

Review of Sino-Korean Maritime Cooperation

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〈CONTENTS〉

- I. Introduction
 - II. Economic Cooperation and Transport Network in Northeast Asia
 - III. Current Issues in Sino-Korean Maritime Cooperation
 - IV. Conclusion
 - V. Acknowledgements
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Abstract: After the epoch-making establishment of diplomatic ties between China and Korea in August 1992, there were a series of maritime talks and the signing of a maritime agreement on May 27, 1993 and its implementation on June 28. To date, maritime cooperation between China and Korea has been very successful. Numerous records in the growth rates of trade volume, cargo volume, shipping lines and routes have been an annual occurrence. The main objective of this paper is to review the maritime cooperation between China and Korea and identify the current issues. Recent years have witnessed major container transshipment cargoes, particularly from North China, using Korean ports due to their location and lower port rates as well as Korea's efficient network system with major trunk routes all round the world. Both countries are likely to benefit further from increased transshipment cargo cooperation.

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I . Introduction

Maritime cooperation between China and Korea has a long history back more than a thousand years when ancient Korea commenced to trade with ancient China through Shandong Province via the Yellow Sea route. China had been Korea's closest ally, and leader in technology and culture transfers with Korea until 1945. After the dormant period of 1945 to 1979, China started "the open door policy", which reactivated maritime cooperation. Cooperation was particularly propelled by the epoch-making establishment of diplomatic ties between China and Korea in August, 1992 and strengthened further by a series of maritime talks and the signing of a maritime agreement on May 27, 1993 and its implementation on June 28.

To date maritime cooperation between China and Korea has shown a great deal of dynamism. Numerous records in the growth rates of trade volume, cargo volume, shipping lines and routes have been annual occurrence. For instance, the trade volume between the two countries skyrocketed from nineteen million dollars in 1979 to 22.552 billion dollars in 1999. This means an amazing 43 % annual growth rate. China was the fourth biggest trade partner with Korea and Korea ranked fifth to China at the end of 1999 (the EU is considered as one entity).¹⁾ The seaborne cargo volume has been growing at an accelerating speed since the *Melisa's* maiden voyage between two countries in 1989. Container cargo and the number of shipping routes more vividly reflect rapid growth. At present, there are twenty eight container vessels and seven ferries in operation solely on the Yellow Sea. It appears to both countries that the maritime cooperation has been mutually beneficial. Thus further cooperation and growth is

1) Junsok Yang & H. Kim, *Issues in Korean Trade 1999: Trends, Disputes and Trade Policy*, Working Paper 200-01, KIEP, 2000.

aspired for the future.

In spite of the successful cooperation hitherto, it is not enough to be complacent. There still appears to exist certain areas to be supplemented and to be introduced for the future. The main objective of this paper is to review the maritime cooperation between China and Korea and identify the current issues.

It deserves to mention here the economic cooperation and the transport network system in Northeast Asia before going into the details between China and Korea in maritime issues.

II. Economic Cooperation and Transport Network in Northeast Asia

Like the bloc economy movements of the EC and NAFTA, the Northeast Asian²⁾ region is increasingly discussing the need of the regional cooperation. The economic importance of the region in the world is rather significant. The Northeast Asian economies share in world merchant trade was 18.1 percent and 14.5 percent of world export and import, respectively in 1998. Three Northeast Asian countries Japan, China and Korea- explain approximately 12.9 percent (\$ 704 billion) of total world exports and about 9.2 percent (\$515 billion) of total world imports. Their intra-regional trade (exports and imports among them) shares are about 9.31 percent of each countrys total exports or imports.³⁾

2) In this paper, Northeast Asia denotes Japan, China, Korea, Taiwan, Hong Kong.

3) Sang-yirl Nam, *Competition and Complementarity in Northeast Asian Trade: Koreas Perspective*, Working Paper 200-02, KIEP, 2000.

Since the early 1970s the rapid growth of economies in the Northeast Asian region has been accompanied and stimulated by the establishment of a supra-regional transport network. Hubs occupy a key position within the networks, offering a variety of opportunities for global and regional marketing facilitated by frequent services and comparatively low distribution costs. During the 1980s, Tokyo emerged as a global, multimodal network hub on a par with London and New York. At a regional level, Hong Kong and Singapore have battled for the right to become the single network hub in the Asia-Pacific region.⁴⁾

In recognition of the importance of the infrastructure, all countries in the region have been developing their transport network systems to become major logistic centers of Northeast Asia in one way or another. For instance, major ports of Japan appear ready to become regional hubs and a few ports of Korea, such as Pusan, Kwangyang, Inchon and Pyoungtaek (new port), are on the way to becoming a hub port. Likewise, China, Russia and North Korea are rushing into taking the initiative in the Tuman River Project, whereby they can develop strong emerging logistic centers in the region through port and inland transport developments as well as a free industrialized zone. Upon completion of the project, it is projected that this area will function as a kind of 'economic corridor⁵⁾ in this region. In line with this movement, Russia and China have already developed transcontinental railway networks (see figure 1) in order to meet the demand for the cargoes between Europe and Asia and the plan of the two Koreas

4) Peter J. Rimmer, 1993, *Taiwan's Future as a Regional Transport Hub*, monograph.

5) This concept was developed by Professor Peter J. Rimmer of Australian National University and means, in general, the most economically central area of region.

through the reconnection of Korean railways.⁶⁾ is under construction.

Thus far, all the tramper routes have been established in the region and container routes are either in active operation between Japan, China and Korea, or at developing stage among China, Russia, Japan and Korea. Container routes to and from North Korea are, at present, underdeveloped. However, they are likely to be open sooner or later.

As for the transcontinental railways, it is noteworthy that since the inception of service in 1972 handling 2,000 TEUs, TSR (Trans Siberia Railway) carried 138,000 TEUs in 1983. Then, remarkably declined to 8,000 TEUs in 1998 and slightly bounced back to 25,000 TEUs in 1999 (MOMAF). The decline was caused by sudden unsettlement after the collapse of former Soviet Union, and the frequent delay of cargoes. (For instance, it was common to have a 1 to 2 week delay). TCR (Trans China Railway) with TMR (Trans Manchuria Railway) and TMGR (Trans Mongolia Railway) started competition with TSR from the mid-1990s in transporting cargo between Europe and Asia.⁷⁾ The Koreans are also planning to have an access to TSR and TCR via a reconnection of the Korea railways – that is TKR (Trans Korea Railway).⁸⁾

6) The two Koreas agreed in the accord of South-North exchanges and cooperation, taking effect on Feb. 19, 1992 (Chapter III, Article 19) that the two sides shall reconnect railroads and roads that have been cut off and shall open South-North sea and air transport routes. (source: the Korea Herald Feb. 20, 1992) Then, while exploring two-Koreas cooperation again recently during Kim Dae-Jung regime, Sept. 18, in 2000 witnessed ground-breaking ceremony to continue disconnected railway between South Korea and North Korea. This construction for disconnected part will be completed by Sep. 2001 and eventual connection with TSR and TCR will be completed by 2005.

7) TCR very often includes TMR and TMGR.

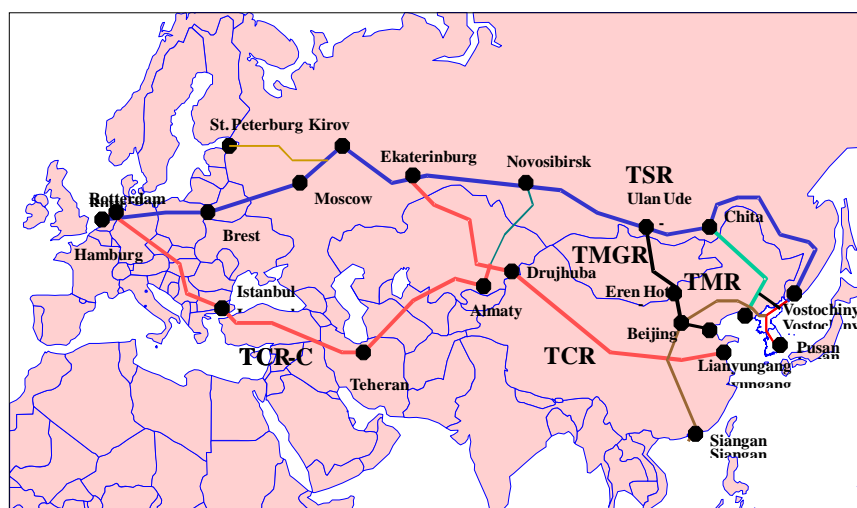
8) On completion of the TKR, two lines in Korea are connected with the transcontinental railways. The first line along the west coast of Korea, called Kyoung-Ui-Sun meaning 'Seoul-Sinuiju-Line', can be connected with TMR. The second line along the east coast, called Kyoung-Won-Sun meaning 'Seoul-Wonsan-Line', can be connected either with TSR or with TMR.

Therefore, it is expected regarding transcontinental cargo, there will be competition among six alternatives; 1) existing sea route, 2) TSR, 3) TCR, 4) TMR, 5) TMGR and 6) TKR. When this occurs, the transportation ability connecting Europe and Asia as well as the Pacific will be strengthened. This will increase transport efficiency⁹⁾ by attracting the world's attention and help Northeast Asia play a key role in the Asia Pacific region and the world's other regional economic zones (see Jon, 1992).

In sum, future trade and investment prospects will be strongly influenced by the evolution of the pattern of trade specialization among the Northeast Asian economies and the policy framework from which these trade and investment flows occur. In this respect, all Northeast Asian countries' willingness to participate in the Tumen River Project implies stronger regional cooperation than ever before and as such, a more efficient transport network in the region can be envisioned in the foreseeable future. This cooperative mood can be strengthened further particularly by the two Koreas cooperation and also similar ensuing cooperation among the Koreas and neighboring countries.

9) According to an analysis, if Korea utilizes the TCR, it can reduce the transportation distance from Pusan to Rotterdam by about 2,147km compared with TSR with a resultant cut of about 20% in transportation cost. Furthermore, transportation by TCR will be shorter than sea route by about 9,152km (see Hong, 1992).

〈Figure 1〉 **Transcontinental Railway System
and Major Ports in Northeast Asia**



Notes : Trans Siberia Railway(TSR) : Vladivostok/Nakhodka-Novosibirsk-Europe
 Trans China Railway(TCR) : Lianyungang/Shanghai-Urumqi-Novosibirsk
 with TSR
 Trans Manchuria Railway(TMR) : Dalian-Harbin-Chita with TSR
 Trans Mongolia Railway(TMGR) : Tianjin-Ulaanbaatar-Ulan-Ude with
 TSR

III. Current Issues in Sino-Korean Maritime Cooperation

Sino-Korean trade virtually started in 1979 with a record of 19 million US dollars and it increased to 22.6 billion dollars in 1999 at the annual growth rate of 43 percent(See table 1).

There are 19 container routes between China and Korea, served by 28 container vessels from 20 companies as of December, 1999. These companies are Korean, Chinese or joint ventures between the two countries or may be third party countries. The service is weekly and

〈Table 1〉

Sino-Korean Trade

Unit : Million US Dollars

Year	Total	Import to Korea	Export from Korea	Balance
1979	18.8	14.8	4.0	-10.8
1990	2,853	2,268	585	-1,683
1996	19,916	8,539	11,377	2,838
1997	23,689	10,117	13,572	3,455
1998	18,428	6,484	11,944	5,460
1999	22,552	8,867	13,685	4,818

Source : Yang & Kim, KIEP, 2000 and KOTRA

calling ports are Pusan, Masan, Oolsan, and Kwangyang in Korea and Shanghai, Tianjin, Dalian, Qingdao, Yingkou, Lianyungang, Nanjing, Nantong, Zhanjiangang and Ningbo in China. Korean companies call four major container ports in China: 1) Shanghai, 2) Tianjin, 3) Dalian, and 4) Qingdao. Chinese companies use the other small ports additionally such as Lianyungang, Yingkou, Nanjing, Nantong, Zhanjiangang and Ningbo to cover vast areas of cargo origin and destination in China. Vessel size range from 178 TEUs to 918 TEUs, with the majority in the range of 400-600 TEUs.

Sino-Korean container cargo has increased sharply from 56,252 TEUs in 1990 to 925,751 TEUs in 1999 at the annual growth rate of 36.5 percent (See table 2). Of all the cargo in 1999, 47 percent was transshipment cargo. Import cargo to Korea was more than export cargo from Korea and the transshipment amount from the import cargo (308,991 TEUs) was more than twice the transshipment cargo of export cargo (128,012 TEUs). This phenomenon explains that Korean ports are more actively used for outbound Chinese cargoes as transshipment ports than inbound Chinese cargoes. Eighty six percent of total Sino-Korean container cargo was handled in the four

major ports and the order of throughput was Tianjin, Qingdao, Shanghai and Dalian. The transshipment cargoes were also in the same order among the four major ports (See table 3).

Passengers by ferry service increased from 248,847 persons in 1998 to 402,632 persons in 1999 with the remarkable growth rate of 61.8 per cent(See table 4).

〈Table 2〉 **Container Cargo on Sino-Korean Route by Shipping Company**

Unit: TEU

	Company	1998			1999			Increase (%)
		Export from Korea	Import to Korea	Subtotal	Export from Korea	Import to Korea	Subtotal	
	SINOKOR	37,596 (9,048)	32,265 (18,605)	69,861 (27,653)	47,646 (10,609)	49,458 (23,286)	97,104 (33,895)	39.00 (22.57)
Alliance Group A	Choyang	14,755 (3,603)	19,593 (17,399)	34,348 (21,002)	14,294 (3,444)	20,562 (15,510)	34,856 (18,954)	1.48 (-9.75)
	Dongyoung	11,358 (4,682)	11,087 (5,656)	22,445 (10,338)	13,409 (4,394)	13,883 (4,485)	27,292 (8,879)	21.6 (-14.11)
	Hanjin	19,789 (9,650)	31,041 (29,144)	50,830 (38,794)	18,461 (8,120)	24,786 (22,557)	43,247 (30,677)	-14.92 (-20.92)
	Namsung	8,060 (671)	4,975 (2,553)	13,035 (3,224)	16,117 (2,370)	19,363 (9,325)	35,480 (11,695)	172.19 (262.75)
	Pan Ocean	11,708 (208)	6,465 (1,871)	18,173 (2,079)	16,343 (1,678)	16,130 (4,579)	32,473 (6,227)	78.69 (199.52)
	Subtotal	65,670 (18,814)	73,161 (56,623)	138,831 (75,437)	78,624 (20,006)	94,724 (56,426)	173,348 (76,432)	24.86 (1.32)
Alliance Group B	Chonkyoung	7,587 (1,204)	6,592 (2,542)	14,179 (3,746)	9,955 (1,500)	11,787 (4,259)	21,742 (5,759)	53.34 (53.74)
	Hyundai	35,481 (20,263)	49,912 (41,351)	85,393 (61,614)	35,996 (19,406)	56,559 (44,151)	92,555 (63,557)	8.39 (3.15)
	KMTC	13,397 (4,832)	16,781 (13,529)	30,178 (18,361)	18,976 (3,975)	24,282 (17,753)	43,258 (21,728)	43.34 (18.34)
	Tan Continental	7,713 (2,349)	9,760 (4,478)	17,473 (6,827)	9,599 (3,340)	12,926 (4,512)	22,525 (7,852)	28.91 (15.01)
	Subtotal	64,178 (28,648)	83,045 (61,900)	147,223 (90,548)	74,526 (28,221)	105,554 (70,675)	180,080 (98,896)	22.32 (9.22)
Chinese Shipping Companies	COSCO	18,210 (630)	15,355 (1,211)	33,565 (1,841)	13,386 (1,974)	20,210 (1,298)	33,596 (3,272)	0.09 (77.73)
	China Shipping	15,389 (6,364)	10,084 (5,215)	25,473 (11,579)	14,382 (5,335)	16,590 (8,656)	30,972 (13,991)	21.59 (20.83)

**Container Cargo on Sino-Korean Route by
Shipping Company(Continued)**

Unit: TEU

	Company		1998			1999			Increase (%)
			Export from Korea	Import to Korea	Subtotal	Export from Korea	Import to Korea	Subtotal	
Chinese Shipping Companies	Shanghai Jinjang		10,309 (4,594)	13,288 (12,140)	23,597 (16,734)	11,911 (6,019)	7,071 (5,967)	18,982 (11,986)	-19.56 (-28.37)
	SINO TRANS	Dalian	567 (-)	3,801 (3,768)	4,368 (3,768)	1,365 (611)	3,190 (2,673)	4,555 (3,284)	4.28 (-12.85)
		Qingdao	5,964 (1,766)	10,794 (8,931)	16,758 (10,697)	7,904 (4,803)	11,225 (8,334)	19,129 (13,137)	14.15 (-12.85)
		Nanjing	3,751 (551)	1,198 (769)	4,949 (1,320)	4,463 (653)	1,643 (895)	6,106 (1,548)	23.38 (17.27)
		Lianyung- ang	1,951 (1,144)	5,448 (2,281)	7,399 (3,425)	2,481 (1,103)	4,975 (1,794)	7,456 (2,897)	0.77 (-15.42)
		Zhangjia- ng	1,855 (528)	1,565 (362)	3,420 (890)	2,903 (871)	2,166 (212)	5,069 (1,083)	48.22 (21.69)
		Subtotal	10,433 (3,989)	22,806 (16,111)	36,894 (20,100)	19,176 (8,042)	23,226 (13,915)	42,402 (21,957)	14.93 (9.24)
	CSC		10,433 (1,976)	9,016 (6,740)	19,449 (8,716)	10,140 (4,372)	17,947 (12,138)	28,087 (16,510)	44.41 (89.42)
	Coheung		16,607 (8,233)	43,274 (35,635)	59,881 (43,868)	22,753 (14,490)	75,216 (66,686)	97,969 (81,176)	63.61 (85.05)
	Subtotal		85,036 (25,786)	113,823 (77,052)	198,859 (102,838)	91,748 (40,232)	160,260 (108,660)	252,008 (148,892)	26.73 (44.78)
Sino-Korea Joint- Ventures	C & K Ferry		6,288 (1,435)	6,112 (2,134)	12,400 (3,569)	7,072 (1,919)	8,625 (1,155)	14,586 (3,074)	17.63 (-13.87)
	Dain Ferry		6,737 (-)	3,903 (-)	10,640 (-)	8,947 (-)	6,046 (-)	14,993 (-)	40.91 (-)
	Jinchon		5,385 (-)	6,196 (293)	11,581 (293)	7,062 (-)	7,059 (164)	14,121 (164)	21.93 (-44.03)
	Weidong		22,825 (-)	16,263 (-)	39,088 (-)	31,172 (-)	24,801 (-)	55,973 (-)	43.20 (-)
	Dandong Ferry		543 (-)	600 (-)	1,143 (-)	3,545 (-)	3,490 (-)	7,035 (-)	51549 (-)
	Shanghai-Inchon		750 (-)	366 (-)	1,116 (-)	4,507 (-)	3,271 (-)	7,778 (-)	59695 (-)
	Subtotal		42,528 (1,435)	33,440 (2,427)	75,968 (3,862)	62,305 (1,919)	52,181 (1,319)	114,486 (3,238)	50.70 (-16.16)
Third- Party Companies	New Orient		17,994 (7,524)	16,964 (11,970)	34,958 (19,494)	18,250 (8,062)	17,660 (12,436)	35,910 (20,498)	2.72 (5.15)
	EAS		10,724 (5,054)	22,056 (17,947)	32,780 (23,001)	13,800 (8,776)	26,008 (20,405)	39,808 (29,181)	21.44 (26.87)
	T.M.S.C		12,824 (6,905)	16,563 (12,020)	29,387 (18,925)	12,365 (8,981)	18,237 (15,151)	30,602 (24,132)	4.13 (27.51)
	MAERSK		969 (247)	1,394 (1,314)	2,363 (1,561)	1,717 (1,206)	688 (633)	2,405 (1,839)	1.78 (17.81)
	Subtotal		42,511 (19,730)	56,977 (43,251)	99,488 (62,981)	46,132 (27,025)	62,593 (48,625)	108,725 (75,650)	9.28 (20.12)
TOTAL			337,519 (103,461)	392,711 (259,858)	730,230 (363,319)	400,981 (128,012)	524,770 (308,991)	925,751 (437,003)	26.78 (20.28)

* Source : MOMAF (Korea Ministry of Maritime Affairs and Fisheries)

〈Table 3〉 **Container Cargo by Chinese Port in Sino-Korean Trade**

Unit: TEU

Port	Export from Korea	Import to Korea	Total
Tianjin	96,636 (40,733)	154,231 (106,702)	250,867 (147,435)
Qingdao	86,416 (22,864)	119,044 (65,940)	205,460 (88,804)
Shanghai	104,061 (28,019)	92,466 (51,378)	196,527 (79,397)
Dalian	52,946 (19,170)	88,353 (56,342)	141,299 (75,512)
Others	60,922 (17,226)	70,676 (28,629)	131,598 (45,855)
Total	400,981 (128,012)	524,770 (308,991)	925,751 (437,003)

Figures in parenthesis indicate transshipment cargo.

〈Table 4〉 **Passengers by Sino-Korean Ferry Service**

Route	1998.1 - 12			1999.1 - 12			Increase (%)
	Outbound from Korea	Inbound for Korea	Subtotal	Outbound from Korea	Inbound for Korea	subtotal	
Inchon/Weihai	57,199	54,849	112,048	66,190	70,251	136,441	21.8
Inchon/Qingdao	15,825	15,069	30,894	24,251	27,171	51,422	66.4
Inchon/Tianjin	15,258	13,660	28,918	19,404	22,035	41,439	43.3
Pusan/Yantai	4,412	4,105	8,517	7,772	7,681	15,453	81.4
Kunsan/Yantai	3,929	4,292	8,221	8,353	9,115	17,468	112.5
Inchon/Dalian	21,982	10,613	42,595	32,803	35,727	68,530	60.9
Inchon/Dandong	8,966	7,979	16,945	30,406	31,170	61,576	263.4
Inchon/Cheju/Shanghai	490	219	709	4,991	5,312	10,303	1,353
Total	128,061	120,786	248,847	194,170	208,462	402,632	61.8

* Source : MOMAF

The first direct sea route between China and Korea was opened in June, 1989 before the establishment of diplomatic ties when a joint

venture, Sinokor was founded and the Melisa was on her maiden voyage. After that, shipping companies in the Yellow Sea increased remarkably to, at present: 1) ten Korean companies, 2) ten Chinese companies, 3) six joint-ventures and 4) four third-party companies. (See table 2) At present twenty eight container vessels and seven ferry vessels are in operation in the Yellow Sea. The ferry services are on eight routes by seven vessels(See table 5). Inchon/Weihai services are most frequent- three times a week and others are once or twice a week. The ferries can carry out 110 293 TEUs containers in addition to 290 656 passengers per vessel.

〈Table 5〉 Ferry Services between Korea and China

Route	Distance (mile)	Company	Ship Name	Capacity (people, TEU)	Frequency
Inchon/Weihai	238	Weidong	New Golden Bridge	656 (280 TEU)	3 times/week
Inchon/Qingdao	330	Weidong	Xiang Xue Lan	392 (293)	2 times/week
Inchon/Tianjin	460	Jinchon	Tian Ren	618 (247)	6 times/month
Pusan/Yantai	540	Yantai	Zi Yu Lan	392 (293)	Once/week
Kunsan/Yantai	273	Yantai	Zi Yu Lan	392 (293)	Once/week
Inchon/Dalian	288	Dain	Dain	545 (170)	2 times/week
Inchon/Dandong	284	Dandong	Oriental Pearl	405 (110)	2 times/week
Inchon/Cheju/ Shanghai	508	Shanghai-I nchon	Arafura Lily	290 (224)	Once/week

Source : MOMAF

In Korea, the total cargo containers were about 8.8 million TEUs in 2000. The Port of Pusan handled 7.42 million TEUs in 2000 (including coastal container trade, it was 7.54 million TEU), eighty

four per cent of the nationwide total , which ranked third in the world, surpassing the Port of Kaoshiung. The portion of containers handling at the Port of Pusan out of national container total has been decreasing slightly. This trend is believed to be augmented as the Port of Kwangyang (new port) is developed according to its development plan(See table 6).

〈Table 6〉 **Container throughput by port in Korea**

Unit: TEUs / %

Year	National total	Pusan	Inchon	Oolsan	Kwangyang	Others
1995	4,800,977 (100.0)	4,502,596 (93.8)	236,641 (4.9)	42,567	–	19,173 (0.4)
1996	5,202,898 (100.0)	4,760,507 (91.5)	348,727 (6.7)	47,003 (0.9)	–	46,661 (0.9)
1997	5,820,725 (100.0)	5,233,880 (89.9)	432,795 (7.4)	93,009 (1.6)	–	61,041 (1.1)
1998	6,371,535 (100.0)	5,752,955 (90.3)	401,536 (6.3)	125,829 (2.0)	32,135 (0.5)	59,080 (0.9)
1999	7,393,323 (100.0)	6,310,664 (85.4)	447,162 (6.0)	149,493 (2.0)	415,399 (5.6)	70,605 (1.0)
2000	8,842,628 (100.0)	7,424,871 (84.0)	483,342 (5.5)	236,396 (2.7)	615,327 (7.0)	82,692 (1.0)

Source : Korea Container Terminal Authority

Bracket : portion of each port out of the national total. Coastal container cargo (domestic trade) excluded.

The cargo containers in Pusan are handled by five specialized container terminals with the total annual capacity of 4.15 million TEUs as of January, 2001. Since the cargoes demanded in Pusan surpassed the total capacity of all the five specialized terminals,

conventional piers had to handle 2.4 million TEUs to supplement the gap between supply and demand of container port facilities. The characteristics of the five container terminals in Pusan and the other in Kwangyang Port are shown in table 7.

〈Table 7〉 **Characteristics of Specialized Container Terminals in Pusan and Kwangyang**

	The Port of Pusan					Kwangyang
	Jasungdae	Shinsundae	Gamman	Uam	Kamchon	
Construct. period	74-96	85-97	91-97	95-99	88-97	87-97
Start of Operation	Sep, 1978	June, 1991	April, 1998	Sep., 1996	Nov., 1997	July, 1998
Operator	HMM	PECT	4+ companies	WTC	HJ	4+ companies
Quay length	1447 m	1200 m	1400 m	500 m	600 m	1400 m
Water depth	12.5 m	14-15 m	15 m	11 m	13 m	15 m
Annual Capacity	1 million TEU	1.28 million TEU	1.2 million TEU	300 K TEU	370 K TEU	960 K TEU
Berthing Capacity	50000 DWT*4; 10000 DWT*1	50000DWT*4	50000 DWT*4	20000 DWT*1 5000 DWT*2	50000 DWT*2	50000 DWT*4
Con. Cranes	11	11	12	4	4	8

Source : Korea Container Terminal Authority + HJ (Hanjin), HMM (Hyundai Merchant Marine), Sebang, Korea Express Capacity as of January, 2001

The table shows that three terminals in Pusan can handle about one million TEUs, respectively, with each terminal accommodating four 50,000 DWT ships. The other two terminals can handle three to four hundred TEUs per terminal. The Jasungdae terminal was developed in two phases as the first specialized container terminal in Korea. It

used to be run as a state-run company before being privatized in September, 1999. The Port of Pusan lacks container yard area within the terminal and therefore, most of containers have to be transferred to the 37 Off-Dock Container Yards dispersed in the city. This causes increased traffic congestion in the city. Pusan plans to develop a new container port (Kaduck New Container Port) in two phases by 2011, with a view to providing 24 berths and having the annual capacity of 4.6 million TEUs.

Kwangyang has also been developing its second phase plan from 1995 to 2001 in addition to its present terminal. The new development during the second phase will provide four berths for 50,000 DWT ship class and another four berths for 20,000 DWT ship class, resulting in the annual capacity of 1.44 million TEUs.

China handled 17.7 million TEUs in 1999. Of these, Shanghai handled 4.2 million TEUs and other major ports were Yantian, Qingdao, Tianjin, and Gungzhou. The total container cargo grew sharply even reaching almost a fifty percent growth rate in 1997(See table 8). Table 9 shows major characteristics of five container ports in China. It shows that Shanghai port has been most developed, but the water depth is very shallow, limiting its potential future growth. Yantian port, however, is emerging as a new hub port, capitalizing on its natural deep water depth.

Approximately half of Chinese mainland exports are handled through Hong Kong and around 90 % of cargo emanating from South China passes through Hong Kong. But, two major ports at Shekou and Yantian are now in position to compete directly with Hong Kong. Yantian is operated by Hutchinson Whampoa and Shenzen Dongpen Industries as a joint venture. In terms of cost, exporting a 40 foot laden container originating in the Pearl River Delta direct from Shenzen to America saves US\$ 175 compared to transshipment

through Hong Kong and for a 20 foot laden container to Europe, US\$ 30 can be saved.¹⁰⁾

〈Table 8〉 Container Throughput in 10 Major Ports of China

Unit : 1000 TEU

Port	1996	1997	1998	1999
Shanghai	1,923	2,530	3,066	4,200
Yantian	353	638	1,040	1,580
Qingdao	810	1,031	1,213	1,500
Tianjin	823	935	1,018	1,300
Guangzhou	547	687	848	1,177
Xiamen	400	546	654	840
Dalian	416	455	525	700
Shekou	90	214	463	601
Ningbou	202	257	353	600
Fuzhou	165	225	253	320
Total	7,400	10,774	13,158	17,710
Growth rate (%)		45.64	22.09	34.59

Source : Hyoun-Geun Kim, *Weekly Maritime Information*, KMI (Korea Maritime Institute), Nov. 20, 2000 Up to 1998, Containerization International Yearbooks were used Year 1999 was based on Cargo Systems (July, 2000) 1999 Total is estimate.

10) Kevin Cullinane, *The Competitive Position of the Port of Hong Kong*, Proceedings of KASS and KOMARES International Symposium: Challenge of the World Shipping and Response of the Korean Shipping in the 21st Century, Nov. 10-11, 2000.

〈Table 9〉 Major Characteristics of Five Container Ports in China

	Shanghai	Tianjin	Qingdao	Dalian	Yantian ⁺
No. of Terminal	3	1	1	2	2
No. of Berth	NA	4	5	7	6
Quay Length(m)	2,281	1,300	1,189	918	1,900
Water Depth(m)	9.4-12.5	12	6-13	12-14	15-15.5
Ship/shore cranes(Ton*No)	35.5T*1 35T*5 30.5T*3 30T*6	40T*2 ^A	40.5T*2 45.5T*1	30.5T*2 superpost Panamax*7	41T*62
Yard Storage Capacity(TEU)	60,800	22,100	6,840	30,566 plus ^B	25,000 plus ^C

Source : Containerization International Yearbook. +: Phase II container terminal was due by end of 1999 and so it is assumed that this terminal is completed as planned.

A : In addition to ship/shore container cranes, there are 5 mobile cranes (40t*1; 25t*4) and 13 yard cranes (40t*7; 40.5t*6)

B : No data were available about storage of Dayaowan Container Terminal

C : 2nd phase data were not available.

It is noteworthy that Shanghai Port Authority newly formed 50-50 equity joint ventures (Shanghai Container Terminals Limited: SCT) with one of Hong Kong's largest companies, Hutchison Whampoa Limited and its subsidiary, Hong Kong International Terminals in August, 1993. SCT's total projected investment was 5.6 billion RMB with 2 billion RMB in registered capital. The joint venture term would last 50 years. The joint venture company took over operation of Shanghai's three main container terminal facilities - Zhang Hua Bang, Jun Gong Lu, and Bao Shan and its top priority was the conversion of five general cargo berths (two in Zhang Hua Bang and

three in Jun Gong Lu) to container berths, thus totaling twelve berths on the completion(See table 10).

Then, the company looked into potential sites in the municipality for new container terminals, including Wai Gao Qiao in Pudong and Jin Shan Zai along Hangzhou Bay. Shanghai Port Authority has been developing Wai Gao Qiao (hereafter WGQ) as a new main container terminal since 1991, completing its first and second phase development plan. The WGQ terminal is scheduled to be expanded in two more phases through year 2003, providing a capacity of 2.4 million TEUs. In addition, the port authority has been considering a deep water port in Daxiao Yangsan area with a capacity of 22.4 million TEUs by 2020. This area is, at present, composed of two small islands.

The new port can only be built requiring a great deal of landfilling and dredging so that the islands can be connected to be used as the quay structure of the port. The port authority awaits the approval of city government(See table 11).

〈Table 10〉 Shanghai Container Terminal Facilities

Terminal	Zhang Hua Bang	Jun Gong Lu	Bao Shan	Total
Quay Length(m)	783	858	640	2,281
Total Area(sq.m)	303,000	337,000	218,000	858,000
CFS Shed Area(sq.m)	6,841	6,841	10,426	24,108
Yard Capacity (TEU)	22,000	23,000	15,800	60,800
Gantry Cranes	5	6	4	15
Water Depth(m)	12.5	10.5	9.4	9.4-12.5

Source : Containerization International Yearbook

〈Table 11〉 **New Terminal Developments in Shanghai Pudong and Daxiao Areas**

Terminal	Period	Quay length (m)	Gantry cranes	Water depth (m)	Total area (m ²)	Capacity (TEU)
WGQ I	91-93	900	7	12.5	500,000	1,200
WGQ II	97-99	900	6	12.5	1,000,000	1,200
WGQ III	99-01	700	7	12.5	600,000	800
WGQ IV	00-03	1,250	12	13.0	1,000,000	1,600
DAXIAO	01-20	-	-	15.0	-	20,000
Total		3,750	42		3,100,000	24,800

Source : a shipping companys meeting report on Shanghai terminals

Shanghai's weakest point used to be the shallow water so that any vessel of 2,000 TEUs could call upon the port only in the high tide. The Ministry of Communications and the Shanghai Municipal Government ordered a technical study on the improvement of the fairway at the mouth of the Yanzi Jiang River and the deepening of the Hangzhou Bay fairway up to the water depth of 12.5 meters in order for third- and fourth-generation container vessels to pass.¹¹⁾ Consequently it deepened the water depth from 10.5 meter to 12.5 meter in the Zhang Hua Bang Terminal and from 8.5 meter to 9.4 meter in the Bao Shan Terminal during late 1990s. However, the water depth in the approach channel was only seven meters deep so the port deepened the channel to 8.5 meters by 1.5 meters from July 1st, 2000. But the water depth is still not deep enough to accommodate super post-Panamax vessels like the 5000-6000 TEUs class, which require 15 meters water depth. Shanghai expects container growth of

11) Liu Hai Hu, *Shanghai Port Greeting the 21st Century*, In Asia-Pacific Ports Symposium Proceeding, Kobe, 1993, p.243.

1 million TEUs every year for five years. The container volume in 1999 already surpassed the capacity by one million TEUs and this lack of capacity is to be further worsened in the future without a breakthrough development plan. To resolve this problem, the port authority has been considering a new site in Daxiao Yangsan islands area for some years, but its implementation is still questionable.

In this respect, it is noteworthy that Yantian has enough water depth for these class vessels and well equipped with a great deal of container cranes. What is more, the Port of Yantian has on-dock railway track link up, with Yantian and Pighu Nan Railway station which connects JingGuan railway at Pinghu Nan and Jingjiu railway at Chang-Ping.¹²⁾ In short, the Port of Yantian has all the major factors to be a hub port: 1) water depth, 2) modernized cranes, 3) on-dock railway system for long-distance inland transportation. It appears, therefore, to have great potential for full-fledged function in Chinese container transport network in the near future. Though Dalian, Qingdao and Tianjin have a relatively more advantageous water depth than Shanghai, due to their geographical location, ocean-going container vessel of foreign flags are less likely to directly call them. They would, rather, be functioning as feeder service ports.

As for the China Land Bridge, the TCR was connected with the TSR in Novosibirsk in August, 1990, when a new rail of 460 km was constructed from Urumqi to Alataw Shankou (borderline of China to Kazakhstan). It became possible for the cargo between Europe and Fareastern Asia to pass through the Chinese railway, then to be connected with the TSR destined for Europe and/or Asia. The total length of the railway is 10,700 km inclusive of the TSR. China covers 4,111 km encompassing six provinces, (Jiangsu, Anhui, Henan,

12) *Containerization International Yearbook*, 2000, p. 139.

Shaanxi, Gansu and Xinjiang) from Lianyungang /Shanghai through Xian, Lanzhou, Urumqi to Alataw Shankou(See figure 1).

It is reported that TCR can reduce the transportation distance from Pusan to Rotterdam by about 1,930 km compared with the TSR, with a resultant cut of about 20 per cent in transportation cost.¹³⁾ China and Korea agreed to cooperate in using the TCR and the two countries have explored the possibilities to transport the containers between Europe and Fareastern Asia through TCR. However, performance and service using TCR has aggravated the two countries mainly due to the China's difficulties in reaching agreement on the transit cost with Kazakhstan and also lack of transshipment facilities in Alataw Shankou and Druzhba stations. (The latter is the borderline of Kazakhstan to China). The Druzhba transshipment station, opened in 1990 already exceeded its capacity, sending about 1.2 million tons of goods to China and receiving about 300,000 tons of finished goods from China. The cargo destined for Europe can be transported using TCR in three ways: 1) Trans-Rail (rail and rail), 2) Trans-Sea (rail and sea) and 3) Tracon (rail and truck).

According to a survey conducted in 1993 with the 600 largest Korean companies trading with China,¹⁴⁾ most complaints resulted from customs clearance, inland transportation, sea transportation, stevedoring and stuffing and stripping in the order of magnitude of the complaints. One illustration is that for customs clearance, long lists of documents were required and processing of documentation was also deemed to be too slow and cumbersome.

13) Seoung-Yong Hong, "Ocean Industry Cooperation in the Yellow Sea: Strategy and Implications", *Ocean Policy Research*, vol. 7, No. 2, 1992, p.294.

14) Internal survey data by KOTRA conducted during August, 1993 on the six hundred biggest Korean companies in volume trading with China.

IV. Conclusion

During the last decade, the economic dynamism of the Yellow Sea rimland countries has been a focus of world attention. The recent free movement of capital, technology, commodities and labor are facilitating the formation of the Yellow Sea Economic Bloc.¹⁵⁾ For this reason, the Yellow Sea rimlands are entitled to forming economic corridor in the Asia-Pacific region in the eyes of human geographer.

Concerns in the region have been expressed about the adequacy and efficiency of the infrastructure in meeting society's needs at the lowest costs in terms of the countries total resources. If infrastructure investments are to be optimized and if they are to respond to the greater complexity of economies, more intense international competition and their failure to meet user needs, individual countries must re-examine the framework through which port services are delivered.¹⁶⁾

This paper has reviewed how maritime cooperation between Korea and China has progressed thus far and what the contemporary issues are. Since the open door policy of Chinese government, the international trade between China and other countries seems to have exploded as is typified by the one between Korea and China showing amazing forty three per cent annual growth rate between 1979 and 1999. Ten years later than the open door policy, the maiden voyage was on the Yellow Sea carrying the first seaborne cargoes, which accelerated the ensuing maritime trade, resulting in current twenty eight container vessels and seven ferries in operation solely on the Yellow Sea. Therefore, the container cargoes increased from 56,252 TEU in 1990 to 925,751 TEU in 1999 at the annual growth rate of 36.5

15) Hong, *op. cit.* pp. 301-302.

16) Rimmer, 1993, *Taiwan's Future as a Regional Transport Hub*, monograph.

percent between the two countries. To accommodate bigger vessels and sharply increasing cargoes and/or implicitly to be a regional hub, the two countries have developed and expanded their port facilities remarkably. Likewise, inland container transport network has also been expanded, particularly by transcontinental railway system such as TCR and TSR. Noticeably, South Korea and North Korea have recently explored to reconnect the formerly used railway for final connection with TSR and TCR. All these developments from ports to inland network will eventually make the regional transport network more efficient and in turn will intensify the regional cooperation. Accordingly, the maritime cooperation between Korea and China will play the key role in contributing to strengthening the regional cooperation in East Asia. Undoubtedly, the cooperation will benefit not only the two countries, but also neighboring ones and ultimately the whole global society. In conclusion, the cooperation should be further expedited to put the recommendable picture into implementation in the foreseeable future. One practical way of more maritime cooperation between the two countries is to use Korean container ports as the major transshipment ports for Chinese cargoes. China's container growth has shown almost forty percent figure and this trend is believed to be continued for many decades. Compared with this cargo growth, the container port development is not enough to handle these enormous cargoes. In this respect, Korea is willing to develop several terminals to be used for the transshipment port for these Chinese cargoes. Recent years have witnessed major container transshipment cargoes, particularly from North China have been using Korean ports due to the vicinity and lower port rates as well as efficient network system with major trunk routes all round the world. Therefore, both countries are likely to benefit further from increased transshipment cargo cooperation.

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