

Searching for Best Practices in Developing Ports as Logistics Centers*

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Key Words: logistics center, value-added logistics service, free trade zone

Abstract

Global firms are seeking to implement their global logistics strategies in two ways: the use of centralized inventories and/or postponement of final assembly. These strategies stress the importance of regional logistics centers. In most cases, regional logistics centers are located in or near ports so that changing demands can be met with economy, reliability and flexibility. The port can profit not only from the activities of logistics center itself, but also the increasing flow of cargo through the logistics center. A number of ports respond to this trend by shifting their emphasis from traditional cargo-handling services to value-added services. This paper presents guidelines drawn from the best practices of ports to be successful logistics centers to provide many aspects of value-added logistics services. These include: Effective Planning and Development of Logistics Centers; Institutional Incentive Scheme; Development of Free Trade Zones; Financing Infrastructure related to Logistics Centers; Developing Logistics Service Providers and Logistics Professionals; Development of Information Technology; and Regulatory and Administrative Issues. These guidelines will help managers of ports and policy makers of governments in the East Asian region learn to recognize, analyze and adopt the best practices for use.

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I. INTRODUCTION

Ports and shipping have been key factors in the East Asian region's extraordinary economic growth and development. A port is no longer just a linkage between land and sea. Ports increasingly accommodate industrial demands of customers. With the rapidly changing business environment of the industries, a port's success today does not guarantee its success in the near future. As such, one of the primary concerns of every port is how to create a sustainable competitive advantage.

Many researches show that a port can gain a sustainable competitive advantage by attracting greater value-added activities while bringing down operating costs. As trade barriers are dismantled and logistics service requirements and costs increase, multinational companies (MNCs) have been changing the ways they source materials, and produce and distribute products. MNCs are searching for industrial and logistics centers where repackaging, labeling, bar-coding, light assembly and other value-added services to merchandise in transit are handled. The benefits of having a logistics center for providing value-added logistics (VAL) services are evident in the examples of successful logistics centers at the ports of Rotterdam and Singapore, as well as several ports in the East Asian region. Many ports are vying to attract international business, logistics and distribution centers¹⁾. They are aiming at adding value to the cargo transshipped through the port by value-adding logistic activities. The goal is to open the containers in their region, instead of merely transshipping them as fast as possible towards the hinterland. They are also aiming at strengthening industrial functions in the port, since the massive port industry is tied to good-flows to the port.

Consequently, the strength of a port will depend greatly on how successful it is at attracting global, regional and local logistics centers for various types of high-valued activities. Ports are beginning to regard the VAL activities as vital as the traditional cargo-handling activities in promoting the port as a full-fledged logistics hub. These high value-added activities in the port sector play a key role in economic growth of a port and

1) In addition to these premier global ports, the commercial development of a port as a logistics center is not limited to only first- and second-tier ports. Indeed, there are many opportunities for small ports to function as logistics centers by making extensive use of their location and land holdings. Recently, there have been many attempts in the ports of the East Asian region to shift their emphasis from traditional cargo-handling services to value-added logistics services in order to remain competitive in the regional market. Bangkok Port is one of the most recent examples.

its hinterland.

The main purpose of this study is to develop strategies and guidelines that would help ports in the region to become regional or national logistics centers equipped with sophisticated logistics capabilities and innovative forms of logistics systems. In achieving this objective, it would be extremely useful for ports in the East Asian region to learn from successful examples and best practices of ports as logistics centers, within and outside the region. In this study the authors raise questions when surveying how advanced ports sharpen their focus to establish excellence in developing logistics centers, among them the following:

- What are the key factors for success?
- What role have policy makers, the port authorities, and related industries played?
- How were legal and institutional barriers dealt with?
- How have governmental procedures in port operation and management been streamlined?
- How have advanced technologies, including telecommunications and information systems been adopted in order to enhance the efficiency of logistics systems?

Following the introduction, Chapter II reviews the transition process of ports from traditional cargo handling services to value-added logistics services. Major functions of a valued-added logistics center are analyzed as the best ways to perform a business process. Chapter III formulates guidelines for the types of strategic, institutional, and administrative practices required in order to build ports as logistics centers. Since infrastructure capacity is an important element in the development of a logistics center, the issue of financing is another important issue to be dealt with in this chapter.

II. THE CHANGING ROLE OF PORTS: FROM TRADITIONAL SERVICES TO VALUE-ADDED LOGISTICS SERVICES

These days, the commercial success of a port could stem from a competitive advantage in traditional cargo-handling services, from VAL services, or from a combination of the two.²⁾ Competitive advantages used to come mainly from countries of scale and countries of

2) The traditional port services are:

scope, suggesting that the most productive ports will be those that are equipped to handle large cargo volumes and/or significantly reduce unit costs through efficient management.

Nowadays, however, shippers and carriers select individual ports not only based on their cargo handling service capabilities, but also the benefits they are capable of "delivering." Unless a port can deliver benefits that are superior to those provided by its competitors in a functional aspect, port customers are likely to select ports based merely on price. This fact raises the question of how a port can achieve value differentiation.

In the 1970s, almost every port provided the same basic package of services to almost every customer. In contrast, today, it is more difficult for ports to compete on the basis of cargo-handling service. There has been a convergence of technology within cargo-handling service categories. This means that though new technology may sometimes provide a window of opportunity for productivity improvement, in many cases that same technology is also available to competitors. It is no longer possible to compete effectively on the basis of basic, traditional functions. Thus, there is a need for ports to seek out new means of gaining a competitive edge.

The late 1980s saw the emergence of major changes. Customers began to ask ports to provide a greater variety of services. Providing VAL services is a powerful way for ports to build a sustainable competitive advantage. Shippers and port customers are becoming increasingly demanding. Customers now tend to look at VAL services as an integral part of their supply chain. As a result, ports must attempt to satisfy these needs by offering differentiated services. This poses a particular challenge for port management.

Studies show that the most successful ports are those that not only have a productivity advantage in cargo-handling services, but that also offer value-added logistics services. Thus, there are several available options for ports to choose from, as shown in the simple matrix in Figure 1.

The ports providing traditional services in the bottom left hand corner of the matrix are indistinguishable from their competitors. The only option for such ports is to move to the

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- Receiving goods, breaking shipments, preparing for shipment, returning empty packaging
 - Simple storage, distribution, order picking

The main VAL services are:

- Localizing and customizing, adding parts and manuals,
- Assembly, repair, reverse logistics
- Quality control and testing of products
- Installation and instruction
- Product training on customer's premises
- Bonded exhibition

right side of the matrix, toward productivity-advantage leadership, or to move upwards, towards value-added service leadership. We have found that there continues to be a need for ports that provide the basic, traditional cargo-handling function, and that there continue to be many customers for such services. Perhaps it is for this reason that many ports in the East Asian region still concentrate on improving their productivity with regard to traditional port functions.

However, it is clear that, in the future, there will be fewer ports that prosper only in this area. Rather, we will see the dominance of superior service leaders that possess both a productivity advantage and a value-added service advantage. In between traditional service ports and superior service ports are the leading-edge service ports. These are the ports that are on their way to becoming superior service ports.

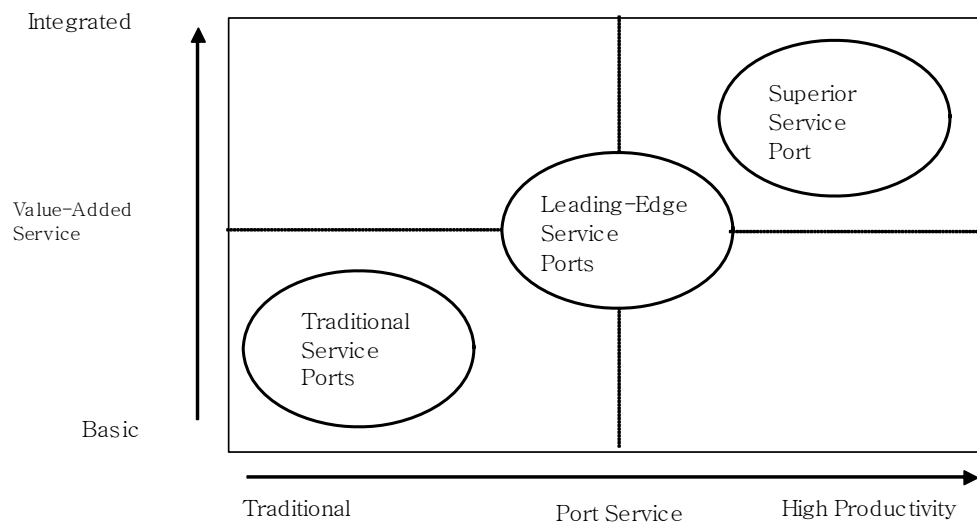


Figure 1. Matrix of Competitive Advantage

A number of ports have responded to this trend by focusing on VAL services as a means of gaining a competitive edge. In this content, VAL services refer to the process of developing relationships with customers through the provision of an augmented offer, which may encompass many aspects of VAL services.

Ports can experience synergistic benefits from the logistics centers to provide VAL services.³⁾ It is advantageous for a port to be a logistics center, since the logistics center can generate cargoes that can be shipped through the port. There is a positive correlation

between cargo flows at the logistics center and the number of ships calling at the port. In other words, cargoes attract ships, and ships attract cargoes. The port benefits by generating increased revenue and by creating jobs. The port can profit not only from the logistics center itself, but also from the increased flow of cargo through the port. Thus, an ideal port should provide a diverse range of VAL services that are highly integrated. As such, there is a need to seriously consider the increasing importance of logistics centers in the East Asian region.

The overall benefits of having a logistics center for providing value-added logistics services are evident in the examples of successful logistics centers at the ports of Rotterdam and Singapore, as well as several Japanese ports. In particular, the port of Rotterdam has been phenomenally successful in attracting Euro Logistics Centers (ELCs) and related economic activities into the port area. Although logistics centers have not been considered in traditional internationalization model, it certainly should be considered an important step in the overall internationalization process. When analysing the amount of foreign direct investment in the period 1960-1993, Jagersma (1994) concluded that most ELCs could be placed between the phases 'location of trade offices' and 'location of production centers' in the development model. He also concluded that on average one ELC resulted in 3 extra indirect foreign investment projects in the Netherlands (of more than US\$ 5 million). This result shows that logistics centers in ports of the East Asian region will help hosting economy's overall internationalization patterns and strategies of global companies.

ELCs are often forerunners for the establishment of other international activities in The Netherlands, such as head offices, shared service centers and call centers. Many of the foreign firms that had established an ELC in a port of the Netherlands later decided to move their European headquarters, customer call centers, and training and R&D centers to the Netherlands. According to the survey by the Holland International Distribution Council (2001), this has been the case with 51 percent of the ELCs set up in the Netherlands. The reverse is far less frequent. Only 17 percent of ELCs were created following the

3) When logistics centers are grouped together in a common dedicated area, it is sometimes called a Distripark(distribution park). Therefore, a Distripark is a large-scale, advanced, value-added logistics complex with comprehensive facilities for distribution operations at a single location, which is connected directly to container terminals and multimodal transport facilities for transit shipment, employing the latest information and telecommunication technology. Rotterdam in the Netherlands, Bremen in Germany, and Singapore are examples of this kind of arrangement. Container ports are generally a preferred choice to set up Distriparks, since they are already closely located to various inland transport facilities and a highly skilled workforce.

establishment of other international activities by the companies concerned. This is one of economic growth rate of the Netherlands amidst the intense competitiveness of the European market.

The Port of Singapore has also achieved phenomenal success by becoming a transport and logistics center, and by attracting foreign logistics firms and the manufacturing/assembly plants of multinationals. Singapore has become a super-hub for shipping and logistics activities in Southeast Asia by attracting a large number of global and Asian logistics centers of foreign MNCs. Transport experts contend that Singapore may not be superior to some of the other countries in the East Asian region in terms of geo-economically strategic position such as centrality and intermediacy. Instead, Singapore has been mainly because it has built up transport capacity ahead of demand, and because of its business-friendly economic and social environment.

III. GUIDELINES FOR DEVELOPING LOGISTICS CENTERS IN PORTS

After surveying many good examples of a few of successfully restructured ports, this chapter provides major guidelines, which might be helpful for many ports in the East Asian region to follow. The guidelines listed below are not intended to be prescriptive models for all ports to follow. Rather, they are intended to serve as a helpful resource which many ports in the East Asian region may follow, if they would so choose.

- i) Effective Planning and Development of Logistics Centers
- ii) Institutional Incentive Scheme
- iii) Development of Free Trade Zones
- iv) Financing Infrastructure related to Logistics Centers
- v) Developing 3PL Service Providers and Logistics Professionals
- vi) Development of Information Technology
- vii) Regulatory and Administrative Issues

3.1. Effective Planning and Development of Logistics Centers

Objective: To utilize a system-oriented approach for planning and developing ports, associated logistics centers, and city functions.

Collaboration between the port and logistics centers is crucial for the success of port. However, in the past, planning and development of port and logistics centers have been approached in an isolated manner. The problem basically boils down to insufficient understanding of logistics centers in regional ports and lack of planning in an integrated way. There is a need for a systems-oriented approach for planning and developing ports, associated logistics centers in port areas, and city functions to meet the demands of shippers, port users, and citizens.

Action 1: Ports should, in advance, prevent the use of land space behind them in random development or without regard to port-related functions.

One of the reasons why the lack of logistics center has become a salient issue in the East Asian region is because governments have not adequately understood the importance of sufficient land space for developing logistics centers. That is, the general practice in developing ports in the past has been little considerations by port authority with regard to securing sufficient land space for the development of logistics centers in the process of planning and development of port. Consequently, the shortage of land space has led to the difficulty of building logistics centers at most city ports in the East Asian region. Ports should place a high priority, in advance, on preventing the land space behind them from being used in random developments or from being used without regard to the original port and port-related functions.

Another measure should be taken is to control port land extending beyond the boundaries of port land by legislation. A port is beset by problems of competing land uses through out its life. Even if port authorities set up a long-term plan, their time and efforts would fail, if they fail to maintain the consistent control of land necessary to execute that plan. Therefore, it is desirable for a port to control all its land resources.

Even with fully control of land-use, ineffective management practices cause problems. Examples of such problems include the grant of contracts to use port land for purposes, which extend far beyond the economic life of the activity and afterwards become an embarrassment and a frustration to the port⁴⁾. This example indicates that all ports contracts for land should be drawn up to cover use, level of activity and length of contracts.

4) Suppose a case that port grants a 50 years contract of site in port areas for the use of conventional industrial activity. Twenty years after the contract was granted, that industrial activity may cease to be viable. Nevertheless, the port may be denied economic port use of the area for a further 30 years if the contract contains no clause to cover this eventuality.

Therefore land use management policies must aim at:

- Retaining operational land in operational use;
- Retaining maritime industrial land in an appropriate classes of industrial uses;
- Ensuring that full economic use is made of areas in occupation;
- Making it possible to recover land from obsolescent and obsolete uses for redevelopment; and
- Phasing contracts as closely as possible to the life of the activity.

Measures to provide the use of dredged land areas or other land provision matters can make a useful contribution to the building logistics centers in ports. An example of the best practice in the development of logistics centers can be found in the Port of Rotterdam, which have succeeded in transforming the barren land along the port area into sophisticated and highly successful composite logistics centers. In Rotterdam, the first logistics centers was established in old port basins, next to the existing container terminals in the Eemhaven Region. Construction of the Botlek Distriparks followed. In the 1980s, as the container trade started to grow substantially, the Port of Rotterdam redeveloped Maasvlakte, a large port basin originally developed in the late 1960s but remained empty because of stagnation.

Action 2: Measures should be taken to integrate the objectives of the city development into logistics development policies especially with regard to improving the harmony between city functions and port functions including logistics centers.

Activities in logistics centers may cause a number of problems, including water and soil pollution, dust pollution, land intrusion, traffic congestion and other problems inherent to the port activities. Although the resulting social costs are impossible to quantify, they still remain a substantial burden to the supporting city. Consequently, reflecting the logistics center development into the city development plans is a vital component of integrating city development objectives into logistics development policies, especially with regard to improving the harmony between city functions and port functions.

In this regard, in the development of logistics centers in port areas, more attention must be paid to the development of city-related functions, international conventions and other related facilities as well, which, in turn, would provide new sources of commercial impact for the port industry in the East Asian region.

Summing up, strengthening city-functions and creating an internationally competitive urban setting in conjunction with logistics center development will attract major service and trade

related activities to the port region. The Port of Yokohama in Japan is an example of success in redeveloping an older port area, a site where conventional berths used to be, into a complex of urban and logistics area with composite facilities including hotels, offices, department stores, and logistics centers. The Port of Yokohama could succeed because of its use of sophisticated plans and effective connections with the city developments, its early retrieval of development expenses through land sales, and direct supervision of the marketing of logistics facilities by top management of the port and city authorities. Therefore, actions for planning and developing logistics centers should include effective harmonization with city development plans, functions and facilities.

Action 3: Regional ports should approach partnership and conduct in-depth research in planning and developing the logistics centers in port areas to prepare for future requirements, to avoid possible conflicts among all parties involved in the development, and to promote integrated and rapid development.

Planning and developing the logistics centers in ports involves parties at all decision-making levels: the central government, local governments, port authorities, shippers, the logistics companies, and so on. In this regard, coordination and cooperation are essential among them to promote integrated and rapid development. In order to achieve such integration, the public authorities (including governments and the planning agencies) and the users should form a task force or partnership. Furthermore, in-depth research should be conducted in planning and developing the logistics centers in port areas to prepare for future requirements.

A legal framework enshrining the principles of consultation and compromise should be set up to institutionalize a public participation process. In such cases, it is mandatory for port authorities/agencies in charge of developing logistics centers to document their proposals, and the expected impacts of the proposals. In the course of documenting their proposals for public consideration, some alternatives may be offered to gain community acceptance. Ports, which involve the public in their planning and development stages of logistics centers, generally succeed in having their vision as commercial logistics centers realized.

The need for this partnership approach is nowhere more evident than at the close interconnection between land transport and logistics center. It is essential for ports and logistics centers to have easy access to inland transport and close inter-connection between them to perform their functions properly. Therefore, providing or improving rail and local road access into logistics centers should be one of the highest on the agenda in ports of

the East Asian region. To achieve an efficient, seamless transport and distribution system, the Integrated Transport Strategy of the Sydney Ports Corporation makes it clear that land transport is of no less importance than adequate port facilities and services (Hayes, 2002). Consequently, co-ordination is required among ports, rail operators and local authorities and strong assistance by the government with regard to land, roads, railways, and energy. Assistance by all parties concerned at the Japanese ports to build ports and logistics centers (Free Access Zones) may serve as a good guideline for developing ports in the East Asian region.

3.2. Institutional Incentive Schemes

Objective: To provide MNCs and international logistics service providers with institutional incentive schemes such as tax incentives and other supporting schemes to establish their logistics centers in ports.

Developing logistics centers requires a long construction period and a large amount of investment. Considering the examples from successful ports, the tax and other incentives are essential for developing the logistics centers. Ports and relevant government agencies should accordingly support the MNCs and international logistics service providers through tax incentives and other supporting schemes to attract their operations in their port regions.

Action 1: Ports should provide a variety of incentives, such as pioneer status, preferential taxation, loan guarantees, credit insurance, low-interest financing and bonded services in the development of logistics centers.

Table 1 shows the various tax and other incentives used to support logistics center investors in selected countries in the East Asian region. An example of some best practices in embarking on an active campaign to encourage MNCs and a number of international logistics service providers to establish their logistics centers can be garnered from the Port of Singapore. Singapore has succeeded in transforming the city-state into logistics hub of the region through various incentive schemes such as pioneer status, tax exemptions, and so on. Japanese ports also provide examples of a variety of business support and financial incentives, including preferential taxation, loan guarantees, credit insurance, low-interest financing and bonded services in the development of logistics centers (FAZ). Further examples from other successful countries make it certain that the tax and other incentives are essential for efficient logistics center construction.

Table 1. Incentives for the Port Logistics Centers in Selected East Asian Countries

Country	Tax and incentives for the construction of logistics center in ports
China	15 percent of tax on juridical persons levied. If a firm operates distribution centers more than 10 years, tax on juridical persons will be exempted for a specified period of time. When the specified period expires, 50 percent of tax will be exempted.
Hong Kong	16 percent of tax on juridical persons and 15 percent of property tax levied. No tax on interest income, dividend income, etc.
Taiwan	In Export Processing Areas, import tax, commodity tax and trade tax will be exempted. In Science Industrial Areas, tax on juridical persons will be exempted for 4 years when a firm increases its facilities.
Japan	35 percent of tax on juridical persons and total tax on permanent asset will be exempted for firms that employ more than 20 workers for 5 years.
Singapore	Economic Development Board and IE Singapore provide various incentives. 10 percent of tax on juridical persons levied. Over depreciation system is adopted.

Action 2: Port authorities or relevant government agencies should try to accept delayed returns in providing the land for logistics centers, in order to attract investment of MNCs and international logistics companies in their port regions in return for growth of regional economy.

Whether major logistics firms or manufacturing companies are willing to invest in logistics centers in this region will depend on the price of land provided by the ports. As such, attracting investors will depend on the degree to which the ports can accept delayed returns, and how much investors are willing to pay for the land or buildings.

Some ports in the East Asian region, especially Japan, Singapore, Hong Kong, Taiwan and Korea, still have many problems with regard to high land prices or rental fees for the port logistics centers. Since the emergence of VAL services at ports, some countries in the region have started to develop vast areas of land for the logistics centers in port areas. But the costs of development are still too expensive for MNCs or logistics firms to locate in the region. A sensible example to overcome shortage of land and resultant high land cost is the Port of Hong Kong, which exploits intensive utilization of land by constructing a high rise building.⁵⁾ Another measure for the East Asian countries to induce as many MNCs and

5) ATL Logistics Center in Hong Kong is the world's first and largest intelligent multi-storey drive-in

logistics companies as possible to the port areas is that the government and port authorities should lower land related costs in developing the vast land areas. Although lowering the cost of land will likely mean much slower returns on investment, cheaper land costs could help to differentiate the port from other emerging competitors by attracting more investors into the logistics center. In consequence, a growth in port region's employment and tax revenues will be expected.

3.3. Development of Free Trade Zones

Objective: To establish Free Trade Zones as part of wider port policies aiming at inducing port traffic and producing value-added services by attracting logistics centers of MNCs and international logistics companies, thereby increasing employment and tax revenues in local economy.

In order to lead global logistics business within their respective regions, logistics centers in Singapore, Hong Kong and Taiwan have consistently expanded their logistics facilities such as ports and airports. Using such facilities as a base, they have actively established FTZs as part of their efforts to consolidate and centralize logistics management. These ports, each of which is a major regional logistics center, have become favorite locations for global MNCs. Assistance given to the Japanese ports for building ports and logistics centers (FAZs) may serve as a good institutional guideline for the developing FTZs in ports of the East Asian region.

Action 1: In order for the FTZs to function effectively, ports and relevant government agencies eliminate or reduce the unintended costs or obstacles associated with tax and trade laws.

An FTZ has long been considered as a way to contribute to the efficiency of international trade and logistics services. Furthermore, FTZs have long been a part of wider policies aimed at attracting port traffic and producing value-added services by attracting logistics centers, thereby increasing employment and revenue in local economy. The setting up of FTZs to facilitate entrepot trade in dutiable and quota-restricted goods contributed to

cargo logistics center, which is conveniently located in the heart of Kwai Chung Container Terminals. It comprises 7 floors at Center A and 13 floors at Center B providing over 9.3 million square feet total floors area and over 6 million square feet leasable area to CFS, logistics, air-freight and all kinds of business operators under one single roof.

today's success of Singapore as a logistics and business center in Southeast Asia.

There are currently 845 free trade zones that offer comprehensive logistics and production capabilities (UNCTAD, 1999). There is, however, no uniform pattern for a free trade zone in the world. Rules governing the zone vary greatly from one country to another. Singapore and Hong Kong have a long history of free trade zone in ports. Japan and Taiwan have already established FTZs in several ports and developed logistics centers in the zones. China has actively developed logistics centers through large-scale foreign capital inducement beginning in the early 1990's, adopting a free trade zone system to ensure the free trade of global firms. Recently developed Port of Tanjung Pelepas in Malaysia is aggressively developing an FTZ for distribution, logistics and industry to cater towards increased traffic.

A notable exception is the distribution parks in the Netherlands, which are not FTZs. However, each company within them can be considered as a free zone, or a free point, in and of itself. In the Netherlands, there are approximately 1,500 of these free points. The Distriparks can offer freer facilities than a free port. When a company fulfills certain conditions with respect to security, and when it has established an on-line computer connection meeting certain standards with Customs, it may obtain a license from the Customs permitting it to carry out certain basic customs formalities on itself. Such a system makes the goods flow faster and more efficient.

Summing up, FTZs are intended to promote host country's participation in trade and commerce by eliminating or reducing the unintended costs or obstacles associated with host country's trade laws. Of course, that would not be an easy task or one that could be accomplished in a short period of time. Therefore, legal and institutional procedures should be arranged in a continuous and integrated way.

3.4. Financing Infrastructure for Logistics Centers

Objective: To make the best possible use of limited funds and to maximize the effectiveness of their respective roles of all parties concerned.

Since the volume of port traffic in the East Asian region will continue to grow for many years to come, the ports must make massive and sustained capital investments to meet the demand. However, financing the development of logistics center in port regions poses a number of major problems.

Action 1: High priority should be placed on financing infrastructure including port

facilities and related logistics centers to meet the growing demand for logistics activities.

In addition to new investment to cope with growing demand, a particular consideration should also be given to the additional investments required to replace existing older and deteriorating infrastructure in many of this region's ports. The physical conditions of existing port facilities are several decades old and will be unable to meet the minimum standard that will be required of port services in the future. Furthermore, the life cycle of most existing port facilities will come to an end, thus compounding the burden of cargo handling and traffic movement. Consequently, the future investment will need to be made not only in new port facilities, but also in replacing older ones.

Above mentioned facts imply that ports and logistics facilities have to put more emphasis on financing infrastructure including port facilities and related logistics centers. In many cases, however, the central and local governments in the East Asian region do not have the proper funds to develop even the basic port facilities. Consequently, at present, they are not able to place high priority on developing logistics centers in port areas.

The need to make the best possible use of limited funds will require that every effort from all parties concerned should be made to maximize the effectiveness of their respective roles. This clearly implies that the public sector's investments are intended to support the infrastructure only, whereas the private investors provide the superstructures in most cases. But before promoting participation of the private sector, a clear and systematic framework for regulation and supervision has to be established to restrict monopolistic and unfair practices that might be exercised by private sector.

Action 2: Measures should be taken for better utilization of existing facilities and innovative approaches to financing relevant infrastructure of logistics centers.

To overcome severely limited financial capacity in the region's logistics centers in ports, following measures should be taken. First of all, careful planning and sound investment will be needed to avoid over-capacity and unprofitable operations while assuring continuous growth. However, to overcome the chronic shortage of facilities, new approaches to financing infrastructure have to be adopted. The most significant may be the strengthening of private sector participation in the development of logistics centers. Already, the range of private sector participation is very wide, from straight-forward BOT (build-operate-transfer) to the extreme case of complete privatization with no government involvement. Successful privatization of the port and related facilities will bring greater operational efficiency, reduced labor costs and less bureaucracy through the invisible power of free enterprise.

History shows that the private participation in the development of logistics centers has led to greater efficiency and reduced lead times for the development. However, in many cases including Korea, protracted negotiations over the terms of BOT developments have actually delayed the development of the logistics centers and related infrastructure. In order to induce private capital for the development of logistics centers, ports in the region will have to provide more favorable institutional, regulatory and administrative environments in a timely manner, and share the risks in the approach.

3.5. Developing 3PL Service Providers and Logistics Manpower

Objective: To improve the quality of logistics service providers, and to develop a solid workforce of logistics professionals.

In many cases, the policymaking in the logistics sector has focussed on 'hard' factors instead of 'soft' factors. Particularly, the East Asian region has hardly paid attention to 'soft' factors like a policy to develop professions and manpower in the logistics industry. These soft factors became important during the late 1990s. To do business in foreign markets, MNCs need the capacity to handle a variety of factors, including the new and uncontrollable economic environment, laws and systems, social and cultural values and behavioral standards, the structure of the market, as well as desired service levels and the quality of usable information. Thus, in order to meet the demand of these global firms, there is an urgent need to improve the quality of logistics service providers, and to develop a solid workforce of logistics professionals. Both of these things have contributed to the Netherlands' and Singapore's status as the hubs of Europe and East Asia, respectively.

Action 1: Professional logistics services should be promoted by attracting global 3PL service providers for new logistics centers in ports.

In response to lean production and distribution systems, the trend towards outsourcing of logistics services continues. The specialized service providers, so-called third-party logistics (3PL) service providers, offer global firms many advantages, including reducing the need for capital investment, reducing working capital needs, and enabling the penetration into new markets more quickly and with less capital. Consequently, the demand for stability, consistency, and flexibility has led to an increasing use of 3PL in almost every aspect of logistics activities. According to Amstrong & Associates, 78 percent of North American companies, 79 percent of Western European companies, and 58 percent of Asia Pacific

companies now use 3PL services (Byrne, 2004).

Table 2 shows how 3PLs function as full-service providers, thus ensuring that all services required by customers can be met cost effectively. 3PL service providers in the Netherlands and Singapore offer a wide range of services that complement the specific needs and capabilities of global firms. The quality of 3PL's services is considered to be an important factor in attracting new logistics centers in their countries. In line with this trend, ports in the East Asian region must attract and develop world-class providers of customized logistics services in order to attract global firms to set up their logistics centers in the region.

Table 2. Range of Services Offered by 3PL Service Providers

Classical	Advanced Services	Full Services
Warehouse management	Pick and pack	Order processing
Transportation	Assembly/packaging	Order planning
Dispatch	Returns	System/IT
Delivery documentation	Labeling: <i>price and bar code</i>	Invoicing
Customs documentation	Stock account	Payment collection
		Logistics consulting
		Shipment tracking
		Materials planning

Source: OECD, Logistics Integration in the Asia-Pacific Region, 2000.

Action 2: An effective education and training program must be prepared to produce not only logistics specialists equipped with SCM, IT and strong language capabilities, but also technologically trained and skilled work force.

Every advanced port in the world is putting forth great efforts to build its information infrastructure and train personnel for a knowledge-based economy. Just as knowledge enterprises are recognized as the best firms, only those ports that are armed with knowledge and technology will be able to maintain their statuses as competitive ports. Ports in the East Asian region will only be able to achieve its goal of becoming the logistics centers if they direct adequate resources toward training logistics professionals and skilled work forces at the most advanced level.

An effective program must produce logistics specialists that not only have strong language capabilities and the ability to work effectively with information technology, but also a solid foundation in all aspects of the supply chain management, including warehouse management, inventory management, customer service, transport, purchasing, budgeting, accounting and

forecasting. A skilled personnel is also a necessity, as evidenced by the growing gap between the supply of and demand for technologically competent labor forces in logistics services. Technologically trained work force in ports and logistics centers is increasingly in short supply. However, the current system of training of work force is simply incapable of producing specialized workers needed to meet the requirements of highly specialized logistics center operations.

In the Netherlands, a large government initiative had started in mid-1990s in developing specialized knowledge related to the logistics sector as a whole. This government initiative to transfer new knowledge to the Dutch logistics sector is to increase its competitive advantage. This is done by means of two knowledge centers: one for transportation research, aimed at the transport-industry called Connekt, and one for chain-management, aimed at shippers, called KLICT. Another notable example of an effort to support growing manpower needs in the logistics sector is AFT-IFTIM (Association of the Development of Professional Training in Transport/Institute of Training and Warehousing Technique) in France.

In order to achieve its vision of becoming a global logistics hub, Singapore's IE Singapore (previously Development Board)⁶⁾ has been consistent in training logistics professionals equipped with supply chain management skills and other critical IT skills. As part of this effort, it launched a professional accreditation program for logistics professionals, i.e., Certified Professional Logistician, ensuring a high-level professional certification worthy of regional and international recognition.

In comparison, ports in the East Asian region lack professionals and specialists in logistics. Recently, in Korea a program has been proposed to train 10,000 logistics specialists over the next five years in order to produce personnel to meet the growing needs of Northeast Asian logistics system (Jun, 2001). However, this kind of program cannot be achieved without greater institutional support. As such, port authorities should support the establishment of logistics education and training systems for managers and employees of logistics centers. Continuing education programs and institutions should also be expanded to ensure more highly-trained and skilled labor force for the future.

6) TDB has been restructured to International Enterprise Singapore (IE Singapore) to meet the challenges of an increasingly competitive global market.

2.6. Development of Information Technology

Objective: To make the best use of IT to reap the benefits of e-commerce and to improve the efficiency of logistics chain.

A number of ports have taken steps to improve the quality of their services, and to provide basic logistics and communications infrastructure in order to reap the benefits of e-commerce. Because of increasing importance for the technological development to control logistics activities, expenditure on IT and telecommunication system is expected to surpass inventory-carrying costs in its priority next to transportation costs in logistics chain (Anderson and House, 1990). This fact represents a fundamental shift in logistics strategy toward information-intensive control system from asset-intensive strategies such as many warehousing and inventory levels.

Action 1: The common-user and robust e-commerce-based administrative and commercial services in ports should be available to allow the ports in the East Asian region to connect to the IT networks of administrations, transport operators and logistics centers.

Information technology, especially internet-based systems, is increasingly being employed in all logistics services. As shippers become more attuned to sophisticated supply chain management, ports will be faced with challenges to overcome. The growing power and speed of information processing is reshaping the port industry to offer one-stop value-added services.

However, in many ports of the East Asian region, the transaction capabilities offered by a number of port websites, which are likely to become standard features in the near future, are still not accessible to many customers. This is mainly due to a multitude of factors such as limited information and telecommunication infrastructure, limited level of e-commerce and internet culture, and limited skill base for building e-commerce.

The application of e-commerce in ports could contribute to the efficiency of international trade. The availability of common-user and robust e-commerce-based administrative and commercial services in the ports of the East Asian region would allow them to connect to the IT networks of administrations, shipping lines and other transport operators. Of course, scalable systems with certain core functions are needed in order to cater to the different needs of a wide range of ports and terminals serving developing countries' trade.

Action 2: Steps based on balanced, coordinated and standardized information systems

must be taken to improve the efficiency of administrative and customs activities in the ports of the region.

In most ports of the East Asian region, shippers and clients suffer from the burdensome and time-consuming administrative and customs clearance procedures. As such, there is a need to place priority on reforming the various complex administrative systems in the ports of the East Asian region. Customs are major bureaucracies where it is difficult to change operational and administrative procedures to improve services.⁷⁾

In addition to customs clearance, shipping companies and their agents must deal with onerous and inconsistent reporting and inspection procedures for notifying the port, coast guard, immigration and health authorities and other government organizations regarding a ship's arrival/departure, cargo handling requirements and other vessel services needed. These are all formal requirements related to the ship's port activities. The information for vessel, crew and cargo manifest, collected by one organization is seldom shared with another organization within the same port, or even within the same organization's offices in other ports. This reporting system of redundant information is labor intensive, costly and inefficient.

Consequently, information system can be used effectively to streamline and enhance supply chain processes, enhance cooperation between carriers and their customers by enabling instant communications, and eliminate many burdensome procedures and regulations. For most country in the East Asian region, existing information systems have been developed individually for each sector, resulting in a lack of balance, coordination and standardization between different systems and transport modes. Thus, the main issue for the development of logistics information systems in the future will be how to build balanced, coordinated and standardized information systems without interfering with the continuous development of existing system.

Most developed ports have already implemented a variety of strategies and policies to develop their information infrastructures. In many ports, they have been transformed into integrated logistics information systems through interconnected efforts with other logistics-related information systems.⁸⁾ The most advanced IT of its kind may be the

7) Even a developed country like Japan has a restrictive customs law, which states that the declaration and clearance process is accomplished only after the cargo is moved to a bonded area.

8) INTIS at the Port of Rotterdam, DAKOSY at the Port of Hamburg, and SEAGH at the Port of Antwerp are good examples of IT that facilitates electronic submissions and clearance of shipping information.

PORTNET at the Port of Singapore. The PORTNET, which was developed in 1984 and then refined and improved upon over many years, is the world's first and still-only nationwide e-commerce network that has the participation of the entire shipping and port community in Singapore. The PORTNET system facilitates end-to-end information workflow and creates value for port users in many areas, including the on-line booking of resources, e-fulfillment of port services, facilitation of billing services, customs clearance and linkage to government agencies.

3.7. Regulatory and Institutional Issues

Objective: To develop a legal framework and key institutions for the building of logistics center in ports.

Overly complex administrative procedures and bureaucracy are frequently addressed as an obstacle to building a logistics center in the East Asian region. Consequently, legal and institutional issues must be addressed before establishing logistics centers in port areas. The main emphasis will be on the development of a legal and institutional framework for the building of logistics center in port regions.

Action 1: Legal and institutional issues must be identified before establishing logistics centers in port areas, and the new logistics-related laws and national strategies should be launched to transform and upgrade ports to the next level of logistics development.

As to the legal aspects regarding logistics centers in ports, institutional schemes should be made to improve the conditions and simplify the administrative procedures affecting logistics centers. Experiences around the world also show that the existence of effective institution plays a crucial role in building logistics centers in ports. Recently, some ports in the East Asian region have set up a new port policy, whose goal is to stimulate employment and create added-value in the region's economy by establishing logistics centers in ports. They launched the logistics-related laws and national strategies to transform and upgrade them to the next level of logistics development.

As part of its logistics-promotion efforts, the Japanese government enacted a special law in July 1992 called the *Law on Extraordinary Measures for the Promotion of Imports and Facilitation of Inward Investment*. The stated purpose of the law was to enhance access to the Japanese market for foreign products and to encourage more foreign companies to export to and/or invest in Japan. The law permitted the establishment of a nationwide

network of FAZs, which establish and strengthen logistics facilities located in ports.

Singapore already launched the *Logistics Enhancement and Applications Programme*, as well as the *Logistics Master Plan*, which was drafted by a steering committee comprised of thirteen agencies and headed by the then TDB. Both of these aim to position Singapore at the forefront of logistics services in the region by creating new logistics capabilities and enhancing competitiveness.

In support of the development of ports of Taiwan into regional logistics centers, Taiwan introduced *The International Logistics Center Operation Act* in 1999 under the *Asia Pacific Regional Operation Center (APROC)* plan. The APROC plan was launched in January 1995 in an effort to encourage global firms to set up regional operation centers in Taiwan as their base for business and logistics in Southeast Asia and mainland China. For effective implementation of the plan, most of the legal revisions were embodied in one comprehensive piece of legislation for speedy enactment as a package. *The International Logistics Center Operation Act* is also focusing on amending laws and regulations that are outdated and no longer suitable for newly emerging business practice.

Several years ago, the Korean government also enacted *The Act on Designation and Management of Customs-Free Zones for Fostering International Logistics Centers*, and Busan and Gwangyang ports have been designated as customs-free zones. However, this act raised two major problems due to its inflexibility and the overly rigid regulations regarding FTZ and logistics centers.

The first was its minimum physical requirement to be designated as customs-free zones. However, such a method of prioritizing certain seaports only by physical size will not be successful. Instead, it will be necessary to develop major trading ports, as well as adjacent areas, into customs-free zones. It is both rational and internationally accepted to prioritize certain areas as customs-free zones based on their potential economic impact rather than on physical conditions. Only by this method can global firms invest in areas that can operate at their full capacity based on functional characteristics and the amount of land required to build VAL service complexes in each region.

Another problem was the exclusion of production functions such as processing, manufacturing and assembly within customs-free zones. In most free trade zones, it is normal to include functions such as manufacturing, assembly and processing, in addition to VAL services. Only in this way can synergy be achieved. Therefore, it is essential to integrate logistics and manufacturing functions into FTZs, then the logistics promotional function and the value-added logistics function can be greatly enhanced.

Action 2: Forging key drivers for building ports into logistics centers must be encouraged to execute the tasks more efficiently and effectively.

Some government agencies and institutions in the Netherlands and Singapore have been given credit for building their ports into logistics hub and leveraging the existing base of regional logistics centers located in their countries to provide integrated logistics support for MNCs operating in Europe and Asia respectively.

The Netherlands' role as an international logistics and distribution center was promoted by two key drivers: the Netherlands Foreign Investment Agency (NFIA) and the Holland International Distribution Council (HIDC). In Singapore, the corresponding champion agencies have been the Economic Development Board (EDB) and the IE Singapore. These government agencies drew up a logistics master plan to develop Singapore into Asia's leading integrated logistics hub. Ports in the East Asian region must learn lessons from above mentioned ports in order to ensure successful development of logistics centers. Setting up a champion agency will help in executing the task more efficiently and effectively.

IV. CONCLUSIONS

Research findings suggest that, while ship calls and cargo handling is still important success factor, it needs no longer to be the prime focus of small ports overall business strategy. Ports can experience synergistic benefits from the logistics centers to provide value-added services. It is advantageous for a port to be a logistics center, since the logistics center can attract cargo that can be shipped through the port. There is a positive correlation between cargo flows at the logistics center and the number of ships calling at the port. During this study, we have been convinced that VAL services at logistics centers will become a source of growth for ports in the East Asian region when added to the traditional port functions. Since shippers and logistics service providers select individual ports not only based on their cargo-handling capabilities but also their value-added logistics services, providing value-added service becomes a powerful means of achieving sustainable competitive advantage in the current market.

A number of ports have responded to this trend by focusing on value-added services as a means of gaining a competitive edge. Logistics centers in the Netherlands and Singapore

have been the key drivers of these nations' economic growth. The guidelines derived from best practices of successfully re-engineered ports have been presented in this paper. The keys to its success, however, depend on a systems approach from a long-term perspective, and pursuing a win-win strategy, through which both the users and port authorities are able to share the profits of development.

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