

Short-term perspective strategy for recent challenges in the Korean port industry

Chan-Young Jun *

ABSTRACT

Changes in the port industry at home and abroad demand a new paradigm of port development. Ports have moved from forward approach to backward approach to do multi-functions and create remarkable added value by connecting the hinter land logistics complex. Under these circumstances, it is necessary to diversify the standard determining port development. The port operating market has been rearranged from seller's market to user's market. Therefore, increasing productivity and securing price competitiveness for the operators are prerequisites for dealing with the challenges

The current issue for Korea faces is opening the door to a new market by investing in various sectors of the target country. Measures on selecting sites and running pilot programs are needed to advanced into the overseas market. A new business model using EDCF (Economic Development Cooperation Fund) and ODA (Official Development Assistance) as a way to enter into new markets in foreign port development should be identified. Building environment-friendly ports emitting low greenhouse gas is emerged as a key issues including renewable energy and modal shift. Green growth also highlights the importance of developing 'resource recycling ports'

Key words : hinter land logistics parks, seller's market, user's market, renewable energy, modal shift, Green growth, resource recycling ports

* Director, Port Research Department, Logistics and Port Research Division, Korea Maritime Institute. 1652 Sangamdong Mapogu Seoul, 121-270, Korea. E-mail: cyjun@kmi.re.kr, Tel. : +82-2-2105-2823

1. Introduction

With rapid changes in macro-environment surrounding Korea, the port industry undergoes continuous changes at home and abroad. The world economic downturn triggered by the financial crisis of 2008 attributed to dramatic decline in cargo volume and has become a biggest challenge to the Korean port industry. Furthermore global efforts to reduce greenhouse gas emission and environmental pollution put much stress on the necessity to secure the next growth engine by making environmentally friendly ports. Recognition on role and function of ports has been changed over times. They become a leisure complex and the center of value-added economic activities and provide reasons for ports to develop harmonized with cities.

The trend in larger vessels, started in the late 1990's, has been widely spread at a rapid pace. It took only 10 years that the size of vessels enlarged from 8,000 TEU to 12,000 or 13,000 TEU. The trend results in fewer ports of call and intensifies competition among hub ports across the world. It is expected that the trend would continue for the time being as larger vessels need less required capital per TEU and fuel costs.

With relocation of manufacturing companies to overseas and diversified industrial structure, growth rate of export/import cargo has been slowed. Recently, China's increasing investment in building and improving port facilities further puts brake on the growth of transshipment cargo in Korea. Against this backdrop, fierce competition among domestic freight terminals and some unused logistic facilities are pointed out as problems to be dealt with. Increased unloading productivity, newly opened minor ports across the nation and Busan new port are likely to intensify the competition. However, local governments' demand for developing further ports in their regions has continued. There are concerns that handing over the management rights of 16 trade ports to local government would cause conflict between market economy and political interests over port development.

In this paper, changes in the port industry at home and abroad are examined and issues emerging with them are analyzed. Policy priorities to respond these changes are examined in short term perspective.

2. Changes in circumstances at home and abroad

2.1 *Changes in circumstances abroad*

2.1.1 Decrease in cargo volume caused by the global economic recession

Sub-prime mortgage crisis of the US, center of the world economy, in the late half of 2008 led to the financial crisis, causing the global economic recession. The world average economic growth was around 5 percent until it dropped to 3 percent in 2008. The growth of global trade volume, pushed up by rapid development of BRICs (the fast growing developing economies of Brazil, Russia, India, and China) decreased from an annual 7.3 percent in 2007 before the financial crisis to 2.9 percent in 2008. Gloomy economic forecast are expected in 2009 due to the aftermath of the financial crisis. The world economic growth and trade volume growth are projected at negative 1.1 percent and negative 11.9 percent respectively in the coming year, which is the largest drop since the Great Depression in 1930's.

However, slowdown in international trade volume growth was predicted even before the global economic recession hit the world. There are various reasons behind the grim forecast. First, globalization and regionalization of the world economy have great impact on companies' management plans. Put it simple, global manufacturing network and outsourcing initially promoted trade through vertical integration in production. But local production of key parts may lead to decline in captive cargo of each country.¹

Second, continued slower economic growth of advanced countries constrains spending. As a result, rapid trade volume growth of emerging countries including BRICs, which highly depend on export to them, would lose speed in the long term.

Third, the world economic recession triggered by the financial crisis undermines the global potential economic growth. That makes nations strictly regulate the financial and exchange markets to prevent a future economic crisis from occurring as the economic cycle has shorten than before and boost domestic demand to reduce their dependence on export. All of reasons above mentioned would put more pressure on international trade and investment, resulting in diminishing global potential economic growth.

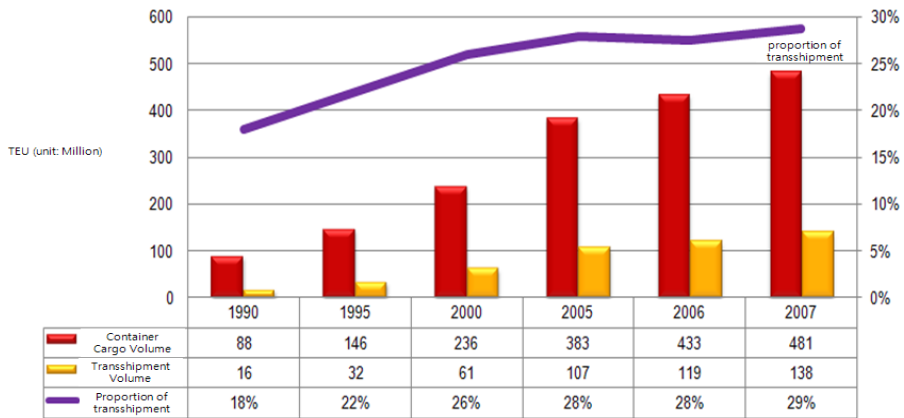
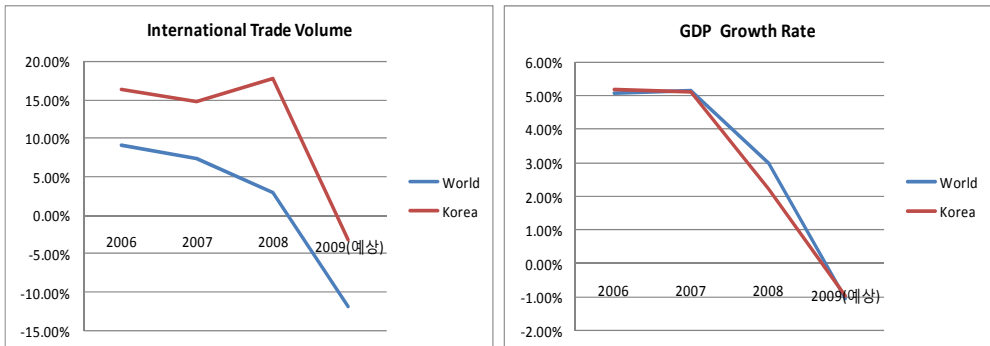
¹ Samsung Electronics is a case in point. It is projected to sell over 250 million handsets across the world this year. But only 18 percent of them are manufactured in Korea. If small companies supplying parts to Samsung do not sharpen their competitiveness, they would be replaced by local manufacturers, leading to decline in captive cargo.

Table 1. Changes in international trade volume and economic growth rate

(Unit : %)

Growth rate		2006	2007	2008	2009(projection)
World	Trade volume	9.10	7.33	2.95	-11.89
	Economic growth	5.09	5.17	3.00	-1.06

Source : IMF (2009) World Economic Outlook, Statistics from Korea International Trade Association Revised economic outlook of KDI, 2009.9.8



Source : INFORMA, Containerization International Yearbook (of each year)

Figure 1. Global container throughput and transshipment cargo volume 1990~2007

2.1.2 Intensified competition among ports in Northeast Asia

Posting rapid economic growth, Northeast Asia emerged as a key area and currently accounts for over 30 percent of the global container cargo volume. Now, Korea, China and Japan fiercely compete each other to become a hub port of the region and attract more vessels. CY Yearbook said that 6 out of the world top 10 ports are located in Northeast Asia, including Shanghai, Hongkong and Shenzhen based on cargo throughput in 2008. Busan port ranked third in 2000 and inched down to 5 in 2005. In the years to come, it would be closely followed by both Ningbo and Qingdao in China.

Competition among ports in the region became full-fledged after Shanghai's New Yangshan Port opened on December, 2005. The first and second-phase construction of Yangshan Deep Water Port was finished and it is equipped with 9 berth with total designed capacity of 4.2 million TEUs of containers annually. The Chinese government plans to turn the Yangshan port into the world first largest container port by 2010 when its construction plan to build additional 7 berths with capacity of handling 7 million TEUs will have been finished. It shows great confidence that the country's ever-increasing cargo volume would drive growth of the port.

Table 2. Container throughput of world top 10 ports

(Unit : 10,000 TEU)

Ranking	1990		2000		2003		2005		2008	
	Port	Cargo Volume	Port	Cargo Volume	Port	Cargo Volume	Port	Cargo Volume	Port	Cargo Volume
1	Singapore	522	Hong Kong	1,810	Hong Kong	2,045	Singapore	2,319	Singapore	2,992
2	Hong Kong	510	Singapore	1,704	Singapore	1,841	Hong Kong	2,260	Shanghai	2,798
3	Rotterdam	367	Busan	754	Shanghai	1,128	Shanghai	1,808	Hong Kong	2,425
4	Kaohsiung	350	Kaohsiung	743	Shenzhen	1,065	Shenzhen	1,620	Shenzhen	2,141
5	Kobe	260	Rotterdam	628	Busan	1,041	Busan	1,184	Busan	1,343
6	LA	259	Shanghai	561	Kaohsiung	884	Kaohsiung	947	Dubai	1,183
7	Busan	235	LA	488	LA	718	Rotterdam	925	Ningbo	1,123
8	Hamburg	197	LB	460	Rotterdam	711	Hamburg	809	GwangZou	1,100
9	New York, New Jersey	187	Hamburg	425	Hamburg	614	Dubai	762	Rotterdam	1,080
10	Keelung	183	Antwerp	408	Dubai	545	LA	749	Qingdao	1,032

Source : INFORMA, Containerization International Yearbook (of each year)

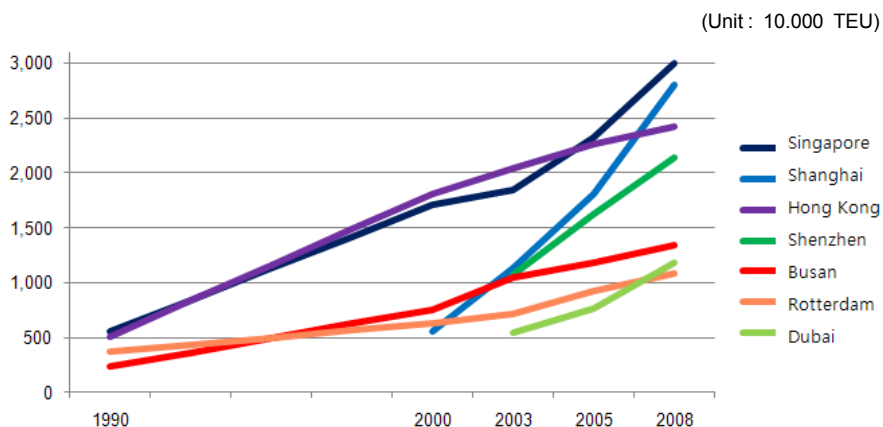


Figure 2. Changes in container shipment of major ports

As competition to become a hub port has become intensified in Northeast Asia, the importance of Japanese ports has been reduced. Japan dominated the world in terms of the port industry before China became part of the world economy in 1990's. Furthermore, no major ports, in Kobe, Osaka, and Tokyo, ranked on the world top 20 container ports list. There are various reasons for reduced role of Japanese ports : relatively high port charges : decline in domestic cargo volume, caused by moving manufacturing to low cost overseas. Now Japan attempts to regain its lost fame of the world hub port based on its super hub port project. The main object of the project is to deal with high costs and low productivity issues.

2.1.3 Worsening polarization in economic growth

There were so-called NICs, referring to Asia's tigers, Korea, Hongkong, Taiwan, and Singapore in the past. The NICs posted dramatic economic growth rate in 1960's to 1970's and represented the emerging markets. Those have grown enough to join the ranks of the advanced countries.

Later, BRICs (Brazil, Russia, India, and China) replaced those old day emerging markets. RICs was an acronym created by Goldman Sachs in 2003 to describe the 4 largest growing economies, which had phases of good economic performance through the 1990's.²

BRICs have been the center of international trade growth and economic powerhouses. They have great potential to become a key player in the world economy based on strong domestic demand, large territory, huge population and abundant natural resources. BRICs are home to more than 40 percent of the world population, over 2.7

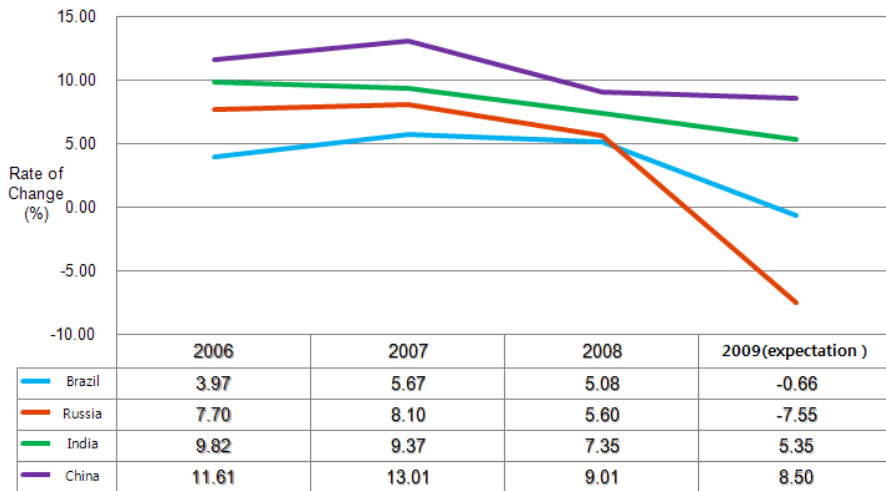
² Some say that an increasingly confident Indonesia may well replace Russia in the club of emerging superstars and the BRICs could become the BICIs.

billion. It means that their potential domestic demands are very impressive. In practice, demand and purchasing power of BRICs has increased at a neck break speed. Continued brisk export and foreign investment also support their economic growth.

Before global economic crisis in 2007, China and India recorded around 10 percent of economic growth, Russia (8%) and Brazil (5%), respectively. Due to the aftermath of the financial crisis, their economic growth little slowed down in 2008, but still record relatively high growth rates compared to others.

Many economists paint optimistic picture on their growth in 2009 when the impact of the economic crisis would spread across the world. China is expected to post economic growth of 8 percent and India (5%) while other nations record negative growth. China overtook the US in terms of GDP and become the largest economy in the world. That is the reason the world pays more attention to China. Although Brazil and Russia emerged as key players in the global economy, none of two countries could rival China and India when it comes to the size of the economy.

Under the current recession, BRICs with impressive growth rate play a crucial role in leading economic recovery and revitalizing international trade. As powerhouse of the world economy, BRICs will have a great deal of weight on it.



Source : IMF (2009) World Economic Outlook

Figure 3. Changes in GDP growth rate of BRICs

2.1.4 Trend in larger and larger vessels

The trend in larger vessels results in fewer ports able to handle these vessels and intense competition among pivot ports to attract more vessels. Numerous research found that the trend, starting in the late 1990's, is rapidly spread and becomes a phenomenon. While it took 10 years that the size of vessels enlarged from 8,000 TEU to 12,000 or 13,000 TEU. A study says that the larger the size of vessels is the less capital costs (depreciation expenses, interests, costs of maintenance and repair, interest premium) and fuel expenses are. Yet, constraints to the trend in larger vessel are ship structural design, engine and cavitation, depth of quay and new Panama Canal.

2.2 *Changes in circumstances at home*

2.2.1 Sluggish in total cargo volume handling in domestic ports

Economic recession directly has impact on export/import cargo. Highly diversified industrial structure and relocation of manufacturing companies to overseas result in sluggish cargo movement. Slowdown in international trade affects domestic cargo movement. Container cargo volume grew by 9.9 percent in 2007, but it is expected to drop by 2.2 percent the next year. In 2009 when the aftermath of the global economic crisis widely spread, cargo movement recorded negative growth (annual growth rate of domestic cargo movement was 5.3 percent for the latest 5 years). Facility expansion of port in North China attributes to slow growth of transshipment container in Korea. Transshipment cargo movement accounts for around 35 percent in total modal freight transport and the growth of it stagnates. As the world economy is recovering at a faster pace than expected and the Korean is boosting its economy with various stimulus package, there is high expectation that decrease in total cargo volume handling in local ports will slowdown quarterly. From 2010 when the Korean economy is predicted to record positive growth, cargo volume would increase again to a certain level before the economic turbulence hit the nation.

Each port shows different level of decline in cargo volume. Incheon Port, mainly handles cargo bound to China, distinctively showed stiff decline. Given that China rebounds from the global economic recession and is on the right track in terms of economy, cargo volume handling in Incheon Port will pick up in the near future. Yet the port would take at least 1 to 2 years to fully recover.

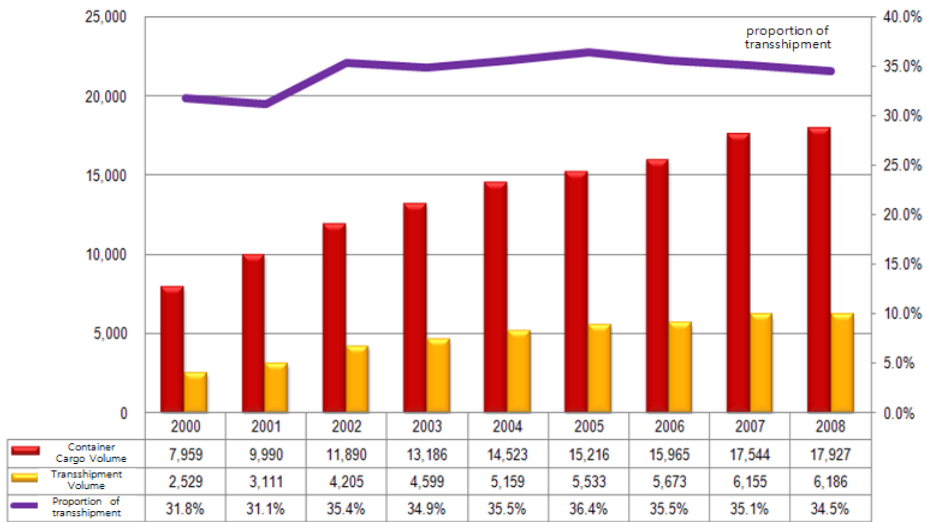


Figure 4. Changes in domestic container cargo volume and transshipment (2000-2008)

2.2.2 Expansion of supply on port facilities

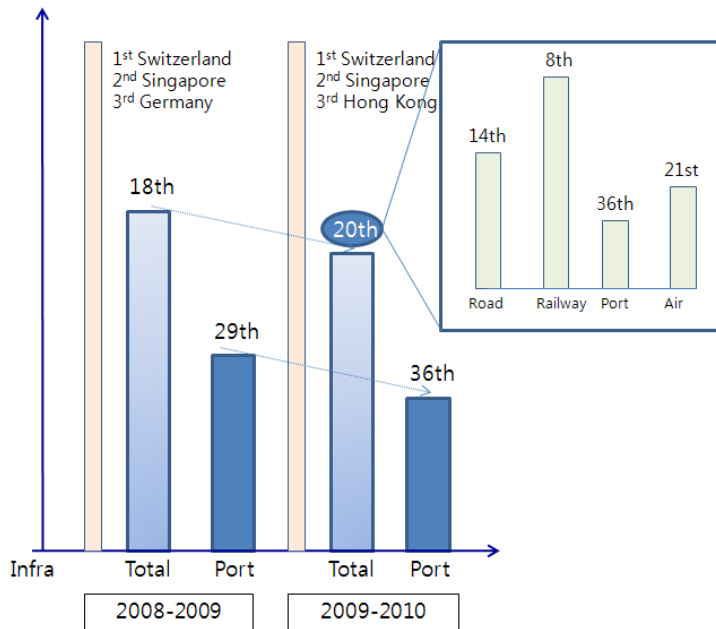
While demand for port facilities has declined, supply of port facilities has continuously increased in Korea. That raises concerns because the increasing number of newly opened ports at the time of economy slowdown could lead to supply and demand imbalances among ports. Expanding port facilities not only in pivot ports like New Busan Port and Gwangyang Port but in regional ones brings about fierce competition to attract cargo and has negative impact on themselves. For example, New Busan Port and Busan North Port compete each other and down port charges one after another to attract more cargo. In addition, some regional ports are being unused or being converted for another purpose.

Some argue that intensified competition among ports is only to put much burden on shipping lines, port operating companies and port logistics companies. The Korean government well recognizes the current situation. It now implements various measures such as exemption of port charges, tax break and rent reduction so that it supports them, but many companies are on the brink of going bankrupt.

- In 2009, Pohang New Port open (4 berths handling 20,000 TEU)
- In 2009, Ulsan New Port open (6 berths with 20,000 to 30,000 TEU)
- In 2009, Busan New Port, Complete the first phage of its second-stage construction plan (3 berths with 50,000 TEU)
- In 2010, Busan New Port, Complete the second phase and Open the quay (3 berths with 50,000 TEU)

2.2.3 Low efficiency of logistics infrastructure

According to a report of 2009 World Economic Forum, Korea's port competitiveness³ ranked 36, down 7 notches from the previous year. Korea relatively recorded good scores in the general infrastructure competitiveness, it downed 2 notches over the past year to 18th place. In port competitiveness, Singapore and Hongkong ranked second and third respectively, which have lots of implications to Korea. Korea is far behind than its rivals in LPI (Logistics Performance Index), released by the United Nation. Singapore led the rankings of the LPI report 2007, followed by Netherlands and German. Among the Asia-Pacific countries were Japan (6th), Hong Kong (8th), Taiwan (21st), South Korea (25th), and China (30th). The result clearly reveals that Korea has to go a long way to catch up its competitors even it is little ahead of China.



Source : World Economic Forum (2009)

Figure 5. Infrastructure rankings of Korea

³ Global competitiveness rankings are calculated from both publicly available data and the Executive Opinion Survey. Executives of companies are requested to answer questions about business environment of a country where they do business. Therefore, the report on ranking should be used as a reference rather than overacting to the results.

Table 3. LPIs of major countries

	General Classification	LPI	Customs Clearance	Infrastructure	Interantioanl Transport	Cargo Capacity	Logistics Tracking	Domestic Transportation Costs	Just-in-time
Singapore	1	4,19	3,9	4,27	4,04	4,21	4,25	2,7	4,53
Netherlands	2	4,18	3,99	4,29	4,05	4,25	4,14	2,65	4,38
Germany	3	4,1	3,88	4,19	3,91	4,21	4,12	2,34	4,33
Japan	6	4,02	3,79	4,11	3,77	4,12	4,08	2,02	4,34
Hong Kong	8	4	3,84	4,06	3,78	3,99	4,06	2,66	4,33
UK	9	3,99	3,74	4,05	3,85	4,02	4,1	2,21	4,25
USA	14	3,84	3,52	4,07	3,58	3,85	4,01	2,2	4,11
UAE	20	3,73	3,52	3,8	3,68	3,67	3,61	2,8	4,12
Taiwan	21	3,64	3,25	3,62	3,65	3,58	3,6	3,1	4,18
Italy	22	3,58	3,19	3,52	3,57	3,63	3,66	2,39	3,93
Korea	25	3,52	3,22	3,44	3,44	3,63	3,56	2,73	3,86
Malaysia	27	3,48	3,36	3,33	3,36	3,4	3,51	3,13	3,95
China	30	3,32	2,99	3,2	3,31	3,4	3,37	2,97	3,68

Source : World Bank (2008) LPI

2.2.4 Changes in port governance

Revised Port Law, announced on June 9, 2009, will give more authority on development, management and operation of Foreign trade and coastal ports to local government. Under the original Port Law, the central government was in charge of management and development of trade ports as well as coastal ports while local governments only had responsibility of managing coastal ones. But the revised law classifies trade ports into two groups-national ports and local ports, and gives appropriately developing and managing authority to central and local governments. Under the revised Port Law, local governments have most authorities for ports except the designate right. As designate right is about setting out and amending Port Master Plan, the central government keeps it.

Table 4. Changes in port governance

Port governance 2009				
Classification	Policy planning	Port development	Port management	Terminal operation
Trade port	Central government (National port policy committee)	Central government and private (Quasi-governmental organization, Act on private participation in infrastructure)	Central government and private (Quasi-governmental organization, Act on private participation in infrastructure)	Private
Costal port	Central government	Central government	Local government	Private

↓

Port governance after 2010				
Classification	Policy planning	Port development	Port management	Terminal operation
Trade port	Central government (Subcommittee of national port policy committee)	Central government (National port) Local government (Local port) Public corporation (Complex) Private	Central/Local Government National port policy committee	Private
Costal port	Central government	Local government	Local government	Private

Transfer of management rights from central government to local ones means paradigm shift in port development and management. Simply put, local governments make decisions on related issues. But the paradigm shift has positive and negative effect at the same time, so numerous measures and proactive plans must be closely reviewed.

Table 5. Projected effect by transfer of management rights

Positive effect	Negative effect
<ul style="list-style-type: none"> • Promote local governments' capacity by giving more authority on port planning and management • Establish port planning and management system customized to the local needs • Promote procedural democracy by increase local residents' participation in the process of polish making and implementation • Vitalize the local economy 	<ul style="list-style-type: none"> • Reckless development resulted from excessive demand on port development • Expand local governments' fiscal deficit • Possible conflict between central and local governments over port development and management rights • Weakening competitiveness of port and undermining efficiency of port policy due to lack of management and too much emphasized port development

3. Challenges

3.1 Demand on new paradigm of port development

Changes in the port industry at home and abroad demand a new paradigm of port development. In the past, ports were only recognized as a mean of transport freight and auxiliary of industrial production activities. So it was ports prime task that was loading and unloading cargo for transport. The volume of cargo determined demand for port development.

Ports do multi-functions as storage and warehouse, multi-modal transport center, shopping center and create remarkable added value by connecting the hinter land logistics complex. Ports have moved from forward approach to backward approach to this end. Under the circumstances, it is not appropriate that demand on cargo volume is the only one standard of determining maintenance of port facilities. For example, in a case of a port which handles not much container cargo volume but has potential to create much added value, the port has enough importance to be kept. As far as ports in Korea concerned, volume of added value that ports create is much less than their competitors in foreign countries largely because the role of port is mainly confined to handling container cargo. It is necessary at this point to generate much added value by connecting the hinter land logistics complex with port development. But that doesn't ignore a Trigger Rule, a system on forecasting port cargo volume and distribution and introduced to prevent oversupply. The Trigger Rule should be strictly applied to while applying various standard beside cargo volume to ports with potential of creating added value. The main purpose of diversifying standards is to establish necessary port facilities in time.

3.2 Enhancing efficiency of port operating system

The port operating market has been rearranged from seller's market to user's market. Therefore, competition among ports to attract container cargo would be intensified, which may result in charge cuts for a time being. In this situation, quay operators should pursue 'a nimble penny'- small profits and quick returns in order to keep their business afloat. Creating added value is one way to keep their business running, though, no one should be sure that all profits generated by added value would go to the operators.

Key challenges are increasing productivity and securing price competitiveness for the operators. These are prerequisites for dealing with the challenges : port facilities large enough to accommodate large vessels : one stop service: advanced operating system : and effective labor supply system. In addition, more larger size quay operating companies should be created to go through the current hardship. Small-sized ones have difficulties in promoting

competitiveness and only rival each other for a small piece of pie. Competing is only to cut the charges and leave smaller profits. The Korean government needs to provide support and make efforts to help small operators merge on a voluntary basis while impose barriers to new operators.

3.3 Open the door to the port development market in foreign countries

It is little late for Korea to advance into the port development market overseas. For an instance, China and Japan, based on enormous foreign exchange reserve, have invested in Africa, Asia, and Latin America as forms of natural resources and SOC (Social Overhead Capital) development and food aids. Those help them to enter into the new markets. The current challenge for Korea faces is opening the door to a new market by investing in various sectors of the target market country. Investing first in potential market has significancies not only for Korea but also the beneficiaries ; for Korea, it can be a good way for the saturated port development market to develop inroads into overseas markets ; for beneficiaries, they can be passed on the know-hows Korea⁴ has been accumulated. In relation to it, Korean government searches a good way to enter into a new market connecting ODA(Official Development Plan) and GLN(Global Logistics Network) business.

3.4 Efforts to make ports eco-friendly

“Environment” will be the word of this year as the climate change convention is scheduled to be held this year. Under the Kyoto Protocol, global nonbinding climate-change agreements, took effect in 2005, Korea obtained developing country status and exempted from the obligation to cut greenhouse gas emissions. But from 2013, it lose the status. The Korean government set a goal of cutting greenhouse gas emissions to 4%⁵ below its 2005 level by 2020. The Korean government stated ‘Low Carbon, Green Growth’ as the center of the nation’s vision in 2008 and mapped out an action plan, ‘Comprehensive Plans on Combating Climate Change’. For the port sector, it conducted a policy study, titled ‘Building Eco-Friendly Ports’ in 2008 and established Green Port policy in 2009. With the government’s movement and policies, building environment-friendly ports emitting low greenhouse gas is emerged as a key issues including renewable energy and modal shift. Green growth highlights the importance of developing ‘resource recycling ports’ - they recycle and reuse waste as energy sources. The resource recycling port system has various advantages ; it is well suitable to Korea with less available land to store waste ;

4 Include various sectors, like planning, design, review on business feasibility, construction technology.

5 It is same amount to the plan, cutting greenhouse gas emissions by 30 percent by 2020 relative to the level of BAU (Business As Usual).

and it reduces environmental stress. Furthermore, the Korean government should pay more attention to coastal areas where more frequently suffers natural disasters because of extreme weather events and build safety structures to protect those areas.

4. Strategy for recent challenges in short term perspective

4.1 Make ports create demand and added value

4.1.1 Create a business complex in the logistics parks of international ports

The paper explores the reasons for creating business complex in the logistics parks of ports and strengthening ports role as hub of logistics as a short term measures to make them create more added value and demand. The Korean government well recognized the reasons and came up with “Comprehensive Plan for Development of Business Complex in the Logistics Parks of International Ports” in 2006. Under the plan, it builds total 8 business complexes with 8 million pyeong (3.3058m² = 1 pyeong) by 2020. As of 2009, 45 consortiums applied to move into Busan New Port and Gwangyang Port. 10 businesses applied to relocate into Pyeongtaek · Dangjin Port at the first stage of constructing the logistics parks and there are now 13 businesses in the logistics parks of 4th quay Incheon Port.

However, from the perspective of invigorating port’s logistics parks area, ports should attract more companies and businesses. For Busan New Port and Gwangyang Port together, only 16 companies relocated to the complex and created a meager volume of container cargo.

Table 6. Comprehensive Plan for Development of Logistics Parks of International Ports 2006

(Unit : 1,000 m²)

Classification	2011 (Year)	2015	2020
Busan New Port	4,656 (1,408)	6,238 (1,887)	7,713 (2,333)
Gwangyang Port	2,760 (835)	3,689 (1,116)	4,960 (1,500)
Incheon Port	3,409 (1,031)	4,470 (1,352)	6,216 (1,880)
Pyeongtaek. Dangjin Port	1,319 (399)	2,595 (785)	4,455 (1,348)
Ulsan Port	839 (254)	1,092 (330)	1,451 (439)
Mokpo Port	518 (157)	734 (222)	1,049 (317)
Phohang Port	373 (113)	666 (202)	913 (276)
Masan Port	88 (27)	154 (47)	237 (72)
Total	13,962 (4,224)	19,638 (5,941)	26,994 (8,165)

Notes : Unit in () is 1,000 pyeong

Source : The Comprehensive plan for development of logistics parks of international ports 2006 by The Ministry of Maritime Affairs and Fishery

Business model of these companies in these logistics parks is weak to external risks because either they heavily depend on trade with China or Japan, or their revenue sources center on certain countries. Therefore revision of relevant laws and diversification of business model should be put on the front burner in order to facilitate companies to enter into new markets. Relevant laws were revised to allow manufacturers besides logistics companies to move into the logistics parks of international ports. To vitalize logistics parks, businesses and companies should understand necessities to move into the logistics parks first and have no inconvenience in carrying out business activities. To this end, various measures should be taken. They include revision in minimum amount of investment, expansion of employment for foreign workers, creation and publication of systematic standards of selecting enterprises into the logistics parks and one-stop administrative service. Current business model heavily depending on China or Japan should be broadened to the emerging markets like East Europe, Latin America, Southeast Asia, and India. The companies in the logistics parks should diversify business profile, focusing on items taking advantages of no or less tariffs, or the rule on the country of origin labeling, which is strictly imposed due to the acceleration of trade agreements like FTA with other nations.

4.1.2 Reinforce the role of ports as logistics hub

Korea has advantages for being a logistics hub as it imports most raw materials and energy and is located between China and Japan, world's largest consumers of raw materials and energy. Korea can create added values by becoming a hub of container and bulk freight transport of natural resources, pursue development of the financial sector and reduce risks domestic companies face at the same time. To fully take advantage of its location and to determine possibilities of being a logistics hub in Asia, Korea needs to analyze supply and demand of raw materials in Northeast Asia and main routes for freight transport like chemical product, grain and raw materials. Korea also reinforces its role as a logistics hub by integrating scattered London Metal Exchange (LME) warehouses in Busan, Gwangyang, Incheon, and so on.⁶ As the need arises, ports attract exchanges by connecting them with an exchange center.

Before ports take a firm root as a logistics hub, port clusters with international competitiveness should be built. Now the port cluster in Busan is regarded as a good example, though, lack of proximity, a defining characteristic of a cluster, is pointed out as a main reason of inefficiency. Without building a cluster, no port carries out its original role of loading and unloading freight. For development of ports, it is necessary to build a port cluster connecting with complexes back of ports, cities and industrial complex. To do that, 'comprehensive plan on logistics and industrial cluster' should be mapped out at a national

⁶ As of 2008, Korea handled 9 percent of world LME volume and 32 percent of Asia. Due to concerns over lengthy economic slump, mid-dealers are expected to buy materials in bulk.

level. If there are too many items in the plan to discuss and figure out, it would be a way to review feasibility by incorporating it into the current comprehensive plan on development of complex back of ports. The comprehensive plan should include the results of studies on feasibility of each port to build a cluster and on selection of candidate sites.

4.2 Establish advanced port operating system

4.2.1 Establish port governance system

From this year, development and management rights of 15 ports transfer to local governments. It is urgent to set up and utilize a management system about distribution of port development budget and evaluation of ports' performance. To this end, it is needed to conduct satisfaction measurements and quantitative assessments- cargo handling performance of a port, extent of non-operating facilities, management of statistics about port operation, and facility maintenance and repair of port under the local governments' authority every second year. Then the Port Policy Committee reviews the outcomes of the assessment and reflect them into policy. That is, budget support should be provided as a form of matching fund based on port performance and basic budget support mechanism.⁷ As mentioned above, newly established system should cover all the range of information systematically collected on port development and management including statistics related data and materials. Port administrative procedures also needs to be unified by drawing up an distributing guidelines centered on 43 mandate office work such as respective role of local government and the central government, scope of authority. A conflict management system also is need to be established to solve any conflict between the local and central government on ports. Port experts at the Port Policy Committee may participate in the process of setting up the conflict management system.

4.2.2 Improve the quay operation system

Appropriate size of terminal operators can be figured out based on research, covering possibilities of merge and close among businesses on the blink of shutting down, government incentives to them, merge and shut-down examples in foreign countries. Productivity and efficiency of port could be improved by designing and implementing measures for smooth labor supply and advancement of labor supply system. The most urgent task ports face is to intensify competitiveness port operation. Advanced technologies could boost the productivity. According to a study, improving soft ware system boosts productivity much more than hard ware. Upgrading the current operation system is feasible when various information technologies and advanced system are combined and necessary experts and

⁷ For example, provide financial support - marketing costs, port facilities charges reduction/exemption based on budget, size of developing structure and human resources for port development to vitalize ports.

technologies are secured. Therefore the government needs to establish and phase in ‘road map and action plan for technological development on the ports’, and ‘measures for securing and fostering experts in ports’.

4.2.3 Strengthen port security and safety system

It is an international trend in strengthening security at sea and airport since the September 11 terrorist attacks in 2001 and a bomb attack by al-Qaeda against the French oil tanker in 2002. To respond the trend, harbor master, massive research on it is under way, could be used further. Harbor master has independent authority on and is in charge of port safety in port. But, first of all, plans on adding port security facilities and equipment should be set. Along with that, safety standards to protect precious human lives and port property are needed to be established based on scientific studies on engineering about loading and unloading cargo.

4.3 Building environment-friendly ports

The Korean government set a goal of cutting greenhouse gas emissions to 4 percent below its 2005 level by 2020 in order to show its strong commitment to cut greenhouse gas emissions. Under the current frame work on climate change, Korea is classified into a developing group and exempted from the obligation to cut greenhouse gas emission. Korea has no its own calculation method about greenhouse gas emission, so it follows IPCC(Intergovernmental Panel on Climate Change) tools and guidelines on calculation.⁸ When Korea uses the IPCC calculation method, there is some disadvantage of making a mistake in calculation and the amount of its greenhouse gas emission might be exaggerated. Therefore the government must set its own calculation methods to evaluate greenhouse gas emission by ports and figure out ways to reduce greenhouse gas based on specific role of ports.

Table 7. Ways to cut greenhouse gas emission in ports

Classification		Ways to cut greenhouse gas emission
Ships	Ship operating within harbor limit	<ul style="list-style-type: none"> • Impose mandatory on use ultra-low-sulfur fuel for harbor craft • Improve engine of Harbor Craft • Lower speed of Harbor craft
	A ship at anchor	<ul style="list-style-type: none"> • Alternative Maritime Power(AMP) • Using clean energy when a ship at anchor
Unloading		<ul style="list-style-type: none"> • Modernize unloading equipment and Impose mandatory on use ultra-low-sulfur fuel • Shift to electricity unloading equipment
Yard		<ul style="list-style-type: none"> • Use hybrid yard tractor • Change outworn truck

⁸ When a nation draws a report on greenhouse gas emission, it must follow the guidelines IPCC (Intergovernmental Panel on Climate Change) for calculating the amount of gas emission.

Along with that, modal shift to coastal transport which emits only a quarter of greenhouse gas than road transport and shift to low carbon freight transport system can reduce greenhouse gas emission. Ports have geographical advantages in terms of harnessing wind, tidal and solar powers. The government needs to establish an action plan on using renewable energy generated in ports to take the advantages above mentioned. To build environment-friendly ports when it comes to effective ways of recycling and using waste, studies on technological and economical feasibility as well as selected locations and the scale of development must be conducted. Revision of related laws on selecting developing eco-friendly hub ports needs to be followed.

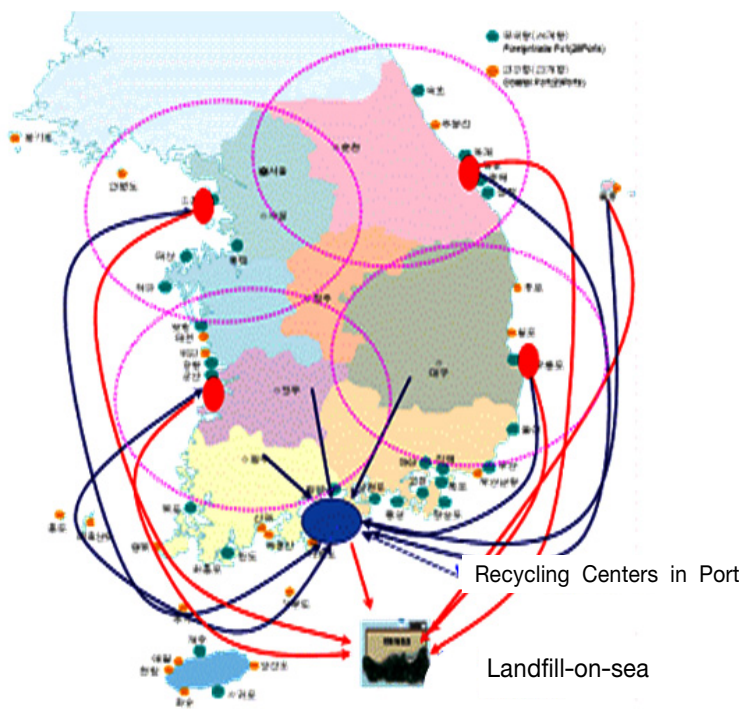


Figure 6. The concept of recycling port

4.4 Strengthen ports' international cooperation

Measures on selecting sites and running pilot programs are needed to advanced into the overseas market. A new business model using EDCF (Economic Development Cooperation Fund) and ODA (Official Development Assistance) as a way to enter into new markets in foreign port development should be identified. When businesses move into new markets, they should engage in numerous businesses like building an industrial complex

in the hinterland of port or securing natural resources in the target market. For businesses on building global port network, feasibility studies on selecting strategic locations should be conducted first and synergy effect could be generated by providing ODAs to the target markets. A task force team or committee needs to be set up for the purpose of improving business environment in order to encourage logistics companies to enlarge their size and helping them enter into new foreign markets. When Korean companies advance overseas, their brand represent themselves in the new market. Therefore, research on way to enhance ports' brand value should be conducted first. According to a study, Korea's national brand value is approximately 30 percent of its GDP.

5. Conclusions

In the paper, four policy directions were presented to respond to the changes in the international port industry. All the directions the policies presented mainly focus on the short term goals, at the same time, they are practical solutions to be applied to works at hands.

However, the 4 policies should be implemented with long term view considering their political feature. Then we could see ultimate effects of them.

First, one of the goals to create value-added ports for generating demand is to assist companies moving into the cluster, to increase freight cargo volume and to designate all area of port hinterlands as free trade zone. Furthermore, it is needed to implement coherent policies of establishing integrated transportation system and logistics network between countries for the purpose of reinforcing the function of port as logistics hub.

Second, satisfaction measurements and quantitative assessments should be kept carrying out on a continuous basis for establishing advanced management system of each port. For the development of port operating system, modification of related policies and introduction of advanced technologies are required to deal with conflict over rights to labor supply and boost productivity of port operation to keep up with advanced countries. When it comes to port security, all ports are needed to be fully equipped with security system in the long run and then establishing 'Port-Based Access Control Network' at a national level is required.

Third is creating eco-friendly ports to realize the goal of cutting green house gas emissions generated by ports. To achieve this, measures to develop a new intermodal transportation system and to power ports using tidal and wave forces are needed to be reviewed.

The last goal is promoting cooperation with other countries by establishing global port network. To realize the goal, at least dozens of overseas footholds should be secured. In addition, we have to make continuous efforts to create one or two large scale logistics companies through M&A and world-top-class port brand value in the long run.

In conclusion, the research was carried out to present the future directions which the Korean Port Policy should go, then find out short term strategies to help the policy be on the right direction to achieve all goals above mentioned in an effective manner.

References

- Jun, Chan-Young (2009) Before implementing the Third Port Development Plan. *Marine Logistics Research*, Korea Maritime Institute.
- INFORMA (2009) *Containerization International Yearbook and Container On-line*.
- IMF (2009) *World Economic Outlook*.
- Jun, Chan-Young and Jong-Pil Lee (2007) *Analysis of Container-cargo Attraction Potential of New Port and Existing Port in Busan*.
- _____ (2006) *Analysis of Factors Affecting Recent Variation of Container Traffic Volume*.
- Korea Development Institute (2009) *KDI Revised Economic Outlook*.
- Korea Maritime Institute (2010) All presented papers. In : 2010 International Conference on Prospects and Issues of Shipping, Port and Logistics.
- _____ (2009) All presented papers. In : International Symposium on Northeast Asia Economic Outlook and Port Policies.
- Ministry of Land and Transport and Maritime Affairs (2009) All presented papers. In : International Symposium on Port Logistics Environment : Global Changes and Future Prospects.
- _____ (2006) *Comprehensive Plan on Developing the Hinterland in Ports*.
- Ocean Shipping Consultants Ltd. (2006) *East Asian Containerport Markets to 2020*. Ocean Shipping Consultants Ltd., England.
- World Economic Forum (2009)
- World Bank (2008) Logistics Performance Index.