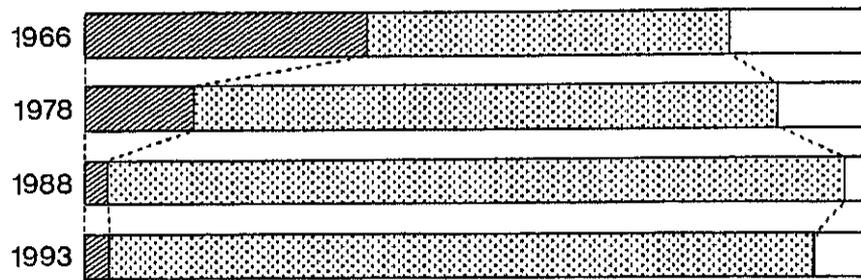
- Paper and Pulp (Figure 15 (a))

The amount of exported paper and pulp in the Kushiro port was the most of any port in Hokkaido. 96.3% of paper and pulp were transported from Kushiro city. There were two paper manufacturing plants in Kushiro city and paper and pulp were transported from these plants. Only 127 tons of paper and pulp were transported to the Hakodate port. 93.8%

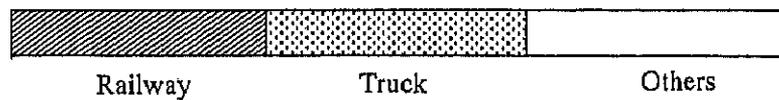
(a) Export



(b) Import

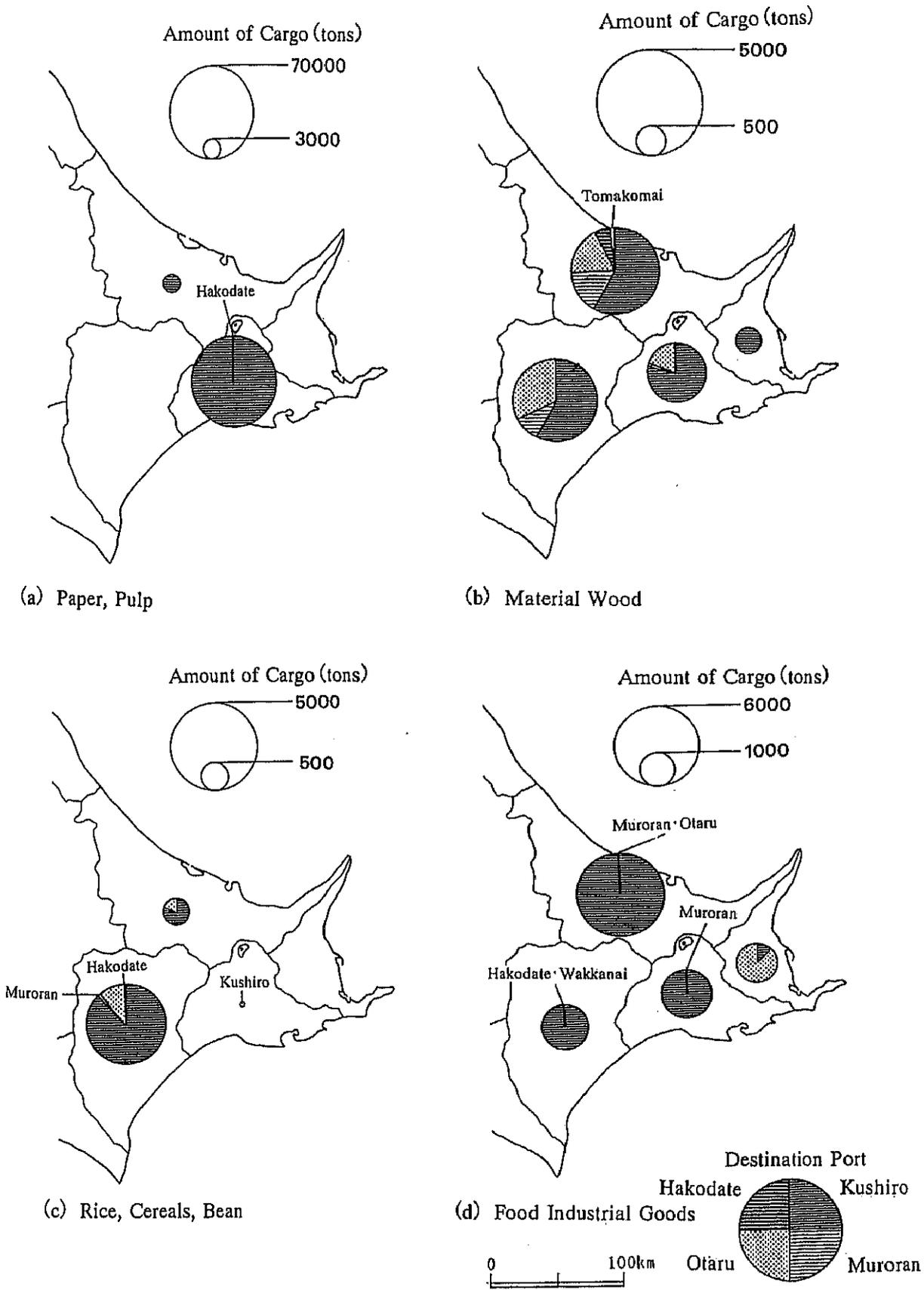


0 50 100%  
Transport Share



**Figure 14 Changes of the Transport Share of Cargoes in the Kushiro Port**

Source: Compiled from *Cargo Flow Investigation*, 1966,1978,1988,1993.



**Figure 15 Outbound Movements by Commodity in the Eastern Part of Hokkaido in Jun. 1966**  
 Source: as Figure 14.

of paper and pulp produced in the paper manufacturing plant in Kitami city were for domestic use and were transported to the Sapporo area by rail. The rest, which were for foreign use, were exported from the Kushiro port. Therefore, the hinterland of the Kushiro port was limited to Kushiro city and Kitami city where the paper manufacturing plants were located. Paper and pulp were not exported from the four ports in the eastern part of Hokkaido except for from the Kushiro port and these four ports did not have hinterlands.

- Material Wood (Figure 15 (b))

52.8% of material wood in Tokachi and Abashiri districts were transported to the Kushiro port. A lot of material wood in Tokachi district were transported to the Otaru port and their amount accounted for 55.6% of the amount of material wood transported to the Kushiro port. Besides this, a lot of material wood were exported from the Tokachi port and their amount accounted for 89.4% of the amount of exported material wood from the Kushiro port. Therefore, it seems that the some amount of material wood produced in Tokachi and Abashiri districts were transported to the Tokachi port. Material wood was exported from the Abashiri port and the Monbetsu port, but its amount was little<sup>20)</sup>. As material wood in Kushiro district was chiefly transported to the Kushiro port, Kushiro district was the hinterland of the Kushiro port. And the Kushiro port had a rival relation with the Tokachi port in Tokachi and Abashiri districts. However, its extent is uncertain because statistics can not be obtained.

- Rice, Cereals, and Beans (Figure 15 (c))

87.8% of rice, cereals, and beans were transported from Tokachi district and 8.0% of them were transported from Abashiri district. So the Kushiro port was an export port of rice, cereals, and beans produced in Tokachi district. Though they were transported from Tokachi district to the Otaru port, their amounts accounted for only 10.8% of cargoes transported to the Kushiro port. Rice, cereals, and beans, whose amounts accounted for 21.3% of those of the Kushiro port, were exported from the Tokachi port. It seems that the some amount of rice, cereals, and beans which were produced in Tokachi district were transported to the Tokachi port. Additionally, in the eastern part of Hokkaido a few rice, cereals, and beans were exported from the Abashiri port<sup>21)</sup>, but this port did not form a hinterland of them.

- Food Industrial Goods (Figure 15 (d))

The amount of the export of food industrial goods in the Kushiro port was the best in Hokkaido and it accounted for 60.4% of total exports of food industrial goods in Hokkaido. This is because a vast cultivated field extended in Tokachi and Abashiri districts. Starch and sugar were typical food industrial goods and a lot of plants were located in Tokachi and Abashiri districts<sup>22)</sup> which are production centers of potato and beet. Therefore, 59.9% of food industrial goods that were exported from the Kushiro port were from Abashiri district and 16.9% of them were from Tokachi district. And some food industrial goods were exported from the

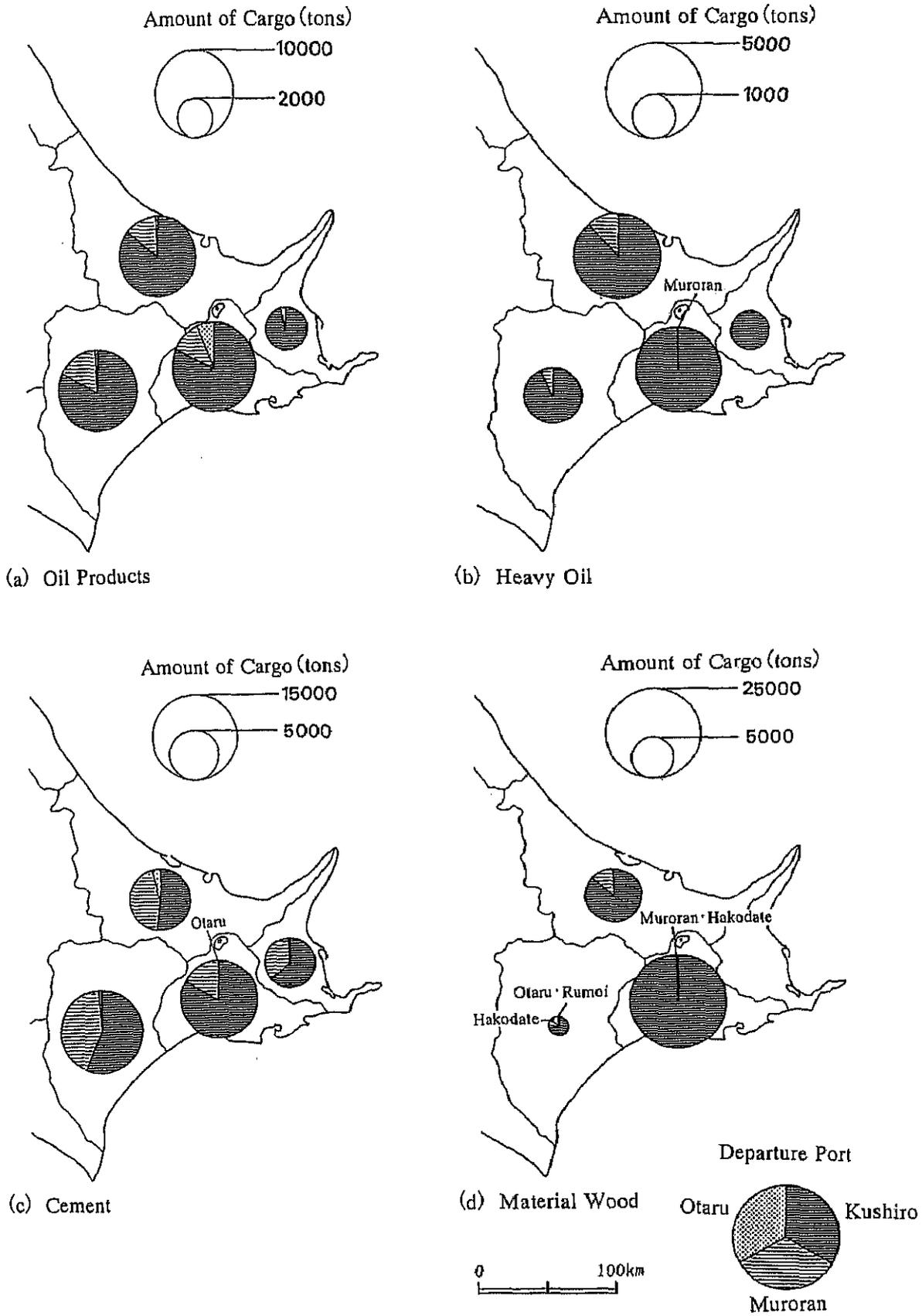
Tokachi port, too. Also, they were exported from the Abashiri port and the Monbetsu port, but their amounts were only a little. Therefore, the hinterland of the Kushiro port extended from Kushiro district to Abashiri district and competition of the hinterland with the Tokachi port was seen in Tokachi district.

#### **b. Imports**

99.2% of the imports of the Kushiro port were transported to the eastern part of Hokkaido<sup>23)</sup>. Especially, 47.6% of them were transported to Kushiro city, so the port city was the biggest arrival place. Truck accounted for 45.5%, railway accounted for 36.9%, and other transportation means accounted for 17.6% of cargoes transported from the Kushiro port (Figure 14 (b)). The percentage of truck transport was the highest. But as trucks were mainly used for short transport, rail had a high share for long distance transport<sup>24)</sup>. In the imports, rail was also dominant for short transport because coal produced in a mine in Kushiro city was transported to the Kushiro port by rail.

#### • Oil Products (Figure 16 (a))

As for oil products, the eastern part of Hokkaido was almost within the hinterland of the Kushiro port. Some oil products were transported from the Muroran port to Abashiri and Tokachi districts, and share of the Muroran port was 13.9% in Abashiri district and 16.8% in Tokachi district. Though oil products were imported in the Tokachi port, the Nemuro port, and the Abashiri port, their total amount was only 2.8% of



**Figure 16 Inbound Movements by Commodity in the Eastern Part of Hokkaido in Jun. 1966**  
 Source: as Figure 14.

those of the Kushiro port. By the way, the exports of oil products exceeded the imports in these three ports<sup>25)</sup>, so it is thought that the lack of the oil products was supplied from another port in Hokkaido by land. Therefore, as for oil products, the Tokachi port, the Nemuro port, and the Abashiri port did not form a hinterland.

- Heavy Oil (Figure 16 (b))

The eastern part of Hokkaido was within the heavy oil hinterland of the Kushiro port. Heavy oil was imported in four ports except the Kushiro port and the total amount of four ports accounted for 25.2% of that of the Kushiro port. As imports and exports were almost the same amount in the Tokachi port and the Nemuro port, it is thought that the amount of heavy oil transport to the interior was little and a hinterland was not formed. On the other hand, exports exceeded imports in the Abashiri port and the Monbetsu port. So local hinterlands were formed in and around these port cities. And, all heavy oil in the Abashiri port and the Tokachi port were imported from the Kushiro port by oil tank ships<sup>26)</sup>. In a broad sense, hinterlands of the Abashiri port and the Tokachi port belonged to the hinterland of the Kushiro port. That is, in the hierarchy of ports, the Kushiro port ranked higher than the Abashiri port and the Tokachi port was seen.

- Cement (Figure 16 (c))

Cement was transported to the eastern part of Hokkaido. The share of the Kushiro port was 56.1% in Tokachi district and 53.0% in Abashiri

district. Because a lot of cement were transported from the Muroran port to Tokachi and Abashiri districts. Cement was transported from the Otaru port, too, but its share was 0.8% in Tokachi district and 3.6% in Abashiri district. The competition between the Kushiro port and the Muroran port was seen in Tokachi and Abashiri districts like this. Cement was imported in the Tokachi port, the Nemuro port, and the Abashiri port, but their total imports accounted for 12.7% of the imports in the Kushiro port, so these three ports did not form hinterlands.

- Material Wood (Figure 16 (d))

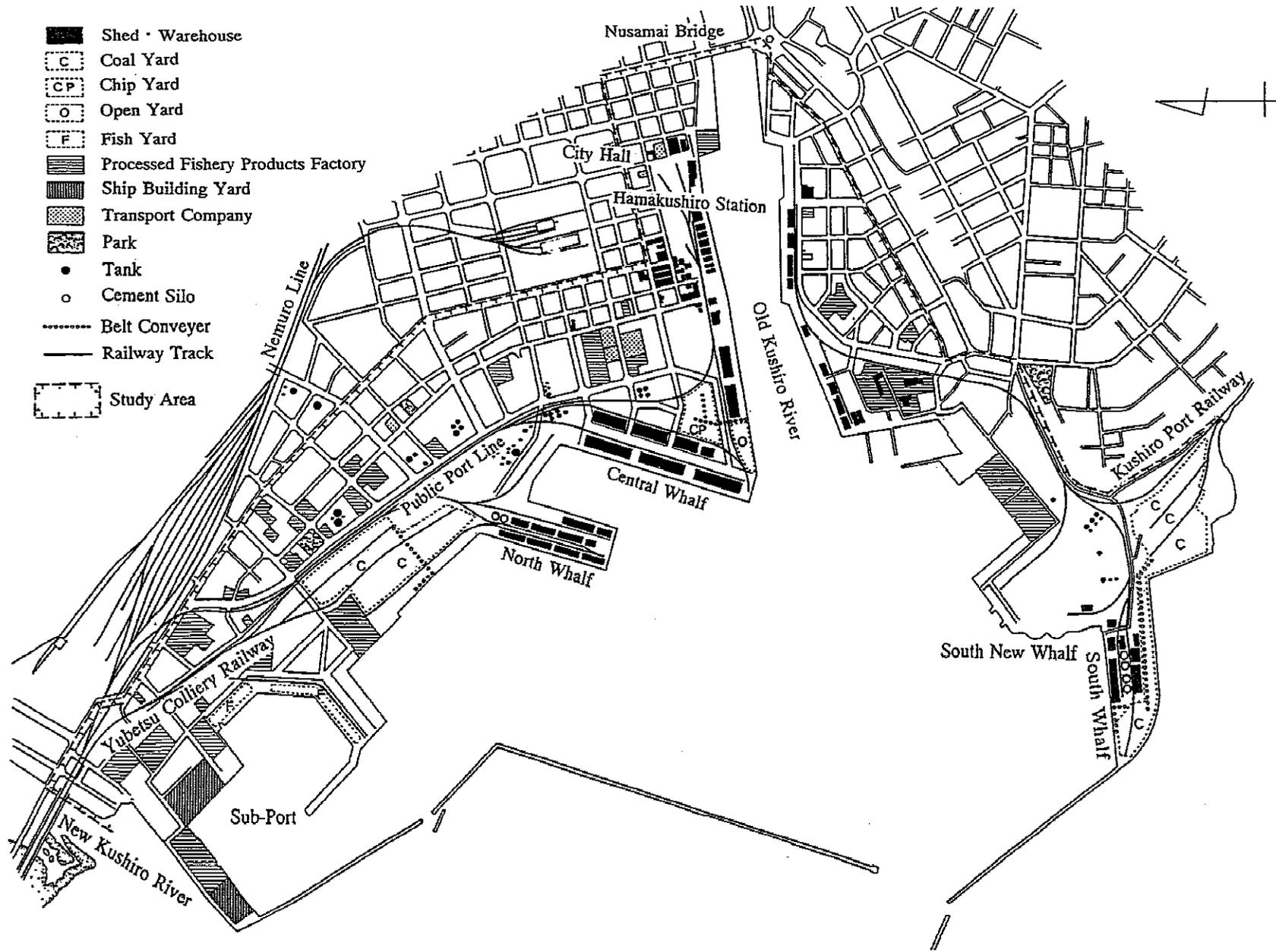
74.7% of material wood were transported to Kushiro city and the rest were transported to Abashiri district. So the port city was the biggest arrival place. Some material wood were transported from the Muroran port, but its share was only 13.0%. A small amount of material wood were transported to Tokachi district and Kushiro district, except Kushiro city, from the Kushiro port and they were not transported to Nemuro district. Arrival places were almost limited to Kushiro city and Abashiri district, because most of the material wood were transported to the paper manufacturing plants. That is, two paper manufacturing plants were located in Kushiro city and one paper manufacturing plant was located in Kitami city in Abashiri district and material wood processed to paper or pulp there<sup>27)</sup>.

### 3.3. Port Space in the Era of Rail Dominance

The Kushiro port had not been improved from 1941, when the Pacific War started, to 1951 in the postwar period. Port improvement projects in which mother ships could come alongside a pier directly progressed one by one, because the Kushiro port was specified for an important port. The wharves were constructed in the order of South Wharf, North Wharf, and Central Wharf. These wharves were facing toward the open sea. The following is thought as its factor. (1) The Old Kushiro River was too narrow and too shallow for mother ships to enter. (2) Port space for loading was not prepared on the riverside of the Old Kushiro River, because downtown was adjacent to this river. (3) Tranquil anchorage could be secured because of the completion of the breakwater. On the other hand, quays in the Old Kushiro River had declined gradually by the moving the loading functions to the new wharves. For example, the loading site of coal from Yubetsu coal mine was moved from the quay near the New Kushiro Station to the North Wharf. Thus, the center of the loading site moved from the river area to the coastal area.

Lastly, Central Wharf was completed in 1968. At that time, the mooring quay for large-scale ships extended 2,597m and for small-scale ships extended 8,582m. Then characteristics of port space of the Kushiro port in 1968 are shown based on figure 17, in the order of South Wharf, South New Wharf, North Wharf, and Central Wharf.

South Wharf is the first wharf in the Kushiro port and coal from



- Shed · Warehouse
- ⊂ Coal Yard
- ⊂ CP Chip Yard
- Open Yard
- ⊂ F Fish Yard
- ▨ Processed Fishery Products Factory
- ▨ Ship Building Yard
- ▨ Transport Company
- ▨ Park
- Tank
- Cement Silo
- ⋯ Belt Conveyer
- Railway Track
- ⊂ Study Area

0 500.m

Figure 17 The Port of Kushiro in 1968

Sources: Compiled from residential quarter chart and aerial photo.

Taiheiyo Coal Mine was chiefly exported from this wharf. Coal was transported from the coal preparation plant of Taiheiyo Coal Mine to the coal yard situated behind South Wharf by the Kushiro Rinko Railway. Coal was transported from the coal yard to South Wharf by belt conveyer and was loaded into the coal ship by two coal loaders. Cement was imported and general cargo was exported in this wharf, and cement silos, sheds, warehouses, and freight lines of Kushiro Rinko Railway connecting these facilities with the hinterland were situated on this wharf. The Kushiro Rinko Railway opened to Shiroyama Quay facing toward the Old Kushiro River in 1937 and to Irifune-cho Quay in 1940. This railway strengthened the loading function of Irifune-cho Quay, but reduced or moved the fishery function around this quay. For example Kushiro Fishery Wholesale Market in Irifune-cho moved to Nishiki-cho situated on opposite side of the Old Kushiro River and four shipbuilding yards for fishing boats adjacent to this market moved to South Wharf district or around the Kusuri Bridge. And the fishery settlement behind Irifune-cho Quay was cut off from the river by freight lines and warehouses. However, the mouth of the Old Kushiro River was used for a basin of fishing boats. At that time South New Wharf was under construction, but sixteen oil tanks were already situated behind this wharf and preparation for the energy base was advanced.

On the west side of the Old Kushiro River, North Wharf, where mother ships could come alongside, was completed in 1950. Many freight lines of Yubetsu Colliery Railway and a vast coal yard were located behind this wharf. Coal from Yubetsu coal mine and other coal

mines in Shiranuka town and Onbetsu town was transported to this coal yard by rail. Coal was transported from the coal yard to the adjacent wharf by belt conveyer and was loaded into the coal ships by two coal loaders. The railway ran into North Wharf and connected with sheds and warehouses. Various kinds of cargoes were loaded, unloaded, and warehoused there. Fifty-seven small-scale oil tanks were located behind North Wharf. Thus North Wharf and South Wharf had a characteristic of the energy base for oil and coal. For your information, the Yubetsu Colliery Railway transported 963 thousand tons of coal, 207 thousand tons of oil, and 294 thousand tons of other freights in 1966.

Central Wharf, completed in 1968, became the first public wharf in the Kushiro port, because South Wharf and North Wharf were private wharves of coal mining companies. Freight lines of the National Railway, sheds, and warehouses were constructed in this wharf. And Hamakushiro Station<sup>28)</sup>, situated in a terminal point of this freight line, was constructed. A chip yard and container yard<sup>29)</sup>, which were not seen in the past Kushiro port, were set up in this wharf, and also a quay of 10 m in depth was prepared. So this wharf had the latest functions. For example, wood chips were unloaded directly from the ship by loader and transported to the chip yard which was situated in the center of the wharf by belt conveyer, then transported from the chip yard to the paper manufacturing plants by truck. Container cargoes were loaded in the same quay that wood chips were loaded. The sheds, as seen in the past port, were not situated behind this quay, but a container yard where container cargoes were temporarily stored was prepared. However, no

container cranes were prepared in this quay, so container cargoes were loaded by the crane of the container ship. Central Wharf had new functions not to be seen in a past wharf. The Kushiro port had already been pre-modernized at the time of completion of Central Wharf in 1968, because the First Five-year Plan of Hokkaido Comprehensive Development (1952-1957) was planned before high growth of economy and motorization. Therefore, a lot of problems occurred in the Kushiro port. To give some examples: Port ability did not catch up with the increase of the amount of cargo by the economic growth of the port hinterland: The Kushiro port did not cope with truck transport and a large-scale cargo ship: Cargoes were complicated because of the shortage of a special quay.

The Kushiro port had been improved as mentioned above. But it had improved as a commercial port, so this improvement brought the decline of the fishery settlement behind the port and the move of the fishing port district. That is, originally, fishery activity like the kelp collection had been done on the Kushiro coast. After the Meiji era, a lot of fishermen migrated from Tohoku and Hokuriku districts, and the fishing settlement was formed at the mouth of the Old Kushiro River. The cargo ships and the fishing boats were complicated in the Kushiro port and the fishing boats and the barges were shipping in and out at the same quay, because the river mouth was used for a basin of the fishing boats. The fishing port called Saga Fishing Port was constructed by a private citizen in the western part of the Kushiro port in 1937 and the separation of the fishing port and the commercial port came to be seen to some degree. Sub-Port

(Figure 17) made repairs on this Saga Fishing Port and became the base of the northern sea fishery. Landing stages for fish are situated behind the pier in Sub-Port and a fish wholesale market, an ice plant, a refrigeration plant, a dockyard, and a fisheries experiment station are situated behind landing stages for fish. All fish have been landed in the Sub-Port since 1965.

A lot of fisherman's houses were situated behind Shireto Quay, North Wharf, Central Wharf, and Sub-Port. The fishery settlements were formed here. Shops for fishing net and fishing implements, and a fishing net yard were situated in these settlements. Also, small or medium-sized processed fishery products plants were situated there. Because a large amount of walleye pollacks had been landed in Showa 30's, some fishermen came to be engaged in processed fishery products industry. And some processed fishery products plants and refrigeration plants of big fishery companies were located around Sub-Port and South New Wharf. They were constructed according to the large amount of landing of mackerel, mackerel pike and whale after World War II .

Figure 18 is the outline map of port space of the Kushiro port based on the result of the above-mentioned. The following features are seen. The ratio of rail transport facilities occupying to port space was large. Rail transport facilities were located between cargo loading facilities and urban area, and separated the port from urban area. Zones where processed fishery products plants and fisherman's houses existed together were seen behind the port. The vast storage facilities for coal were seen in the port.

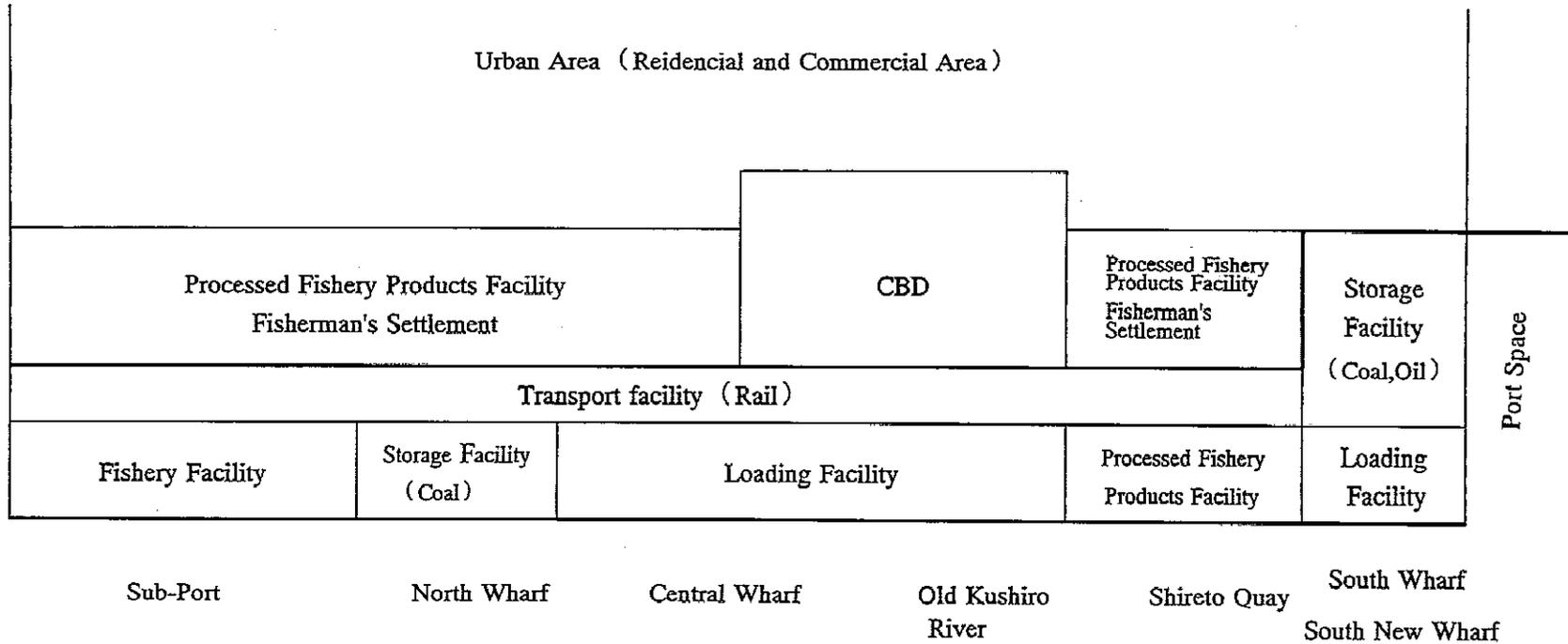


Figure 18 Schematic Diagram of Port Space and Surroundings of East port in Jun. 1968