CHAPTER 1

Industrial Estates, Ports and Airports and Connectivity in the Mekong Region

Masami Ishida

This chapter should be cited as:

ISHIDA, Masami, 2011. “Industrial Estates, Ports and Airports and Connectivity in the Mekong Region.” In *Intra- and Inter-City Connectivity in the Mekong Region*, edited by Masami Ishida, BRC Research Report No.6, Bangkok Research Center, IDE-JETRO, Bangkok, Thailand.

CHAPTER 1

INDUSTRIAL ESTATES, PORTS AND AIRPORTS AND CONNECTIVITY IN THE MEKONG REGION:

Masami Ishida

INTRODUCTION

Over the past 30-40 years, ASEAN countries have shown remarkable economic growth, primarily by attracting export-oriented foreign direct investment (FDI). After reviewing the development at the local level, it is clear that the areas that received significant amounts of FDI have two common characteristics: a relatively short distance from a port or harbor and a relatively large population (Ishida, 2009, pp. 34-35). A city with a relatively large population is important as it means that the market size is larger on the demand side and the procurement of labor is easier on the supply side.

In the Mekong Region, Bangkok, Ho Chi Minh and Hanoi and their surrounding provinces (what we will call "Greater Bangkok," "Greater Ho Chi Minh," and "Greater Hanoi," hereinafter), have attained outstanding economic development and received a large amount of FDI. At the same time, they have larger populations than other provinces and are in close proximity to large ports, such as Klongtoey Port, Laem Chabang Port, ports along the Saigon River[1] and the Dongnai River, and Hai Phong

[1] Ports along the Saigon River are generally referred to as "Saigon Port." "Saigon Port" is also the name

Port, which have played important roles for supporting import and export activities. In addition to larger populations and smaller distances to ports or harbors, they have hard infrastructures such as ports, airports, industrial estates, roads and electricity and soft infrastructure including incentives for investors, all of which has had a positive effect on their development.

The positive effect of the ports, airports, roads and industrial estates on the development of specific areas is the primary focus of this book. In this book, we have reviewed the development paths of Greater Bangkok, Greater Ho Chi Minh and Greater Hanoi. At the same time, we have also examined the development of promising cities in Cambodia, Lao PDR and Myanmar (CLM countries) such as Phnom Penh, Sihanoukville, Vientiane, Savannakhet, Pakse, Yangon, Mandalay, Mawlamyaine and Dawei. Furthermore, we looked at Babet, Koh Kong and Poipet, three border cities in Cambodia, as firms locating along border areas of Cambodia with Thailand and Vietnam can enjoy Cambodia's advantages in areas such as lower wage and generalized system of privilege (GSP), as well as and Thailand or Vietnam's more developed infrastructure, e.g. cheaper electricity and better access to ports.

Getting back to the subject on the cities, positive economic growth in a specific city attracts migration from other areas and the resultant increase in population causes the residential area to expand to the outskirts of the city. On the other hand, the coexistence of existing factories and new residences causes a lot of confusion, including an increase in traffic and accidents, as well as environmental pollution. What this means is that residential space and manufacturing space should, ideally, be separated, with factories moving into industrial estates on the outskirts of the city area.

---

of a firm that operates many terminals along the Saigon River and others. In order to avoid confusion, we will refer to "ports along the Saigon River" in this chapter.

Positive economic growth also increases the income level of the people, which combined with the increase in population results in increased consumption, especially in terms of sales of motorcycles and cars. In addition, the development of the manufacturing sector increases the number of trucks and trailers, which further adds to the traffic congestion.

However, the increase in vehicles is not the only reason for the traffic jams. For example, if there is no outer-ring road, a factory on the outskirts of a city may have to traverse the city center to deliver goods to another big market or port located on the other side of the city. This will lead to additional congestion in the center of the city. Additionally, many large cities in the Mekong Region are located on big rivers. If the number of the bridges is limited, this, too, can add to traffic jams, especially near the bridges.

There are several ways to alleviate the traffic jams, such as developing a network of flyovers at key intersections and constructing bridges, by-pass roads and outer ring roads. However, when the supply of such physical infrastructures does not match a city's economic growth, future economic growth is hindered by the negative externalities like traffic jams. This phenomenon was seen at Bangkok in the 1990s and can currently be seen in Ho Chi Minh and Hanoi. In Phnom Penh, Yangon, and even in Vientiane, traffic jams have also become serious. The second focus of this book, therefore, is on the issues of traffic jams and the above-mentioned transport infrastructure plans.

Moving on to ASEAN Connectivity and economic corridors under the Greater Mekong Subregion (GMS) program, cross-border obstacles have been focused on as bottlenecks for the economic corridors, e.g. Ishida (2010). In addition to the

cross-border obstacles, however, the cities with well-chronicled traffic jams also hamper smooth logistics along the economic corridors. For example, the traffic jams in Phnom Penh can be a big obstacle for logistics on the Central Sub-corridors of Southern Economic Corridor. Thus, the third focus of this book is on intra-city connectivity, especially trunk roads that extend in all directions from a city, outer-ring roads and the location of river crossings.

In addition to intra-city connectivity, inter-city connectivity is also examined. More concretely, we have examined alternative roads, such as National Roads (NR) No. 4 and No. 3, both of which connect Phnom Penh and Sihanoukville. There are several roads connecting Phnom Penh and Ho Chi Minh City, including the NR No. 1 of Cambodia and NR No. 22A of Vietnam, NR No. 7 of Cambodia and NR No. 22B Vietnam, and NR No. 8 of Cambodia.

Furthermore, as connecting routes between Hanoi and Bangkok, the NR No. 9 (a section of East West Economic Corridor), NR No. 8 and NR No. 12 of Lao PDR and Vietnam[2] are also alternatives. These alternative roads complement each other, but the areas along each road compete for development.

The details of each city, based on the three viewpoints described above, are the focus of the following chapters. In Chapter 2, the book examines the experiences of Greater Bangkok, which began to solve its traffic jams since the 1990s. The continuing chapters introduce the cities in the CLMV countries; Cambodia (Chapter 3), Lao PDR (Chapter 4), Myanmar (Chapter 5), Greater Hanoi Area (Chapter 6) and Greater Ho Chi Minh Area (Chapter 7). Chapter 8 analyzes the above-mentioned alternative roads.

In this chapter, benefits of investing in industrial estates are examined in Section 1.

[2] The names of the three roads are common in Vietnam and Lao PDR as a result of the common history during the French Indochina.

The scales of ports and harbors and of airports in the Mekong region are compared in Section 2 and Section 3, respectively. With comparing, the positions of each port or each airport in the Mekong Region can be cleared. The geographical locations of industrial estates, ports, airports and roads are analyzed in Section 4. Finally, concluding remarks summarize and review the analysis of this chapter.

1. INDUSTRIAL ESTATES AND SEZS

1.1. Benefits of Investing in Industrial Estates and in SEZs in General

Industrial estates, industrial parks or industrial zones have played important roles for the development of manufacturing industries and attracting foreign direct investment (FDI).

For foreign investors, there are significant benefits to investing in an industrial estate. To begin with, investors do not have to search for land by themselves. This is particularly significant when investors provide 100% of the equity in the project and there are no domestic joint-venture partners. Second, the firm operating the industrial estate can assist the investor with the procedures for obtaining investment approval and other matters. As foreign investors usually are not able to read, write and speak local languages well, this benefit is also large for them.

Third, by locating in an industrial estate, investors do not have to develop infrastructure, such as access roads to the trunk road, electricity, water, waste water and telecommunication facilities, however, not all industrial estates supply all these facilities. These infrastructure facilities are beneficial not only for foreign investors, but also for domestic investors. Fourth, the government sometimes gives incentives for

the firms invested in the industrial estates (Shiraishi, 2010. pp. 69 – 70). Lastly, in lesser-developed countries, firms can be free from the poor investment climates and security at the industrial estates because the estate is fenced and the security can be checked carefully.

Firms that import parts and components from other countries and export 100% of the products after assembling[3] can be exempt from the import tax on the parts and components if they invest in an export processing zone (EPZs), especially in cases where the government promotes exports. Export processing zones are fenced areas from which firms cannot sell to the domestic market; often times, part of an industrial estate is fenced as an export processing zone. When a firm in an EPZ imports parts and components to the factory or exports the products, the process is checked by the customs officials. After being checked, the cargos or containers usually do not have to be checked again at customs at the port, the airport or the land border if they are sealed (locked) and cannot be opened on the way. Thus, there are significant benefits for an export-oriented firm to invest in an EPZ.

From the government side, investors in industrial estates and EPZs are easier to administer because the identification of firms is easier. In addition, in city areas, local and central governments encourage firms to move into the industrial estates when residential areas have expanded to the manufacturing areas.

1.2. Specific Benefits to Invest in Industrial Estates and SEZs by Country

In Thailand, the history of industrial estates is longer than in other countries in the Mekong Region and amount of foreign direct investment (FDI) has increased since the

[3] Or also can supply to other firms in the export processing zones or in other EPZs so long as all the products are finally exported directly or indirectly.

middle of 1980s. Now, many firms that produce parts and components for electric and electronics industries and automotive industries are located in the Greater Bangkok Area. So, firms can enjoy the benefits of the agglomeration of these parts and component industries if they invest in the industrial estates in the Greater Bangkok Area.

In addition, for projects locating in Zone 1 and Zone 2, the corporate income tax holiday period is longer than if they located outside of the estates. Thailand is divided into three zones, each of which receives different tax incentives. Zone 1 includes Bangkok and five surrounding provinces. Zone 2 comprises eleven provinces that are near to Bangkok, as well as the more-developed province of Phuket, while the rest of the country is classified as Zone 3. Firms that locate in industrial estates in Zone 1 are eligible for a corporate income tax holiday of three years, while those outside of industrial estates receive no tax holiday. Firms in industrial estate in Zone 2 are eligible for tax holidays of seven years, while those outside of industrial estates only receive a three-year tax holiday.

In Cambodia, special economic zones (SEZs) correspond to industrial estates. As conditions, an SEZ must have land of more than 50 hectares and a production area inside, while it may have a free trade area, a service area, residential area and tourism areas. An SEZ must have a water sewage network, a wastewater treatment network, a location for storage and management of solid waste, and environment protection measures and other related infrastructure as deemed necessary.

One stop service office is provided for each SEZ by Cambodia's Special Economic Zone Board (CSEZB) (CDC, 2010, V-1). The one stop service office includes officials of the Council for the Development of Cambodia (CDC), General

Department of Customs and Excise of Cambodia (GDCEC), CAMCONTROL (Cambodia Import Export Inspection & Fraud Repression Department),[4] Ministry of Labor and Vocational Training (MLVT). MLVT officials are evaluated to settle the labor issues in SEZ fairly and the trucks and trailers are exempted from inspection at the ports, airports and land borders because the officials of GDCEC and CAMCONTROL inspect imported materials and products being exported inside the SEZ. Import and export procedures, as well as investment procedures, can be done inside the SEZ, and this system is well-rated by firms that have invested in the SEZ outside of Phnom Penh, as they do not have to go to Phnom Penh for such kinds of processes (Ishida, 2010B, pp. 10-12). This is especially useful for firms that have invested in Manhattan SEZ or Tai Seng SEZ, as they can export products to third countries from the ports of Ho Chi Minh City without inspection at the ports if the exporting products are checked inside the SEZ and the cargos are sealed (bonded customs clearance).

In Lao PDR, as of 2010, there is one existing SEZ, Savan-Seno SEZ, in Savannakhet Province, while new SEZs are planned in several provinces, including Khammouan and Champasak. Savan-Seno SEZ comprises four sites (A-D), and Savan Pacifica Development Co. Ltd. developed an industrial estate in Site C. Firms that invest in the SEZ can enjoy several incentives.

First, the condition of tax holiday is more beneficial inside the SEZ. For example a manufacturing firm for which 70% or more of its products are exported can enjoy a 10-year tax holiday. A manufacturing firm for which the export ratio is 30% or greater than 30% and less than 70% can enjoy a seven-year tax holiday, while a manufacturing

[4] CAMCONTROL is a special organization in Cambodia that inspects and supervises export and import activities. It is under the Ministry of Commerce.

firm whose export ratio is less than 30% can enjoy a five-year tax holiday. The tax rate after the tax holiday period is 8%, whereas the general corporate income tax ratio in Lao PDR is 20%. This kind of tax holiday can also be enjoyed by service sector firms, although the length and tax ratio is different based on the amount of the investment (Savan-Seno Special Economic Zone Authority, 2004).

On the other hand, for firms outside of the SEZ, the tax holiday period is seven years, in the longest case, and the corporate income tax ratio is 10% after the tax holiday, but this is only given to firms locating in areas with poor infrastructure. For firms which invest in areas with better infrastructure, such as Vientiane, the tax holiday period is just two years and the tax rate is reduced to 5% for two years after the tax holiday; the firms have to pay 20% of profit as corporate income tax later.

Second, the land use fee is exempted for the first twelve years in case that the investor continues the operation in SEZ for 30 years and more (Ishida, 2010B, p.7). Third, bonded customs clearance is possible, so the products, after crossing the border between Lao PDR and Thailan, are re-exported from ports in Thailand to the third country without the inspection at the ports and airports in Thailand. Fourth, firms in the SEZ do not have to go to Vientiane for import and export procedures, nor for investment procedures, because of the one stop service.

In Myanmar, it is said that the firms in city areas are forced to move to industrial estates in the outskirts of the cities. However, special services in terms of electricity, telecommunications, water and wastewater are not provided by industrial estates in most industrial estates in Myanmar.

In Vietnam, it is said that electricity is supplied to industrial estates and hospitals with higher priority. As a matter of fact, according to a 2008 survey conducted by

Economic Research Institute for ASEAN and East Asia (ERIA), the evaluation on electricity was better among the firms in the industrial estates and in SEZs than outside of them (Ishida, 2010C, p.55). In addition, industrial estates have to establish a common wastewater treatment facility in accordance with government decree No. 29, 2008, which was not the case before (Shiraishi, 2010, pp.67-68).

2. PORTS AND HARBORS

As mentioned at the beginning of the introduction, access to ports and harbors is an important factor for attracting FDI, as ports and harbors play important roles for domestic and international trade. As a matter of fact, there are quite a few port cities that had been developed in the Mekong Region a long time ago, e.g. Ayutthaya in Thailand and Hoian in Vietnam. Well before the 19th century, ports had been developed along rivers and in bay areas to minimize the influences of winds and waves.

In fact, more than a few large cities in the Mekong Region have been developed from river port cities. For example, Bangkok grew following the development of Klong Toey Port on the Chao Phraya River. In the same way, Ho Chi Minh, Yangon, Mandalay and Phnom Penh were also developed with ports. Ho Chi Minh is adjacent to the ports along the Saigon River; Yangon was built around Yangon Port on the Yangon River; Mandalay was built adjacent to Mandalay Port on the Irrawaddy River; and, Phnom Penh developed around Phnom Penh Port on the Mekong River." Over the past fifty years, due to the expanding size of freight ships and the development of construction technology, however, deep sea ports such as Laem Chabang Port of

Thailand and Tien Sa port of Danang have become major international ports. But Thi Vai-Cai Mep port[5], which currently draws more attention, is a river port, which is one of the deepest ports in the Mekong Region.

Table 1 shows the length, depth, dead weight tonnage (DWT)[6], areas of yards or stations and warehouses, as well as the functions of each berth of major ports in the Mekong Region.

Now let us compare Klong Toey Port as an older river port, and Laem Chabang Port as a deep sea port. With a measure of DWT, the berth capacity of Laem Chabang Port is 4–10 times larger than that of Klong Toey Port. As far as comparing the length of berths, however, it does not make a significant difference; what makes the difference is the depth[7].

Table 2 shows the standard scales of length overall, breadth (width) molded, full load draft,[8] DWT and the number of containers that can be loaded by each class of ship. The required levels of berth length for a ship of 10,000 DWT and 20,000 DWT are between 139–177 meters, which is shorter than the berth length of Klong Toey Port. On the other hand, the required depth for a ship of 20,000 DWT is 10.0 meters, which is deeper than the depth of Klong Toey Port. Using the unit of the number of containers that can be loaded, a container ship of 6,300–6,700 TEU class can drop at Laem Chabang Port, while the scale of ship that can be received at Klong Toey Port is less

[5] It is also called as "Caimep-Thivai." Thivai River and Caimep River is the same river and the former is the upstream and the latter is the downstream.
[6] DWT is a measure of how much weight a ship is carrying or can safely carry and it does not include the weight of the ship.
[7] The data on depth should be evaluated carefully. The depth can be changed by tidal conditions and by the rainy and dry season, especially in the case of river ports. It can be shallower by time if the soil is accumulated on the bottom and can be recovered after being dredged.
[8] The vertical distance between the waterline and the bottom of the ship's hull with the thickness of hull included. Draft determines the minimum depth of water a ship or boat can safely navigate. The draft can be changed in accordance with dead weight tonnage (DWT).

Table 1: Indicators on Scales of Major Port Terminals in Mekong Region (Continues)

	Length (m)	Depth (m)	DWT (ton)	TEU	Yard (m^2)	Warehouse (m^2)	Functions
Bangkok (Klongtoey) Port	7.688.0	8.23	12,000				FCL & LCL, General Cargo
Leam Chabang							
Tetminal A0	150.0	16.50	70,000				Ro/Ro
Terminal A1	365.0	14.00	70,000				Passenger & Ro/Ro
Terminal A2	400.0	14.00	50,000				
Terminal A3	350.0	14.00	50,000				General Cargo
Terninal A4	350.0	14.00	40,000				General & Bulk Cargo
Terminal A5	450.0	16.00	70,000				
Sub Total[1)]	2,065.0						
Terminal B1	300.0	14.00	50,000				FCL & LCL
Terminal B2	300.0	14.00	50,000				FCL & LCL
Terminal B3	300.0	14.00	50,000	4,692	4,620		FCL & LCL
Terminal B4	300.0	14.00	50,000	6,672			FCL & LCL
Terminal B5	400.0	14.00	120,000				FCL & LCL
Sub Total	1,600.0						
Terminal C0		6.5 - 8.5					
Terminal C1		6.5 - 8.5					
Terminal C2		6.5 - 8.5					
Sihanoukville Autonomous Port							
Container Terminal (5 berths)	750	10.00			17,000		
Inner Berth of Old Jetty (2 berths)	290	8.00					
Outer Berth of Old Jetty (2 berths)	290	9.00					
Sokimex Terminal	200	10.50	13,000				
Stone Wharf	53	4.20					
Phnom Penh Autonomous Port							
Container Terminal	300.0	4.2 - 6.5	3,000		108,249	3,600	General Cargo, LCL & FCL
Domestic Port (2 berths)	333.0	3.0 - 4.0	300				General Cargo
Yangon Port							
Ahlone Wharves (3 berths)	614.0			1,000	54,041	6,430	Container
Myanmar Industial Port	310.0			300	102,385	6,140	Container
Bo Aung Gyaw Wharves (3 berths)	457.0			1,000	48,000	400	Container
Hteedan Rice Berth	139.0					6,889	Rice & Rice Products
Sule Pagoda Wharves (7 berths)	1,026.5				36,809	67,520	General Cargo
Port Health Jetty	91.0				21,737	4,366	General Cargo
Hteedan Berth	180.0				21,739		General Cargo
Thaketa Wharves (2 berths)	212.4				16,294	4,462	General Cargo
MIPL Wharf	200.0				20,000	3,000	
Myanmar International Terminals, Thilawa	1,000.0	9.00	35,000	1,500	500,000		

Table 1: Indicators on Scales of Major Port Terminals in Mekong Region (Continued)

	Length (m)	Depth (m)	DWT (ton)	TEU	Yard (m^2)	Warehouse (m^2)	Functions
Hai Phong Port							
Central Terminal (11 Berths)	1,717.0	8.40	10,000		163,000	31,320	General & Bulk Cargo, LCL
Chua Ve Container Terminal (5 berths)	848.0	8.40	10,000		179,400	3,300	
Hai Phong New Port (5 berths)	1,002.0	8.70	40,000		101,000		
Quang Ninh (Cai Lan) Port							
Berth No. 1	166.0	8.60	25,000		2,200		General, Bulk & Others
Berth No. 5	220.0	12.00	75,000		26,000	5,400	General, Bulk & Others
Berth No. 6	220.0	12.00	75,000		52,000	4,600	
Berth No. 7	220.0	12.00	45,000		49,000		
Saigon River							
Saigon New Port (Tang Cang Terminal)	704.0				275,000	24,050	FCL & LCL
Saigon Port (Nha Rong Terminal)	139.0	9.10					
Saigon Port (Khanh Hoi Terminal, 13 berths)	1,665.0	7.3-10.0					
Saigon Port (Tan Thuan Terminal, 4 berths)	713.0	11-12.1					
Ben Nghe Port (4 berths)	816.0	9.5-13.0	36,000		200,000	11,520	FCL, LCL & Bulk Cargo
VICT (4 berths)	678.0	10.0					
Saigon Port (Tan Thuan 2 Terminal)	222	10.50					
Dongnai River							
Cat lai Terminal (7 berths)	1,189.0	12.00	30,000	2,000	568,000	80	
Thivai-Caimep River							
Saigon-International Terminals Vietnam	730.0	14.00					
SP-PSA International Port (2 berths)	600.0	14.50	50,000				
Tan Cang Cai Mep Port (3 berths)	890.0	15.80	110,000	9,000	480,000	60	
Danang Port							
Tien Sa Port (3 berths)	965.0	11.0-12.0	45,000	2,000	82,230	2,160	
Song Han Port (5 berths)	528.0	6.0-7.0	5,000		16,330	3,314	

Note 1) Total length of Terminal A is the summarized values of the above-mentioned terminals.

Sources: 1) Klong Toey, Laem Chabang and Yangon Port are based on survey results.
2) Sihanoukville, Haiphong, Quang Ninh, Saigon and Saigon New Port, Danang Port are based on brochures.
3) VICT and Ben Nghe Port are based on the websites.

than 1,000 TEU class.

The port areas that can received the same level of freight ships with Laem Chabang Port are Thivai-Caimep area; SP-PSA International Port can receive a ship of

Table 2: Relation among DWT, Length, Width, Draft and TEU by Scale of Ships

<Under-Panamax Ship>

DWT (t)	Length (m)	Width (m)	Draft (m)	TEU
5,000	109.0	17.90	6.3	300 - 500
10,000	139.0	22.00	7.9	630 - 850
20,000	177.0	27.00	10.0	1,300-1,500
30,000	203.0	30.40	11.4	2,000-2,200
40,000	225.0	30.60	12.5	2,600-2,900

<Panamax Ship>

DWT (t)	Length (m)	Width (m)	Draft (m)	TEU
30,000	201.0	32.30	11.3	2,100-2,400
40,000	237.0	32.30	12.0	2,800-3,200
50,000	270.0	32.30	12.7	3,400-3,900
60,000	300.0	32.30	13.4	4,000-4,600

<Over-Panamax Ship>

DWT (t)	Length (m)	Width (m)	Draft (m)	TEU
60000	275-285	37.2-40.0	12.7-13.8	4,300-5,400
70000	276-280	40.0-40.0	14.0-14.0	5,300-5,600
800, - 100,000	300-304	40.0-42.8	13.5-14.5	6,300-6,700

Source: Takahashi, *et al*. (2006).

50,000 DWT and Tan Cang Cai Mep Port can receive a ship of 110,000 DWT. The scale of terminals of Thivai–Caimep area can receive Panamax Class freight ships, which are between DWT 30,000 and DWT 60,000 (Table 2). The specific feature of Panamax is the width of the ship (32.30 meter), and the columns of containers are limited to thirteen, in the case of a container ship.

The width of the ship is limited by the width of the locks of the Panama Canal (33.53 meter). A new Panama Canal has been under construction and will be completed in 2014. Then the width limit will be expanded. On the other hand, the ships which are larger than Panamax Class are called as Post-Panamax ships.

Cai Lan port can also receive Panamax Class ships and Tien Sa Port of Danang is positioned after Cai Lan Port in the scale. Then Din Vu Terminal (Hai Phong New Port) Ben Nghe Port, Cat Lai Terminal, Myanmar International Terminal Thilawa (MITT) are positioned as medium-scale ports that can receive ships between 30,000 DWT and 40,000 DWT, or around 2,000 TEU. Klong Toey Port and Central and Chua Ve Container Terminal of Hai Phong Port are positioned as small-scale ports; Song Han Port of Danang and Phnom Penh Autonomous Terminal are further smaller-scaled ports.

The scale of cargo or container throughput (Table 3), however, is not only dependent on the size or depth of the port, but also on the economic scale of the surrounding areas of the port. For example, Hai Phong Port is shallower than Cai Lan Port (Quang Ninh Port) and Tien Sa Port of Danang, but the container throughputs of Haiphong Port is 4.4 times that of Cai Lan Port and 10.2 times that of Danang Port, while the summarized container throughput of Saigon New Port, Cat Lai Terminal and Tang Can Caimep Port (Saigon Newport Corporation) is three times larger than Hai

Table 3: Container Throughput of Major Ports in Mekong Region

	2005	2006	2007	2008	2009
Sihanoukville Autonomous Port	211,141	231,036	253,271	258,775	207,861
Phnom Penh Autonomous Port	30,281	38,233	47,504	47,507	43,312
Myanmar International Terminals, Thilawa	171,905	197,225	226,503	264,006	281,704
Hai Phong Port	424,155	463,899	683,689	790,000	815,831
Quang Ninh (Cai Lang) Port	118,637	113,360	34,481	33,220	185,235
Saigon New Port	1,086,245	1,470,000	1,849,746	2,017,863	2,454,000
Danang Port	34,383	37,404	53,372	65,000	80,000

Sources: 1) The data of Sihanoukville, Hai Phong, Quang Ninh, Saigon New Port and Danang Port are based on respective brochures.
2) The data of Phnom Penh are based on the power point sheet for the public relations.
3) The data of Thilawa are based on survey results.

Phong Port[9].

But it has been said that Haiphong Port cannot catch up with the increasing freight demand of the Greater Hanoi Area. So, Hai Phong New Port or Dinh Vu Terminal will be expanded. In addition, there are plans to construct Lach Huyen port by reclaiming the offshore of Dinh Vu Island, which will accommodate a ship of 50,000 DWT with the depth of 10.8 meters. The potential container throughput of Hai Phong Port is larger than its actual throughput. The container throughput of Phnom Penh Autonomous Terminal is also said to be increased by the development of Phnom Penh Second Container Terminal, which is being constructed with the assistance of China.

3. AIRPORTS

As well as ports and harbors, the location and scale of airports is also important. This section will discuss the length, width, and number of runways of major airports in the Mekong Region, as well as terminal area, and number of flights and passengers handled.

What is the relationship between the “length and width” of runways and the size of airplanes? Just as the increase in weight of freight make the draft of a ship deeper, the increase in passengers and in the amounted weight of luggage and in the quantity of fuel makes the required length of the runway longer. For example, the required take-off distance and landing distance of the Boeing 747-400D, a jumbo jet model designed for domestic flights, is 2,280 meters and 2,110 meters, respectively. However, it is better for a runway for a Boeing 747 class aircraft to be 3,000–3,500 meters and better still if

[9] Saigon Newport Corporation is more specialized in carrying container ships.

it is 4,000 meters so that for domestic flights, the fuel quantity in the tank is not needed to be high.

The International Civil Aviation Organization (ICAO) stipulates the Aerodrome (Airplane) Reference Code (ARC) to specify the standards for individual airports which are suitable for use by airplanes within a range of performances and sizes. The code is composed of two elements: the first element is a number related to the airplane reference field length (ARFL) (four levels: 1 – 4):

1: ARFL is less than 800 meters

2: ARFL is equal to or longer than 800 meters and less than 1,200 meters

3: ARFL is equal to or longer than 1,200 meters and less than 1,800 meters

4: ARFL is equal to or longer than 1,800 meters

The second element is a letter related to the airplane wing span (WS) and outer main gear wheel span (OMGWS) (six levels: A – F).

A: WS is up to but not including 15 meters and
OMGWS is up to but not including 4.5 meters;

B: WS is 15 meters up to but not including 24 meters and
OMGWS is 4.5 meters up to but not including 6 meters;

C: WS is 24 meters up to but not including 36 meters and
OMGWS is 6 meters up to but not including 9 meters;

D: WS is 36 meters up to but not including 52 meters and
OMGWS is 9 meters up to but not including 14 meters

E: WS is 52 meters up to but not including 65 meters and
OMGWS is 9 meters up to but not including 14 meters

F: WS is 52 meters up to but not including 65 meters and
OMGWS is 14 meters up to but not including 16 meters

On the other hand, ICAO also classifies airplane models by code number, airplane reference field length, wing span and outer main gear wheel span (See Appendix Table A).

Table 4: Capacity of Airport Runways in Mekong Region

Airport	City	Code	Lengths (m)	Widths (m)	Maximum Available Aircrafts	
					Boeing	Airbus
Phnom Penh International Airport	Phnom Penh	4D	3,000	44	B767-300ER	A300-600
Siem Reap International Airport	Siem Reap	4D	2,550	44	B767-200ER	A300-600
Wattay International Airport	Vientiane	4D	3,000		B767-300ER	A300-600
Luangphrabang International Airport	LuangPhrabang	4E	2,200	45		A320-200
Savannakhet Airport	Savannakhet		1,633	38		
Pakse International Airport	Pakse		1,625[1)]	36		
Yangon International Airport	Yangon	4E	3,413	60	B747-400	A330-200
Mandalay International Airport		4E	4,267	61	B747-400	A330-200
Noi Bai International Airport	Hanoi	4E	3,200	45	B747-SP	A330-200
		4E	3,800	45	B747-400	A330-200
Tan Son Nhat International Airport	Ho Chi Minh	4E	3,048	45.72	B747-SP	A330-200
		4E	3,800	45.72	B747-SP	A330-200
Suvarnabhumi International Airport	Bangkok	4F	3,700	60	B747-400	A380
		4F	4,000	60	B747-400	A380
Don Mueang Airport	Bangkok	4E	3,500	45	B747-400	A330-200
		4E	3,700	60	B747-400	A330-200

Notes: 1) Maximum available aircrafts are based on Appendix Table A-1.
2) the lengths of the runway of Pakse International Airport is planned to extend to 2,200m (Yamada, 2008).

Source: Made by the author based on survey results, website of ICAO and Material of ICAO, Yamada (2008).

In this meaning, the major airports except Savannakhet Airport and Pakse Airport in the Mekong Region of Table 4 satisfy the max condition on the length of runway (ARFL). As for the width of the runway, Phnom Penh International Airport, Siem Reap Airport, Wattay International Airport of Vientiane are classified as 4D, and many models of Boeing 737 and A320-200 aircraft can be used for these airports. Luangphrabang International Airport is classified as "4E," but this airport is limited by the length of its runway and only some models of Boeing 737 aircraft can land and take off.

Yangon International Airport, Mandalay International Airport, Don Mueang Airport of Bangkok, Noi Bai International Airport of Hanoi, and Tan Son Nhat International Airport are classified as "4E," and the last three have two runways of same level. Many models of Boeing 767, Boeing 777, Boeing 747, A330 and A340 aircraft can be used at these airports. Only Suvarnabhumi International Airport is classified as "4F," while its WS is less than 65 meter. The largest passenger aircraft model, A380, can land on and take off from this airport.

Next let us see the number of flights in 2008 and in 2009. The number of domestic flights at Wattay International Airport in Vientiane is not available, but the scale was estimated to be one-fifth of Phnom Penh International Airport, based on the number of international flights (Table 5).[10]

The number of total flights at Yangon International Airport was a little bit smaller than that at Phnom Penh International Airport, while the number of flights at Suvarnabhumi's International Airport was 12.9 and 12.2 times the number for Phnom

[10] According to Table 5, the number of flights in 2009 of Noi Bai international Airport is the largest. Considering the possibility that the numbers of Noi Bai and Tan Son Nhat International Airport are over or under-estimated, so I do not mention many on the number of flights and passengers of these two airports, respectively.

Table 5: Number of Flights and Frequency of Landing & Taking off per Runway

	Number of Flights						Frequency of Landing & Taking off per Runway			
	International		Domestic		Total		2008		2009	
Airport	2008	2009	2008	2009	2008	2009	per day	per hour	per day	per hour
Phnom Penh International Airport	16,253	16,096	4,130	4,256	20,383	20,352	55.7	2.8	55.8	2.8
Siem Reap International Airport	15,431	13,287	4,551	4,960	19,982	18,247	54.6	3.2	50.0	2.9
Wattay International Airport	3,281	3,485			3,281	3,485	9.0	0.5	9.5	0.6
Luangphrabang International Airport	2,584	3,328	2,820	2,372	5,404	5,700	14.8	1.1	15.6	1.1
Yangon International Airport	7,184	7,886	12,336	12,116	19,520	20,002	53.3	3.3	54.8	3.4
Noi Bai International Airport	67,678	109,661	78,510	160,873	146,188	270,534	199.7	10.0	370.6	18.5
Tan Son Nhat International Airport	29,582	n.a.	29,032	n.a.	58,164	n.a.	80.1	4.0		
Suvarnabhumi International Airport	197,759	175,469	64,675	72,228	262,434	247,697	358.5	17.9	339.3	17.0
Don Mueang Airport	2,904	2,277	90,526	68,475	46,586	28,627	127.6	6.4	96.9	4.8

Note: 1) Frequency per hour is calculated with dividing the frequency per day by the opening hour of the airport. In case of airports with opening for 24 hours, it is divided by 20 hours.

2) The data of Noi Bai International Airport and Tan Son Nhat International Airport are based on the survey results (interviews with the airport authorities) and the data show that the number of flights at the former airport is larger than that at the latter. According to the website news of Vietspace Travel Service dated on January 27, 2011, however, the number of flights per day at Tan Son Nhat International Airport is 370 and larger than 170, the number of flights at Noi Bai Airport. And the number of flights of Vietnam Airlines at Tan Son Nhat International Airport was 58,139 while that at Noi Bai International Airport was 58,139 flights in 2010.

Source: Survey results and Website of Cambodia International Airports.

Penh International Airport in 2008 and in 2009, respectively. On average, 17.0 flights per hour take off or land at Suvarnanhumi International Airport, a rate of roughly one flight every three minutes. The frequency is further increased during the rush hour.

Table 6 shows that, based on the number of passengers, Suvarnabhumi International Airport was the largest in both 2008 and 2009, handling more than 38 million passengers. On the other hand, the numbers of passengers handled by Phnom Penh International Airport, Siem Reap International Airport and Yangon International Airport was between one and two million each.

The ratio of international passengers to domestic passengers at Yangon International Airport was 1.5 in 2009, while the ratios at Phnom Penh International Airport and Siem Reap International Airport were 12.0 and 8.2, respectively. On the other hand, the ratio was 2.3 at "Bangkok," with the number of "Bangkok" domestic passengers including traffic at both Suvarnabhumi and Don Mueang.

When looking at passenger terminals, it is important to understand that Tan Son Nhat International Airport and Don Mueang Airport are divided into separate international and domestic passenger terminals. On the other hand, Suvarnabhumi International Airport's area is not divided into separate terminals. At Phnom Penh International Airport and Yangon International Airport, one terminal is only for international passengers, but the other is used for international and domestic passengers.

As an indicator of supply and demand of passenger terminal, the ratio of number of passengers to the total area of the terminal is calculated. The ratio of Suvarnabhumi, Tan Son Nhat and Phnom Penh is between 60 and 90. On the other hand, that of Noi Bai is 251.6. Even though the data of the number of passengers at Noi Bai International Airport might be overestimated (see the *Notes* of Table 5), the possibility that supply has

not kept up with the increase in demand is high. To meet the rise in demand, there are plans to develop T2 International Terminal Noi Bai International Airport.

Table 6: Number of Passengers and Area of Terminals of Major Airports in Mekong Region

<Number of Passengers>

Airport	International		Domestic		Total	
	2008	2009	2008	2009	2008	2009
Phnom Penh International Airport	1,535,209	1,465,940	156,661	122,046	1,691,870	1,587,986
Siem Reap International Airport	1,361,544	1,118,744	170,276	136,422	1,531,820	1,255,166
Wattay International Airport	410,431	429,632			410,431	429,632
Luangphrabang International Airport	159,654	121,364	116,588	102,174	276,242	223,538
Yangon International Airport	824,595	967,622	654,974	659,607	1,479,569	1,627,229
Noi Bai International Airport	9,138,326	8,906,728	11,284,755	13,733,856	20,423,081	22,640,584
Tan Son Nhat International Airport	3,969,400	n.a.	4,033,200	n.a.	8,002,600	
Suvarnabhumi International Airport	29,779,410	28,562,562	6,993,132	10,210,281	36,772,542	38,772,843
Don Mueang Airport	0	0	5,017,208	2,445,571	5,017,208	2,445,571

<Areas of Terminals and Ratio of Number of Passengers with the Areas>

Airport	Total Area (m^2)			(Number of Passengers)/(Area)		
	International	Domestic	Total	International	Domestic	Total
Phnom Penh International Airport	17,300	1,560	18,860			84.2
Siem Reap International Airport						
Wattay International Airport	14,578			29.5		
Luangphrabang International Airport			2,500			89.4
Yangon International Airport	15,922	2,860	18,782	92.1	42.7	24.2
Noi Bai International Airport			90,000			251.6
Tan Son Nhat International Airport	93,000	30,000	123,000	42.7	134.4	65.1
Suvarnabhumi International Airport			563,000			68.9
Don Mueang Airport	109,033	22,266	237,886	0.0	109.8	10.3

Note: The number of passengers at Tan Son Nhat International Airport in 2010 is 16,460,847 according to website of Southern Airports Corporation. As shown in the Notes of Table 5, there is a possibility that the number of passengers at Noi Bai International Airport is smaller than that at Tan Son Nhat International Airport.

Source: Survey results and Website of Cambodia International Airports.

4. CITY CONNECTIVITY

The location of industrial estates, ports, airports, trunk roads and rivers influence the development of the city. If there is only one trunk road and the city along the road expands, by-pass roads are developed as alternative roads. On the other hand, if there is a big city and several trunk roads extend in different directions and the city expands in all directions, an outer ring road is needed. These are more common. The existence of a large river, however, makes some differences among cities.

Bangkok is a rare case in that both sides of Chao Phraya River were developed at least one hundred years ago; the western bank of the river is Thonburi and the eastern bank is Phra Nakhon (Figure 2, Chapter 2). Industrial estates are located in Samut Prakan, Chonburi, Rayong, Chachoeng Sao and Ayutthaya provinces and these provinces are all eastern side of Chao Phraya River while Ayutthaya is located beyond the north of Bangkok. Laem Chabang Port is located on the Eastern Seaboard and Suvarnabhumi Airport is on the way to the Eastern Seaboard from Bangkok (refer to Figure 12, Chapter 2). So, the firms in the above-mentioned provinces can access Laem Chabang Port and Suvarnabhumi Airport without passing through the center of Bangkok and crossing Chao Phraya River, while firms in Ayutthaya can directly go to Suvarnabhumi Airport by using an expressway. In this regard, there are no clear logistics bottlenecks due to location.

Phnom Penh city has been developed at the west bank of Tonle Sap River and Basak River where the Tonle Sap River crosses with the Mekong River and the Basak River separates from Mekong River. The east bank of the Mekong River almost has never been developed. Most of the trunk roads gather at Phnom Penh. NR No. 1,

toward Ho Chi Minh, and No. 2, toward Takeo, start from the southern end of the west bank of the Tonle Sap and Basak Rivers. NR No. 3, toward Kamport, and NR No. 4, toward Sihanoukville, all start at the western end of Phnom Penh, and Phnom Penh International Airport is located in this area. NR No. 5, toward Bangkok or Battambang, NR No. 6, toward Siem Reap, and NR No. 7, toward Kampong Cham, all start at the northern end of the west bank of the Tonle Sap River, and the Phnom Penh Autonomous Port (PPAP) is located in this area (See Figure 12 and Figure 13, Chapter 3).

Phnom Penh SEZ (PPSEZ) is on NR No. 5 and very close to Phnom Penh International Airport (PPIA). From PPSEZ to PPAP, or from firms in Kampong Chnang to PPIA, trucks and trailers pass an outer road which connects NR No. 4 and NR No.5, and, thus, do not have to pass through the center of the city.

From the direction of NR No. 1 and No. 2 to the direction of NR No. 3 and No. 4, there is a connecting road, but it is often congested. In this meaning, the traffic jams in Phnom Penh City is very chronicle.

In Vientiane, NR No. 13 which carries people and goods from the North to the South in Lao PDR passes through the center of the city. On the other hand, there is another road which leads to the First Mekong Friendship Bridge. Wattay International Airport is located along NR No. 13 to the north. In recent years, traffic jams have become an issue in Vientiane, but the problem is not as serious as in big cities in other countries in the Mekong Region.

The linkage between the road to the Friendship Bridge and NR No. 13 is not good, and trucks and trailers have to go through the center of the city. The newly developed 450 Years Memorial Road connects the bridge and NR No. 13, and Vientiane Industrial District has been developed at the intersection of the 450 Years Road and KM21 road

(see figure 18, Chapter 4).

So far domestic market oriented factories tend to be located along NR No. 13 and export oriented firms tend to be located along the road to the Friendship Bridge. Therefore, the 450 Years Road is expected to improve the linkages between the domestic market oriented factories and export oriented factories.

Downtown Yangon has been developed at the intersection of the Yangon and Bago Rivers (the second and the largest river in Figure 2, Chapter 5, respectively). The city of Yangon has been developed to the north of that intersection. NR No. 1 starts from the northern end of Yangon and other national roads, such as NR No. 2 toward Bagan and NR No. 3 toward Mawlamyaine, are separated from NR No. 1 on its northern extension. Thus, NR No. 1 is a very important road as it carries people and goods to all other markets in Myanmar. Accordingly, the airport and some industrial estates are located in the northern part of Yangon. Industrial estates are also located along the west and east banks of the Hlaing River (a branch of Yangon River, flows from the left in Figure 2, Chapter 5).

With most of the terminals of Yangon Port are located along Yangon River, traffic jams often occur at Insein Road, Bayint Naung Road and Pyay Road, all of which travel from the downtown to the north. As for Yangon Port, however, there are shallow points at the mouths of Yangon River and Pazun Daung Creek (Monkey Point). So, navigation becomes impossible when the tide is low. To promote exports, some businessmen say it will be necessary to expand the terminals at Thilawa. The construction of bridges on the Bago River and the development of the east bank of the Bago River will also be needed in the future.

Hanoi City was developed on the west bank of Red River. In general, the city

expands to the west, but the industrial estates were developed the east bank of the Red River. One big reason that the industrial estates were developed on the east bank is because NR No. 5, which goes to Hai Phong Port, starts at the east bank of the Red River and, therefore firms transporting foods to market do not have to cross the Red River bridges. Other industrial estates also have been developed along NR No. 5 and along NR No. 1 toward the north (see Figure 1, Chapter 6). Some industrial estates are located along Thanlong Boulevard toward Noi Bai international Airport. This group of industrial estates is located on the same side with the east bank but the connecting road to NR No. 1 and NR No. 5 is still under construction. As for the connection between the east bank area and NR No. 1 to the south, automobiles have to pass through the center of the city. The development of the third outer ring road has created a shortcut. With the development of the third outer ring road and the bypass road of NR No. 1 to the north, the number of industrial estates in Bach Ninh province has increased. The development of Hai Phong Port, however, has not yet caught up with the increased demand.

Ho Chi Minh City was developed on the west bank of the Saigon River and the east bank has been underdeveloped because the land is damp. In recent years, the east bank has been developed as a new frontier. In Ho Chi Minh City, port terminals are located along the Saigon and Dong Nai Rivers, and Tan Son Nhat International Airport is located in the city. Industrial estates have been developed in Dong Nai Province along NR No. 1, in Bin Duong Province along NR No. 13, and in an inner city area along NR No. 22 (Figure 5, Chapter 7). In other words, the airport and ports are located in the center and the industrial estates are located on the outskirts of the city. Thus, trucks and trailers tend to gather at the center of the city; the passing of trucks in the center of the city, however, is prohibited in daytime. In the morning and in the evening, there is also a

rush of commuters from the outskirts to the center of the city. Thus, the traffic jams in Ho Chi Minh City are very serious. The development of the Beltway and city railways/subways have been promoted to help deal with these transport issues.

On the other hand, new terminals have been developed in Baria-Vungtau Province along the Thivai–Caimep River, and the new Long Thanh Airport plans to be developed on the way to Baria-Vung Tau Province along NR No. 51. However, too much dependence on ports along the Thivai – Caimep River can bring about traffic jams on NR No. 51. In this meaning, ports along the Saigon and Dongnai Rivers are used for ships that travel through Asia, while ports along the Thivai–Caimep River are used for ships to the United States and Europe[11].

CONCLUDING REMARKS

The benefits of investing in industrial estates have been explained, both in general and in each country. Ground pictures and the relative positions of ports and harbors and airports in the Mekong Region have been drawn. Regarding the ports and harbors, mismatches of supply and demand in terms of port infrastructure have been observed. As for airports, tight schedules of runways have been observed in Vietnam and Thailand. The situation regarding the terminal of Noi Bai International Airport not catching up with increasing demand has been made clear, and the development of T2 International Terminal needs to be hastened. As for city transport, geographical features are briefly reviewed in major cities in the Mekong Region. In this way, the following chapters deepen the analysis on industrial estates, ports and harbors, airports and city transport

[11] Interview with Saigon New Port dated on September 21, 2010.

on a city-by-city basis.

APPENDIX

Table A1: Airplane Classification by Code Number and Letter

Model	Code	Airplane Reference Field Length (m)	Wing Span (m)	Outer Main gear Wheel Span (m)
B717-200	3C	1,670	28.4	5.4
B737-600	3C	1,690	34.3	7.0
B737-700	3C	1,598	34.3	7.0
B727-100	4C	2,502	32.9	6.9
B727-200	4C	3,176	32.9	6.9
B737-100	4C	2,499	28.4	6.4
B737-200	4C	2,295	28.4	6.4
B737-300	4C	2,160	28.9	6.4
B737-400	4C	2,550	28.9	6.4
B737-500	4C	2,470	28.9	6.4
B737-800	4C	2,090	34.3	7.0
B737-900	4C	2,240	34.3	7.0
B707-300	4D	3,088	44.4	7.9
B707-400	4D	3,277	44.5	7.9
B720	4D	1,981	39.9	7.5
B757-200	4D	1,980	38.1	8.6
B757-300	4D	2,400	38.1	8.6
B767-200	4D	1,981	47.6	10.8
B767-300ER	4D	2,540	47.6	10.9
B767-400ER	4D	3,130	51.9	10.8
B747-100	4E	3,060	59.6	12.4
B747-200	4E	3,135	59.6	12.4
B747-300	4E	3,292	59.6	12.4
B747-400	4E	2,890	64.9	12.6
B747-SR	4E	1,860	59.6	12.4
B747-SP	4E	2,710	59.6	12.4
B777-200	4E	2,390	61.0	12.9
B777-200ER	4E	3,110	61.0	12.9
B777-300	4E	3,140	60.9	12.9
B777-300ER	4E	3,120	64.8	12.9
A320-200	4C	2,480	33.9	8.7
A300 B4	4D	2,605	44.8	10.9
A300-600	4E	2,332	44.8	10.9
A310	4E	1,845	44.8	10.9
A380	4F	3,350	79.8	15.0

Source: Material of ICAO.

REFERENCES

Ishida, Masami (2009) “Special Economic Zones and Economic Corridors.” In *ERIA Research Project Report 2008 No. 5, Research on Development Strategies for CLMV countries*, ed. Kuchiki, Akifumi and Shuji Uchikawa. Jakarta: Economic Research Institute for East Asia and ASEAN (http://www.eria.org/pdf/ERIA-DP-2009-16.pdf).

____ (2010A) ed., *Focusing on Economies of Border Area in Mekong Region* (in Japanese). Chiba: Institute of Developing Economies.

____ (2010B) “Comparing Investment Climates Among Major Cities in CLMV Countries.” In *Investment Climate of Major Cities in CLMV Countries*, BRC Research Report No. 4, ed., Ishida, Masami, Bangkok: Bangkok Research Center, IDE-JETRO.
（http://www.ide.go.jp/English/Publish/Download/Brc/pdf/04_chapter1.pdf）

____ (2010C) “Survey Findings on Investment Climates in Major Cities in CLMV Countries.” In *A Study on Upgrading Industrial Structure of CLMV Countries*, *ERIA Research Project Report 2009, No. 7-3*, ed. Banomyong, Ruth and Masami Ishida, Jakarta: Economic Research Institute of ASEAN and East Asia (ERIA).

Savan-Seno Special Economic Zone Authority (2004) *Compilation of Decrees of the Prime Minister Concerning the Savan-Seno Special Economic Zone*.

Shiraishi, Masaya (2010) “Industrial Estates and Economic Zones in Vietnam.” In New Era in East Asia and Vietnamese Economy, ed. Institute of Vietnam of Waseda University (in Japanese). Tokyo: Bunshindo.

Takahashi, Hironao, Ayako Goto and Motohisa Abe (2006) “Study on Standards for

Main Dimensions of the Design Ship." Technical Notes of NILIM, National Institute for Land and Infrastructure Management. (http://www.nilim.go.jp/lab/bcg/siryou/tnn/tnn0309pdf/ks0309002.pdf)

The Council for the Development of Cambodia (CDC) (2010) *Cambodia Investment Guidebook*, January 2010.

Yamada, Takashige (2008) "Current Situations and challenges of Airway Business in Lao PDR." In *Current Situation and Challenges for a Land-Locked Country, Lao PDR* (in Japanese), Suzuki, Motoyoshi and Norihiko Yamada ed., Vientiane: Laos Office of JICA.

<Websites Referred>

Bennghe Port: http://www.benngheport.com/

Cambodia International Airports: http://www.cambodia-airports.com/

ICAO: http://www.icao.int/icao/en/anb/meetings/

Southern Airports Corporation: http://www.sac.vn/cms/vi/tin-tuc/22/

VICT: http://www.vict-vn.com/

Vietspace Travel Service: http://vietspacetravel.com/