

FUTURE DEVELOPMENT OF SEA TRANSPORTATION CORRIDORS IN NORTHEAST ASIA

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Abstract: This paper outlines the achievements of joint research carried out by Japanese, Chinese and South Korean port-related research institutions that are members of a working group, which was established by the Northeast Asia Port Director-General Meeting of these three countries. The purpose of this joint study was to promote the development of international trade routes in Northeast Asia among the three countries. Through this study, we identified seven trade corridors and each current situation that we believe to be of particular importance, and clarified traffic problems in trade corridor. The three countries' demand forecasts were also carried out using identical methods and almost identical data. Additionally, we analyzed the significance of international ferries in Northeast Asia, based on the current situation. We forecast that a high quality network of international division of labor and industry will be formed through the transport network in future.

Key Words: International Trade, Trade Corridor, Northeast Asia, Demand Forecast, Sea Transportation

1. OBJECTIVES OF STUDY

The purpose of this joint study is to promote the development of international trade routes in Northeast Asia among the three countries.

The following tasks will be carried out through the course of this study:

- Collection of data and information on transportation corridors and ports in the Northeast Asian region
- Research on current situation of each corridor and cargo transportation including international ferry system
- Cargo volume forecast of those corridors and ports
- Analysis of infrastructure requirements and measures for institutional reform
- Study on the role of corridors and their future direction
- Recommendation

2. DEFINITION OF THE NORTHEAST ASIA SEA TRANSPORTATION CORRIDOR (STC)

The Sea Transportation Corridor (hereinafter referred to as STC) is defined as follows:

Sea transportation corridor is an international transportation route consisting of principal overland transportation route, principal ocean shipping liner routes and port(s) connecting between the overland transport and maritime transport. A principal overland transport route is called a trade corridor.

3. CURRENT SITUATION AND MAJOR ISSUES OF STC

3.1 Trade Corridors

Northeast area of China consists of four provinces (autonomous regions) of Liaoning, Jilin, Heilongjiang and Inner Mongolia. We identified the seven international transport routes as trade corridors (Figure 1). Significant characteristics of each corridor are as follows:

(1) Dalian Trade Corridor: Dalian – Shenyang – Changchun – Haerbin – Manzhouli - Fareast hinterland area of Russia

The corridor is the main artery for China's northeastern region (Liaoning, Jilin and Heilongjiang) that forms the geographical and economic center of continental Northeast Asia.

(2) Suifenhe Trade Corridor: Fareast hinterland area of Russia – Manzhouli -Haerbin –Suifenhe - Primorsky Krai

The corridor gives Heilongjiang Province access to the sea and sea lanes, and links it to Japan, the ROK and the USA.

(3) Tumen River Area Trade Corridor: Changchun – Tumen - North Korea port and Changchun – Hunchen - Primorsky Krai

The corridor gives Jilin Province access to the sea and sea lanes, and links it to Japan, the ROK and the USA.

(4) Mongolia Trade Corridor: Tianjin – Beijing - Erlianhaote- Ulaanbaatar-Russia

The corridor is the most important international transportation route for the landlocked country of Mongolia. It is also used for transit transportation between Europe and Asia via the SLB.

(5) China Land Bridge (CLB): Lianyungang –Zhengzhou –Xian –Lanzhou –Ulumuqi –Alashankou - Kazakhstan-Russia

The corridor connects East Asia with Central Asia. It will compete with the SLB in future, becoming a transit route between Europe and Asia.

(6) Siberia Land Bridge (SLB): Trans-Siberia Trade Corridor

The corridor is the only railway route that connects east and west Eurasia at present. This route plays a great role in Russian domestic transport and it is the main artery that connects Moscow and Far East Russia. It is also developed as a substitute for marine transportation between Asia and Europe.

(7) Korean Peninsula Trade Corridor: Land Bridges between North and South Korea

The corridor links Busan Port with the Dalian Corridor and the SLB. However, the lines linking the ROK and the DPRK are disconnected. If this bottleneck can be overcome, transporting freight from East Asia to Europe and Central Asia will become more diverse and convenient.

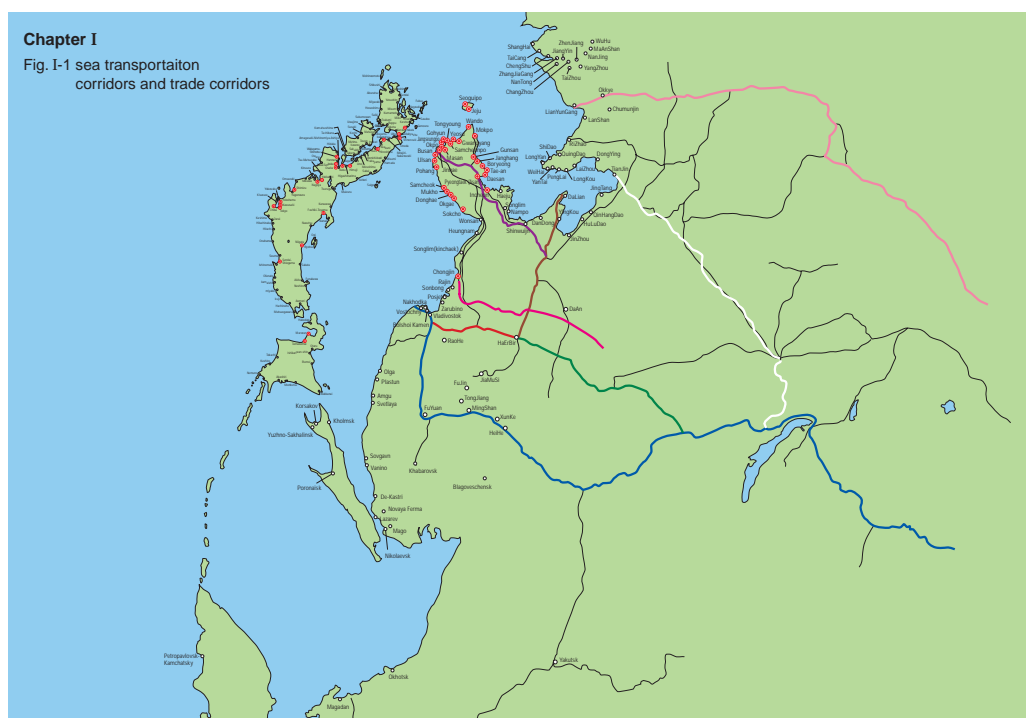


Figure 1. Map of Northeast Asia (Including Sea Transportation Corridors)

3.2 Traffic Problems in Trade Corridors

There are many overland borders on the Northeast Asia continent. Transport efficiency falls drastically at these borders due to various restrictions, inadequate facilities etc. This situation is common to both railway and truck transport. To cope with the problem, modernization of loading/reloading facilities and innovation of free gauge train in the railway transport, and deregulation of domestic transport-related laws and participation in TIR convention in truck transport will be examined.

The more critical issue in realizing efficient international transport among China, Russia, Mongolia and the ROK is soft environment. First of all there exist many relevant laws in each country that hinder the enhancement of transport efficiency, the traditional transport formalities has not been solved fully and some problems have been dragged on for years. On the other hand the system of laws and regulations in each country itself is not complete and man-made factors especially make transport efficiency low and transport cost high.

3.3 Recent Traffic Statistics in Trade Corridors

Manzhouli, Alashankou, Suifenhe and Erlian (Erenhot) are the four principal ports among international routes in China, and collectively accounted for 95.6% of the total volume of freight handled at railway ports of China in 2002.

Table 1. Recent Increase of Border Traffic in Continental East Asia

(Unit: ten thousand ton)

Site of Border	Past Volume	Volume in 2002
Manzhouli-Zabaykalsk	320(1998)	900
Sifenhe-Grodekovo	210(1999)	500
Erenhot-Zamin Uud	230(1998)	410
Ala Shankou- Druzhba	360(1999)	580
Suhbaatar-Naushki	250(2000)	470

(Source: ERINA Tokyo Symposium, Feb. 2003)

3.4 Salient Features of Maritime Container Transport Network in the Northeast Asia

As is shown in Figure 2, Figure 3, Table 2 and Table 3, the followings can be observed as salient features of maritime container transport network in the Northeast Asia:

- **Container movement in the world**

East Asia is the center of world container movement in terms of movement scale.

- **Internal container movement of the region in the world**

East Asia is the most vigorous region in the world in terms of internal container

movement

- **Container movement in Asia**

Container handling volume within Asia has steadily increased year by year.

- **Change of the container volume in Asian countries by country**

Container volume of China has been increasing rapidly in recent years

- **Container Cargo movement between Far East Asia and South East Asia**

More than half of the total container cargo is handled in Far East Asia.

- **Ratio of volume of cargo transported among three countries i.e. Japan, China and the ROK, to whole volume transported among Asian countries**

The total of Japan, China and the ROK has a 33% share of whole Asia in terms of container movement and this ratio has been increasing recently.

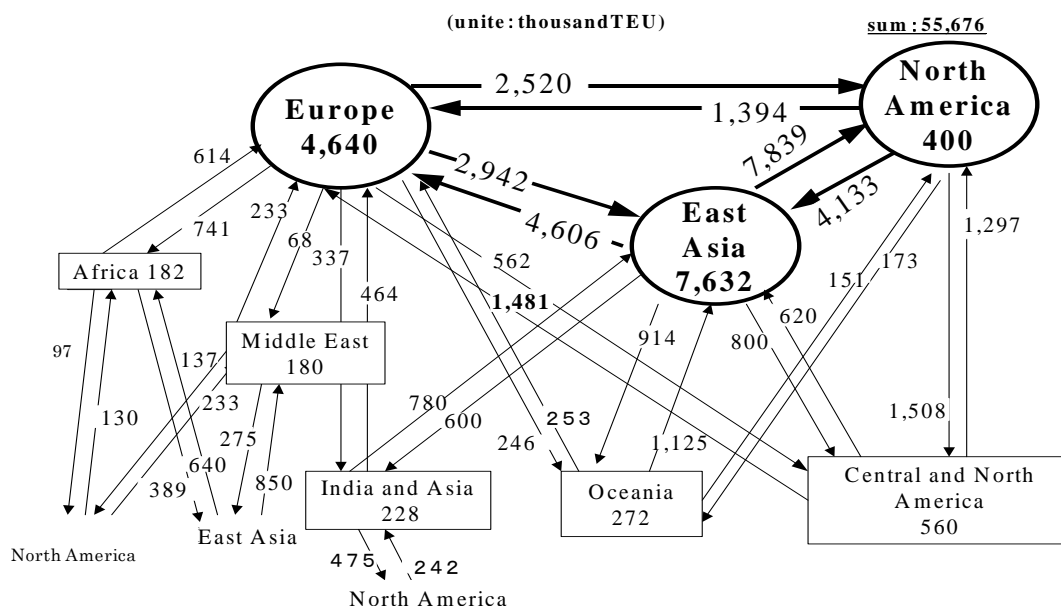


Figure 2. World Maritime Container Movement in 2001 (Source: MOL, Nov.2002)

Table 2. Change of Container Handling Volume within Asian Countries

(Unit: million TEUs)

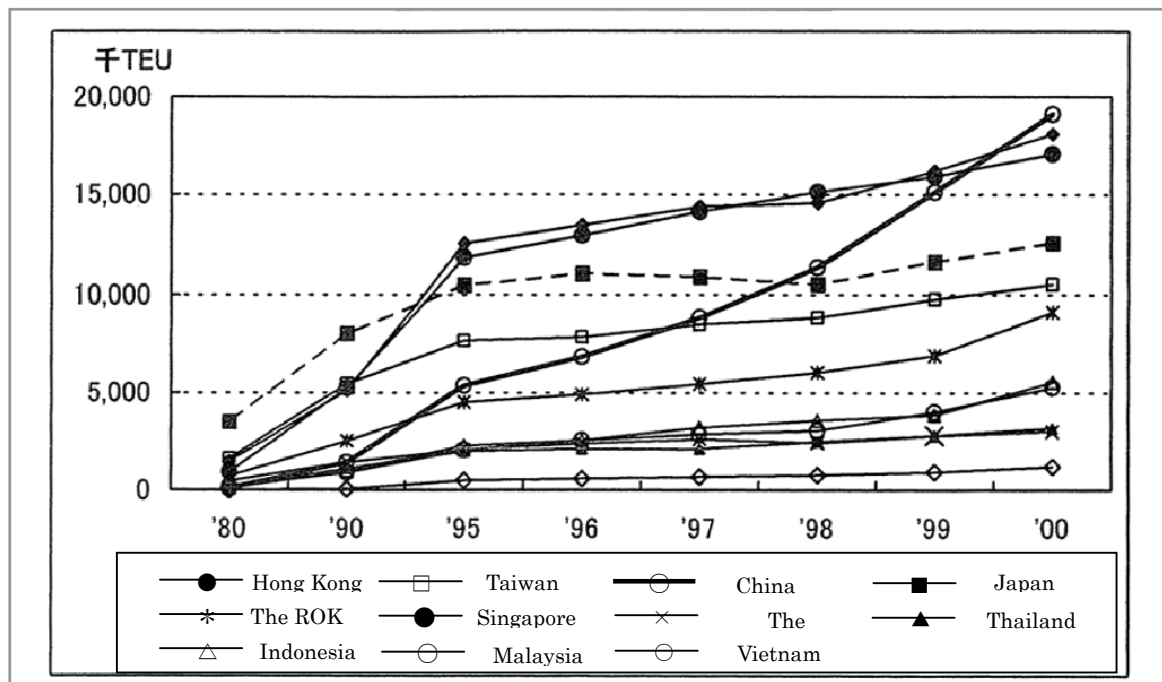
Year	Container movement in Asia
1997	5.50
1998	5.62
1999	6.66
2000	7.44
2001	7.63

(Source: MOL, Nov. 2002)

Table 3. Rate of Container Cargo Handled in Interstate of the Three Countries to Whole Asia

year	ratio(%)
1997	29.2
1998	28.2
1999	30
2000	32.6
2001	35.4

(Source: MOL, Nov.2002)



(Source: MOL, Nov. 2002)

Figure 3. Change of Container Handling Volume in Asian Countries

In conclusion, the region consisting of Japan, the ROK and China are the busiest in the world in terms of container movement. Northeast Asia may be called the economic engine of the world economy. That might be due to the large number of Japanese and Korean corporations that have moved their production bases to China.

3.5 Current Situation of SLB (Siberia Land Bridge)

Consignors of East Asia, when trading with European merchants, almost exclusively utilize All Water transport system (via the Indian Ocean and the Suez Canal) for transporting containers in the East Asia-Europe trade. Travel time of approx. 30 days is required in the case of All Water transport while travel time can be reduced to 2 days by air (though at much higher transport cost). However, consignors are looking for different transport means with intermediate travel time and cost.

Siberia Land Bridge (SLB) may be the answer, because its travel distance is much shorter and

its train speed is faster than the All Water system. However, SLB has not been able to compete with the All Water in the past decade. Table 4 shows SLB-related shipping liner service as of May 2002. Container liner service between Busan and Vostochny (SLB) has the frequency of 5 times per week, while that for Japan-Vostochny is only two or three times per month. In order for SLB to gain competitiveness, more frequent service and modernization of its operation are required.

Table 4. SLB-Related Shipping Liner Service (As of May 2002)

Country	Shipping line	Calling ports	Frequency of calling to Vostochny Port
Japan	TSCS	Yokohama, Kobe, Nagoya, Simizu, Moji, Tomakomai	Two or three times per month
China	FESCO	Shanghai	Every 10 days
	TMI	<i>Mentioned below</i>	<i>Mentioned below</i>
	SCF	<i>Mentioned below</i>	<i>Mentioned below</i>
ROK	KSDL	Busan, Masan	Weekly
	TMI	Busan, Masan, Shanghai	Weekly
	SCF	Busan, Ningbo, Shanghai	Weekly
	MCL	Busan	Weekly
	HSS	Busan	Weekly

(Source: OCDI)

3.6 Current Situation of International Ferry in Northeast Asia

International ferry network in Northeast Asia is shown in Figure 4. There is a pronounced difference in the density of the network between the northern side of the Tsushima Straits (the Korea Strait) and the southern side. In the Bohai Sea, the Yellow Sea and the East China Sea, international ferry transportation is very common, while in the Japan Sea, only a few routes between the continent and the ROK or Japan are in service.

While the most important role of domestic ferries in Japan, China, Russia and the ROK is the movement of vehicles (including railroad wagons), all international ferry services of Northeast Asia basically transport only cargo and passengers with the exception of Shimonoseki-Busan ferry. Shimonoseki-Busan ferry can deal with the movement of automobiles and trucks to some extent. Japanese (the ROK) vehicles can enter into the ROK (Japan) under some conditions. International ferries in Europe, where a borderless society has already been realized, deal with a huge number of vehicle movements.

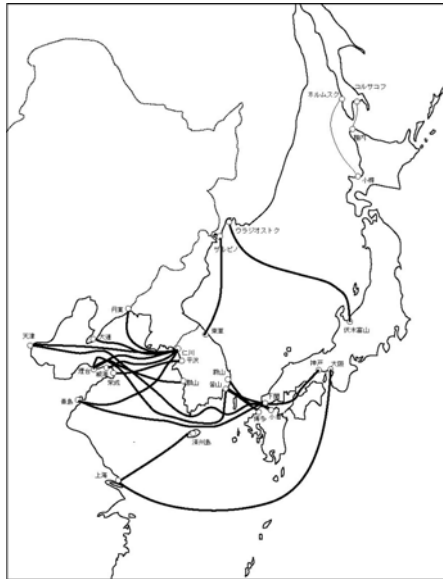


Figure 4. East Asia International Ferry Network as of 2002 (Source: ERINA)

3.7 Characteristics of Current Northeast Asia Cargo Transportation

Summarizing the above, we can make the following observations concerning current Northeast Asia cargo transportation:

- Busiest maritime transport in the world. Rapid advancement of international division of labor and industry among the three countries.
- Drastic increase of container cargo volume in China. Insufficient supply of port facilities to overcome rapid increase of demand in China and the ROK.
- Extreme difference between south area and north area of the Tsushima Strait (the Korean Strait)
- Developing stage of land bridge transport in Eurasian Continent
- Rapid increase of border traffic in continental Northeast Asia in recent years
- Low development stage of international ferry system in Northeast Asia

4. DEMAND FORECAST OF CARGO VOLUME TRANSPORTED IN STC

4.1 Demand Forecast of Cargo Volume Handled in Ports

In order to discuss the future direction and major issues of STC, each of our members implemented demand forecast, respectively. Table 5 shows key-conditions of demand forecast and Figure 5 shows the outline of demand forecast in the case of Japan. Figure 6 through Figure 8 depict the results in summarizing figure style.

There is discrepancy among the results of the three countries despite the fact that a common forecast method was adopted. Cargo demand forecast by Japan is a little larger than the other

two countries. Cargo was forecast using the interrelation between trade value and maritime trade volume. However, there were some slight adjustments made by each country and this could account for the discrepancy in the results.

Table 5. Demand Forecast Method

- Forecast Index	Trade Value Trade Volume Container Cargo Volume
- Target Year	2005, 2010, 2015
- Forecast Method	Trend Analysis
-Selected Countries/Regions	China, the ROK, Japan, Asia, North America, Central & South America, Europe, Africa
- Data Base (Trade Value)	ITCS International Trade by Commodity Statistics, 1990-2000, OECD
-Data Base (GDP)	SITC/CTCI-Revision 2, 1990-2000, World Bank

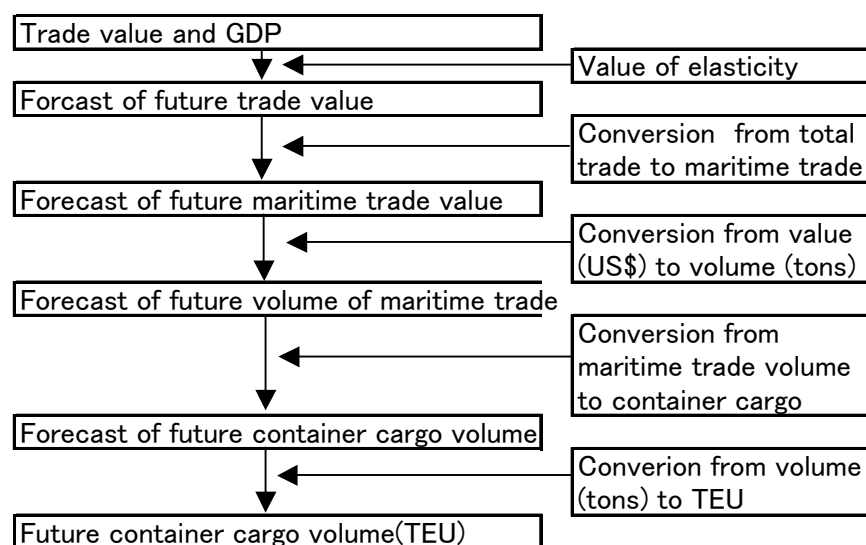


Figure 5. Outline of Demand Forecast (in the Case of Japan)

4.2 Transshipment Container Cargo

Transshipment container cargo (T/S cargo) is container that is unloaded at the relevant port and, next, reloaded onto a vessel bound for another country (destination). Although T/S cargo demand forecast was not carried out in this Joint Study, it is predicted that T/S cargo will increase in future because of the following reasons:

- Increase of international container volume and enlargement of O/D (origin and destination) network in worldwide container movement in line with the expansion of international division of labor and industry and steady and rapid growth of global trade.

- Reorganization of shipping liner route network caused by appearance of large container vessels.

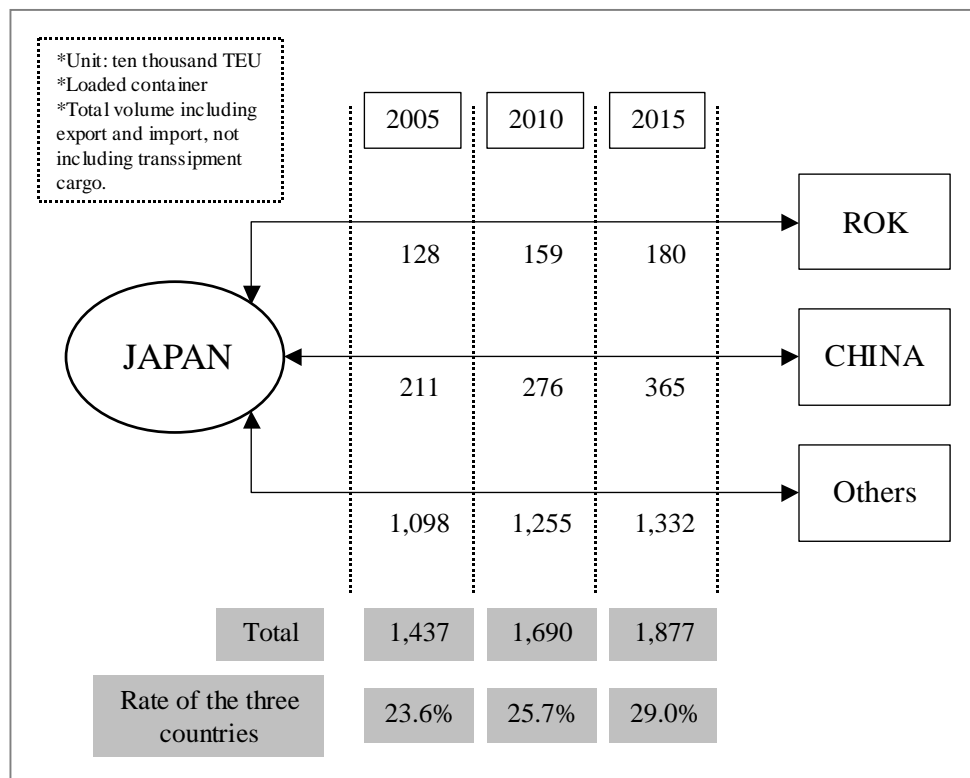


Figure 6. Foreign Trade Container Throughput Predicted by Japanese Side

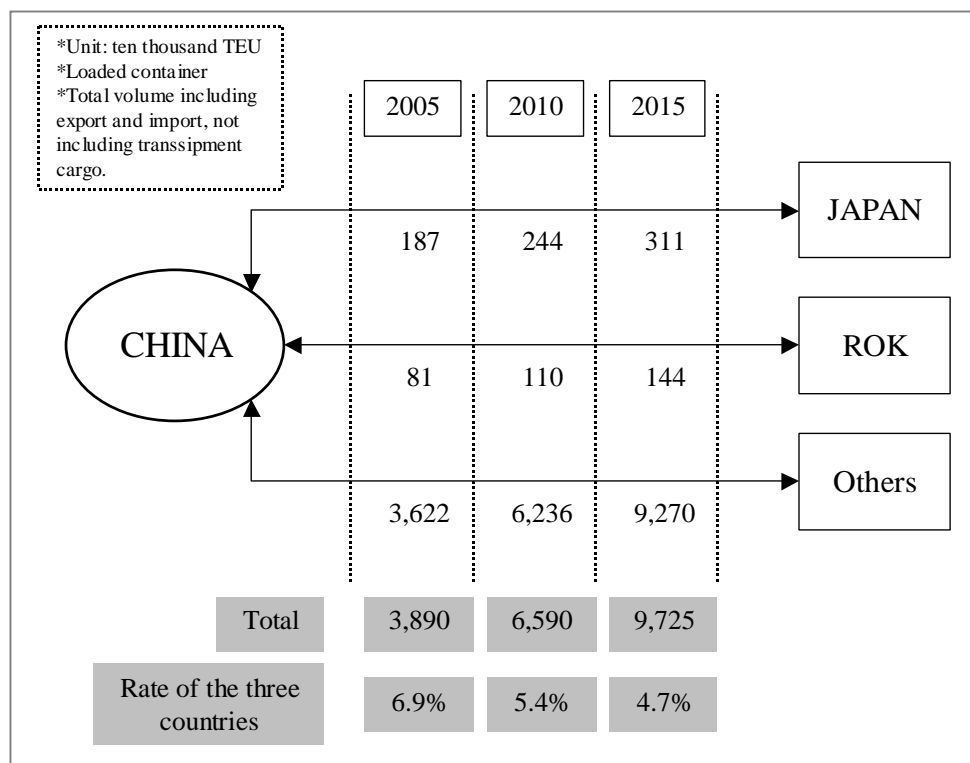


Figure 7. Foreign Trade Container Throughput Predicted by Chinese Side

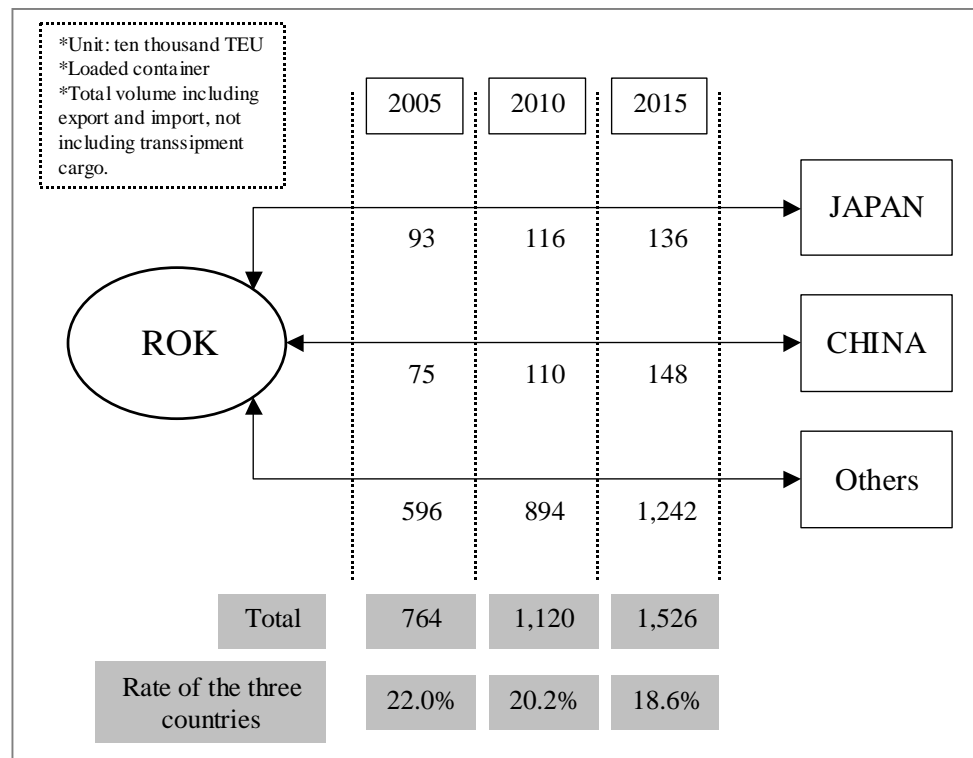


Figure 8. Foreign Trade Container Throughput Predicted by the ROK Side

4.3 Demand Forecast of Cargo Volume in Trade Corridors

As for demand forecast of cargo volume in trade corridors, followings are respectively predicted. Of these, (1) through (5) are based on interviews with relevant authorities in China.

(1) Dalian Trade Corridor

This route has not seen transit freight from Japan, the ROK and other countries.

(2) Suifenhe Trade Corridor

The overall freight traffic will reach 12 million tons in Suifenhe Port by 2005, among which there are 500,000 tons of containerized cargos accounting for 4.1% of the total.

International transit freight will reach 100,000 tons by 2005, 300,000 - 500,000 tons and 1 - 1.5 million tons by 2010 and 2015 respectively.

(3) Tumen River Area Trade Corridor

Container traffic is forecast at around 10,000 - 15,000 TEU by 2005 and 50,000 TEU by 2010.

(4) Mongolia Trade Corridor

It is predicted that the transit transportation traffic will reach 40,000 TEU by 2005 and 80,000 TEU by 2010.

(5) China Land Bridge (CLB)

Traffic of transit containers from Lianyungang to Alashankou will be 30,000 TEU by 2005, and 50,000 TEU and 80,000 TEU by 2010 and 2015 respectively.

(6) Siberia Land Bridge (SLB)

It is less practical to predict future demand of transit container volume between East Asia and Europe along with the Russian economy development because "transit" has little relation with its development. On the other hand, it is significant to examine how to strengthen international competitiveness of SLB to draw cargo away from the All Water system to SLB.

(7) Korean Peninsula Trade Corridor

It is predicted that the freight traffic will not be very large even if this route opens to service by 2010.

5. FUTURE DIRECTION AND MAJOR ISSUES OF STC

Through the discussion about future direction of STC, the following issues were proposed from the working group members of three countries:

5.1 Major Issues of STC from Regional Aspect

Regarding STC of Northeast Asia, there is quite a difference between the southern side and the northern side of the Tsushima Strait (the Korea Strait) in terms of maritime transport network. Therefore, each side will be described separately.

(1) The Southern Side of the Tsushima Strait (the Korea Strait)

At present, this area is the busiest and most vigorous in the world in terms of international transportation. Key issues in future are to make the international maritime transport network more effective and make its connection with the inland area of the continent more speedy and reliable. To this end, improvement of infrastructure, in both soft and hard aspects, to deal with rapid growth of cargo volume and securing funds for such improvement will take on greater importance than at present. Another important matter is the deregulation of domestic transport institutions in each country. Traditional practices in each country may have to be reformed before an international transport system among the three countries can operate effectively, and this will require the understanding of all people concerned. Furthermore, since technological innovation in the field of transport has remarkably advanced, introduction of state-of-the-art logistics system, reform of transport-related rules and training of personnel based on these innovations are indispensable. In particular, system control technology using IT is expected to be greatly advanced, and thus replacement of old IT-related facilities with new ones will be

required.

(2) The Northern Side of the Tsushima Strait (the Korea Strait)

The Northern side of the Tsushima Strait (the Korea Strait) has much less traffic in comparison with the Southern side. The reason is not that this area is at a low level of economic development, but that political differences in the area are interfering with economic exchanges among the countries. However, globalization is reaching this area as well. It is only a matter of time before an international division of labor and industry will be achieved here as in the Southern area. The following 4 transport-oriented reforms are necessary to promote economic development in the area.

- Ensuring smooth overland connection with the Japan Sea for the Northeastern part of China.
- Improvement of transport efficiency in SLB (Siberia Land Bridge)
- Freedom of transit through the DPRK territory
- Enhancement of border traffic efficiency

5.2 Major Issues of Enhancement of Transport Efficiency of STC

In order to enhance transport efficiency of STC, the following countermeasures should be examined.

- Establishment an integral and unified corridor transportation information system such as “International Corridor Transportation Information Platform
- Enhancement of port productivity
- Simplification of custom clearance formalities so as that cargo bound for two or more countries should be only checked once in the country of origin in order to reduce transport time, if possible
- Simplification of documentation procedures in railway transport

5.3 Improvement of Related Infrastructure

- Improvement and Utilization of Manzhouli, Alashankou, Suifenhe and Erlian (Erenhot) as the strategically important ports for STC
- Renovate the bottlenecked segments in various main transportation routes and expand their capacity
- Increase of the capacity of railway transport

5.4 Ensuring Good Connection between Trade Corridor and Ocean Liner Service Route

In order to promote corridor traffic, establishment of the following additional trade routes should be examined.

- Building Korean Peninsular Corridor
- Establishment of SLB-Japan route
- Establishment of Tumen river area-Japan route

5.5 Strengthening of Competitiveness in SLB Transport to All Water Transport

To increase the volume of transit container conveyed between Europe and East Asia by SLB, it is necessary to draw cargo away from the All Water system through strengthening its international competitiveness. Therefore, introduction of competitive principle into SLB business world (namely privatization) has to be taken into account.

At present, consignors in Northeast Asia have two transport alternatives in exporting cargo to Europe: air transport, which takes only 2-4 days but is very expensive, and maritime transport (All Water), which takes 30-40 days but costs little. The travel costs and time taken by SLB transport are almost the same as on the All Water route as of 2000; i.e. less advantageous for consignors. Clearly, the SLB has less international competitiveness than All Water. However, there are a variety of preferences in terms of travel costs and times for individual containers, and the combined container volume of 7 million TEU is greatly diversified. Accordingly, there is a large quantity of freight that falls into the intermediate category between the two alternatives, for instance, a travel time of 10-20 days and mid-range costs. At present, there is no means of transport suitable for this combination. The SLB has great potential to fill this gap, given the fact that the SLB is 7700 km shorter than the All Water route, and, generally speaking, trains can travel faster than ships. In addition, maritime transport time between Japan and Vostochny should also be examined with a view to reducing it.

5.6 Future Direction of Ocean Liner Service

(1) Promoting the Northeast Asia International Ferry

We assume that economic ties among the countries of Northeast Asia will be strengthened and regional economic integration will advance. Then, restrictions on traffic flows will gradually decrease. EU has already realized almost perfect borderless communities within the region. Northeast Asia also will likely move in this direction. If so, the international ferry system would play a very important role in the future Northeast Asia as it does in EU. However, the international ferry service of Northeast Asia with the exception of Kamp ferry is at a low level of development at present. Even the Kamp ferry has only reached a medium level of development as strict restrictions are in place regarding vehicle movement across borders. Accordingly, it is necessary to upgrade the international ferry system of Northeast Asia, that is, mitigation of border-crossing vehicle movement restriction has to be undertaken.

(2) Eliminating the Blank Zone of the Japan Sea Maritime Network

There are conspicuous differences between Southern and Northern parts of the Tsushima

Straits (Korea Strait) in terms of density of marine liner service network. Southern sea area has the busiest traffic in the world, while ocean liners are rarely encountered in the Northern area. However, the Northern has gateway to the Russian Far East (pop: 7 million) and to DPRK (pop: 25million) as well as an outlet to Northeast China (pop: 65 million).

In order for continental Northeast Asia to promote international trade in the future, the shipping liner route network to the Japan Sea needs to be fortified. On some routes, large container vessels linking North America and Busan via the Japan Sea are not calling port in Japan or Russia. If such vessels were to call ports such as Niigata or Vladivostok, Japan Sea Rim area would have opportunities to export/import directly the North America, which likely lead to emergence of new era in Northeast Asia

(3) Train Ferry

There is a vision to reconnect the ancient silk road from Western China to Europe through the development policy of Western China Development. In the course of studying the project, the importance of cargo transportation by train-ferry crossing the Yellow Sea is initiated to connect between Far east and Europe efficiently through TCR, TKR, Train-Ferry.

Train-Ferry is called "Sea train" or Green road. The project was planned to transport cargo trains on the ship to cross the Yellow Sea from the ROK to China. This system is regarded as the most efficient mode to move cargoes between two points in case of inland distance over 800km and under 300 nautical miles. The ROK and China government are examining Incheon port in the ROK and Yentai or Dalian port in China as the origin and destination port.

5.7 Regional Coordination Organization

It was proposed from the working group members of three countries to establish a regional coordination organization specifically for the corridor transportation at the earliest possible time.

6. CONCLUSION

As mentioned in above section, we described the current situation, major issues and future direction of Northeast Asia sea and land international transportation routes. The region formed by Japan, China and the ROK is the most vigorous in the world; it is the driving force of global market. Economic prosperity in this area is supported by both the international division of labor and industry among the three countries and cargo transportation network formed throughout Northeast Asia. Northeast Asia sea and land international transportation routes (STC in this paper) start at the innermost part of continental Northeast Asia, reach foreign trade ports and, via shipping liner routes, and ultimately link with the port cities of other region in the world.

There have been a lot of underdeveloped areas in Northeast Asia that have not take part in the world trade market. In future, wave of international exchange will engulf these areas and international division of labor and industry will extend throughout Northeast Asia. Thus Sea Transportation Corridors will become more fortified and more sophisticated and elaborated with state-of-the art logistics structure.

Finally, the conclusions in the present report can be summarized as follows:

- To improve inland transport, ensuring smooth border traffic is the most important issue.
- Construction of port facilities to cope with the rapid increase of cargo is also an important issue. Fund procurement also requires attention.
- In addition, emphasis should be placed on the enhancement of port service through competition among suppliers and introduction of state-of –the art logistics system, in line with the rapid advancement of international division of labor and industry in Northeast Asia.
- There are blank zones in the Northeast Asia Sea Transportation Corridor network. Those have to be filled up soon.
- Northeast Asia cargo transportation network has been advancing vigorously on the whole towards a more sophisticated and elaborated level. We forecast that a high quality network of international division of labor and industry will be formed through the transport network in future.

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