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Port Development in Tamil Nadu: Lessons from Chinese Provinces

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Abstract

This paper examines the infrastructure needs for the state of Tamil Nadu in the area of ports, and its development. It undertakes a case study of China and its provinces with the objective of analyzing the development of port infrastructure in China and to draw lessons for Tamil Nadu. The paper looks at the steps China undertook to modernize and develop its ports. We found that the three most significant aspects of the reform included: the decentralization of policy initiatives to its provinces, an open door policy and attitude to foreign investment, and a maritime policy that is at par with international standards, all of which helped in the overall growth of China.

The paper undertakes a detailed and historical analysis of the development of ports in China. This includes a close examination of its maritime policy, shipbuilding and its open door policy which introduced a competitive spirit of economic development between its provinces. We also undertake a comparative analysis of China SEZs and India's EPZs to understand what were the reasons for the former doing so well. A comparative analysis of ports in the Chinese provinces is also included to highlight the competitive development of different regions of China. In sum, the paper charts out what China has done to boost the development of its ports. A brief section on the privatization of ports in Malaysia is also included to get a further comparative perspective.

JEL Code: L92, L98, R41, R58

Keywords: Port Development, Chinese Ports, Tamil Nadu.

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Introduction

This paper examines the infrastructure needs for the state of Tamil Nadu in the area of ports, and its development. The simple hypothesis that infrastructure affects growth can be taken as given. In that context there is a need for state governments to design policies, which will attract investors and investments to the state. Since ports in India are primarily administered by the regulatory framework of the central government, the key issue is to investigate what maneuverability states have within the constraints of the national ports policy and regulatory regime – that is, what specific measures can state governments undertake to develop port infrastructure, given their limited jurisdictional capacities.

This paper undertakes a case study of China and its provinces with the aim of looking at the development of infrastructure in China and draw lessons for Tamil Nadu. The paper looks at what steps China undertook, including the decentralization of policy initiatives to its provinces, an open door policy and attitude to foreign investment, all of which helped in the overall growth of China.

The paper undertakes a detailed and historical analysis of the development of ports in China. This includes a close examination of its maritime policy, shipbuilding and its open door policy which introduced a competitive spirit of economic development between its provinces. We also undertake a comparative analysis's of the China SEZs and India's EPZs to understand what were the reasons for the former doing so well while the Indian EPZs despite policy liberalization have not performed as well. A comparative analysis of ports in the Chinese provinces is also included to highlight the competitive development of different regions of China. In sum, the paper charts out what China has done to boost the development of its ports.

To gain a further comparative perspective we have included a brief section on the policy of privatization of ports in Malaysia. The case of China and Malaysia are both important for India in general, and for Tamil Nadu in particular as the latter undertakes further policy changes in the area of infrastructure, including ports. Finally, the paper draws lessons for India and Tamil Nadu from these comparative experiences.

Section I

I India: Infrastructure

The central government declared “infrastructure” a “Thrust area” in 1998. The term infrastructure has also been expanded to cover sectors like telecom, oil exploration and industrial parks so that these sectors could avail of fiscal incentives, such as tax holidays and concessional

duties given by the government. The Economic Survey of 1997-98 stated that “the availability of adequate and high quality infrastructure facilities provides the essential enabling environment for rapid overall development.”

The 1996 budget of the United Front government, recommended the setting up of the Infrastructure Finance Development Corporation (IFDC) with a initial capital of Rs. 5,000 crores. The IFDC was incorporated on 30th January 1997 with an authorized share capital of Rs. 5,000 crores comprising equity capital of Rs. 4,000 crores and unclassified shares of Rs. 1,000 crore. The IFDC has been established as a private company with public funds to provide long term finance for infrastructure.

The Rakesh Mohan Report also called the India Infrastructure Report was submitted to the government in June 1996. It calls for a new approach in infrastructure development given the wave of privatization and deregulation sweeping this sector around the world. It points to five main reasons for this change, resources required for infrastructure, efficiency of investment and delivery, changes in technology, helping competitiveness of businesses and possibility of raising large funds because of the integration of world capital markets.

A number of policy initiatives have been taken so far on the basis of the recommendations of this Report (Some of these are listed in the 1998 Economic Survey, p. 125). According to the India Infrastructure Report, the total infrastructure investment requirements was of the order of about Rs. 4,000 to 4,500 billion or US \$ 115 billion to \$ 130 billion over the period 1996-2001. The investment required in building the infrastructure needs of the country was calculated on the basis of a projected growth rate of about 7 percent by 2001.

The union government has allowed private sector investments in infrastructure and is attempting to create an environment that is conducive for the private sector to make investments in the infrastructure sector. Some policies that will help the private sector in this regard are: holding companies/promoters have been allowed to raise External Commercial Borrowings (ECBs) up to \$50 million to finance equity in a subsidiary/joint venture company implementing infrastructure projects. Regulatory authorities in telecom (Telecom Regulatory Authority of India, TRAI) and ports (Tariff Authority for Major Ports, TAMP) have been set up in 1997. An ordinance for setting up the Central Electricity Regulatory Commission (CERC) at the center and State Electricity Regulatory Commissions (SERCs) in the states was promulgated in 1998.

II. Ports

The Rakesh Mohan Committee on Infrastructure has estimated the overall port traffic to reach 390 million tons by 2000-2001 and over 650 million tons by 2005-06. In 1997-98, the major ports in the country (which account for over 90 per cent of the traffic) handled 215 million tons. To raise the capacity to 350 million tons in the first phase of expansion, the Committee has estimated the resource requirement at Rs. 25,000 crores at 1996 prices. The enormity of the task of raising the resources on the required scale and to expand the cargo handling capacities over the next decade prompted the Government to initiate certain measures in this sector.

The Union Cabinet approved new guidelines allowing foreign direct investment (FDI) as well as domestic private investment in the ports sector in 1998. As a result tie-ups between major and minor ports, major and foreign ports and joint ventures with private companies are being allowed. The Cabinet has also accorded its approval for entering into bilateral arrangements with foreign Governments for port development. These policy changes are intended to facilitate a much bigger flow of private and foreign investment in this sector.

While the major ports in the country will continue to have a controlling stake in the proposed joint ventures under the new guidelines, active participation of partners are to be sought. These changes are a major step forward from the highly selective approach of approving the private sector foreign participation on the BOT (build, operate and transfer) basis for individual projects.

III. State of Tamil Nadu

Tamil Nadu stands second in the country in terms of investments proposed and under implementation, according to a CMIE report published in December 1998. "Of this 61 percent has gone to infrastructure sector, out of which 50 percent has gone to power sector," said the Tamil Nadu industry secretary, Mr. M. S. Srinivasan.

Tamil Nadu has a long coastline of 992 kilometers, which has been realized as potential for the development of port capacity. The Government of Tamil Nadu (GoTN) visualizes the coastline of the state as the "Eastern gateway of India to the world." The need to accelerate industrial activity by providing better and improved port facilities has been recognized by the GoTN. The New Port policy brought out by the state government stated the need to take measures for the development, and modernization of ports. The policy document has identified the following areas that need attention, to relive congestion in ports, technological upgradation in areas of cargo handling, container terminals, port layout, and allied infrastructure including hinterland vehicle traffic. It has also set up the Tamil Nadu Maritime Board (TMB), an autonomous body, to co-ordinate these activities for the ports.

Currently, there are two major ports in Tamil Nadu, Chennai and Tuticorin, which fall under the jurisdiction of the central government in New Delhi. These two major ports handle about 17% of the total cargo at Indian ports. In the policy document, the Government of Tamil Nadu has stated that it wants to see this figure increase to handle 25% of India's total cargo. Chennai Port alone handles 34 million tons of cargo which is deemed to reach 45 million tons by the year 1999-2000. There are two intermediate ports, Cuddalore and Nagapattinam and seven other minor ports in Tamil Nadu like Rameshwaram, Pamban, Kolachal, Kanniyakumari and Valinokkam.

IV. Present Situation of Indian Ports

About 90% of Indian trade is transported by sea, but the country's port capacity is inadequate to handle the increasing trade flows. India's 11 major ports, which account for over 90% of the country's port traffic, handled a record 251.44 million tons of cargo during 1997-98,

an increase of 10% over 1996-97. Port traffic has been growing by 9 to 10% annually, and is expected to reach 424 million tons by 2002. In addition to being stretched beyond their optimal capacity, India's ports are very inefficient by world standards, with turnaround time for ships averaging 9 to 10 days. Much of this inefficiency stems from highly unionized labor and lack of management autonomy of the Port Trusts, which manage the major ports under the supervision of the Ministry of Surface Transport (MOST), Government of India.

To meet the huge gap between demand and availability of port capacity, private and foreign investment in ports is being encouraged by the government, which issued guidelines liberalizing the sector in October 1996. As part of its port revival plan, the government has decided to lease out port assets to private companies at attractive terms to generate more revenue. MOST is also planning to incorporate the eleven major ports, and has announced a port investment plan of \$7.6 billion for 21 projects in those major ports. Port capacity is to be increased from the current level of 215 million tons to 850 million tons by 2012. Of the total planned investment, \$905 million is to go to the Jawaharlal Nehru Port Trust (JNPT) near Mumbai. The investment plan of JNPT includes developing a marine chemical terminal at an estimated cost of \$335 million on a build-own-transfer (BOT) basis. The Port Trust Board of JNPT has also approved a \$34 million expansion plan for private investment. A private Australian company will build a new container terminal at JNPT on a BOT basis.

The Tariff Authority for Major Ports, which was recently formed by MOST, has allowed BOT project operators to levy tariffs higher than those being charged by the government port trusts. The higher tariffs are being allowed to aid BOT operators to recover their costs within the concession period. In May 1998, in order to boost FDI in the port sector and to expedite implementation of development schemes, the major ports were permitted to form joint ventures with foreign ports owned and managed by public trusts, minor ports and private sector companies. The Indian Government will hold a maximum equity of 11% in these ventures.

India's 139 minor ports are under the jurisdiction of their respective states. Most are in Gujarat and Maharashtra, which have progressive privatization policies. Development of the minor ports is hindered by lack of infrastructure, such as rail and road links, but less red tape is usually involved when dealing with the state governments, which compete with each to attract private investment. The cost of transport by road or by railways is high as compared to India's competitors. Turning around ships in Indian ports varies from 4 to 7 days, whereas it is hardly 12 hours in Sri Lanka and 4 to 5 hours in Korea and Singapore. The container facility is not available in time. The loading and unloading of air cargo is too slow to meet international delivery schedules.

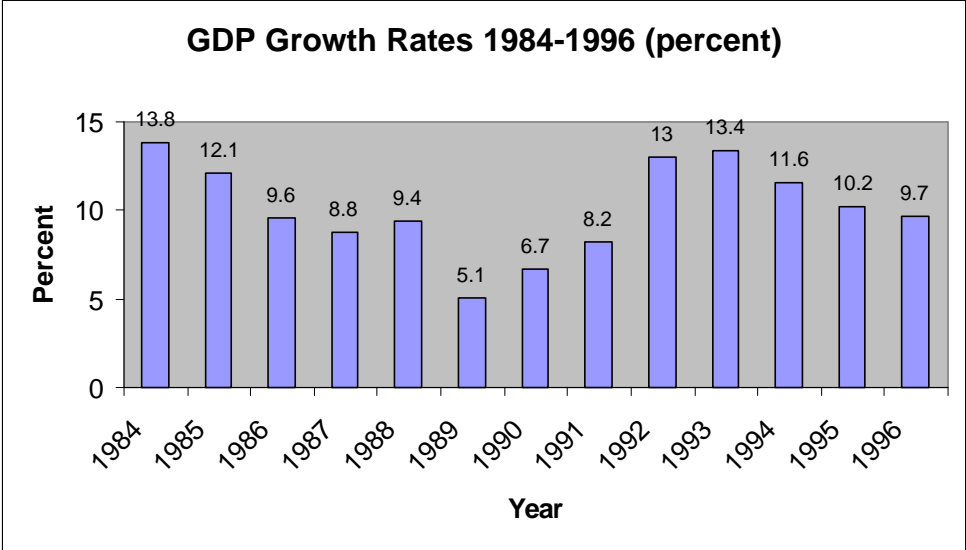
Section II

V. Policy of Port Development: The Chinese Case

The People's Republic of China undertook to implement economic reforms since 1978. As one of the world's most rapidly growing economies, China achieved an average GDP growth

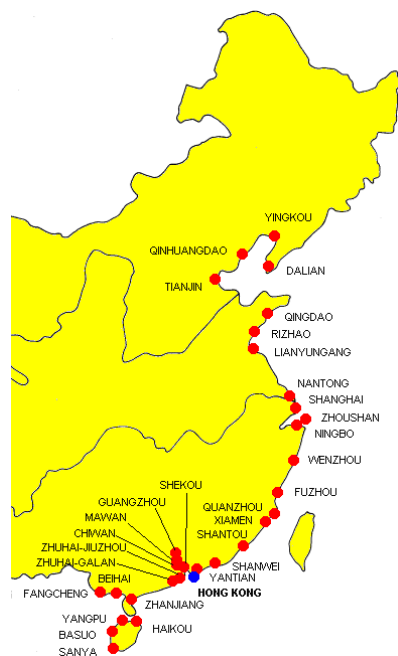
of 9% which it has been able to maintain since 1979. This is expected to continue into the next century. The rate of inflation seems to have been tamed and is expected to continue below double digits for the foreseeable future. The rate of exchange for the Chinese currency (Renminbi) has also been very stable for the past three years. Changing gradually is one of the characteristics of and possibly, a contribution to, the success of Chinese reform. China began experimenting with market economy by allowing certain pockets to generate exports and earn foreign exchange. To maintain economic expansion, the Chinese government has focused a great deal of its resources on modernizing China's infrastructure. This includes China's seaports, which have enjoyed even greater growth rates than the general economy for almost 20 years.

Table 1: China's GDP Growth Rates



Source: China Facts and Figures Annual Vol. 23 1998; Academic National Press, Gulf Breeze, FL; James Mulvenon

Figure 1: Location of China's Major Ports



VI. China's Economic Reform Policy

While China has indeed protected its large state-owned industrial sector, the source of dynamic growth in China lies in the *non-state sector*, which has operated much closer to market forces. Indeed, outside of the state-enterprise sector, the Chinese economy has much in common with the other East Asian economies, especially when these other economies were at an earlier stage of development. While the non-state Chinese economy operates without many of the legal underpinnings of a more advanced market economy, it is at least subject to the strong market forces, international trade, and low taxation. In China, the non-state sector is relatively unconstrained by government regulation while in India, the non-state sector continues to be tied down by extensive regulations that hinder in dynamic development.

When Deng Xiaoping began market reforms in China in 1978, state-enterprise employment was approximately 18 percent of the total Chinese labor force. Approximately 71 percent of the population was engaged in peasant farming, and another 10 percent or so operated in various non-state activities outside of agriculture, especially urban collective enterprises attached to state enterprises, and Industrial Township and village enterprises. The Chinese “gradual” reforms after 1978 have involved the liberalization of the non-state part of the economy, while preserving the socialist character of the pre-existing state-owned enterprises. Thus, in terms of the labor force, roughly 20 percent of the labor force has been maintained in the socialist sector, while a little more than 80 percent of the labor force has operated in the non-state part of the economy.

China's boom has come in three main ways. First, agriculture boomed as soon as the commune system was dismantled, and peasant farming resumed on the basis of household plots of land. Second, rural industry was greatly liberalized after 1978, especially in the form of Township and Village Enterprises (TVEs). Third, urban export-oriented enterprises were encouraged by the designation of a growing number of special economic zones (SEZs), coastal open cities, and economic and technological development zones (EDTZs), all designed to encourage manufacturing exports. These special areas received various kinds of favorable tax and regulatory treatment, such as tax holidays, and duty-free access to imported inputs and capital goods needed for export production. Thus, the SEZs and other special areas were akin to the export processing zones that had been used in other parts of Asia as part of their initial export-led growth.

One key institutional support for rapid growth has been the *decentralization of economic policy making in China*. One of the reasons that state control on the non-state sector has been limited is that the power of the central bureaucracy in Beijing has been substantially weakened in favor of provincial and local governments. In particular, the coastal provinces have been relatively free to pursue market-oriented policies in support of export-led growth without being blocked by planners in Beijing. The provinces have a significant control over government expenditure and taxation; infrastructure projects; and even the policies regarding foreign direct investment. Indeed, the provinces have been competing actively with each other to attract foreign direct investment and to upgrade the infrastructure. The relative decentralization of economic policy making among the Chinese provinces contrasts markedly with the continued strength of the Indian Federal Government in Delhi in setting the overall economic agenda for India, including most major decisions over infrastructure expenditure and foreign investment.

VII. Export-led Growth

If there has been one lesson of recent development experience, it is that rapid overall economic growth depends on rapid export growth. The strategy of inward-looking development, in which exports would be unimportant because imports would be held to a minimum, proved to be ineffective in all countries in the world, even the most populous such as Brazil, China, India, and the former Soviet Union.

Inward-looking development was based on the idea that a large country such as India could develop its own capital goods sectors and intermediate goods sectors so that it would not have to rely on world markets for imports of capital and intermediate products (by intermediate products we refer of course to manufactured and semi-manufactured goods used as inputs for final products). There was a little bit of truth to this proposition, in that India and the other large economies were more equipped to develop domestic capital goods industries than much smaller countries, but still the idea failed miserably. The failure, as is now appreciated, came from various directions. First, the vast proportion of new technologies in the world inevitably had to be imported. There was no way for any single country, especially a developing country, to rely on its own activities for technological advance. Autarkic strategies inevitably cut the economy off from technological progress in the rest of the world.

Second, even a large domestic market such as India's or Brazil's was not large enough to spur strong internal competition in the absence of vigorous competition from abroad. Protected home markets turned monopolistic or oligopolistic, because the minimum efficient scale of production often represented a large proportion of the home market. Domestic enterprises, unchallenged by foreign competition, turned lazy and relied on state largess rather than their own efforts to survive.

EPZs in the manufacturing sector can play a major role in the overall growth strategy of the state. Virtually all of the East Asian countries have utilized EPZs to help attract foreign investment and to initiate the process of manufacturing export-led growth. EPZs have not aimed to pick "winners" in the classic sense of industrial policy. Rather, they have attempted to carve out a geographical zone in which export-businesses can conduct profitable export-oriented activities, exempt from costly regulations, tax laws, and labor standards that apply more generally within the country. In general, the relatively successful industrial policies have had a few common characteristics: (a) they have aimed to promote exports, rather than to protect the domestic market; (b) they have provided subsidies on the basis of successful performance (e.g. the growth of exports) rather than to cover losses; and (c) they have given temporary rather than permanent subsidies (e.g. a five-year tax holiday for new export firms).

Table 2 and 3 show the fundamental difference in India's and China's economic performance in the past two decades. China achieved rapid overall growth on the basis of rapid export growth, while India managed only moderate success in exports and moderate overall growth. In China, exports of goods and services went from 6 percent of GDP in 1980 to 21 percent of GDP in 1995. In India, by contrast, the same ratio went from 7 percent of GDP to 12 percent. Yes, there has been some opening of the economy, but the results have been much more modest in terms of export-led growth. In dollar terms, the comparison is even more striking. China's merchandise exports (excluding services) rose from \$18.1 billion in 1980 to \$148.8 billion in 1995. India's merchandise exports rose from \$8.6 billion to a mere \$30.8 billion. China exported \$123 per person in 1995, while India managed only \$33 per person. Nothing more clearly accounts for the difference in growth performance of the two countries 8.3 percent average annual growth per capita in China during 1985-95 compared with just 3.2 percent in India than the difference in export growth.

China understood that the root of export growth would be diversification away from traditional sectors, especially raw materials, into non-traditional sectors especially manufactured goods. But China lacked the technology by itself to be competitive in manufactured goods. Therefore, it invited in foreign direct investors to provide the capital and the expertise to achieve export competitiveness in a wide range of sectors, including electronics, apparel, plastic toys, stuffed animals, ceramics, and many other labor-intensive sectors. In each sector, the key was to link foreign investor capital and expertise with a large and low-cost Chinese labor force. The foreign investors brought in the product design, specialized machine tools and capital goods, key intermediate products, and knowledge of world marketing channels. The Chinese assured these foreign investors certain key conditions for profitability, such as low taxes, reliable infrastructure, physical security, adequate power, decent logistics for the import and export of goods, and so forth.

At the center of China's export strategy were the special economic zones in which favorable export conditions were assured. These SEZs, along China's coastline, were designed to give foreign investors and domestic enterprises favorable conditions for rapid export promotion. All key aspects of the export environment were secured. Exporters, for example, were allowed to import intermediate products and capital goods duty free. They were given generous tax holidays. The exporters were assured decent physical infrastructure, often through the provision of land, power, physical security, and transport to the ports, within specially created industrial parks.

Table 2: China's Special Economic Zones

Names	Shenzhen	Zhuhai	Santou	Xiamen	Hainan	National Share of SEZs
Year Established	1980	1980	1981	1981	1988	
Area Coverage sq km	327.5	121	234	131	33931	0.36%
GDP (million Yuan)						
1979/1980*	196	380*	na	na	na	na
1991	17446	6045	3720	6250	10900	2.05%
1994	na	na	na	na	na	3.27%
Staff & Workers (1000)						
1980	26.5	24.1	222.1	185.1	954.5	
	1.49%					
1991	648.8	185.7	368.9	277.7	1077.4	
	1.76%					
Exports (mil dollar)						
1980	11	9	232	140	na	na
1991	3446	699	1024	1151	670	9.73%
1994	18309	1488	2202	3389	987	21.79%
Foreign Capital Utilization (mil dollar)						
1980	27	16	na	na	na	na
1991	580	170	197	183	216	11.65%
1994	1730	763	774	1241	918	12.56%

Source: China's SEZs & ETDZs Yearbook 1980-89, 1990-92. Gao, Wang & He, 1993, p 2227. CSSB, Almanac of China's Foreign Economic Relations and Trade 1995/96

Notes:

#1 refers to 1991's data, from China's SEZs and Coastal Economic and Technological Development Zones Yearbook 1990-92, p 74.

#2 is estimated according to Gao, Wang & He, 1993, p 2227 "In ten years since the establishment of Xiamen SEZ, Xiamen created 92.6 thousand jobs."

#3 refers to 1982's data.

India approach to export zones has been one of relative neglect rather than support. While China's five main special economic zones (Shenzen, Zhuhai, Santou, Xiamen, Hainan) exported \$26 billion in 1994, roughly 22 percent of the national total, India's main export processing zones, or EPZs (Kandla, Santacruz, Noida, Madras, Cochin, and Falta), managed a tiny fraction of that, both in absolute levels and as a proportion of total Indian exports. India's EPZs have not performed as well as China's SEZs for many reasons, including:

- limited scale and overcrowding of the EPZs
- insufficient logistical links with airports and seaports
- poor infrastructure in areas surrounding the zones (e.g. unpaved roads and poor physical security)
- government ambivalence and red-tape regarding inward foreign direct investment
- unclear incentive packages governing inward investment
- lack of interest and authority of state and local governments, and the private sector, compared with the central government, in the design, set-up, and functioning of the zones.

Table 3: Performance of Export Processing Zones (US \$Million)

Name of Zone and No. Of units	Number of persons employed	1981	1989	Exports 1990	1991
KAFTZ, 107	11,000	NA	203	254	173
SEEPZ, 115	10,500	NA	174	217	203
NEPZ, 71	4500	NA	31	25	29
MEPZ, 107	6616	NA	18	34	50
CEPZ, 23	2170	NA	7	3	12
FEPZ, 12	400	NA	10	14	11
Total= 435	35,186	218	443	547	478
National Exports		8704	16955	18477	18266
EPZ Exports Share		2.50%	26%	3%	2.60%

Source: Economic Survey, 1992-93, p 108, 1994-95, p s-71, s72.

In China, the major responsibility for the SEZs rests with local and provincial governments, whereas in India, the responsibilities remain heavily with Delhi. Under the present circumstances, many state governments have actually been averse to the idea of EPZs in their state.

Most coastal cities in China are port cities. The first emerging interest in Chinese coastal cities relates to the catalytic role they are playing in the nation's recent drive toward modernization and economic development through the adoption of the open policy. After four SEZ's were established in 1979 and worked well the Chinese leadership was determined to pursue further accelerated economic development. Thus, in April 1984, fourteen coastal cities¹ were "opened" to foreign investment. They soon became centers of foreign business investment and hence part and parcel of economic development zones. Like SEZs the open cities were

granted special status, including upgrading of administrative status to provincial level, permission to practice flexible trade and investment and greater powers to offer preferential treatment to overseas investors. They were allowed to develop Economic and Technological Development Zones (ETDZs) and science parks with generous provisions for corporate profit tax, import and export duties, and other conveniences accorded to SEZs.

VIII. Foreign Trade

Over 90 per cent of China's international trade is transported by ship and passes through its ports.² China's foreign trade amounted to 1.1 billion in 1950 and had grown to 3.8 billion by 1960. Between 1950-1962 Communist countries accounted for an annual average of two thirds of China's foreign trade. But that trend was reversed by 1963 when non-communist countries took the largest share of foreign trade and by 1986 the ratio of China's trade with the non-communist countries was 89 percent.³

Shipping was a basic problem in expanding China's foreign trade, as many countries refused to permit entry of Chinese-Flag ships in their ports. To overcome such shipping obstacles, the State Council gave the Ministry of Communications (MOC) authority to establish in Hong Kong wholly owned shipping companies to operate ships under foreign flags in worldwide trade.

However, it was with initiating a dialogue and improving relations with USA in 1971-72 that had a major impact on China's foreign and economic relations with the outside world. China had been attempting to become a member of the United Nations but it was only after 1971 that China's membership was accepted and backed by USA. 1979 was the first year a Chinese ship from the China Ocean Shipping company (COSCO) made its first call to an American port, Seattle. Between 1979 and 1988 US and China trade increased sixfold, from \$ 2.3 billion to \$ 14 billion. By 1974 foreign trade had risen to \$14.6 billion, going up to \$20.6 billion in 1978 and increasing to \$ 60.1 billion by 1986.⁴

Table 4: China's Import and Export with The 15 Biggest Trading Partners 1997

UNIT: US\$ 100 million										
Country(region)	Standings	Import and Export			Export Volume			Import Volume		
		Volume 1997	Volume 1996	Growth Rate%	Volume 1997	Volume 1996	Growth Rate%	Volume 1997	Volume 1996	Growth Rate%
Japan	1	374.6	364.9	2.7	197	186.4	5.7	177.6	178.5	-0.5
HongKong	2	316.1	243.2	30	272.3	192.6	41.3	43.8	50.6	-14.3
U.S.A	3	301.3	254.3	18.6	200.7	157.8	27.3	100.6	96.6	4.4
R.O.K	4	148.5	123.3	20.5	57.5	46.1	25	91	77.2	17.8
Taiwan	5	120.8	112.7	7.1	20.2	17.3	16.6	100.6	95.4	5.4
Germany	6	75.3	79.2	-4.9	39.5	36.4	8.5	35.8	42.8	-16.3
Singapore	7	54.2	45.3	19.8	26.4	22.8	16.3	27.8	22.5	23.3
Russia	8	37.6	47.3	-20.4	10.1	10.5	-3.7	27.5	36.8	-25.1
U.K	9	33.9	30.1	13	22.4	19.1	17.5	11.5	11	5.2
Netherlands	10	33.3	26.7	24.8	27	20.8	30.3	6.3	5.9	5.6
Australia	11	32.4	33.7	-4	12.3	10.1	21.2	20.1	23.6	-14.8
Italy	12	29.2	31.1	-5.9	14.1	11.4	23.2	15.1	19.7	-22.8
Indonesia	13	29.1	22.1	31.8	11.6	8.5	37	17.5	13.6	28.5
France	14	28.8	27.7	4	14	11.8	18.3	14.8	15.9	-6.5
Canada	15	24.4	26	-6.3	11.9	9.9	20.6	12.5	16.1	-22.9
Total		1992.6	1762.3	13.1	1123.7	906.1	24.1	868.9	856.2	1.5

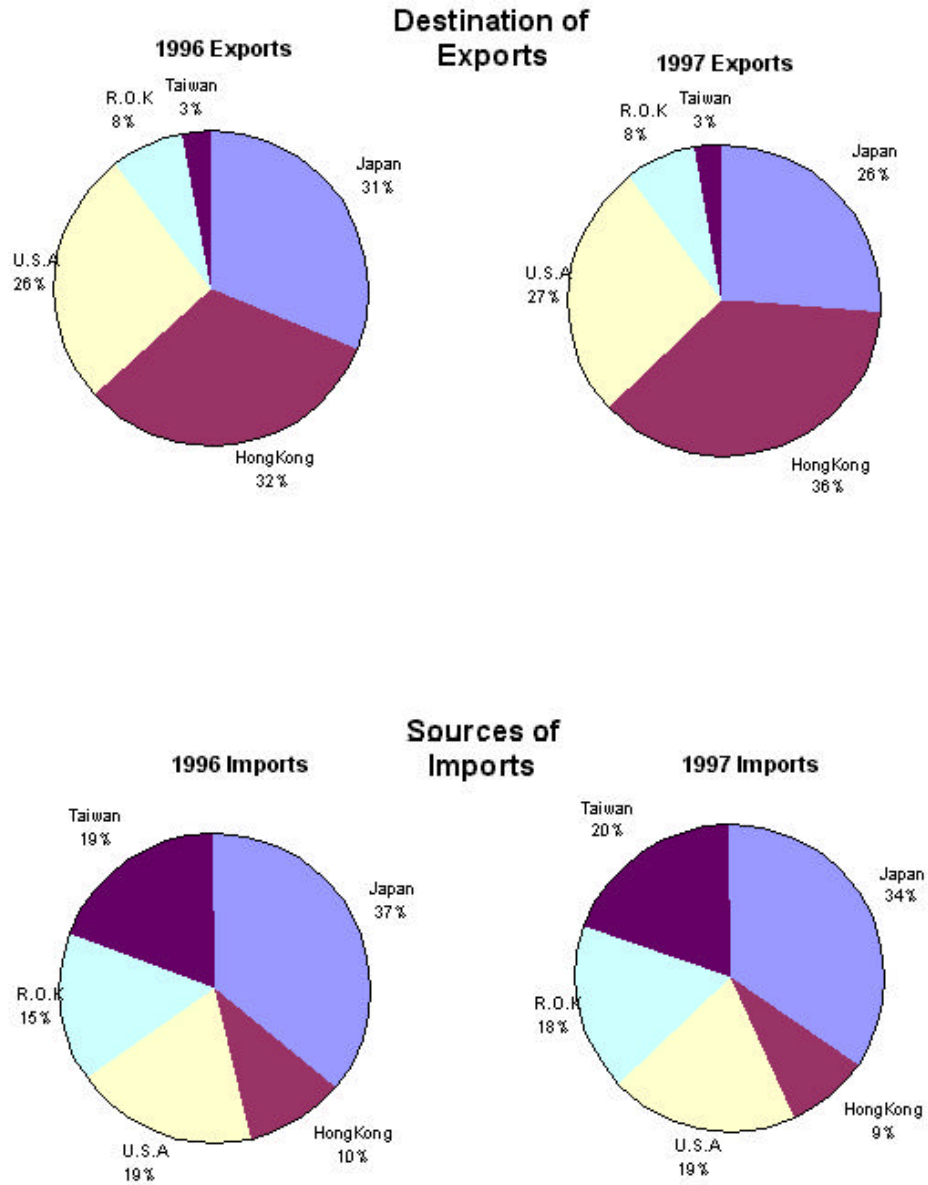
Source: Ministry of Foreign Trade and Economic Cooperation, PRC

Table 5: Imports and Exports by Mode of Transportation (Year 1997) Unit US\$ 1,000

Mode of Transportation	Total		Exports		Imports	
	Value	%	Value	%	Value	%
Water	198,197,554	60.9	108,573,910	59.3	89,623,644	62.9
Rail	6,019,346	1.8	3,191,713	1.7	2,827,633	1.9
Road	95,039,293	29.2	60,323,455	33.0	34,715,838	24.3
Air	24,449,671	7.5	9,463,576	5.1	14,986,096	10.5
Mail	216,168	0.0	149,679	0.0	66,489	0.0
Other	1,239,988	0.3	1,089,322	0.5	150,666	0.1
Total	325,162,020	100.0	182,791,655	100.0	142,370,366	100.0

Source: China Customs Yearbook 1997, General Customs Administration of the PRC

Figure 2



IX. Maritime Policy

China began to work on a Maritime policy soon after the communist revolution and the coming to power of the communist party in 1949. However, it was only in 1961 that China adopted a maritime program for a national flag merchant marine to operate the country's foreign trade. The process of drafting more laws and policies continued and one of the most far-reaching laws was adopted in 1983 called the Maritime Traffic Safety Law of the People's Republic of China. A drafting committee established by the MOC in the 1950s wrote it after years of study. The policy was designed to have comprehensive control over maritime matters carried out directly under the State Council and the Ministry of Communications.

A. China's Maritime Code 1992

The Maritime Code was adopted on November 7, 1992 which marked the completion of the legal framework for China's maritime policy. The original drafting was started in the early 1950s when a committee was established by the MOC. The first official draft was finished in 1963. Over the next forty years, the Cultural Revolution and other political reasons interrupted work. The open door policy and the fast development of foreign trade and the shipping industry required a long-term maritime policy. In this sense the publication of the Maritime Code and regulations was a very important step in maritime development and reform of the country.

The MOC plays a vital role in Chinese shipping and administration. It lost its role as Ministry of Transportation in 1975 when it was no longer responsible for railways and civil aviation. Its key functions today comprise of controlling Chinese seas, waterways, and highway transportation, including giving permission to foreign ships to engage in Chinese ports. It also includes maritime strategy and maritime policy-making.

In China the government had followed two different regimes: one for its "domestic trade" and the other for its "international trade" in keeping with international practices and customs. However, in 1988, an important reform measure was adopted and the Chinese opened international trade to the outside world. Accordingly the government completely withdrew from assigning or reserving any foreign trade cargo on any domestic or foreign carrier (a reform measure that accrued great losses to the national shipping companies, for example, the Chinese Ocean Shipping Group Company [COSCO] alone lost a security of about 255,000 tons of cargo every day. Since then agreements with various countries has encouraged the major containers to run operations directly in the Chinese market.⁵

In port services foreign flag vessels used to pay higher port dues than national flags vessels when calling at Chinese ports. This practice was also changed in April 1992, eliminating any discriminatory treatment to foreign flag vessels in international trade.

Prior to 1992, no foreign ship was allowed to engage in Chinese coastal transport. While this still holds true, since 1992 with the new Maritime code exceptions have been made where:

1. the ships are a joint venture with a foreign partner,
2. where special technology and skills are needed and not available among the national companies,
3. ship owned by Chinese-foreign joint ventures whose principal place of business is located in China, and
4. where the registered capital contributed by Chinese investors is not less than 50 percent. Such investment however, require the prior approval of the MOC.

In July 1992, the Chinese government also allowed foreign investors into certain maritime auxiliary activities such as cargo handling, storage, warehousing, packing and unpacking, in the form of joint ventures with domestic partners. This policy was also applied to internal waterways and road transport. Shipping agency services were also opened to foreign operators. As a result, a number of foreign shipping companies started operating in the Chinese waters and ports. There are also a number of successful joint venture programs undertaken in port construction and operations.

B. Maritime Agreements

China has successfully used maritime agreements to expand the horizons of China's economic and political interests, especially during the 1960s when China's contacts with foreign nations outside the Communist bloc were limited. The first one of these agreements that China signed was with Poland in 1951. It continued to sign various other agreements first with the communist bloc and later with other developing countries in Africa and East Asia. Joining the United Nations in 1972 opened new frontiers for China and slowly China entered into maritime agreements with the developed world.

C. Shipbuilding

Shipbuilding is another pillar of China's maritime policy. Self-reliance in shipping and shipbuilding has been a basic tenet of China's maritime policy. China's maritime policy set two goals for the shipbuilding industry: increase ship construction to supply China's ship requirements for its foreign and domestic trades and build ships for export. This is significant as more than 90% of China's foreign trade is seaborne, of which more than 40% is transported by Chinese-flag ships.

A domestic shipbuilding industry was supported and encouraged because it would

1. Strengthen the domestic transportation structure,
2. Contribute to the transportation of China's foreign trade
3. Earn and conserve foreign exchange by helping to reduce dependence on charters of foreign owned ships and
4. Eventually become an export commodity of increasing importance to the nation's economy.

With encouragement from top leaders like Mao Zedong and Zhou Enlai, the shipbuilding industry began to earn returns. Licensing of designs and patents as well as direct purchases of

advanced technology for ship power plants, machinery, and equipment is leading China to make not only basic types of merchant ships like freighters, tankers and bulk carriers but also complex types such as containerships and special multipurpose vessels for domestic and export purposes. In 1977 for the first time an ocean going merchant ship built in the People's Republic of China was delivered to a foreign owner.

In 1987, China ranked ninth in tonnage of ocean going merchant ships and fourth in commercial shipbuilding among the world's maritime nations. China has been able to achieve this position by

- 1) a dynamic, coherent well funded maritime policy and
- 2) by the use of maritime accords to advance China's maritime interests initially with the Communist bloc, other countries of Africa and South-east Asia and after being admitted to the UN in 1971 to other countries of the industrial world and the more advanced third world countries.

Expanding trade is the basic goal of port development in China. Related to this is the construction of large vessels. At present only the ports of Dalian and Shanghai have facilities where ships over 100,000 dead-weight tons (DWT) can be built. Port development authorities are thus paying emphasis to speed up construction activities along the coast.

X. Chinese Government's role in Port Development

Ports in China come under the jurisdiction of the Ministry of Communications (MOC). MOC is responsible for the administration of the waterway transport industry and transportation organizations, and regulates the transport of goods and materials. This includes strategic planning, policy development and organizing "key" projects. It is also responsible for the improvement of the information and service systems.

The MOC is also in charge of the task to reform and rationalize the structure of the entire water transport industry. In April 1997, Vice Premier Zou Jiahua announced the new State emphasis on improving the layout, design and management of the country's existing ports. The State Port Administration Office (SPA0) was charged with conducting an investigation into China's ports to determine which small ports to close or consolidate and which ports should be earmarked for further investment. The local port authority is under the jurisdiction of the municipality.

Both the State Council and the Ministry of Communications realized that the development of China's merchant fleet and the nations ports must be in harmony. Hence the goals of a maritime policy and those of trade were aligned. One of the major influences on China's economy is the capability of its ports to serve efficiently the nation's foreign and domestic trades.⁶

Of China's thirty-five ports open to foreign trade, twenty-five are located along China's coast from Dalian in the north to Fangcheng in the Gulf of Tonkin. An additional ten ports on the

Yangtze River were opened to foreign trade in the early 1980's. Five foreign trade ports, Wenzhou, Fuzhou, Xiamen, Shanwei, and Beihai – do not come under the authority of the Ministry of Communications but are administered by local authorities in their respective provinces.⁷

A number of ports specialize in the shipment of specific commodities. Qinhuandao, Lianyungang, Zhanjiang and Shijiusuo are China's major coal ports. Petroleum is mainly exported from Dalian. Some ports specialize in handling grain (Details on major ports is listed below).

A. Historical Overview

Port development in China got off to a slow start. Between 1949 and 1979 only one deep-water berth was built per year. China's ports were in a deplorable situation during 1950-70. An early report revealed that of the seventeen major ports reviewed, sixteen could accommodate no larger than medium-size vessels because of relatively low water depths. Facilities for handling containerships were minimal while available equipment was inadequate to load and discharge cargoes efficiently.⁸

In the early 1970's under Zhou Enlai's encouragement the government undertook to deepen channels and rebuild a number of berths at various ports, adding 100 million tons of handling capacity. During the Sixth Five-year Plan the government borrowed from the World Bank and the Japanese Cooperative Foundation to modernize and quicken port construction along China's coast and principal river systems.

However, once the "Open Door" policy was implemented the growth in China's foreign trade and merchant maritime surpassed the progress of port development. The rapid increase in exports put pressure on China's ports, leading to severe congestion and costly delays to Chinese and foreign-owned ship's tasks of loading and discharging cargoes. At times congestion delayed ships in some ports for weeks, severely affecting vessel-operating costs.

B. Port Development

Hence, China decided that improvement of her ports and infrastructure must be part of the basic tenet of China's maritime policy. Since 1979 dramatic changes in the pace of construction of China's coastal facilities started. Construction and utilization of port facilities to handle containerships and their cargoes at China's ports began. In 1982 a loan of \$124 million from the World Bank helped construct seven container wharves. Great attention was given to modernization and construction of new ports and their infrastructures. Construction of 132 additional deep-water berths at fifteen ports began in early 1980's of which 52 were completed by 1985. The State Council's Provisional Regulations governing Preferential Treatment for Ports and Terminal Development projects financed by Chinese and Foreign Joint Ventures, was issued on September 30, 1985.⁹

A major priority of the Seventh Five-year plan (1986-1990) was to accelerate investment in ports and their infrastructures from government resources and imports of foreign capital on favorable terms. The plan further gave special emphasis to overcome the problems at the ports. For example, between 1986 and 1990 Fujian Province launched more than forty harbor building projects. Eleven of these were deep-water berths. With these new projects came a dramatic expansion of overall Chinese trade.

In order to streamline port efficiency, by the end of 1987, the Ministry of Communications turned over the management of fifteen major ports to local authorities to decide their own operational activities and financial affairs. The Ministry however, continued to formulate policy and to establish rules and regulations for the ports under its jurisdiction. Also initiated was the restructuring of organizations, the separation of governmental functions from business management, stepping-up economic and technical exchanges with foreign companies, and increased importation of advanced technology.

According to SPAO in China there are now 235 ports established by the Central government - 184 of which were built during the past 18 years. Of these, 30 ports handle 80% of the total shipping for China. China claims that 40 of its ports are "deep water" ports. The Chinese refer to "deep water" as anything with a draft of over 9 meters. International standards consider a deep-water port to be over 14 meters. By such standards only one Port in China today, - Ningbo - can claim that distinction. Ningbo is the only Chinese port that can handle the new large 200,000 dwt. ships. Given the salutation problem in many of China's ports, dredging is usually required to achieve and maintain "deep water" status.

The top ports slated for further Chinese government development support and investment during the current 9th Five-Year Plan (FYP) are: Shanghai, Tianjin, Ningbo, Dalian and Xiamen. Other ports may receive some government support but most are expected to raise substantial funds directly from foreign or domestic investors. The central government is encouraging ports to specialize along the lines of their natural advantages. While China's decision making for port development is becoming more rational, political considerations can still tip the balance.

Hong Kong is considered as a benchmark against which China measures the development and progress of its own ports. Hong Kong has six times the throughput of Shanghai (13M TEU's for Hong Kong vs. 2M TEU's for Shanghai) and is a world leader in container handling efficiency as well as being a world class deep-water port. But as other Chinese ports develop Hong Kong will face competition in the future, as Hong Kong's port charges are high and land access to the territory by road and rail is also overburdened.

Since China containerizes only 4% of it's cargo, at present, the container business can be expected to increase dramatically during the next 10 years. This will be driven by the fact that the cargo mix, as China develops, is shifting rapidly toward manufactured goods from primary commodities. Only a few of China's ports are able to handle container traffic effectively. Under the new central government's policies it is more likely that those already handling containers will enhance their facilities, rather than new container facilities being constructed. The main container

ports, at present, are Shanghai, Tianjin, Dalian, Qingdao, Shenzhen, Xiamen and Yantian. The Chinese government claims to have 40 container ports, but most of them are minimally equipped.

XI. International Institutions

China has used international institutions effectively wherever possible for training and transfer of knowledge. China became a member of UNCTAD in 1972. Subsequently in the 1980's China became actively involved in the technical activities of UNCTAD's Shipping Division concentrating on ports and multimodal transport.

China's planners were always aware of the need to harmonize the nation's shipping activities with the capability of China's ports to handle their constantly increasing volumes of cargoes moving in domestic and overseas trades. Port development and improvement was given special priority in the sixth and seventh five-year Plans.

Cognizant of UNCTAD's technical facilities for port development, senior officials of China's Ministry of Communications made a formal request for UNCTAD's assistance in the translation of Improving Port Performance (IPP) course materials into Chinese and for support to train China's port and institute personnel. Collaborating with the Shanghai Maritime Institute, a seminar was convened at Shanghai in April 1985, to conduct UNCTAD's IPP course on the Management of General Cargo Operations. UNCTAD agreed to China's request for financing of the production of the audio-visual programs in Chinese. Instructors from fourteen ports and three institutes participated in that seminar.¹⁰

China's officials in assessing the results of the seminar noted that the "IPP course was most relevant to conditions in Chinese seaports The project could have a major beneficial influence on the management skills of .. port managers and have a significant impact on the efficiency of China's seaports."¹¹

Multimodal transport was new and still a small operation in China in the mid-1980's. As a member of ESCAP (Economic and Social Commission for Asia and the Pacific) China had access to its activities. UNCTAD had developed a program called "Training Development in the Field of Maritime Training (TRAINMAR MT) designed for senior policymakers in governments interested in multimodal transport. Officials representing the China National Foreign Trade Transportation corporation (SINOTRANS) at ESCAP's shipping division seminar at Bangkok in October 1984 were impressed with the effectiveness of the TRAINMAR MT workshop and recommended that Beijing request UNCTAD for a China-only training workshop. Two years later the workshop on Multimodal transport, organized by UNCTAD and ESCAP was held in Beijing on September 3, 1986. The officials of SINOTRANS viewed this workshop as very useful for developing multilodal transport in China. Funding was provided jointly by four organizations: UNDP, SINOTRANS, UNCTAD and ESCAP.¹²

XII. Integrated Development

China pays significant emphasis to build vital links to the ports by expanding the connections between the ports via inland transportation, by major highways, railroad lines, and riverways to the hinterland. There is much emphasis to see that these links are built and keep pace with port development to deal with the existing bottlenecks, which exist and cost China millions of dollars in losses every year. This aspect can be seen clearly in the section on specific ports below. (See Appendix I). Each port has naturally a hinterland that it caters to or by linking the interior with a port provides easy access and communication.

XIII. Technology

China has emphasized the use of the latest technology and software for use in its ports. The creation of a Data Processing Center at the Shanghai Ship and Shipping Research Institute further provided for cooperation between China's ports in the use of technology. UNCTAD was the executing agency for the project, which assisted in financing the computer software and training application analysts and others in the development of application software in the maritime sector.¹³

Similarly an Electronic Data Interchange (EDI) has been set up at the most modern port of Shenzhen in the southern province of Guangdong. The growth trend at Shenzhen is one which will soon beat Shanghai in trade volumes. This is so because the volumes at Shenzhen has risen by 62% between January to May 1999. It has a reliable and sufficient source of containers, access to large land area for loading and unloading of cargo and the use of the latest technology in processing port activities. The development of the Shenzhen port offers guidelines to other ports in China. A recent study pointed to the lessons that the Shanghai port can learn from the Shenzhen port.

XIV. Review

Studies and review of existing ports are continuously under way and action is taken as recommended by these studies. As Hong Kong plays an overwhelmingly dominant role in China's trade, continuous review of conditions and enhancements are in place. Presently the port of Hong Kong has major plans to expand. The Hong Kong Port and Maritime Board decided in June 1998 to promote Hong Kong as an international shipping center. A review of the procedures and action plan has been drawn up accordingly. The Marine Department has also undertaken a detailed review of the management and operation of the Hong Kong Shipping Register to improve its attractiveness to international shipping agencies. These include simplifying ship survey procedure, streamlining safety requirements for newly registered ships and reduction of some registration fees and charges.

XV. Future Development

China has ambitious plans for port development along the coast as well as along the major rivers. Port construction is in order to capitalize on the growing international trade. While domestic funds are being used, there is not enough domestic capital for all major port construction projects and hence the governments and business bodies at various levels are soliciting financial help as well as managerial help from financial institutions and foreign investors throughout the world. According to Paul Sullivan, the vice president (East) of the Asian Development Bank (ADB), of the estimated US \$233 billion investment required for infrastructure in China over the Ninth Five-year plan (1996-2000), around US \$ 111 billion will be required for transport (road, rail, sea and their equipment).¹⁴

The government has also drafted a number of favorable policies designed to attract more foreign capital for port and cargo handling facilities. Overseas businesses are being allowed to invest in building docks and open navigation channels. They are also allowed to construct and manage special port areas and docks on the tracts of land in which have invested.¹⁵

While the global shipping industry has recently experienced a slump and is contending with over-capacity, the seaports of China are still behind in their ability to efficiently process the increasing volumes of cargo flowing into them. China's ports face bottleneck in terms of their efficiencies in ship navigation and scheduling, berthing, cargo off loading, inspection, customs clearance, security, and tracking and storage. The low-tech portions of this market are gradually being supplied by domestically producers. Hence the major opportunities for foreign companies are in providing equipment, software and project management skills to increase the efficiencies in the operation of existing port facilities.¹⁶

Future development plan: China has extensive plans for development of its ports. During the eight five-year plan between 1991-1995 and the ten year plan between 1991-2000 China hopes to have 2000 coastal ports, 1,200 of them deep-water ports.

China's government recognizes the need to develop automated systems and a systems approach to managing port facilities. It is expected to become a major consumer of automated equipment, project management services, technical consulting and training. Since it has a limited domestic ability to provide these services at present, foreign investment in these areas will be encouraged.

XVI. Foreign Investment

The Chinese government's ambitions regarding port improvements exceeds its ability to pay. China expects up to 60 per cent of the needed port funding to come from foreign sources. Without foreign investments, the port sector's growth plans will have to be severely curtailed. U.S. companies willing to invest in China have an opportunity to tie sales of their products to such investment.

The Chinese law prohibiting foreign ownership over 49% of any port facility has slowed the flow of investment. "... in most cases foreign investors in China prefer management control. This is even more likely to be the case where ports are concerned, since improved management is vital to success."¹⁷ The Chinese government has also recently undertaken a serious attempt to understand "the recent drop in overall foreign investment in China, which has prompted a nationwide debate on how best to court foreign money."¹⁸

Some port projects are offered through open bidding, but not all. Projects funded by a multilateral development bank such as the Asian Development Bank or the World Bank must use open bidding methods. Even in "open bidding" results are often politically influenced and a bidders submittal is not always kept in confidence from favored competitors.

A financing alternative that is being considered for port improvements is the build-operate-transfer (BOT) principle. In this investment structure, the foreign supplier provides the capital and the management from the facility construction through a fixed period of operation. The operator is expected to recover the investment and earn a profit during the operations phase, after which the project is turned back to the Chinese. The Chinese have said that this could work for port facilities but no known project is presently using this approach.

XVII. Foreign Investors in Chinese Ports

The US invested in a number of port projects in China. China's overwhelming need for foreign capital had led a number of U.S. companies to invest for the long term. To date, the major U.S. Company with the largest ownership position in China's ports is Sealand Corp. It is building a large container depot in the Port of Shanghai in partnership with the Shanghai Harbor Bureau. The joint venture is known as the Shanghai Orient International Container Transportation Co., Ltd. Sealand's local entity is known as Sea-Land Orient Ltd. Sealand's total investment in Shanghai, to date, is over \$12m.¹⁹

Sealand is also investing \$29m in 49% of a joint venture at the Port of Tianjin to modernize three container berths. The Tianjin municipal government and the Tianjin Harbor Bureau will together hold 51%. U.S. construction giant Bechtel announced plans in 1995 to turn Davie Island off Ningbo into a major port.

In the past China imported a great deal of port equipment from Japan, the U.S., Hong Kong, Singapore, Korea and Germany. As China's ability to domestically produce low-tech forms of port equipment has grown, its foreign imports have been shifting toward higher technology equipment to fill the need for increasing port efficiencies.

Japan entered the China port market early by extensive use of "tied aid" (i.e. China had to use the Japanese money to purchase Japanese goods) in the form of "soft loans" (given at low or no interest and a long payback). In recent years (since 1993) Japan has been raising its prices on equipment and there is not as much tied aid money due to domestic financial concerns and international pressures. When tied aid is not a factor, China is much less apt to buy from Japan.

Hong Kong's Hutchinson Whampoa is making extensive investments in many of China's ports, from Shanghai south. In particular, they set up the port of Yantian and it is one of the best showcases of a modern port facility in China today. It only broke ground in 1994 and expects to rival the top ports in China within the next ten years. Hutchinson Port Holdings (HPH) is the majority owner of Yantian International Container Terminals Ltd. (YICT).

Singapore is also a major foreign investor in port upgrades. The Port of Dalian is consolidating and upgrading its container facilities through a joint venture with Singapore port authorities, the Jurong Town Corp., the Sembawang Maritime Co. and the AIG Infrastructure Fund. This group is able to provide the needed capital (\$480M) and is also very interested in a long-term commitment in China.

A Norwegian company provided the navigation system to the Port of Tianjin in 1995. Analysts believe that navigation systems will show the greatest near term growth but fully integrated software systems will be preferred when the port can afford to purchase it. The high tech sector of port improvements in China is not yet visible. It is a new market without comprehensive statistics and the information market in China is still disorganized and chaotic. Nevertheless, it is the high-tech sector in port improvements that will show the highest growth.

XVIII. Business Practices

Compared to other market sectors in China, the port sector has a relatively simple decision process since all procurement decisions ultimately end up coming to the attention of the Director of the Port. He makes a good many decisions on what new projects are coming up for bidding. Most port projects using foreign funds, and especially those financed through multilateral development banks use open bidding. This will not necessarily make the process straightforward or fair. The bidding may be already "rigged" or the bid may be disclosed to a favored competitor. Relationships do play a big role. Foreign companies which have spent a lot of time and money in developing a network of important relationships in the Ministry of Communications and with the port authorities usually have an edge in the bidding wars.

In late 1993, the Chinese central government ruled that no foreign investor could own more than 49% of any given Port project or facility. Before that time, the Hutchinson Whampoa group from Hong Kong was able to lock in several "sweetheart" first-right-of-refusal contracts to develop most of the Ports south of the Yangtze River, including Shanghai. Hutchinson Whampoa is the only non-PRC entity currently owning controlling interest in any of China's core port facilities. As a general contractor involved in many port projects south of the Yangtze, they represent a lot of bid tenders for secondary and tertiary suppliers to their projects.

Even though the new rules forbid foreign firms from having a controlling stock position, in practice, it is possible for the foreign partner to negotiate management control if the success of the project is important to the Chinese partner. US companies making serious investments in China, often make operational control a key negotiating issue.

There has been an increasing willingness by Chinese authorities to allow Wholly Owned Foreign Enterprises (WOFE's) to set up service operations within port facilities. As yet there is no possibility for a WOFE to operate in the freight forwarding business i.e. they can't move anything out of the port.

Foreign investors have to also deal with regional differences. As a general rule, business negotiations and operations conducted in Southern China (south of the Yangtze) are characterized by more flexibility in contrast to the more rigid - government sensitive atmosphere in North China. This flexibility difference can effect the variables of any business deal. The more strict adherence to the written law in the northern areas allows for more certainty in the financial outcome of a deal, but the economics -- if not in the foreigners favor -- cannot be altered as easily to find a satisfactory outcome. On the other hand, in the south, the lack of adherence to clear guidelines results in unpredictable and arbitrary interpretations of the "law" which can alter the basic economic assumptions of the deal after the fact.

Lessons from China

1. One of the most important lessons that can be learnt from China is the ability to *decentralize policy-making*. This by itself would have a far-reaching effect. The institutional changes in the MOC, and transferring port management to local municipal authorities had a tremendous impact in the development and modernization of China's ports. It has created a competitive spirit between the ports of various provinces. In India, the centralized system of port governance implies that the states have very little jurisdiction in, or control over, policy and regulatory decisions that would make their states more attractive to prospective private investors. Hence, Indian states have to work within the constraints of the national legal framework. Policy-making, governance, and regulatory functions in the ports sector are largely concentrated at the central level, that is, major ports are under central control and only minor ports are controlled and managed by the states. The comparative research from China and Malaysia has shown that decentralization of policy making and greater decision-making authority to the provinces is crucial in accelerating investment decisions for foreign investors. However, given the present political situation, stronger regional parties and alliances, and ongoing economic reforms; states like Tamil Nadu are in a good position to negotiate for greater freedom from the center to make policy to be able to develop infrastructure in the state.
2. China spent a number of years coming out with a Maritime Policy that was consistent with international standards and the WTO.
 - a. The Introduction of Parity in Port Dues for similar vessels and cargo.
 - b. Private participation in other port activities like cargo handling, storage, warehousing, packing and unpacking.
 - c. Attracting FDI and allowing joint ventures for port activities listed in (b) and other construction and modernization projects.

3. The emphasis on integrated development of ports and its surrounding hinterland for Improving Port performance. We have seen that in China this is done by providing links to railroads, riverways, and roads to major ports. As a result even remote and land locked areas of the interior have been provided access to a minor or major port. Major rivers, like the Changjiang, which provide access to the interior from Shanghai have been deepened and developed so that larger coastal and riverboats can provide link service from the ports to the interior. The development of the riverways is a major aspect of the future development in China's water transportation. There is a need to analyze which of the rivers in south India could be developed in this manner.
4. China made good use of International institutions, like UNCTAD, ESCAP, the ADB and the World Bank to organize short training courses for the employees of port authorities and other government and semi-government organizations. The dissemination of such technical training can be very useful for exposure to systems in practice around the world.
5. As we discuss in the section on "Ports of China" a number of ports have been built in the past decade. These have been made using the latest software and computer aided systems to navigate ships and hence these ports have access to the most modern technology. This is imperative if Indian ports have to compete with other international ports and become competitive globally. We have seen that the older ports in China (like Shanghai) are not equipped with these technologies but the port authorities there have made it a point to learn from Shenzhen (a modern port) and are determined to make Shanghai at par with the newer ports in a few years.
6. Since 1978, when China embarked on its economic reform there has been a constant review of the situation in the ports. Such review and research has led to the adoption of "Action Plan" which have been sought to be implemented in a timely fashion. This is most obvious in the case of Hong Kong which is one of the most efficient and modern ports. But the Chinese authorities realized from recent review that Honk Kong would be facing problems in the next century and are preparing for it now by implementing development plans which will allow Hong Kong to retain its premier position among global ports.
7. It is very useful for the officials of various port authorities to attend the major conferences in the world and also to host a conference even if it involves the help of an industry association. Some of the major conferences for this year include: "**Bunkering in Asia**" - convention to be held in Hong Kong in November 1999. "**APEC Transportation Working Group Meeting**" - to be held in Hong Kong in November 1999. "**Intermodal '99 - Conference cum Exhibition**" - organised by IIR Exhibitions to be held in London in between 8-10 December 1999. The Hong Kong Port and Marine Department make it a point to promote the Hong Kong Shipping Register at such conferences to attract more ship owners and shipping companies to register their ships and open offices in Honk Kong. A similar project could be undertaken for Chennai. (The state government having control over the affairs of Chennai port would be a major incentive, but till such time, a joint project between MOST and GOTN could be undertaken). Attracting foreign

shipping companies to open offices in Chennai would be a preliminary step toward more direct participation in investment, auxiliary activities and more trade.

8. While a number of problems are being implemented and solved at the central government, states need to create jurisdictional space for themselves whereby they can speed up the process of private investment for developing new ports, or creating additional cargo handling or modernizing existing ports.

Section III

Infrastructure in East Asia

Infrastructure in East Asia, including Malaysia, Taiwan, Hong Kong, Japan, South Korea and Singapore shows that while each pursued its own strategy, in overall terms “infrastructure development show the best face of these governments.” It took place and “was guided by a strategic vision”. A World Bank study explained the three features that help explain the success of infrastructure development in this region. These were investment decisions, sustained and powerful government leadership, the nurturing of complex institutions and adaptability to change.

Ports: A Priority in Malaysia

We take a detailed look at the experience of Malaysia as the recent development of ports and privatization policy in Malaysia are of special importance to India .

The port sector has expanded to meet the country's growing external trade. The physical capacity of ports has increased with the construction of new ports and the expansion of facilities at existing terminals. Physical expansion is apparent in the increase in combined handling capacity, from 25.5 million tons in 1980 to 120.5 million tons in 1990. The completion of the expansion programs of the Sixth Malaysia Plan increased the total capacity of Malaysian ports by another 44 percent, reaching 174 million tons in 1995.

In 1970 Malaysia had only two substantive port facilities, Penang Port and Port Klang. The Second Malaysia Plan stipulated that two sizable facilities be built at Johor and Kuantan, not only to meet the growing demand for port facilities, but also to strengthen the regional development strategy of building large infrastructure projects as a catalyst for developing the backward states. Johor Port was completed in 1977, and Kuantan Port became fully operational in 1984. Two other ports were subsequently built, the Bintulu Port, completed in 1982, and the Kemaman petroleum supply base, finished in 1983. Starting from two major ports and several minor ports, some of which were in Sabah and Sarawak, Malaysia now has six federal ports and three other major ports, as well as eighteen minor ports. Under the Seventh Malaysia Plan a new privatized port, Tanjung Pelepas Port, is being developed in the state of Johor.

Starting with the First Malaysia Plan, the government embarked on major expansion programs at both Penang Port and Port Klang, and also undertook expansion at the ports in Sabah and Sarawak. During the 1970s these expansion programs substantially increased the handling capacities of the various ports. Major expansion work continued under the Fourth Malaysia Plan at Port Klang, Penang Port, and Johor Port. Under the Sixth Malaysia Plan the government undertook several large expansion projects, including the North Butterworth container terminal at Penang Port, the West Port project at Port Klang, phases three and four of Johor Port, and a second liquefied natural gas jetty at Bintulu Port. Under the Seventh Malaysia Plan port development continues to focus on capacity expansion. Projects to be undertaken include constructing three additional berths at Port Klang's West Port and implementing phase two of the North Butterworth container terminal project.

Until the Fifth Malaysia Plan the main vehicles for developing the port sector were the construction of new ports and the expansion of existing ones. Improving ports' productivity was never a priority. Beginning with the Fifth Malaysia Plan, however, improving port efficiency has been a prominent strategy for coping with the rapid growth in trade. The plan focused on consolidating and strengthening existing port facilities, a strategy that continued in the Sixth Malaysia Plan. The government improved efficiency and productivity by strengthening road and rail connections to facilitate intermodalism, improving data and information technology, and adopting innovative managerial practices. The electronic data interchange system, introduced in Port Klang in April 1994, is another major initiative to improve the productivity of Malaysian ports. These efforts will be continued during the Seventh Malaysia Plan period. Measures to be taken to improve port efficiency and productivity include implementing berth appropriation schemes, introducing an advanced immigration clearance system and pre-customs clearance of containers, and expanding the electronic data interchange system to cover all major ports. The most significant move toward enhancing port productivity, however, has been privatization.

Port Privatization

The guidelines on privatization issued in 1985 identified the provision of port services as an important area for private participation. Thus far, however, this strategy has been confined to federal ports. The first instance of privatization in the port sector was the privatization of the container terminal in Port Klang. The other facilities at Port Klang have also been privatized since that time, and other federal ports are being privatized. As a first step toward privatization, Johor Port and Bintulu Port were corporatized on January 1, 1993, and the Penang Port Commission was corporatized on January 1, 1994. Johor Port was privatized in 1995 and was listed on the Kuala Lumpur Stock Exchange in 1996. An interesting feature of the privatization of Johor Port is that the agreement requires the Concession Company to develop a new port at Tanjung Pelepas in Johor State. All other federal ports are in the process of getting corporatized or privatized. Of Malaysia's nine major ports, Port Klang, Johor Port, Bintulu Port, and Penang Port account for about 73 percent of the total cargo shipped. Thus private sector involvement in the port sector is already substantial and will become even more significant once the corporatized ports are privatized.

Privatization of Port Klang

The container terminal in Port Klang—the major federal port in Malaysia—was the first instance of privatization in the port sector. Privatization was initiated with the formation of a company called the Kelang Container Terminal (KCT) by the Klang Port Authority. The majority shares of KCT (51 percent) were subsequently sold to a private company, Konnas Terminal Kelang Sdn Bhd. The method used was a sale-lease, in which the terminal's movable assets were sold to KCT and the immovable assets, including the berths and land, were leased to KCT. KCT operates the container terminal under a license granted by the Klang Port Authority. The license is valid for twenty-one years, which is the same time as the lease on the immovable assets. KCT has since been listed on the Kuala Lumpur Stock Exchange.

The rest of the facilities at Port Klang—twenty-two bulk, liquid, and general cargo berths—were privatized in 1992 to Klang Port Management, which has also developed a second container terminal in Port Klang that competes directly with KCT. The third component of Port Klang (known as West Port) was privatized on a sale-lease basis to Klang Multi-Terminal Sdn Bhd, a consortium of five private companies, when the first phase of the project was completed in 1994. KCT's productivity grew by 13 percent a year during 1986-90, following the divestiture of the port facilities (Jones 1994). These improvements can be attributed to the changes in management and incentives under privatization. During 1993 Klang Port Management achieved productivity improvements of 38 percent (*Business Times*, January 1, 1994).^{20 1}

<i>Ports</i>		
Klang container terminal	Lease-sale	1986
Rest of Port Klang	Lease-sale	1992
Bintulu Port	Corporatization	1993
Penang Port	Corporatization	1994
West Port, Port Klang	Lease-sale	1994
Johor Port	Lease-sale	1995

Source: Infrastructure Strategies in East Asia: The Untold Story, The World Bank, 1997, p. 38.

Appendix I

Provinces, Special Economic Zones, and Open Coastal Cities



Port of Hong Kong

The Port of Hong Kong is strategically located, both in relation to China and the neighboring Asian countries. It lies at the mouth of the Pearl River Delta and is at the center of the Asia-Pacific Rim, a region where economy is growing at a phenomenal pace. In 1997, Hong Kong handled a total of 169 million tons of cargo through its port and 14.5 million TEUs, making it the busiest container port in the world for the sixth consecutive year.

Hong Kong is the focal point of all maritime trading activities in Southern China. As it is located at the junction of two different forms of maritime transport routes -- the large ocean-going vessels from the Pacific Ocean and the smaller, coastal and river trade from the Pearl River -- it is the only modern, fully developed deep water harbor between Singapore and Shanghai.

Hong Kong is, and always has been, a free port. The trade policy of the Government of the Hong Kong Special Administrative Region seeks a free, open and multilateral trading system. Ship owning and ship management is a major activity within Hong Kong and an independent shipping registry is in operation. There are now about 6 million gross registered tons of shipping on the Hong Kong Shipping Register.

Port facilities in Hong Kong include 6,059 meters of quays at Kwai Chung and Stonecutters container terminals which can accommodate up to 19 'third generation' container ships simultaneously; 7,742 meters of quays at public cargo working areas; and 61 mooring buoys for ocean-going vessels. There are also two public passenger ferry terminals processing almost 18 million passenger trips a year to and from mainland China and Macau.

About 44,000 ocean-going vessels entered Hong Kong in 1997. On an average day there are almost 250 ocean-going ships working in the port; 1,300 ocean-going and river trade craft enter or leave the port; and about 10,000 craft working and/or passing through the harbor.

Ship turnaround performance is among the very best in Asia and port charges are among the lowest in the world. Container ships at terminal berths are routinely turned round in 10 hours or less, while conventional vessels working cargo at buoys are in port for only 1.9 days on average.

The Port of Hong Kong is unusual in that it does not have a port authority to provide and control port infrastructure. Instead, the Marine Department of the Government of the Hong Kong Special Administrative Region is responsible for the day-to-day administration of the port. Most of the port facilities are privately owned and operated, with minimal interference from government.

The Marine Department, headed by the Director of Marine, is responsible for all navigational matters in Hong Kong and the safety standards of all classes and types of vessels. The mission statement of the Hong Kong port is "to promote excellence in marine services". The following functions are provided,

- (i) facilitate the safe and expeditious movement of ships, cargoes and passengers within Hong Kong waters
- (ii) ensure compliance of safety and environmental protection standards by Hong Kong registered/licensed ships and ships using Hong Kong waters
- (iii) administer the Hong Kong Shipping Register and develop relevant policies, standards and legislation in line with international conventions
- (iv) ensure the competency of seafarers for Hong Kong registered/licensed ships and ships using Hong Kong waters and regulate their registration and employment
- (v) co-ordinate maritime search and rescue operations
- (vi) combat oil pollution, collect vessel-generated refuse and scavenge floating refuse inside Hong Kong waters
- (vii) provide and maintain government vessels

Ports of China

Port of Shanghai in Jiangsu Province

Shanghai is the largest port in China. It is at the center of China's coastal traffic, being at the Changjiang River, and ocean shipping and also at an important water – rail intermodal transport juncture. It is a comprehensive and multi-propose commercial port and one of China's main foreign trade ports. Shanghai has a highly developed economy, its annual industrial output value constituting half of the national total. 99% of Shanghai's foreign-trade goods are handled by its port; its annual passenger traffic and cargo throughput ranks first in China. It is China's largest port with an annual throughput of 1.9M TEU's of one quarter of the country's total. The capacity is expected to rise to 6M TEU's by 2010. (In contrast to Hong Kong's 13 M TEU's in 1997 and expected 31M TEU's in 2010). Shanghai has established trade relations with about 160 countries and regions throughout the world and is served by 20 international shipping lines.

However, its limited depth restricts access to the port. Even with dredging, there is difficulty in accommodating 6000 TEU ships. Shanghai's biggest difficulty in maintaining its preeminent status in China is that the average depth of its harbor is only 7 meters. It has a massive silt problem requiring constant dredging. Present technology may not be able to turn Shanghai into a deep-water port (14.5 meters.).

It may get around this problem by tying in with the Port of Ningbo. This is already happening politically, but to realize the advantages of Ningbo for Shanghai will require tremendous investment in rail and road links between the two ports. Ningbo is already receiving government funds to upgrade and increase its container handling capacity and a new bridge across Hangzhou Bay to make the most direct connection between Ningbo and Shanghai (a \$1B project) is actively being discussed in the Chinese government.

Shanghai led the way toward China's containerization beginning in 1978. Shanghai Container Terminals (SCT), a joint venture set up by Shanghai Port Authority and Hutchison Whampoa Ltd, owns and operates all container facilities in Shanghai.

Communication

The Changjiang River links the port to inland provinces and its central coastal position gives access to all Chinese ports north and south. The Beijing - Shanghai, Shanghai - Hangzhou and Zhejiang - Jiangxi railways link up with the national railway system. The highways network radiates out in all directions to inland provinces. A number of new bridges have been built to link up the various port area.

Planned Development

- The dredging of the Changjiang River to a depth of 12.5 meters is planned in order to accept 5500 TEU vessels by the year 2020.
- New berths have been built at Waigaoqiao within the Pudong Development Zone.
- The Luoqing Coal Terminal Project involves the construction of two discharge berths for ships up to 35,000t and four loading berths for ships not exceeding 20,000t. The planned capacity of this facility is 100 million tons per year and was completed in 1996.
- A deep-water port for fourth and fifth generation container ships is to be built at Jinshanzui to the south of Shanghai.
- The World Bank has provided loans to develop two coal berths of 35,000t class and four berths of 2,000 tons at Luoqing Coal Wharf and a 50,000t grain berth at Min Sheng.

Port of Tianjin in Hebei Province

The port of Tianjin is the gateway to the sea for the capital, Beijing and the Tianjin municipality. An Economic and Technology Development Zone is 2 km from the port and the Port Free Trade Zone exists within the port area. The port is protected by 2 huge breakwaters: 5.4 and 8 kilometers long with the opening of 1.3 km wide.

There are more than 30 scheduled shipping services to over 160 countries and regions world-wide. Container shipping lines serve the United States and Canada, Australia, Japan, Southeast Asia, Hong Kong and Persian Gulf.

Communication

The port is located at a major rail and highway junction. The Beijing - Shenyang railway at Tanggu connects with the provinces of Liaon, Jilin and Heilongjiang. To the west the Tianjin-Pukou railroad serves the southeast and the Beijing-Haukou and Beijing-Baotou railways give access to southern and northwestern regions. Numerous highways link the port to neighboring

provinces. An express way links Beijing and Tanggu. Exports include sundry manufactured goods, salt, non-metal ores. Imports include grain, steel, fertilizers, cement and timber.

Planned Development

The following development plans should be completed by the turn of the century.

- Twelve new 10,000t container berths are under construction as part of the Dongtudi project funded by the World Bank, which began work in December 1993. Further more, Tauga International of Canada is to develop a five-berth multi-phased Container Terminal.
- For the southern end of the port, there are plans to install four new bulk cargo berths (2 coal berths, 2 mineral and ore berths) and one chemical/petrochemical berth.
- In the northern port area, two international passenger terminals are being installed along with five container berths. This will bring in twelve new berths with the capacity of 100 million tons of cargo. This will make the Port of Tianjin among the biggest ports in the world. The total investment is estimated to be around 4.5 billion RMB (USD 550 million). The port authorities are looking at various sources of financing. Pending approval by the government, the port hopes to attract international financing. So far there are preliminary plans for five container berths to be funded by the Canadian government.

Port of Dalian in Liaoning Province

Dalian, an important water-rail intermodal transport juncture, is the largest comprehensive commercial port in northeastern China engaged in passenger and multi-cargo transport. Foreign investment in manufacturing facilities is creating a demand for containerized cargo handling facilities, which are being progressively built. Dalian has a harbor depth advantage over Shanghai. Through a Joint Venture (JV) with Singapore companies, Dalian is making a major effort to concentrate its container facilities in one place and upgrade them. The foreign entities are investing \$480M in this project. This JV will develop, manage and operate three terminals in the Port's Dayaowan Container Terminal.

Exports include crude oil, oil products, grains, timber and general cargoes. Imports are minerals, ores, wheat, chemical fertilizers, machinery and equipment. The port has a thriving passenger service, with 8 long and short-distance coastwise shipping lines.

Communication

Dalian is a sea transport junction for the northeastern coast. The Harbin-Dalian Railway connects to the main rail lines. The Harbin-Dalian Highway links the port to northeastern China and an expressway exists to Shenyang, the capital of Liaoning Province.

Port construction is taking place on a massive scale with 80-90 berths planned in Dayao Bay. The first four berths of the first phase of the Dayao Bay project went into operation in 1993 and a further seven berths are under construction and was completed 1997.

A project has been proposed which will entail the construction of two berths for the export of corn. The handling capacity is designed at 6.1 million tons per year. A further 3 million ton/year berth is planned for the import of wheat in the Dayaowan district.

Port of Qingdao in Shandong Province

Port of Qingdao is located in Shandong Peninsula and on the bank of Jiaozhou Bay, bordering on the Huanghai Sea. It has made a name for itself by creating a training system to provide better efficiency to companies through increased education of management principles, applications in the management of documentation, sailor training, and better utilization of resources and facilities. Being an important foreign trade hub and intermediate port in China, the port is convenient for cargo collection, distribution and transportation.

At present, it has established trade relations with more than 450 ports of over 130 countries and regions. The container handling capacity reached 1 million TEU per year, which ranks the 3rd among the coastal ports in China. Qingdao and Tianjin are fierce competitors since they both serve the same hinterland and have roughly the same capabilities and capacities. Qingdao has deeper water (15 meters vs. 12 meters in Tianjin) and more advanced container handling equipment

Port of Xiamen in Fujian Province

Xiamen is one of the two largest commercial ports in Fujian. It is both an important gateway to the sea and a water-land traffic for the Xiamen Special Economic Zone and the Southern Fujian Delta Development Zone. Xiamen is a transshipment port for Fujian Province, the northern part of Guangdong, the southern part of Jiangxi and the southwestern Zhejiang. There are regional and international shipping services to Japan, Singapore and Hong Kong and to the coastal ports of Zhangjiang, Guangzhou, Shantou, Shanghai, Qingdao, Tianjin and Dalian.

Communication

Xiamen is connected to the national railway system by the Yingtian - Xiamen railroad. Highways link the port to provincial highway network. There are extensive coastal and river passenger services from the port.

Planned Development

- The Phase II development of Dongdu, situated 12km north of Xiamen town, will provide a container terminal of 35,000t class, a coal berth for 25,000t class and two general cargo berths of 20,000t class.
- Redevelopment at Mazugang will provide two 10,000t class passenger berths and improved facilities. This work follows on from a project partly-funded by the World Bank which involved building a 300m long container berth, 180m long container berth and a 170m long general cargo berth - all at Dongdu.

Port of Rizhao in Guangdong Province

When Premier Li Peng inspected Rizhao Port, he wrote down these words of encouragement, "A Great Rizhao Port is coming up at the beautiful beach of Yellow Sea". These words announced the birth of Rizhao Port--a new door for foreign trade was thus opened during the reform period. Rizhao Port, formerly named Shijiu, is situated in the middle part of the country's coastline, at the East End of the new Eurasian Continental Bridge, south of the Shandong Peninsula. It has convenient communications, excellent economic geographic status, temperate climate and it never freezes and silts up. The Port is a major hub for foreign trade and sea-land transshipment now.

The Port owns two of the largest 100,000-ton coal berths of the country, three 10,000-ton general cargo berths and eight smaller berths. The grand annual throughput capacity is up to 17,100,000 tons. The Port is well equipped with facilities and the technology is advanced. There has been rapid progress in production and construction, although it began operations only eight years back. The handling capacity was up to 13,000,000 tons in 1993. The Port has friendly business relations with about 50 countries.

The spirit of Rizhao Port is "unity, struggle, honesty and competition." Based on these principles, the staff and workers are working to speed up the Port's development. There are two 100,000-ton coal berths with annual throughput of 15,000,000 tons, the effective stock area for coal storage is 2217 square meters. The storage ability is up to 1,400,000 tons. The coal terminal is equipped with 17 removable machines and 13 fixed machines, and provided with a central control room to control the whole system and operate automatically and unitedly, the ship loading efficiency can get 6000 x 2 tons per hour, the dumping, efficiency can get 3600 x 2 tons per hour.

The Port has 11 productive general cargo berths, including three berths with a tonnage over 10,000, the other eight are less than 10,000 tons. The total of the designed handling capacity is more than 2,100,000 tons, and the effective storage yards area is 88,690 square meters, warehouses area is 12,300 square meters. There are 102 units of stevedoring equipment for general cargoes handling. The rail cars get to the wharf directly and conveniently.

The berths are flexible to deal with timber, steel and iron, cement, fertilizer, petroleum, cereals, edible oil, CWM, ore, coke, stone production, containers, etc.

Port of Lianyungang in Jiangsu Province

Located at the middle of China's coast, Lianyungang Port has the unique geographic location, vast economic hinterland, convenient transportation and advantageous natural environment. It has presently 29 various berths with an annual throughput capacity of nearly 30 million tons. About 30 types of more than 150 kinds of goods are handled in the port and trade relations with 600 ports in over 120 countries and districts have been established.

Lianyungang Port is the eastern terminus of the future "Asian land bridge" which will begin at the Rotterdam rail line and bring passengers and cargo through Kazakhstan and then through China. It is the only seaport for Kazakhstan and currently receives most of its coal and minerals for exporting to other countries. This port is designated by a Sino/Russian/NIS treaty as duty free for shipments from those areas across China. It is also one of the best natural deep water ports north of Shanghai. Its biggest problem is extreme lack of infrastructure in road, rail and industry links to its immediate area. It will take a great deal of money to bring this port to the fore in China and it is not currently in the governments funding schemes.

Port of Yantian in Guangdong Province

The Port of Yantian was begun in 1994. It is a showcase of how to do it right. Hutchison Port Holdings is the majority owner and has built the facility from scratch using the latest technologies and management techniques. It promises to become one of the premier container handling ports in China. The port is now congestion free and has six of the latest generation container cranes. Like Shanghai, this port has the ability to serve Trans-ocean liners. By the 2000 this port is planning to have at least 48 new berths and be able to put through 8 million TEUs annually. The Phase II berths will have a handling capacity of 6000 TEU vessels, making the port berths the biggest ever produced.

Yantian is still a developing port and has shown good development potential. It is one of few ports in China, which can compete, with Hong Kong in terms of marine access. Cargo handled at Yantian is predominantly sourced from Shenzhen, Dongguan, Guangzhou, Huizhou and other parts of the Pearl River Delta region. At the receiving end, the United States is the largest destination for the container throughput, averaging about 56%, with Europe following with about 35%, and Hong Kong the remaining 9%. Cargo handled in the port currently includes fertilizers, timber, iron and steel, general cargo and containers. Three more container berths were added in 1997.

Communication

A 72 km Grade A Highway connects Yantian to Huizhou and a highway links Sha Tau Kok border crossing to Hong Kong. A 24km rail link connects to the Guangzhou-Shenzhen railway. The link is designed to transport 10 million tons a year of freight.

Planned Development

- The Yantian International container Terminals (YICT) intended to expand its feeder network to include services to all Hutchison Delta Port facilities in the Guangdong region. Yantian International Container Terminal Ltd which is owned by a Hutchison-led consortium and Shenzhen-based Dongpeng Industries Co., Ltd manage the port.

Port of Guangzhou in Guangdong Province

Guangzhou Port is one of China's major ports, however, its development is constrained by extensive shallow areas and the heavy siltation. Plan is in place for dredging the channel down to - 12.5m by 2005 and to - 15m at the final stage. With Guangdong Province together with Guangxi, Hunan, Hubei, Yunnan Guizhou and Sichuan Province as its hinterland and the plan for deepening of the approach channel, it has good potential, for further development.

Communication

The port railroads are connected with the national rail network by Beijing - Guangzhou, Guangzhou-Shenzhen and Guangzhou-Sanshui railroads. The highway system connected the port with Guangdong Province and beyond.

Cargoes handled in the port include coal, crude oil, ores, iron, steel, cement, timber, fertilizer, grain and general cargo.

There is a regular feeder service which links the port to Hangpu, Shekou and Hong Kong.

Planned Development

- Deepening the channel to - 12.5m by the Year 2005.
- Another 5 berths in Xinsha Project Phase I will be completed in 1998.
- Xinsha Project Phase II (10 berths for vessels up to 35,000t) will start construction in 1997.

Port of Beihai in the Guangxi Province

Beihai is a major commercial port in the Guangxi Zhuang Autonomous Region. It is a traffic juncture in south Guangxi and an important foreign trade gateway for Guangxi. The port has bagging facilities with an annual bagging capacity of 200,000 tons. Along with the development of Beibu Bay's Wei oil field within the city boundary, petroleum will become a major cargo.

The other major export cargoes are rice, manganese ore, cassavas, fire-crackers, fireworks, aquatic product, fruit, aniseed, cassia bark, starch, jute etc. The major import cargoes are fertilizer, timber etc.

Communication

The port has four truck highways to the inland areas : Beihai-Qinzhou-Nanning, Beihai-Guixian-Liuzhou, Beihai-Yulin-Wuzhou, and Beihai-Suixi-Zhanjuang, which are connected to the highway and railroad networks in Guangxi and western Guangdong.

Planned Development

- It is planned to construct six 10,000t class berths, the advance work for 2 of these berths has already started.

Port of Fuzhou in Fujian Province

Fuzhou is a river estuary port situated 25 km from the mouth of the Minjiang River. The main harbor is located at Mawei 8 km from the city. There are shipping lines trading to most Chinese major ports. The port also has general and container liner services to Japan and Hong Kong and tramp trading to Asian ports, USA, Australia, and Europe. Fuzhou is the only supplier of standard sand in China. Other export cargoes are stones, cement, grains, sugar, aquatic product, canned foods, lead, coal, sand etc. The imported cargoes are fertilizers, timber, building material , sugar, sea produce etc.

Fuzhou also has a 7,500t class passenger ship terminal.

Communication

The port has very good water and land communications. The port's rail tracks are connected to the national rail system via the Fuzhou - Laizhou railway. There are direct trains from Fuzhou to Beijing, Guangzhou and Xiamen, and regular passenger ships from the port to Shanghai.

Planned Development

- There is a plan to construct two 10,000t class deep water berth, one 20,000t class and four 500t class wharves for handling sand and another 5,000t class berth for handling dangerous goods.

Appendix II

Population and G.D.P

Province	GDP Per Capita (yuan) 1978 = 100			Population distribution between rural and urban Sectors (percentage)					
				1978		1985		1995	
	1978	1985	1995	Urban	Rural	Urban	Rural	Urban	Rural
Fujian	273.0	570.3	1909.4	19.1	80.9	27.5	72.5	83.9	16.1
Guangdong	367.0	728.9	2625.9	—	—	38.3	61.7	39.3	60.7
Guanxi	225.0	335.0	828.9	10.6	89.4	11.9	88.1	65.8	34.2
Hunan	286.0	465.9	955.5	11.5	88.5	30.6	69.4	24.3	75.7
Jiangsu	430.3	878.1	2716.3	13.7	86.3	19.8	80.2	27.3	72.7
Jianxi	276.0	491.3	1185.1	16.7	83.3	27.9	72.1	55.6	44.4
Liaoning	680.0	1113.2	2367.1	36.3	63.7	61.9	38.1	84.8	15.2
Shandong	316.0	615.3	1759.2	13.6	86.4	18.4	81.6	—	—
Yunnan	226.0	397.8	865.8	12.2	87.8	26.4	73.3	45.7	54.3
Zhejiang	331.0	807.0	2565.6	14.0	86.0	18.9	81.1	32.6	67.4

Employment (percentage)

Province	Primary			Secondary			Tertiary		
	1978	1985	1996	1978	1985	1996	1978	1985	1996
Fujian	75.78	61.55	49.46	12.97	19.43	24.05	11.24	19.03	26.05
Guangdong	73.68	60.30	39.74	13.75	22.50	28.02	12.57	17.20	32.25
Guanxi	80.43	80.45	66.16	10.51	8.79	11.71	9.07	10.76	22.14
Hunan	78.43	71.35	60.00	13.39	16.81	16.46	8.18	11.84	23.55
Jiangsu	69.74	53.27	41.56	19.60	32.66	33.27	10.66	14.07	25.17
Jianxi	77.23	66.71	54.91	13.03	20.22	17.86	9.74	13.07	27.23
Liaoning	47.47	35.85	31.74	34.56	41.06	36.94	17.97	23.09	31.31
Shandong	79.16	68.49	53.51	12.32	19.91	24.96	8.52	11.46	21.53
Yunnan	86.10	79.48	75.27	7.67	10.29	9.88	6.23	10.23	14.85
Zhejiang	74.82	54.94	41.87	17.10	31.69	31.42	8.08	13.37	26.71

Transportation Infrastructure

Province	Railway			Highway			Waterway		
	1978	1985	1995	1978	1985	1995	1978	1985	1995
Fujian	1009	1009	1037	29109	35987	46574	3629	3888	3888
Guangdong	1003	1026	1861	52194	51288	84563	14449	10775	10808
Guanxi	1715	2114	2336	29773	32972	39550	4355	4521	4521
Hunan	1886	2536	2602	59541	56002	59125	10798	9941	10050
Jiangsu	732	713	749	17721	22436	25970	23657	23653	23803
Jianxi	1293	1481	1640	30245	31760	34915	6630	4937	4937
Liaoning			@3569			@44041			@508
Shandong	1385	1572	2048	34244	36327	54243	2403	1840	1891
Yunnan	1705	1679	1644	41816	49541	68236	2809	1042	1324
Zhejiang			@942			@36127			@10592

Source: China Statistical Yearbook 1998, China Statistical Publishing House, (1998) Beijing

Telephone Lines

Province	Urban			Rural		
	1978	1985	1995	1978	1985	1995
Fujian	36851	90754	1563099	31177	37074	548499
Guangdong	79252	241885	4524724	95591	12307	2774616
Guanxi	37035	70630		40157	40196	
Hunan	41180	65537	1322387	26127	26112	308601
Jiangsu	121329	283684	3359019	87801	148992	1580807
Jianxi	50654	94256	789924	45856	44263	109706
Liaoning	190755	353802	2437724	59573	77470	375209
Shandong	63000	121000	1658000	38000	52000	461000
Yunnan	42896	73152	732499	36224	41248	111935
Zhejiang						

@ = End of Year 1997, Source: **China Statistical Yearbook 1998**, China Statistical Publishing House, (1998) Beijing

Comparative Statistics on Selected Major Ports in China

Port	Thruput 95	Thruput 96	Cargo Type	No. of Berths
Shanghai	166,000,000	164,018,000	general	140
Qinghuangdao	83,820,000	83,122,000	gen, coal, oil	38
Ningbo	68,528,000	76,388,000	chem, oil, iron	14
Dalian	64,168,000	64,274,000	grain, oil, minerals	58
Tianjin	57,867,000	61,883,000	coal, grain	146
Qingdao	51,020,000	60,028,000	coal, oil, steel	47
Shenzhen	30,800,000	30,205,000	general	113
Zhanjiang	17,279,000	17,688,000	iron, coal, grain	31
Xiamen	13,139,00	15,530,000	coal, containers	74
Yingkou	11,556,000	14,706,000	minerals, grains	18
Yantai	13,611,000	14,304,000	ore, cement, grain, fert.	29
Fuzhou	10,320,000	12,483,000	coal, grain, ore	40
Zhoushan	10,057,000	11,874,000	coal, oil, iron	15
Rizhao				
Lian Yungang	14,520,000	15,754,000	coal	18
	17,158,000	15,834,000	coal, dangerous chems	27

Source: China - **Port Handling Equipment**, Economist's Economic Intelligence Unit.

Note: 1997 thruput may be 600k teu

Number of Berths at Principal Seaports 1986 & 1996

Seaport	Total					
	Length of Harbour (m) 1986	Length of Harbour (m) 1995	Number of berths			
			Subtotal 1986	Subtotal 1995	Of which: 10,000 tonnage 1986	Of which: 10,000 tonnage 1995
Dalian	15,033	15,704	100	62	25	32
Yingkou	1,013	2,831	13	21	1	8
Qinhuangdao	4,063	6,859	22	44	14	23
Tianjin	7,419	11,650	40	68	24	45
Yantai	2,052	3,524	17	26	3	9
Qingdao	8,328	9,487	44	47	16	24
Shijiusuo	1,141	3,413	5	25	3	10
Lianyungang	1,416	273	11	29	5	20
Shantou	16,217	22,676	165	227	45	68
Ningbo	3,586	6,210	40	55	7	17
Shantou	753	1635	9	17	-	1
Huangpu	5,134	12,492	45	137	19	27
Zhanjiang	2,942	6,328	20	39	13	23
Haikou	1,270	1,719	13	15	-	2
Basuo	842	1412	5	8	3	4
Sanya	715	602	7	5	-	-
Total	71,924	159,139	556	1519	178	394

Seaport	Of which: Productive use					
	Length of Harbour (m) 1986	Length of Harbour (m) 1995	Number of berths			
			Sub-total 1986	Sub-total 1995	Of which: 10,000 tonnage 1986	Of which: 10,000 tonnage 1995
Dalian	9,306	11,635	52	62	25	32
Yingkou	917	2750	8	18	1	8
Qinhuangdao	3,552	5,769	16	25	14	23
Tianjin	7,082	10,861	36	60	24	45
Yantai	1,926	3,198	16	23	3	9
Qingdao	6,172	8,934	31	44	16	24
Shijiusuo	691	3093	3	18	3	10
Lianyungang	1,351	4,824	9	25	5	20
Shantou	13,818	18,995	98	140	45	68
Ningbo	3,053	5,353	27	40	7	17
Shantou	620	1536	5	13	-	1
Huangpu	4,093	10,885	28	110	19	27
Zhanjiang	2,707	5,280	16	29	13	23
Haikou	1,040	1,719	9	15	-	2
Basuo	842	1412	5	8	3	4
Sanya	602	602	5	5	-	-
Total	57,772	141,336	364	1263	178	394

Seaport	Of which: Nonproductive use			
	Length of Harbour (m) '86	Length of Harbour (m) '95	Number of berths '86	Number of berths '95
Dalian	3,998	4,069	17	-
Yingkou	96	81	5	3
Qinhuangdao	386	1090	5	19
Tianjin	337	789	4	8
Yantai	126	326	1	3
Qingdao	1,018	553	5	3
Shijiusuo	450	320	2	7
Lianyungang	65	449	2	4
Shantou	2,290	3,681	64	87
Ningbo	533	857	13	15
Shantou	49	99	3	4
Huangpu	1,041	1,607	17	27
Zhanjiang	235	1048	4	10
Haikou	230	-	4	-
Basuo	-	-	-	-
Sanya	113	-	2	-
Total	10,968	17,803	148	256

Volume of Cargo Handled at Principal Seaports

Seaport	1980	1985	1990	1995	1996	1997
Dalian	3263	4381	4952	6417	6427	7044
Yingkou	24	98	237	1156	1493	1605
Qinhuangdao	2641	4419	6945	8382	8312	7862
Tianjin	1192	1856	2063	5787	6188	6789
Yantai	506	689	668	1361	1430	1560
Qingdao	1708	2611	3034	5103	6003	6916
Rizhao	-	-	925	1452	1575	1650
Lianyungang	739	929	1137	1716	1583	1652
Shanghai	8483	11291	13959	16567	16402	16397
Ningbo	326	1040	2554	6853	7639	8220
Shantou	176	201	279	716	1553	884
Guangzhou	1210	1772	4163	7299	7450	7518
Zhanjiang	1075	1231	1557	1885	1769	2050
Haikou	72	170	288	468	537	486
Basuo	278	388	431	275	266	336
Sanya	38	78	37	42	32	30
Other Medium-sized Ports	-	-	5092	14687	16493	19823
Total	21731	31154	48321	80166	85152	90822

Source: **China Statistical Yearbook 1998**; China Statistical Publishing House (1998) Beijing

Port Capacity

Basuo, Hainan	Cargo Throughput	(million tons)	3.4 in 1993
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Beihai, Guangxi	Cargo Throughput	(million tons)	0.82 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Chiwan, Shenzhen	Cargo Throughput	(million tons)	7 in 1994
		(TEUs)	39,000 in 1994
	Planned Capacity	Cargo	Not stated
		Passenger	Not stated
Projected Throughput	Not stated		
Dalian, Liaoning	Cargo Throughput	(million tons)	7.5 in 1994
		(TEUs)	305,003 in 1994
Fangcheng, Guangxi	Cargo Throughput	(million tons)	2.2 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	4 million tons
Passenger		-	
Fuzhou, Fujian	Cargo Throughput	(million tons)	5.6 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Guangzhou, Guangdong	Cargo Throughput	(million tons)	71.58 in 1994
		(TEUs)	220,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	100 million tonnes by 2005 (reported by United Daily News on 4.8.1995.)		
Haikou, Hainan	Cargo Throughput	(million tons)	6 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Lianyungang, Jiangsu	Cargo Throughput	(million tons)	15.88 in 1994
		(TEUs)	-

Port Capacity (cont'd)

Mawan, Guangdong	Cargo Throughput	(million tons)	1.48 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Nantong, Jiangsu	Cargo Throughput	(million tons)	14 in 1994
		(TEUs)	610,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Ningbo, Zhejiang	Cargo Throughput	(million tons)	53.2 in 1993
		(TEUs)	125,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Qingdao, Shandong	Cargo Throughput	(million tons)	35.4 in 1993
		(TEUs)	430,000 in 1994
Qinhuangdao, Hebei	Cargo Throughput	(million tons)	82.07 in 1994
		(TEUs)	4,723 in 1994
Quanzhou, Fujian	Cargo Throughput	(million tons)	-
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Rizhao, Shandong	Cargo Throughput	(million tons)	1.4285 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Sanya, Hainan	Cargo Throughput	(million tons)	0.65 in 1993
		(TEUs)	-
	Planned Capacity	Cargo	1.04 million tonnes
		Passenger	-
Projected Throughput	-		

Port Capacity (cont'd)

Shanghai	Cargo Throughput	(million tons)	166 in 1994
		(TEUs)	1.2 millions in 1994 1.527 millions in 1995
	Planned Capacity	Cargo	-
		Passenger	-
	Projected Throughput	-	
Shantou, Guangdong	Cargo Throughput	(million tons)	3.867 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
	Projected Throughput	-	
Shanwei, Guangdong	Cargo Throughput	(million tons)	0.39 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
	Projected Throughput	-	
Shekou, Guangdong	Cargo Throughput	(million tons)	9.49 in 1993 10.391 in 1994
		(TEUs)	31,000 in 1993 87,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	6 million
	Projected Throughput	25 million tonnes by year 2000	
Tianjin, Hebei	Cargo Throughput	(million tons)	46.3 in 1994
		(TEUs)	630,000 TEUs
Wenzhou, Zhejiang	Cargo Throughput	(million tons)	3.07 in 1990
		(TEUs)	551 in 1990
	Planned Capacity	Cargo	-
		Passenger	-
	Projected Throughput	-	

Port Capacity (cont'd)

Xiamen, Fujian	Cargo Throughput	(million tons)	-
		(TEUs)	227,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Yangpu, Hainan	Cargo Throughput	(million tons)	0.51 in 1993
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Yantian, Guangdong	Cargo Throughput	(million tons)	0.75 in 1993
		(TEUs)	-
	Planned Capacity	Cargo	2.8 million tonnes/500,000 TEUs for Phase I; and increase to 1.7 million TEUs when Phase II completes
Projected Throughput	-		
Yingkou, Liaoning	Cargo Throughput	(million tons)	7.5 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Zhanjiang, Guangdong	Cargo Throughput	(million tons)	18 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		
Zhoushan, Zhejiang	Cargo Throughput	(million tons)	2.5 in 1990
		(TEUs)	-
	Planned Capacity	Cargo	-
		Passenger	-
Projected Throughput	-		

Port Capacity (concl'd)

Zhuhai-Gaolan, Guangdong	Cargo Throughput	(million tons)	0.029 in 1994
		(TEUs)	-
	Planned Capacity	Cargo	7 ~ 13 million tonnes by Year 2000
		Passenger	-
Zhuhai-Jiuzhou, Guangdong	Cargo Throughput	(million tons)	0.785 in 1994
		(TEUs)	260,000 in 1994
	Planned Capacity	Cargo	-
		Passenger	-
	Projected Throughput	-	-

Cargo Handling Facilities

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Basuo, Hainan	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	420	9	10,000	Yes
	Breakbulk Seafrontage	420	9	10,000	Yes
	Barge/Small Craft Seafrontage	151	3	1,000	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Beihai, Guangxi	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	170	9.5	15,000	Yes
	Breakbulk Seafrontage	289	4.5~9.5	15,000	Yes
	Barge/Small Craft Seafrontage	280	2.0~3.8	700	Yes
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Chiwan, Shenzhen	Terminals				
	Container Seafrontage	827	12.1~14	-	Yes
	Bulk Cargo Seafrontage	685	9.6~12.1	35,000	Yes
	Breakbulk Seafrontage	137	8.6	10,000	-
	Barge/Small Craft Seafrontage	515	6.6~7.1	-	Yes
	Oil Terminal Jetties (No.)	130	7.1	5,000	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Dalian, Liaoning	Terminals				
	Container Seafrontage	730	9	25,000	Yes
	Bulk Cargo Seafrontage	6.93	6 ~ 12	50,000	Yes
	Breakbulk Seafrontage	2,036	7 ~ 9.6	25,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	1,266	9 ~ 17.5	-	100,000
	Stream				
	Cargo Working Buoys	7 nos	9 ~ 34	100,000	-
	Cargo Working Anchorages	-	-	-	-
Fangcheng, Guangxi	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	1,860	9.8	30,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	--
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	10 nos	10	-	-

Cargo Handling Facilities (cont'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Fuzhou, Fujian	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	921	-	over 1,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	1	-	3,000	-
	Stream				
	Cargo Working Buoys	8 nos	-	10,000	-
Guangzhou, Guangdong	Terminals				
	Container Seafrontage	603	12	25,000	Yes
	Bulk Cargo Seafrontage	3,644	12.5	35,000	Yes
	Breakbulk Seafrontage	6,403	11	30,000	Yes
	Passenger Seafrontage	1,338	-	3,000	-
	Oil Terminal Jetties (No.)	287	9.5	24,000	-
	Stream				
	Cargo Working Buoys	18	7 ~ 9	30,000	-
	Cargo Working Anchorages	26	6 ~ 9	30,000	-
	Haikou, Hainan	Terminals			
Container Seafrontage		-	-	-	-
Bulk Cargo Seafrontage		972	6 ~ 8.5	5,000	-
Breakbulk Seafrontage		972	3 ~ 8.5	5,000	Yes
Barge/Small Craft Seafrontage		-	-	-	-
Oil Terminal Jetties (No.)		-	-	-	-
Stream					
Cargo Working Buoys		-	-	-	-
Cargo Working Anchorages	4	3 ~ 8	-	-	
Lianyungang, Jiangsu	Terminals				
	Container Seafrontage	-	11	25,000	Yes
	Bulk Cargo Seafrontage	1,216	10 ~ 11.5	35,000	Yes
	Breakbulk Seafrontage	1,372	7 ~ 10	30,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
Cargo Working Anchorages	-	-	-	-	
Mawan, Guangdong	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	150	7.5	5,000	-
	Breakbulk Seafrontage	226	12.4	35,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
Cargo Working Anchorages	-	-	-	-	

Cargo Handling Facilities (cont'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Nantong, Jiangsu	Terminals				
	Container Seafrontage	232	9.5	-	-
	Bulk Cargo Seafrontage	505	10	-	-
	Breakbulk Seafrontage	547	15	25,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	90	8	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Ningbo, Zhejiang	Terminals				
	Container Seafrontage	-	-	60,000	-
	Bulk Cargo Seafrontage	-	18	100,000	Yes
	Breakbulk Seafrontage	-	-	60,000	-
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	762	11 ~ 15	150,000	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Qingdao, Shandong	Terminals				
	Container Seafrontage	1,778	10.5 ~ 13	50,000	Yes
	Bulk Cargo Seafrontage	1,000	10.3	-	-
	Breakbulk Seafrontage	2,150	9.1	-	-
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	402	12.5	-	-
Qinhuangdao, Hebei	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	2,784	6.5 ~ 14.8	100,000	Yes
	Breakbulk Seafrontage	2,373	5.6 ~ 11.6	35,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	896	9.9 ~ 13.5	50,000	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Quanzhou, Fujian	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	921	-	over 1,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	1	-	3,000	-
	Stream				
	Cargo Working Buoys	8 nos	-	10,000	-
	Cargo Working Anchorages	-	-	-	-

Cargo Handling Facilities (cont'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Rizhao, Shandong	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	452	17	10,000	Yes
	Breakbulk Seafrontage	1,510	4 ~ 10.5	25,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Sanya, Hainan	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	714	5 ~ 7.5	5,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Shanghai	Terminals				
	Container Seafrontage	2,982	8 ~ 11.6	10,000	Yes
	Bulk Cargo Seafrontage	3,863	8 ~ 10	40,000	Yes
	Breakbulk Seafrontage	5,909	8 ~ 10	10,000	Yes
	Barge/Small Craft Seafrontage	1,980	3 ~ 4.5	-	-
	Passenger	117	8 ~ 10	5,000	-
	Stream				
	Cargo Working Buoys	96	4.5 ~ 9	10,000	-
	Cargo Working Anchorages	-	-	-	-
Shantou, Guangdong	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	620	7.5	5,000	Yes
	Barge/Small Craft Seafrontage	2	7.5	5,000	-
	Oil Terminal Jetties (No.)	2	7.5	5,000	-
	Stream				
	Cargo Working Buoys	6 nos	-	10,000	-
	Cargo Working Anchorages	11 nos.	5 ~ 11	-	-
Shanwei, Guangdong	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	-	3.7	1,000	-
	Breakbulk Seafrontage	98	3.8	1,000	Yes
	Barge/Small Craft Seafrontage	545	4.7	1,000	-
	Oil Terminal Jetties (No.)	1	5.4	1,500	-
	Stream				
	Cargo Working Buoys	-	-	-	-
Cargo Working Anchorages	-	-	-	-	

Cargo Handling Facilities (cont'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Shekou, Guangdong	Terminals				
	Container Seafrontage	660	14	50,000	4 x 40t
	Bulk Cargo Seafrontage	480	12	50,000	-
	Breakbulk Seafrontage	860	7~12	20,000	-
	Barge/Small Craft Seafrontage	320	6	4,000	-
	Oil Terminal Jetties (No.)	260	6.6	-	-
	Passenger Seafrontage	821	4.5	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Tianjin, Heibei	Terminals				
	Container Seafrontage	2,443	11 ~ 12	50,000	Yes
	Bulk Cargo Seafrontage	1,842	9 ~ 12	50,000	Yes
	Breakbulk Seafrontage	4,877	7.5 ~ 12	50,000	Yes
	Barge/Small Craft Seafrontage	1,063	5.5 ~ 6	6,000	Yes
	Oil Terminal Jetties (No.)	186	11	1,000	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
	Wenzhou, Zhejiang	Terminals			
Container Seafrontage		-	-	-	-
Bulk Cargo Seafrontage		-	-	-	-
Breakbulk Seafrontage		4,490	-	10,000	Yes
Passenger Seafrontage		-	-	-	-
Oil Terminal Jetties (No.)		-	-	-	-
Stream					
Cargo Working Buoys		4	-	25,000	-
Cargo Working Anchorages		4	-	20,000	-
Xiamen, Fujian	Terminals				
	Container Seafrontage	166	12.6	10,000	Yes
	Bulk Cargo Seafrontage	444	10.9 ~ 12.6	50,000	Yes
	Breakbulk Seafrontage	166	10.9	10,000	-
	Barge/Small Craft Seafrontage	164	7 ~ 8	5,000	(floating berths)
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	5	10	10,000	-
	Cargo Working Anchorages	7	12	-	-
Yangpu, Hainan	Terminals				
	Container Seafrontage	222	10.2	20,000	Yes
	Bulk Cargo Seafrontage	222	10.2	20,000	-
	Breakbulk Seafrontage	100	6.5	3,000	-
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
Cargo Working Anchorages	-	-	-	-	

Cargo Handling Facilities (cont'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Yantian, Guangdong	Terminals				
	Container Seafrontage	700	14	50,000	Yes
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	700	13	25,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Yingkou, Liaoning	Terminals				
	Container Seafrontage	-	-	-	-
	Bulk Cargo Seafrontage	951	11	30,000	Yes
	Breakbulk Seafrontage	1,471	-	10,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Passenger	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-
Zhanjiang, Guangdong	Terminals				
	Container Seafrontage	396	11	25,000	Yes
	Bulk Cargo Seafrontage	2,258	9 ~ 12	25,000	Yes
	Breakbulk Seafrontage	2,717	9 ~ 12	35,000	Yes
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	492	12.5	50,000	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	19 nos.	10 ~ 17	100,000	-
Zhoushan, Zhejiang	Terminals				
	There are total 71 berths which include one berth of 200,000t Class, 5 berths of 10,000t Class and 13 berths of 1,000t Class.				
	Stream				
	Cargo Working Buoys	-	-	-	-
Zhuhai-Gaolan, Guangdong	Terminals				
	Container Seafrontage	410	9.5	20,000	Yes
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	-	-	-	-
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream				
	Cargo Working Buoys	-	-	-	-
	Cargo Working Anchorages	-	-	-	-

Cargo Handling Facilities (conc'd)

		Length (metres)	Depth (metres)	Max Vessel Size (GRT)	Cargo Handling Equipment
Zhuhai-Jiuzhou, Guangdong	Terminals	700	5	3,000	Yes
	Container Seafrontage				
	Bulk Cargo Seafrontage	-	-	-	-
	Breakbulk Seafrontage	-	-	-	-
	Barge/Small Craft Seafrontage	-	-	-	-
	Oil Terminal Jetties (No.)	-	-	-	-
	Stream	-	-	-	-
	Cargo Working Buoys				
	Cargo Working Anchorages	-	-	-	-

Port Services

Basuo, Hainan	Tugs	3, max output 1,960 hp
	Repair Facilities	only minor ship repairs
	Others	-
Beihai, Guangxi	Tugs	9, max. output 2,320 hp
	Repair Facilities	minor repairs
	Others	-
Chiwan, Shenzhen	Tugs	6 tugs, 3 with power outputs over 3,000 hp
	Repair Facilities	-
	Others	-
Dalian, Liaoning	Tugs	17, max. output 3,200 hp
	Repair Facilities	Dailain Shipyard and Dailian New Shipyard provide ship repair and drydocking facilities
Fangcheng, Guangxi	Tugs	5, max output 2,600 hp
	Repair Facilities	-
	Others	-
Fuzhou, Fujian	Tugs	24, max. output 1,600 hp
	Repair Facilities	Mawei Shipyard
	Others	2 floating cranes with a max. capacity of 25 tons
Guangzhou, Guangdong	Tugs	-
	Repair Facilities	Ship repair and drydocking facilities are available
	Others	A floating crane of 250t capacity is in service
Haikou, Hainan	Tugs	4 tugs, max, output 1,440 hp
	Repair Facilities	minor repairs only
	Others	-
Lianyungang, Jiangsu	Tugs	6 max. output 3,200 hp
	Repair Facilities	Ship repair available
	Others	a floating crane of 200 tonnes
Mawan, Guangdong	Tugs	2
	Repair Facilities	-
	Others	-
Nantong, Jiangsu	Tugs	6, max. output 2,400 hp
	Repair Facilities	Nantong Shipyard
	Others	-
Ningbo, Zhejiang	Tugs	13 max. output 3,200 hp
	Repair Facilities	ship repairs are available
	Others	-
Qingdao, Shandong	Tugs	9, max, output 3200 hp
	Repair Facilities	drydocking & repair available
	Others	a floating crane of 250 tons capacity
Qinhuangdao, Hebei	Tugs	10, max, output 3,200 hp
	Repair Facilities	Shanhaiguan Shipyard has drydocking and repair facilities for vessels up to 60,000t
	Others	a floating crane of 70 tons capacity
Quanzhou, Fujian	Tugs	2
	Repair Facilities	minor repairs only
	Others	-
Rizhao, Shandong	Tugs	5
	Repair Facilities	available
	Others	-

Port Services (conc'ld)

Sanya, Hainan	Tugs	4, max. output 400 hp
	Repair Facilities	not available
	Others	-
Shanghai	Tugs	80, max output 4100 hp
	Repair Facilities	ship repair and drydocks available
	Others	5 floating cranes, max capacity 2500 tons
Shantou, Guangdong	Tugs	10 max. output 980 hp
	Repair Facilities	voyage repair available
	Others	-
Shanwei, Guangdong	Tugs	-
	Repair Facilities	-
	Others	-
Shekou, Guangdong	Tugs	3, max. output 3,400 hp
	Repair Facilities	-
	Others	-
Tianjin, Heibei	Tugs	20 tugs, max output 3,200 hp
	Repair Facilities	Ship repair and drydocking available
	Others	a floating crane of capacity 200 tons
Wenzhou, Zhejiang	Tugs	5, max output 600 hp
	Repair Facilities	minor repairs only
	Others	-
Xiamen, Fujian	Tugs	12 with max. output of 1,670 hp
	Repair Facilities	Xiamen Shipyard provides voyage repair
	Others	One salvage tug of 2,640 hp
Yangpu, Hainan	Tugs	-
	Repair Facilities	-
	Others	-
Yantian, Guangdong	Tugs	2
	Repair Facilities	-
	Others	-
Yingkou, Liaoning	Tugs	9, max output 3,600 hp
	Repair Facilities	available
	Others	-
Zhanjiang, Guangdong	Tugs	Nine tugs with max. output 3,200 hp
	Repair Facilities	minor repair can be undertaken in port
	Others	one floating crane with lifting capacity of 50 tons
Zhoushan, Zhejiang	Tugs	3 with a max. output of 1,800 hp
	Repair Facilities	-
	Others	-
Zhuhai-Gaolan, Guangdong	Tugs	-
	Repair Facilities	-
	Others	-
Zhuhai-Jiuzhou, Guangdong	Tugs	-
	Repair Facilities	-
	Others	-

Approach Channel

Basuo, Hainan	Length	1,800 m	
	Width	120 m	
	Depth at C.D. (metres)	9 m	
Beihai, Guangxi	Length	0.7 n miles	
	Width	90 metres	
	Depth at C.D. (metres)	6.3 metres	
Chiwan, Shenzhen	Length	3.3 km	
	Width	120 m	
	Depth at C.D. (metres)	12.5 m	
Dalian, Liaoning	Length	-	
	Width	4.7 n. miles	
	Depth at C.D. (metres)	13 ~ 42 metres	
Fangcheng, Guangxi	Length	7.1 n miles	
	Width	80 metres	
	Depth at C.D. (metres)	7.5 metres	
Fuzhou, Fujian	Length	16.7 km	
	Width	-	
	Depth at C.D. (metres)	7.2 metres	
Guangzhou, Guangdong	Length	114 km	
	Width	180 m	
	Depth at C.D. (metres)	8.6 m	
Haikou, Hainan	Length	3.1 nautical miles	
	Width	80 metres	
	Depth at C.D. (metres)	6.5 metres	
Lianyungang, Jiangsu	Length	-	
	Width	160 metres	
	Depth at C.D. (metres)	9 metres	
Mawan, Guangdong	Length	No approach channel	
	Width	-	
	Depth at C.D. (metres)	-	
Nantong, Jiangsu	Length	-	
	Width	1,000 metres	
	Depth at C.D. (metres)	10 ~ 50 metres	
Ningbo, Zhejiang	Length	160	
	Width	various	
	Depth at C.D. (metres)	17.6 metres	
		Outer	Inner
Qingdao, Shandong	Length	22n miles	8n miles
	Width	-	-
	Depth at C.D. (metres)	15 metres	9 ~ 30 metres
Qinhuangdao, Hebei	Length	1.7 nautical miles	
	Width	120 metres	
	Depth at C.D. (metres)	12 - 13.5 metres	
		Outer	Inner
Quanzhou, Fujian	Length	8.5 n miles	3 n miles
	Width	500 metres	350 metres
	Depth at C.D. (metres)	7 metres	3.5 metres

Approach Channel (conc'ld)

		Coal Wharf	General Cargo Wharf
Rizhao, Shandong	Length	2,400 metres	4,100 metres
	Width	200 metres	120 metres
	Depth at C.D. (metres)	15.5 metres	9 metres
Sanya, Hainan	Length	1,650m	
	Width	45 m	
	Depth at C.D. (metres)	7.5 m	
Shanghai	Length	-	
	Width	-	
	Depth at C.D. (metres)	9.5 metres	
Shantou, Guangdong	Length	4.6 n. miles	
	Width	500 metres	
	Depth at C.D. (metres)	4.3 metres	
Shanwei, Guangdong	Length	3 n miles	
	Width	-	
	Depth at C.D. (metres)	4.5 metres	
Shekou, Guangdong	Length	2.6 km	
	Width	140 metres	
	Depth at C.D. (metres)	12.5 metres	
Tianjin, Heibei	Length	12 n. miles	
	Width	180 metres	
	Depth at C.D. (metres)	11 metres	
Wenzhou, Zhejiang	Length	14 km	
	Width	-	
	Depth at C.D. (metres)	4.5 metres	
Xiamen, Fujian	Length	22 km	
	Width	300 metres	
	Depth at C.D. (metres)	8 metres	
Yangpu, Hainan	Length	8,100 metres	
	Width	100 metres	
	Depth at C.D. (metres)	9.2 metres	
Yantian, Guangdong	Access through Dapeng Bay which has a depth of 14 ~ 20 metres.		
		Bayuquan	Yingkou Harbour
Yingkou, Liaoning	Length	8.5 n miles	39 km
	Width	-	-
	Depth at C.D. (metres)	9.2 m	4 m
Zhanjiang, Guangdong	Length	35 n miles	
	Width	9.6 m	
	Depth at C.D. (metres)	200 m	
Zhoushan, Zhejiang	Length	138 km	
	Width	926 m	
	Depth at C.D. (metres)	16 m	
Zhuhai-Gaolan, Guangdong	Length	-	
	Width	-	
	Depth at C.D. (metres)	9.5	
Zhuhai-Jiuzhou, Guangdong	Length	9.7 nautical miles	
	Width	100 metres	
	Depth at C.D. (metres)	6 metres	

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Endnotes

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⁵ Li, op.cit., p.307.

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⁷ Ibid.

⁸ Ibid., p. 4.

⁹ Ibid., pp. 128-131

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