Ministry of Public Works and Transport
Lao Peoples Democratic Republic (Lao PDR)

THE COMPREHENSIVE STUDY ON LOGISTICS SYSTEM IN LAO PEOPLE'S DEMOCRATIC REPUBLIC

FINAL REPORT

Volume 3: Feasibility Study on Savannakhet Logistics Park

January, 2011

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

INTERNATIONAL DEVELOPMENT CENTER OF JAPAN (IDCJ)
NIPPON KOEI

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PREFACE

Lao PDR is located at the center of Greater Mekong Sub-region (GMS). This preferable location currently provides Lao PDR with strategic advantages to transform itself from a “land-locked” to a “land-linked” country, particularly due to globalization in trade and transport and regional economic integration. In this respect, Lao PDR faces a great opportunity to become a regional logistics hub in the GMS and ASEAN region. In cognizance of these situations, the Lao Government has embraced the transformation into a “land linked country” as a major policy essential to the country’s aspirations of graduating from a developing country.

However, there are still several constraints in logistics in Lao PDR; in particular the insufficient logistics system. The current logistics system in Lao PDR still falls below international standards in terms of efficiency, reliability and cost due to unsatisfactory performance by inadequate infrastructure and immature domestic logistics industry.

In this regards, the Japan International Cooperation Agency (JICA) decided to conduct the Comprehensive Study on Logistics System in Lao PDR. JICA selected and dispatched the Study Team between March 2009 and November 2010.

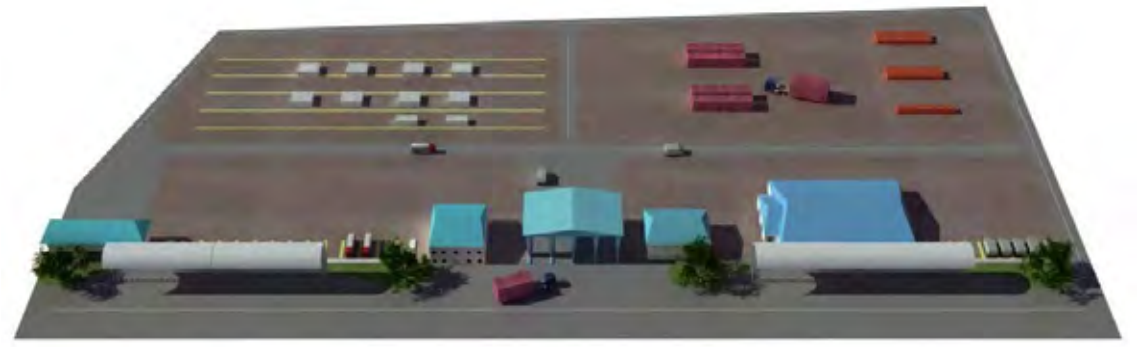
The Study Team held discussions with the concerned officials in the Government of Lao PDR and conducted field surveys in the study area. Upon returning to Japan, the Study Team conducted further studies and prepared this final report.

It is my hope that this report will contribute to development in the Lao PDR, and to the enhancement of a friendly relationship between our two countries. Finally, I wish to express my sincere appreciation to all the people for their generous cooperation with the Study Team.

January 2011

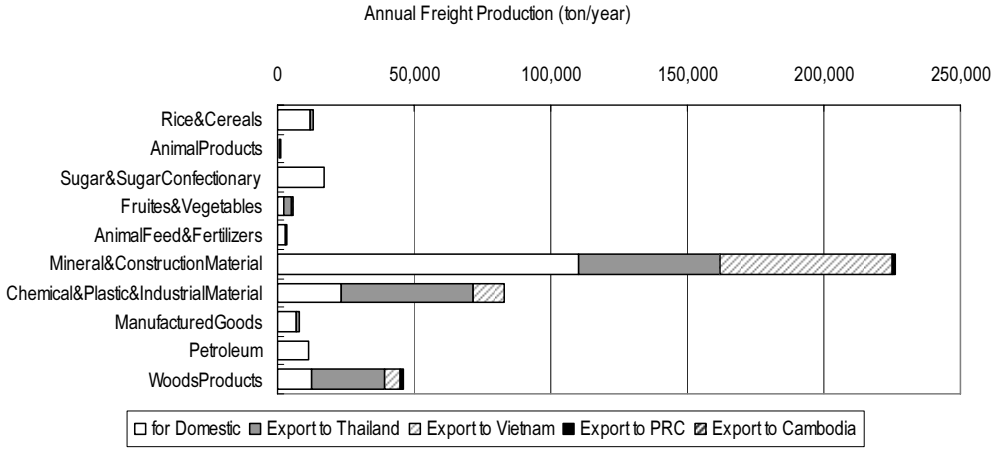
Kiyofumi KONISHI,
Director General
Economic Infrastructure Department
Japan International Cooperation Agency

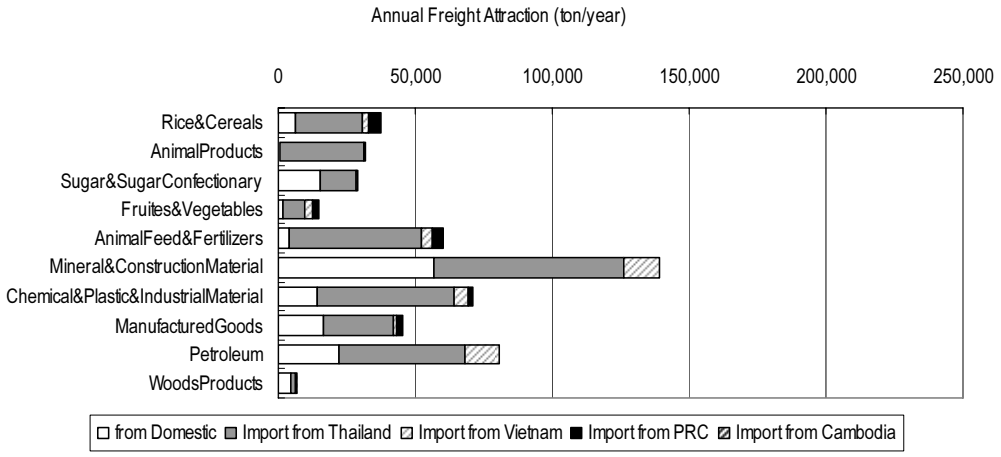
Study Area Map



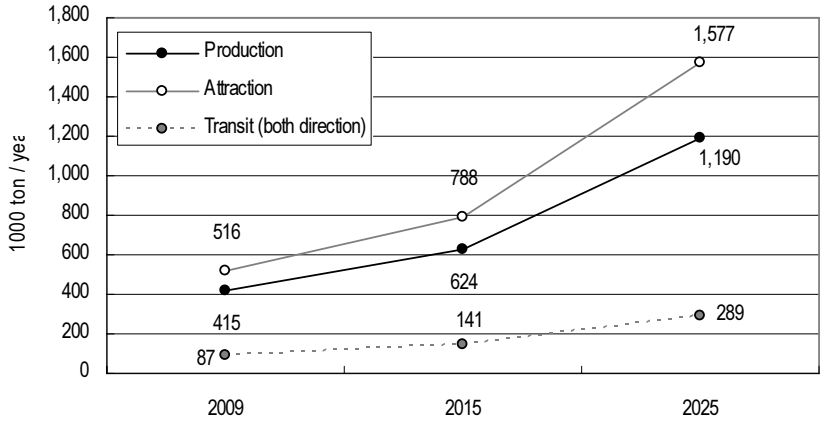
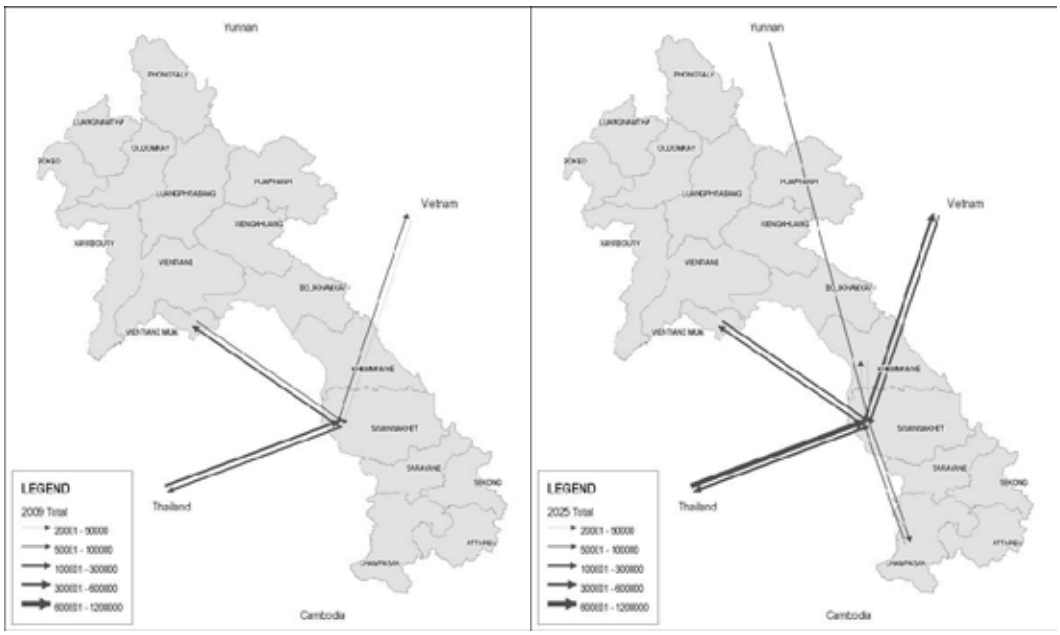
Images of Savannakhet Logistics Park

Project Name	Savannakhet Logistics Park (SLP)
Current Logistics in Savannakhet	Current freight production volume from Savannakhet is about 415,000 tons per year and consists of domestic cargo (48%), exports to Thailand (32%) such as refined copper and exports to Vietnam (19%) such as gypsum. Current freight attraction volume to Savannakhet is about 516,000 tons per year and consists of domestic cargo (28%), imports from Thailand (62%) and imports from Vietnam (8%) such as cement, steel and ceramic products. Transit freight between Thailand and Vietnam through Savannakhet is about 87,000 tons per year. The major commodity from Vietnam to Thailand is agricultural products such as vegetables. The major commodities from Thailand to Vietnam are sugar, beverages and miscellaneous.





Current Freight Generation Volume in Savannakhet

Freight Demand	Future freight production and attraction in Savannakhet is expected to reach 1,190,000 and 1,577,000 tons per year in 2025, respectively. Transit freight between Thailand and Vietnam is expected to reach 289,000 tons per year by the same year.  Forecasted Freight Generation in Savannakhet  Forecasted Freight Distribution to/from Savannakhet
Logistics Strategy	Development of the logistics in Lao PDR can be achieved through application of 3 key strategies: (i) Integration of Cargo Flow, (ii) Business Stimulation, (iii) Market Expansion. To realize these strategies, Savannakhet is expected to become a core in the logistics system in Lao PDR, providing up-to-date logistics park in the heart of Lao PDR, to combine and integrate cargo flows to generate scale merits for Lao PDR, by utilizing geographic and economic advantages of Lao PDR.
Functions and Services Provided at SLP	The SLP is expected to provide the following functions and services. • Interface with Thailand for import/export and transit cargo • Integration of cargo flow along NR-13N including domestic, transit and import/export cargo, competing with the NR-3 route to reduce empty return haulage • Trans-shipment and Consolidation • Inventory and storage service for the areas along Mekong River including Thai side

Handling Volume at SLP

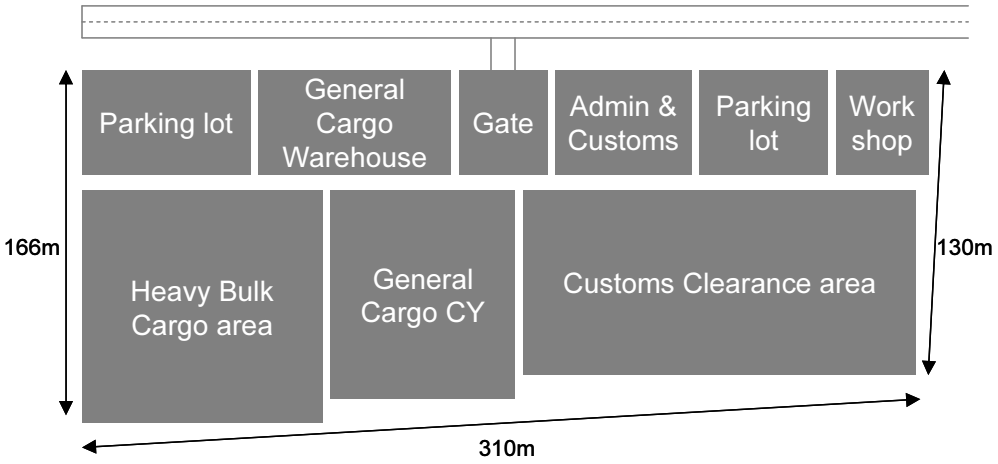
Based on this future freight demand, the volume of cargo handled at the SLP was estimated for target years 2015 and 2025 and summarized in the following table.

Daily Cargo Demand in SLP (Unit: 000tons/year)

Package Type	2015	2025
Container	20.3	123.1
General Cargo	12.2	20.5
Heavy Bulk	3.4	7.3
Liquid Cargo	0.0	0.0
Total	35.9	150.9

Facility Plan at SLP

The facilities proposed at the SLP include (i) Customs clearance area, (ii) Heavy bulk cargo area, (iii) General cargo CY area, (iv) General cargo warehouse area, (v) Parking lots, (vi) Administration and customs office, (vii) Operator office, (viii) Maintenance workshop. The area required for the SLP was calculated as 5.1 ha.



Layout Plan of SLP

Project Cost of SLP

Project cost of the SLP consists of construction cost, administration cost, consultant cost and contingency and was estimated at 4.6 million USD (as of November 2009).

Economic Benefit

Calculated EIRR is 14.7%, and higher than opportunity cost of capital which is 12%. Therefore, the project SLP Development Project is meaningful from the point of economic viewpoint. Creation of value added at SLP, opportunity cost of cargos, and opportunity cost of vehicles (trucks and trailers) are identified as economic benefit in the analysis.

Financial Appraisal

The Project FIRR and FIRR for SLP-MC are 7.3% and 11.6%, respectively: these figures are high enough to attract private sector participation. In order to secure the participation of private sector, Lao PDR Government should prepare measures to mitigate project risks. FIRR for project owner is 5.5%. The project would be financially feasible if soft loan such as yen loan were used for the project.

The Comprehensive Study on Logistics System in Lao People's Democratic Republic

Final Report

Volume 3: Feasibility Study on Savannakhet Logistics Park

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List of Abbreviation

Abbreviations	Name
ADB	Asian Development Bank
AFTA	ASEAN Free Trade Agreement
ASEAN	Association of Southeast Asian Nations
CBTA	Cross-Border Transport Agreement
CCA	Common Control Area
CIQ	Custom, Immigration and Quarantine
CLP	Champasak Logistics Park
CY	Container Yard
DPA	District Protected Area
DPRA	Development Project Responsible Agency
DPWT	Department of Public Works and Transport
ECC	Environmental Compliance Certificate
EDL	Enterprise D'electricite du Lao
EIA	Environment Impact Assessment
EIRR	Economic Internal Rate of Return
EMDP	Ethnic Minority Development Plan
EMP	Environmental Management Plan
ESDF	Education Sector Development Framework 2009 - 2015
ETL	Enterprise of Telecommunications Lao
EXIM	Export and Import
FCL	Full Container Load
FEU	Forty-foot Equivalent Unit
FIRR	Financial Internal Rate of Return
FTL	Full Truck Load
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GMS	Great Mekong Sub region
GRDP	Gross Regional Domestic Product
ICD	Inland Container Depot
ICEM	International Centre for Environmental Management
IEE	Initial Environmental Evaluation
IMF	International Monetary Fund
IRR	Internal Rate of Return
ISA	Initial Social Assessment
IUCN	International Union for Conservation of Nature
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
JIT	Just In Time
JPY	Japanese Yen
LAK	Laos Kip
LCL	Less than Container Load
LMA	Land Management Authority
LNLS	Laos National Logistics Strategy
MAF	Ministry of Agriculture and Forestry

Abbreviations	Name
MOF	Ministry of Finance, Lao PDR
MOIC	Ministry of Industry and Commerce
MPI	Ministry of Planning and Investment
MPWT	Ministry of Public Works and Transport
MRC	Mekong River Committee
asl	above sea level
NBCA	National Biodiversity Conservation Area
NH	National Highway
NLMA	National Land Management Authority
NPA	National Protected Area
NPS	Nam Papa Savannakhet
NR	National Road
O&M	Operation and Maintenance
OD	Origin and Destination
PAP	Project Affected Person
PI	Public Involvement
PMO	Prime Minister Office
PPA	Provincial Protected Area
PRC	People's Republic of China
RP	Resettlement Plan
SA	Social Assessment
SCF	Standard Conversion Factor
SEZ	Special Economic Zone
SEZA	Special Economic Zone Authority
SLP	Savannakhet Logistics Park
SLP-MC	Savannakhet Logistics Park Management Company
SPEZ	Specific Economic Zone
STEA	Science, Technology and Environmental Agency
STENO	Science, Technology and Environment Organization
STM	Synchronous Transport Module
TEU	Twenty-foot equivalent unit
THB	Thai Baht
TOR	Terms of Reference
USD	United States Dollar
UDAA	Urban Development Administration Authority
VLP	Vientiane Logistics Park
WB	World Bank

CHAPTER 1 INTRODUCTION

1.1 Introduction

Regional economic integration has been gradually progressing in the GMS and ASEAN regions. Cross-border transport has been more active through cross-border facilitation, expansion of markets and advancement of international divisions of labor. Such progress presents Lao PDR with a great opportunity to realize the national development policy of transformation from a "Landlocked Country" to a "Land-linked Country". It is greatly expected that certain developments centred on development of international logistics business in GMS region will be realized. Meanwhile, industrialization in Lao PDR has lagged behind neighboring countries in spite of her abundant natural resources and relatively low-cost labor. However, the completion of several key infrastructures and international agreements such as ASEAN Free Trade Agreement (AFTA) in ASEAN and Cross-Border Trade Agreement (CBTA) in GMS gradually stimulates regional investment and movement of peoples and goods, which are greatly expected to promote horizontal division of labor and production in GMS regions.

Lao PDR could realize its potential for future development given its strategic geographic location in GMS and benefits accrued from cross-border agreements with surrounding countries. However, Lao PDR needs to address several constraints, such as limited capacity in investment capital, technologies, human resources, and in particular a very limited domestic market. Consequently, there are more inherent opportunities in the GMS market such that Lao PDR is better served prioritizing the pursuit of GMS market rather than fostering the domestic market.

In light of the above, Laos National Logistics Strategy (LNLS) proposes the following basic strategy:

- To take more business opportunities in GMS, Lao PDR should play leading role in next step of economic integration of GMS countries by pursuing GMS regional single market with more seamless and barrier-free cross-border transport.
- To take advantage of Lao trucks being able to do business in any of the surrounding countries, Lao PDR should promote logistics industries by promoting relocation of foreign transport and logistics businesses into Lao PDR as well as encouraging strengthening of domestics logistic businesses, utilizing advantages of cross-border agreements and its strategic location in the GMS.
- Lao PDR should give high priority to human resource development in logistics and related sectors to spread benefits of logistics business promotion over logistics related and supporting businesses.

Savannakhet Logistics Park (SLP), as explored in this report, would be located along the

East-West Economic Corridor and is expected to function as an international logistics hub to handle the growing number of transit cargo between Thailand and Vietnam. It will also function as a logistics hub to supply export and import cargo to Savannakhet, the second largest province in Lao PDR, and its neighboring provinces. Accordingly, SLP is a key facility in realizing the above basic strategies of LNLS. SLP will basically serve 3 functions, namely: (1) interface function for international trade, (2) incubation function of logistics businesses in Lao PDR, and (3) hub function of domestic transport.

To delineate more clearly and materialize the development concept mentioned above, explored in the Lao National Logistics Strategy (LNLS), this feasibility study on Savannakhet Logistics Park (SLP) was undertaken.

1.2 Structure of this Report

The overall objectives of the Comprehensive Study on Logistics System in Lao PDR (the Study) is to improve international and domestic logistics system in Lao PDR. The major focal points of this particular study are accordingly; (1) to prepare national logistics strategy, consisting of national logistics strategy and logistics strategy in major regional cities, (2) to carry out a feasibility study of the logistics parks in Vientiane, Savannakhet and Champasack which will serve as the hubs of logistics activities and network in Lao PDR.

The Study produces Inception Report, Progress Report, Interim Report and Draft Final Report as intermediate outputs of the Study and produces Final Report as the final output. This report is the Final Report of the Study. This Final Report consists of 4 volumes as listed below:

Volume1: National Logistics Strategy

Volume 2: Feasibility Study on Vientiane Logistics Park

Volume 3: Feasibility Study on Savannakhet Logistics Park

Volume 4: Feasibility Study on Champasack Logistics Park

This Final Report, Volume 3 explores the Feasibility Study on Savannakhet Logistics Park.

CHAPTER 2 CURRENT LOGISTICS IN SAVANNAKHET

2.1 Overview of Socio-economic Characteristics of Savannakhet

2.1.1 Demography

Table 2.1.1 shows district populations in Savannakhet Province. Savannakhet Province accounts for 14.6% of the national population, and is the most populated province in the Lao PDR. Population growth rates were determined as 2.1% from 1995 to 2005 and 1.9% from 2005 to 2007. The growth rate from 1995 to 2005 was the same as the national population growth rate while the growth rate from 2005 to 2007 was 0.2% below the national growth rate.

Table 2.1.1 1995-2007 District Populations in Savannakhet Province

	Population			Percentage Share (%)		
	1995	2005	2007	1995	2005	2007
Savannakhet Province	671,758	825,902	857,581	14.7*	14.7*	14.6*
Khanthabouly	124,896	112,915	115,852	18.6	13.7	13.5
Outhoomphone	69,025	80,516	83,151	10.3	9.7	9.7
Atsaphangthong	48,743	39,102	40,237	7.3	4.7	4.7
Phine	40,994	50,784	53,276	6.1	6.1	6.2
Sepone	35,731	43,046	44,745	5.3	5.2	5.2
Nong	16,723	21,106	22,157	2.5	2.6	2.6
Thapangthong	24,011	31,497	33,037	3.6	3.8	3.9
Songkhone	81,864	82,461	87,944	12.2	10.0	10.3
Champhone	86,550	101,559	105,774	12.9	12.3	12.3
Xonbuly	34,602	51,472	52,894	5.2	6.2	6.2
Xaybuly	42,936	54,441	55,667	6.4	6.6	6.5
Vilabuly	24,560	30,264	31,822	3.7	3.7	3.7
Atsaphone	41,123	50,448	51,883	6.1	6.1	6.0
Xayphoothong	-	44,557	46,266	-	5.4	5.4
Thaphalanxay	-	31,734	32,876	-	3.8	3.8
National Population	4,574,858	5,621,982	5,873,616	-	-	-

Note: Percentage share in national population

Source: Census Report 1995 and 2005, Statistical Yearbook of Savannakhet Province 2008

18.6% of the provincial population lived in Khanthabouly District in 1995; however, the percentage share dropped to 13.7% because part of the district was broken off to form Xayphoothong District. Khanthabouly's percentage share dropped by 0.2% between 2005 and 2007 while the percentage share increased in Phine (along NR-9) and Songkhone (along NR-13).

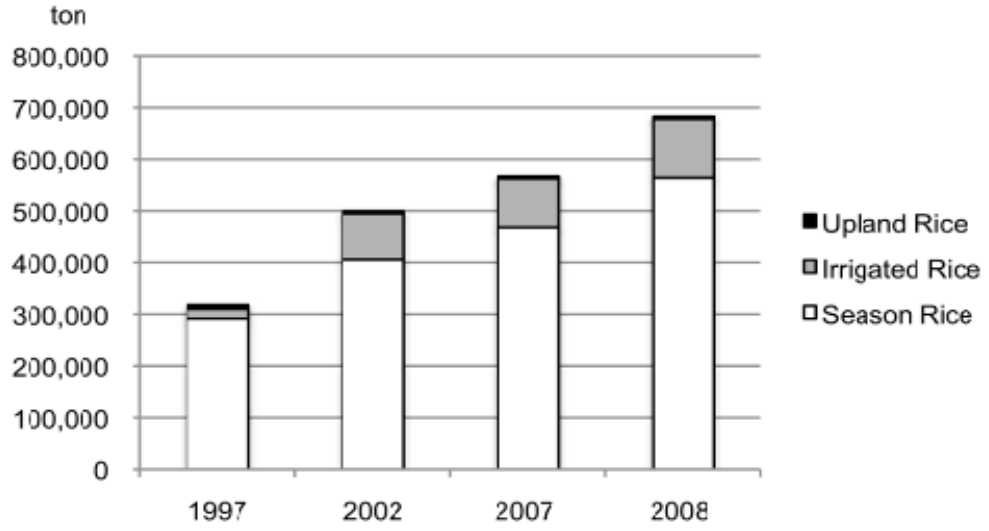
2.1.2 Economy

(1) Industrial Composition

According to provincial statistics, GRDP of Savannakhet Province was estimated at 4,786 billion kip in 2007. It accounted for about 10% of GDP. The provincial statistics also reported that the sectoral apportionment of the GRDP in 2007 was as follows: 48% for the primary industry, 27% for the secondary industry and 25% for the tertiary industry.

(2) Agriculture

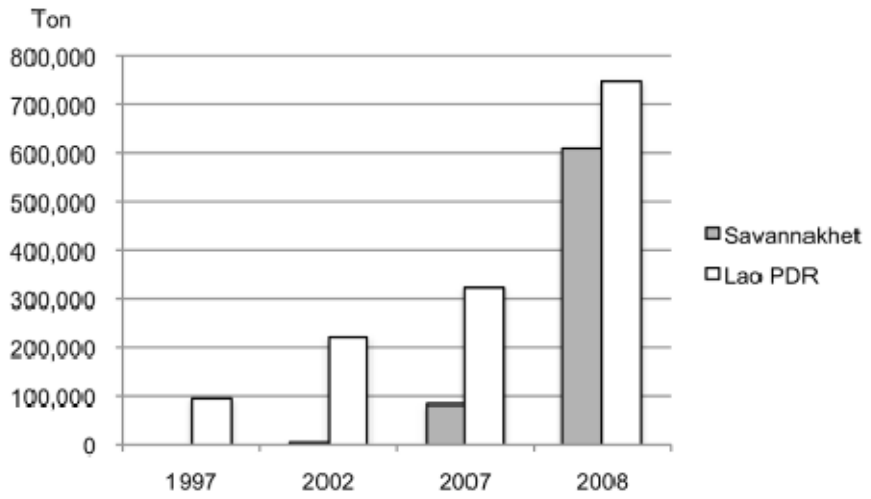
In the primary industry, rice is the most popular product in Savannakhet Province. The production has accounted for about 20% of the national production since the 1990s. As indicated in Figure 2.1.1, rice production has increased by 2 times from 1997 to 2008.



Source: Statistical Yearbook 1975-2005 and 2008

Figure 2.1.1 1997-2008 Rice Production

The other major agricultural product in Savannakhet Province is sugarcane. The provincial production of sugarcane accounted for 80% of the national production. As indicated in Figure 2.1.2, the production has increased rapidly due to commencement of operations at sugar factory along NR-13 that was invested into by a Thai company in 2008.



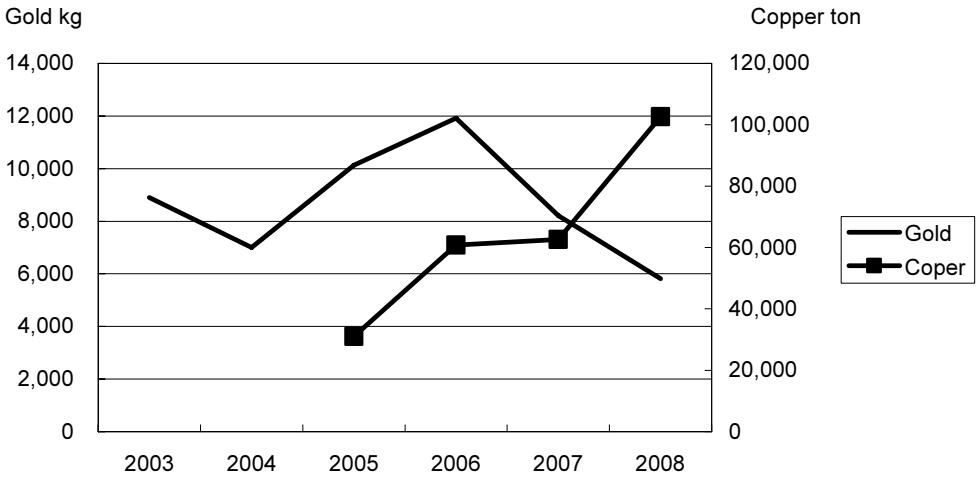
Source: Statistical Yearbook 1975-2005 and 2008

Figure 2.1.2 1997-2008 Production of Sugarcane

(3) Manufacturing and Mining

The most notable activity of the secondary industry is gold and copper mining at Sepone Mine. Gold and copper mining at Sepone has contributed to the recent economic development. Production of gold and copper started in 2003 and in 2005, respectively. Figure 2.1.3 indicates production volumes of gold and copper from 2003. Gold production, which started in 2003, ranges between 6 to 12 tons per year. Since the estimated deposit amount of gold is 46.7 tons, these mines will continue to produce the same volume of gold for more than 10 years.

Production of copper at Sepone Mine started in 2005, and the production amount doubled in 2008 due to commencement of operations at Phu Bia Mine. Together with production of gold, the production of copper at the two mines has contributed to the rapid economic growth in recent years.

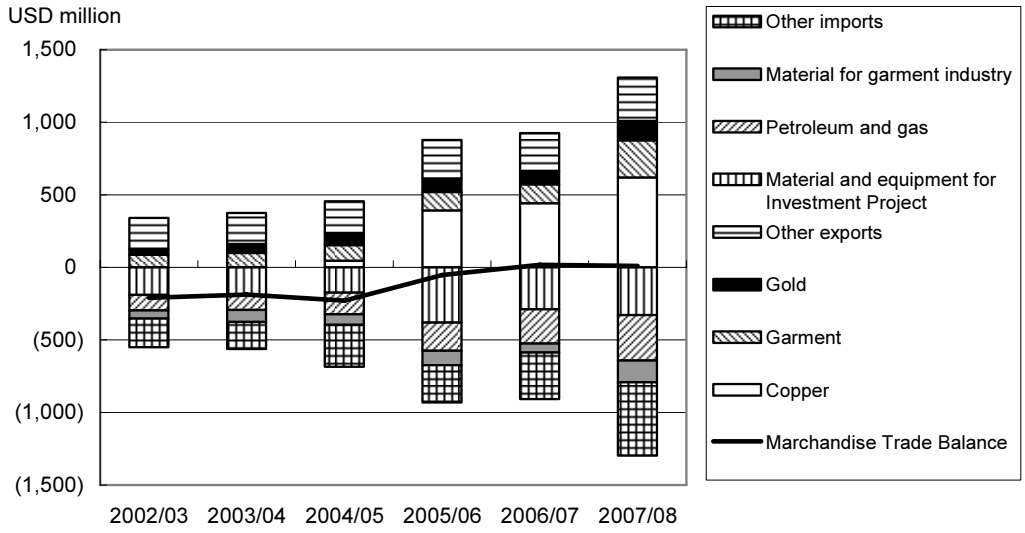


Source: Statistical Yearbook various issues, DoS

Figure 2.1.3 2003-2008 Production of Gold and Copper

Figure 2.1.4 illustrates the change in merchandise trade in recent years. Lao PDR recorded

merchandise trade deficits up to FY2005-2006: the deficits were turned into surpluses since FY2006-2007 due to the rapid growth of copper exports. Copper production in Sepone mine contributes to improvement in trade balance as well as economic growth.



Source: Data from MoIC

Figure 2.1.4 2002/03-2007/08 Merchandise Trade and Its Major Items

(4) Savan-Seno Special Economic Zone (SEZ)

Savan-Seno Special Economic Zone (SEZ) was established by the Decrees of the Prime Minister on Savan-Seno Special Economic Zone (Ref. No. 148/PM, dated 29th September 2003). According to Savan-Seno SEZ Authority (SEZA), 5km on both sides of NR-9 shall be designated as SEZ if investors propose development plans that are then approved. At present, 4 development sites (Site A, Site B, Site C and Site D) were designated between the Second Friendship Bridge and Seno District by the SEZA. Sites A, C and D are located in Khanthabouly District and they are expected to work as centers of economic activities in Khanthabouly in the future. The development situation at each site as of August 2009 is summarized below.

Site A (270 ha): A Thai investor has a concession contract to develop Site A. The investor is, first of all, going to develop Site D to prepare a re-settlement area for residents in Site A: after which, the investor will develop Site A as a commercial activity base. Therefore, construction works are yet to start at Site A. The investor prepared concept of development plan, consisting of duty-free shops, amusement park, shopping malls, theme parks and medical facility for medical tourism. Investors for duty-free shops and amusement park have been sought but are yet to be found. Hence, the development of Site A would commence with investments into duty-free shops and the amusement park.

Site B (20 ha): Site B is managed by the SEZA. A logistic service company, which is a joint venture between Lao PDR, Japan and Thai companies, is based here to provide logistics services to companies investing in Site C in the future.

Site C (230 ha): A Malaysian investor has a concession agreement to develop Site C. Site C will be fully developed for industrial purposes. The Malaysian investor is going to carry out phased development as follows: phase 1 (50 ha), phase 2 (70 ha), phase 3 (60 ha) and phase 4 (50 ha). Land development of phase 1 has already started, while a minute of understanding to conduct a

study on water supply service will be agreed between SEZA and a private company. According to SEZA, some private companies have already decided to enter Site C.

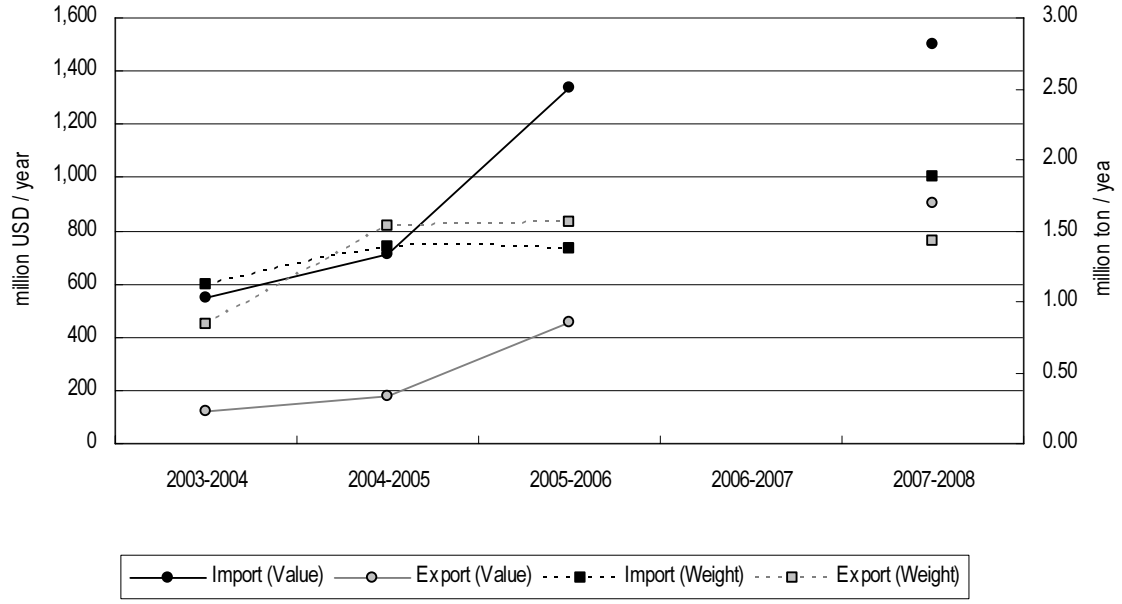
Site D (120 ha): In Site D, settlement area for sale, international bus terminals, colleges (agricultural college and business & accounting college), and a market will be developed as well as re-settlement area for residents displaced from Site A. Construction of 60 houses at the re-settlement area has already started.

2.2 Current Logistics in Savannakhet

2.2.1 Volume and Movements

(1) Trade Volume and Movements in Lao PDR

Chapter 4 of the Lao National Logistics Strategy describes explicitly the current features of trade in Lao PDR. Figure 2.2.1 shows annual import and export volumes in Lao PDR in the recent five years in terms of both weight and monetary value. Trade in Lao PDR seems to be increasing. In the last few years, export and import volumes have remained almost the same while import value has been observed to be 2-3 times as large as export value.



Note: 2006/07 data is blank because data from Oct. 2006 to Sep. 2007 is missing.

Source: C2000 Database

Figure 2.2.1 2002-2008 Import/Export Volumes

Table 2.2.1 shows trade volumes by origin/destination country in 2007/08. Trade in Lao PDR is dominated by trade with surrounding GMS countries: 90% of trade in Lao PDR is with other GMS countries in both volume and value terms.

Table 2.2.1 2007/08 Trade Volumes to/from Lao PDR

Category		GMS Country	Outside GMS	Total (All Countries)	Share of GMS
Volume in million tons / year	Imports to Lao	1.82	0.10	1.92	95.0%
	Exports from Lao	1.41	0.02	1.43	98.9%
	Transit (from)	0.11	0.01	0.12	92.0%
Volume in million USD / year	Imports to Lao	1,291	207	1,498	86.2%
	Exports from Lao	822	78	900	91.3%
	Transit (from)	86	118	204	42.0%

Note1: GMS Countries consist of Vietnam, Thailand, Cambodia and whole China (PRC).

Note2: Exports to outside the GMS are dominated by gold (48.4 million USD), coffee (18.2 million USD) and refined copper (8.6 million USD).

Note3: Transit goods from outside the GMS are dominated by cigarettes from Indonesia (81.3 million USD), ethyl alcohol or spirit (25.6 million USD) from Singapore at customs in Savannakhet.

Source: C2000 Database (Oct. 2007 – Sep. 2008)

Table 2.2.2 shows trade matrix within GMS countries in 2007/08. As seen in the table, import and export volumes in Lao PDR are dominated by Thailand. Major transit cargo through Lao PDR is from Thailand to Vietnam. However, the volume of transit cargo is observed as being relatively smaller than that of export/import cargo to/from Lao PDR.

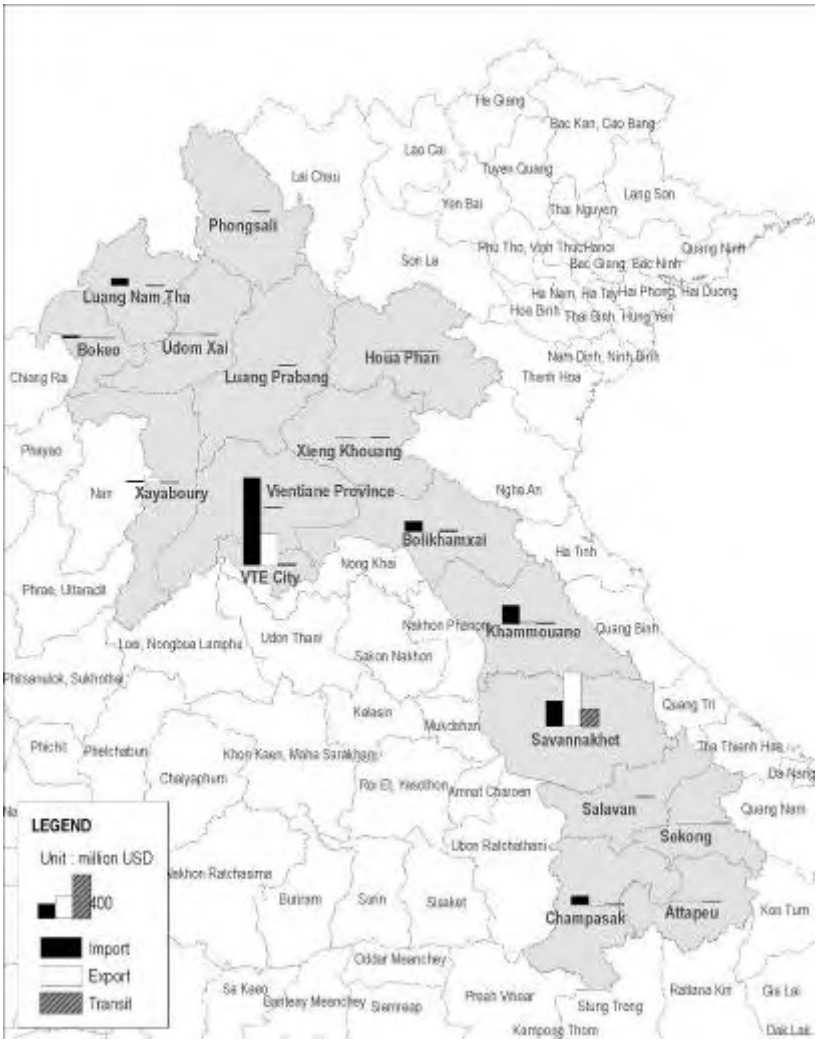
Table 2.2.2 2007/08 Trade in GMS to/from Lao PDR

Unit: USD million

	LAO PDR	VIETNAM	THAILAND	CAMBODIA	CHINA (PRC)	TOTAL
LAO PDR		98.7	476.8		14.7	590.2
VIETNAM	80.5		14.6			95.1
THAILAND	1091.4	184.8			1.2	1277.4
CAMBODIA			0.1			0.1
CHINA (PRC)	118.3		3.4			121.7
TOTAL	1290.2	283.5	494.9	0	15.9	2084.5

Source: C2000 Database (Oct. 2007 – Sep. 2008)

Figure 2.2.2 shows monetary trade volume in 2007/08 by province. 53% of import volume in Lao PDR is concentrated at customs in Vientiane Capital and 53% of export volume is concentrated at customs in Savannakhet.



Source: Prepared by JICA Study Team based on C2000 Database (Oct. 2007 – Sep. 2008)

Figure 2.2.2 2007/08 Trade Volumes by Province

(2) Trade Volume and Movements in Savannakhet

Table 2.2.3 shows import tonnage by customs in Savannakhet Province in 2007/08. There are 2 major customs along the East-West Economic Corridor in Savannakhet: Khanthabouly customs at the cross-border with Thailand and Dansavan customs at the cross-border with Vietnam. The import volumes at these 2 customs are observed as being very distorted: the import volume at Khanthabouly customs was recorded at 643,000 tons in 2007/08 while Dansavan customs reached only 32,000 tons in the same period.

As regards export cargo from Savannakhet Province, Table 2.2.4 shows that the export volume at Khanthabouly customs was recorded at 76,000 tons in 2007/08, with the Sepone Mine the largest contributor to this export volume. On the other hand, the export volume at Dansavan customs was recorded at 142,000 tons in 2007/08, most of which was composed of minerals exported to Vietnam.

Table 2.2.3 2007/08 Import Volumes by Customs in Savannakhet Province

Unit: 1,000 tons / Year

Commodity Type	Khanthabouly		Dansavan	
1) Rice & Cereals	30.0	4.7%	0.6	1.7%
2) Animal Products	20.4	3.2%	0.2	0.5%
3) Sugar & Sugar Confectionary	3.3	0.5%	0.2	0.7%
4) Fruits & Vegetables	10.6	1.6%	0.7	2.3%
5) Animal Feed & Fertilizers	70.7	11.0%	2.0	6.3%
6) Minerals & Construction Materials	268.1	41.7%	16.5	51.7%
7) Chemical & Plastic & Industrial Materials	121.1	18.8%	3.6	11.2%
8) Manufactured Goods	71.7	11.1%	0.8	2.4%
9) Petroleum	47.0	7.3%	7.3	23.0%
10) Woods Products	0.4	0.1%	0.1	0.2%
Total	643.3	100.0%	31.8	100.0%

Source: C2000 Database (Oct. 2007 – Sep. 2008)

Table 2.2.4 2007/08 Export Volumes by Customs in Savannakhet Province

Unit: 1,000 tons / Year

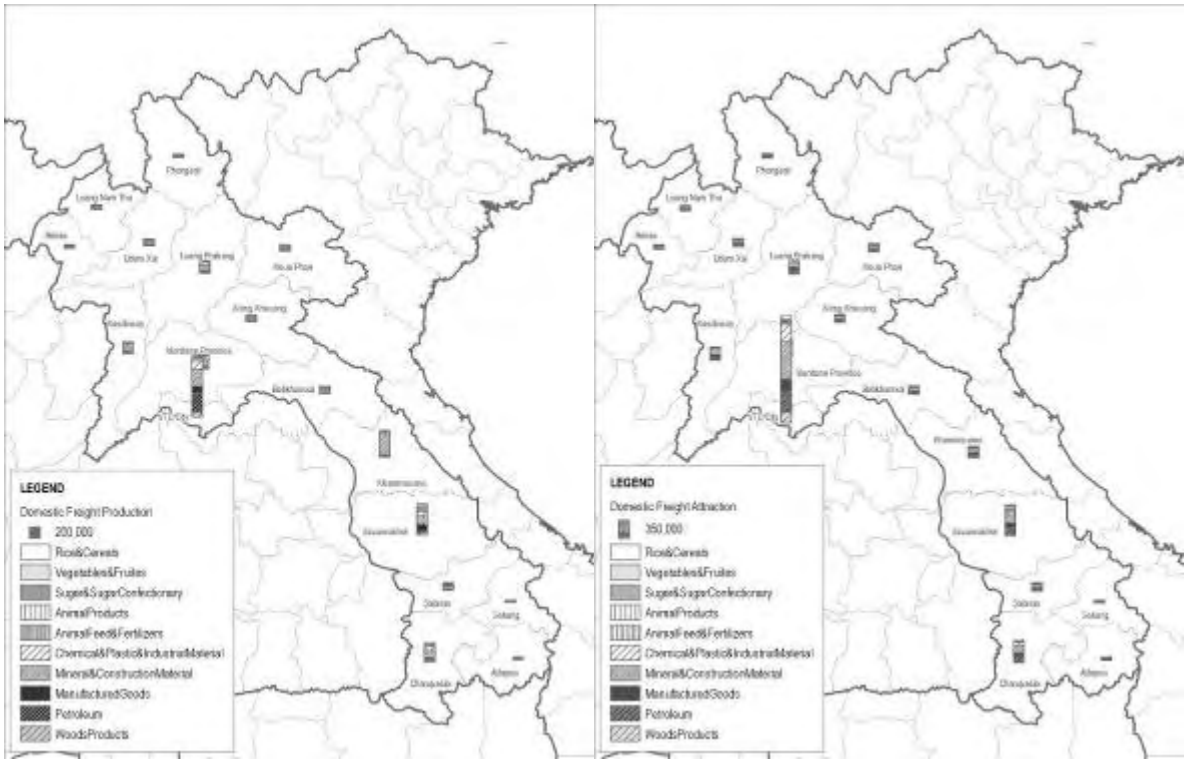
Commodity Type	Khanthabouly		Dansavan	
1) Rice & Cereals	0.8	1.1%	2.6	1.8%
2) Animal Products	0.1	0.2%	0.6	0.4%
3) Sugar & Sugar Confectionary		0.0%		0.0%
4) Fruits & Vegetables	1.4	1.9%	0.1	0.0%
5) Animal Feed & Fertilizers	0.2	0.3%	0.8	0.6%
6) Minerals & Construction Materials	0.1	0.1%	118.4	83.5%
7) Chemical & Plastic & Industrial Materials	49.6	65.6%	8.2	5.8%
8) Manufactured Goods	0.6	0.8%	0.4	0.3%
9) Petroleum		0.0%		0.0%
10) Woods Products	22.7	30.1%	10.8	7.6%
Total	75.6	100.0%	141.8	100.0%

Source: C2000 Database (Oct. 2007 – Sep. 2008)

(3) Volume and Movements of Domestic Cargo in Savannakhet

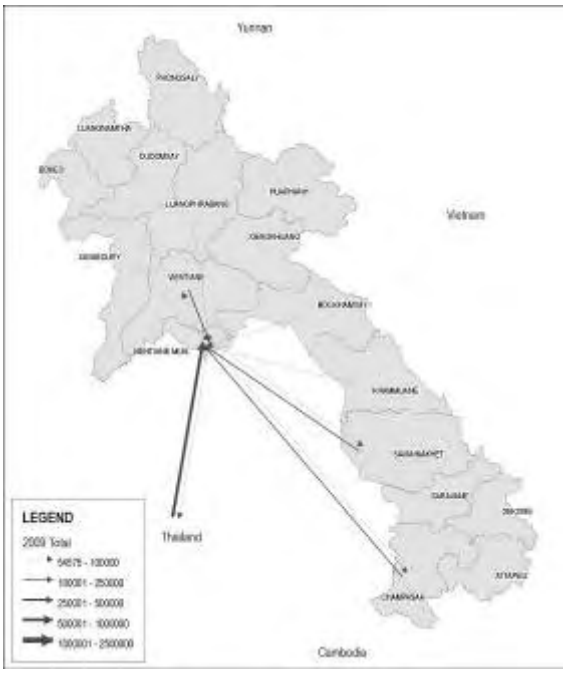
There wasn't any numerical evidence to illustrate the domestic cargo distribution in/between region(s) till this Study conducted an analysis. The comprehensive freight demand forecast model for export and import cargo was developed in this Study using the results of the roadside interview survey, traffic count survey and the secondary data and information such as transport statistics. Figure 2.2.3 and Figure 2.2.4 show the freight generation/attraction and distribution of the domestic cargo.

Looking at the freight generation and attraction in Savannakhet, the volume of freight generation is dominated by minerals that are estimated to reach 199,000 tons per year. On the other hand, the freight attraction is dominated by minerals and petroleum and is expected to reach 142,000 tons per year in 2009. As regards the freight distribution in Savannakhet, most cargo in Savannakhet is distributed to/from Vientiane Capital.



Source: JICA Study Team

Figure 2.2.3 Estimated Domestic Freight Production (left) and Attraction (right) in 2009



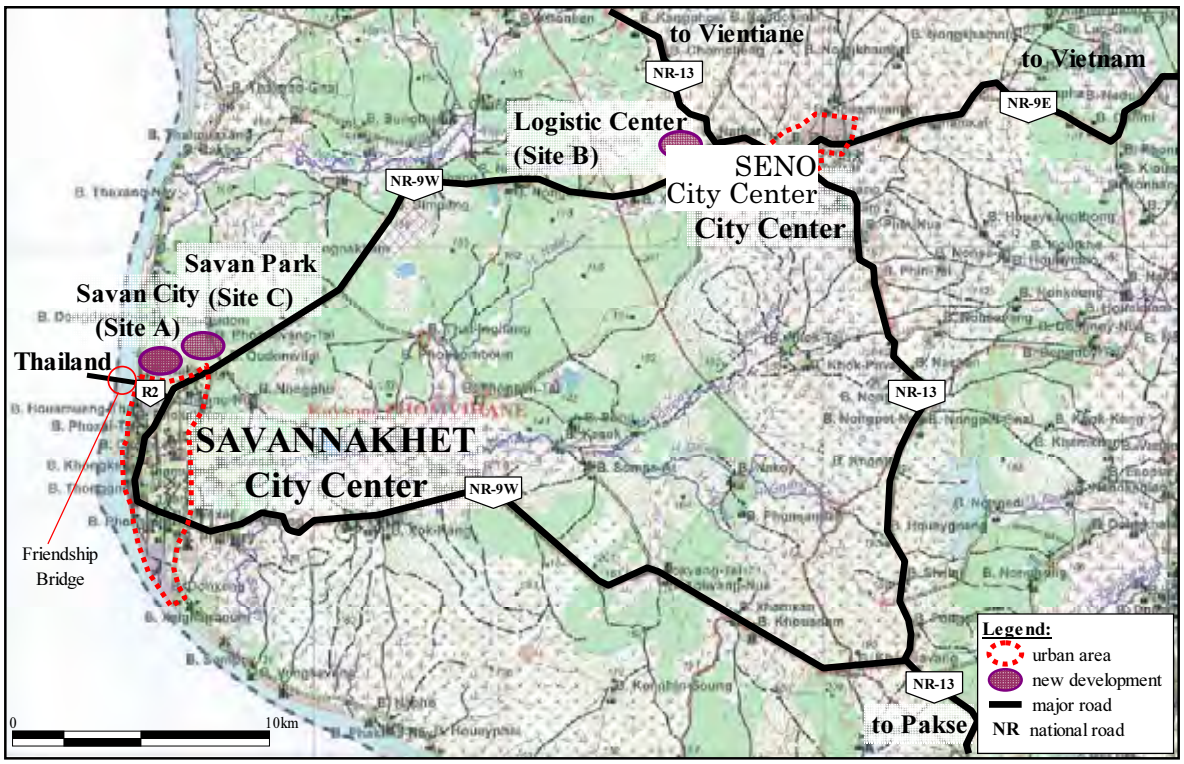
Source: JICA Study Team

Figure 2.2.4 Estimated Freight Distribution in 2009

2.3 Spatial and Physical Conditions

2.3.1 Road Network

Savannakhet is located on the western side of NR-13 which goes through the whole country and also connects Vientiane and Pakse. In order to reach the provincial center of Savannakhet, it is necessary to travel along NR-9W for about 30km. Savannakhet is bordered by Thailand, to which it is connected by the 2nd Friendship Bridge. It is part of the East-West Economic Corridor, and the exchange of people and goods is gradually increasing.



Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

Figure 2.3.1 Major Road Network in Western Part of Savannakhet Province

Total road length in the province was about 19,970km by the year 2006, and consists of road types as listed in Table 2.3.1.

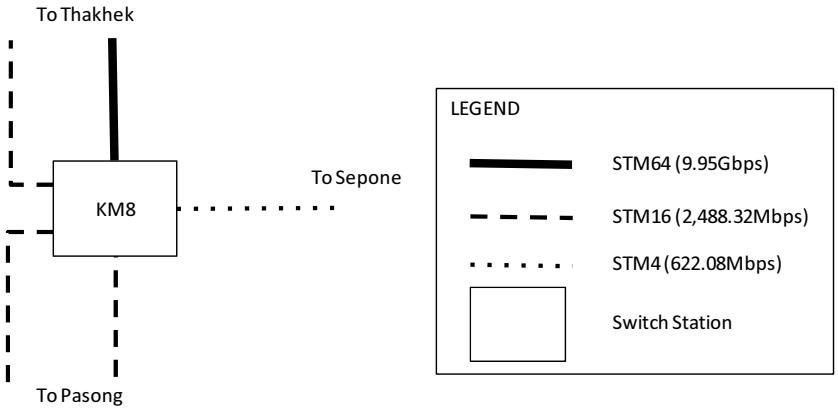
Table 2.3.1 Road Length by Pavement Type (2006)

Road Type		Length	Coverage Ratio
1.	Concrete Road	41 km	0.2 %
2.	Tar Road	1,840 km	9.2 %
3.	Gravel Road	4,805 km	24.1 %
4.	Earth Road	13,064 km	65.4 %
5.	Asphalt Road	218 km	1.1 %
TOTAL		19,968 km	100.0 %

Source: DPI Savannakhet

2.3.2 Telecommunication

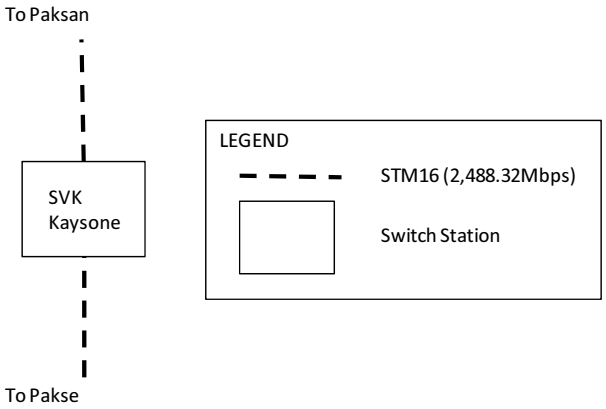
The trunk-line diagram of Enterprise of Telecommunications Lao (ETL) for the surroundings of Savannakhet District is as shown in Figure 2.3.2. The Km8 station is a main switch station located in downtown Savannakhet District. The main trunk-line of Km8 station is connected to the Synchronous Transport Module (STM) 64 (9.95Gbps) from Vientiane by means of optical fiber cable.



Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

Figure 2.3.2 Trunk-Line Diagram of ETL in Savannakhet District

The trunk-line diagram of Lao Telecom for area surrounding Savannakhet district is shown in Figure 2.3.3. SVK Kaison station is the main switch station located in downtown Savannakhet District. The trunk-line of SVK Kaison station is connected to the STM16 (2,488.32Mbps) by means of optical fiber cable and microwave. Branch line is connected to SVK Kaison station by the star configuration connecting method.



Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

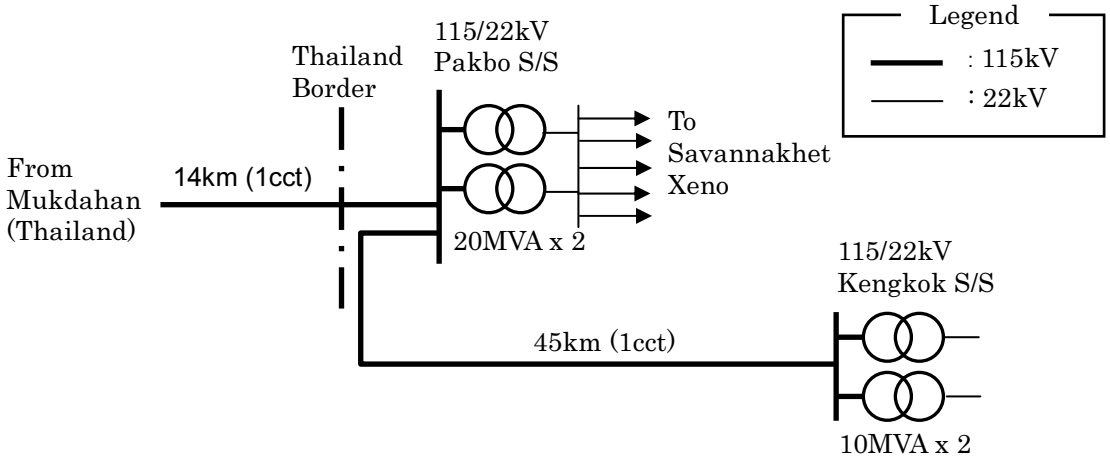
Figure 2.3.3 Trunk-Line Diagram of Lao Telecom in Savannakhet District

2.3.3 Power Supply

(1) Power Grid System

The power grid system in the Savannakhet province is shown in Figure 2.3.4. Since Savannakhet

province hasn't any power plants and the 115kV national power lines from the northern and southern regions aren't installed as yet, all of the power consumed in Savannakhet province is imported from Thailand by means of 115kV power lines. The 115kV national power grid between Thakhek and Savannakhet is being constructed and its development will be completed by 2011.



Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

Figure 2.3.4 Power Grid System in Savannakhet Province

(2) Power Supply System

Features pertinent to the existing 115/22kV substation for the surroundings of Savannakhet district are shown in Table 2.3.2. The power to the surroundings of the Savannakhet district is supplied by means of 22kV distribution lines from the 115/22kV Pakbo substation. As for the surroundings of the industrial zones, 22kV distribution lines are connected.

Table 2.3.2 Existing 115/22kV Substation in Savannakhet District

Name of Substation	Description			Remarks
1. 115/22kV Pakbo Substation	Transformer	:	20 MVA × 2	Power source of all Industrial zone
	Peak Demand	:	26.5 MW	

Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

2.3.4 Water Supply

Nam Papa Savannakhet (NPS) has the responsibility of supplying drinking water to all the 15 districts of Savannakhet Province. However, at present, NPS supplies water to only 6 districts, such as Khanthabouly District with service ratio of 58%; and Outhoomphone District with service ratio of 60%.

The main water source for Outhoomphone District, especially Urban Seno, is groundwater. NPS supplies water by boreholes to Urban Seno. The summary of the water supply condition in 2008 is shown in Table 2.3.3.

Table 2.3.3 Present Water Supply Conditions in Outhoomphone District

Item		Figures in 2008
1	Water Source	Groundwater
	Number of Boreholes	49 wells in total (30 wells in use)
	Water Quality	Good (well depth < 50m), Salinity (well depth > 50m)
	Ave. Daily Production	1,351 m^3/day
2	Population	
	Outhoomphone District	83,152 persons
	Urban Seno	20,219 persons
3	Service Indicators	
	Number of Meter Connections	1,690 in total (Industrial: 30, Commercial: 628, Institutional: 196)
	Service Area	7 villages with an area of 17 km^2
	Service Coverage Ratio	60%
	Ave. Daily Consumption per Capita	185 lpcd
	Ave. Water Tariff	1.377 kip/m^3
4	Efficiency Indicators	
	UFW Ratio	27.1%
	Unit Production Cost	1.101 kip/m^3
	Account Receivable	3 month
	Staff per 1000 Connections	10.2 persons

Source: Prepared by JICA Study Team for Preparatory Survey on Industrial Zone Development in Lao PDR

The target rate of water service coverage of NPS is 100% in urban areas: however, the present water supply and distribution development of Nam Papa does not satisfy that aspiration due to rapid growth of population in the areas surrounding the urban areas. Notably, Khanthabouly District and Outhoomphone District have faced chronic shortage of drinking water supply in comparison to water demand. NPS collects water charges effectively, with a collection ratio of more than 90% while the accounted-for water as a percentage of the total supply is estimated as being less than 30%.

CHAPTER 3 FREIGHT DEMAND FORECAST

3.1 Introduction

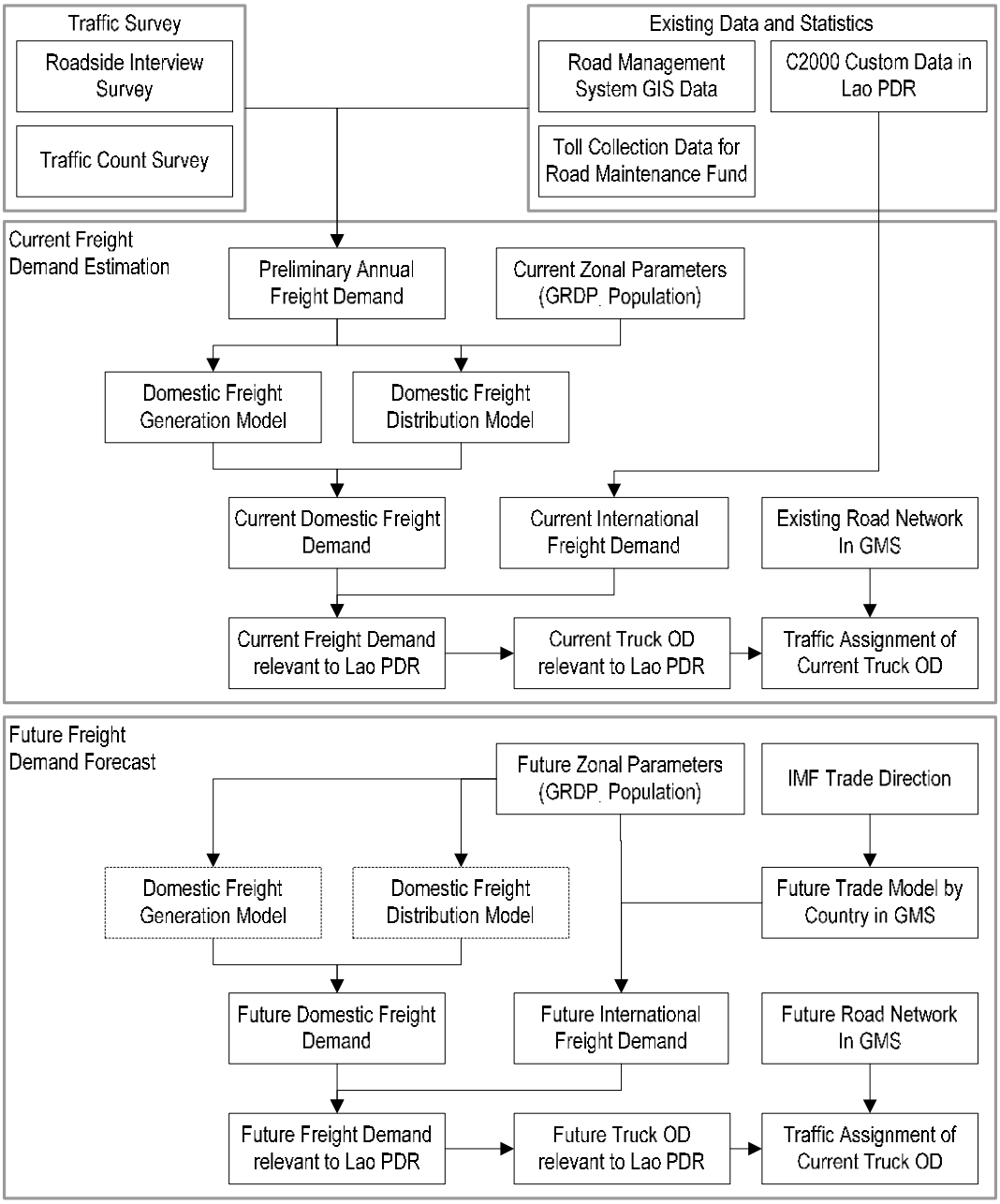
As explored in Chapter 4 of the Lao National Logistics Strategy (Volume2), a comprehensive freight demand forecast model was developed at the national/regional level to foresee domestic, export/import and transit cargo in/though Lao PDR. Based on this freight demand forecast model, this Chapter estimates the future freight demand in the Savannakhet Logistics Park (SLP), and provides numerical inputs for planning and designing the SLP and for testing its economic and financial validity, which will be discussed in the following chapter.

3.2 Methodology of Freight Demand Forecast for EXIM Cargo

The comprehensive freight demand forecast model for export and import cargo was developed, using the results of the roadside interview survey, traffic count survey and the secondary data and information including transport statistics and customs data. The methodology of this freight demand forecast model are summarized below.

- The target year of the projection was set as Year 2025 in the long-term and Year 2015 in the medium-term.
- Commodity-wise freight demand forecast model was developed, based on the conventional 4-step model: Freight Generation Model, Freight Distribution Model, and Traffic Assignment, for domestic, export/import and transit cargo.
- Commodities analyzed by the demand forecast model include (1) Rice and Cereals, (2) Animal Products, (3) Sugar and Sugar Confectionary, (4) Fruits and Vegetables, (5) Animal Feed and Fertilizers and (6) Minerals and Construction Materials, (7) Chemical, Plastic and Industrial Materials, (8) Manufactured Goods, (9) Petroleum (10) Wood Products.

Figure 3.2.1 shows the work-flow for overall freight demand modeling and forecasting.



Source: JICA Study Team

Figure 3.2.1 Work-Flow for Freight Demand Modeling and Forecast

3.3 Summary of Results of Freight Demand Forecast for EXIM Cargo

3.3.1 Socio-economic Framework Applied

A planning framework, which was prepared with reference to the IMF staff report, is shown in Table 3.3.1. GDPs in 2009, 2015 and 2025 were estimated based on the forecasted annual growth rates.

Table 3.3.1 Estimated GDP in GMS Countries

GDP (USD billion)	2000	2001	2002	2003	2004	2005	2006	2007	2009	2015	2025
Cambodia	3.65	3.98	4.28	4.66	5.33	6.29	7.26	8.69	9.67	14.55	27.93
Yunnan (China)	22.73	25.13	26.94	29.84	35.76	42.34	50.17	62.13	73.07	119.21	269.52
Lao PDR	1.74	1.77	1.83	2.15	2.51	2.87	3.51	4.14	4.72	7.29	14.46
Myanmar	8.91	6.48	6.78	10.47	10.57	11.99	14.50	19.62	N/A	N/A	N/A
Thailand	122.73	115.54	126.88	142.64	161.34	176.35	206.99	246.05	265.88	363.09	592.84
Vietnam	31.20	32.50	35.15	39.63	45.55	53.05	61.00	69.23	80.73	123.55	246.18
GMS Total	190.95	185.40	201.86	229.38	261.06	292.89	343.43	409.86	434.06	627.7	1,144.9

Source: The World Economic Outlook (IMF), National Statistic Bureau of PRC.

Note: GDPs in 2009, 2015 and 2025 were estimated by annual growth rates in IMF Staff Report.

3.3.2 Freight Generation

The future trade to/from Lao PDR, which provides the control total of import/export volumes, was initially estimated by the regression model using the GDPs of the home country and other neighboring countries. Table 3.3.2 summarizes the results of the forecasted trade volumes, indicating that both imports and exports are estimated to grow by 1.6 times by 2015 and over 3.0 times by 2025 and that both would continue to rely on Thailand till 2025.

Table 3.3.2 Existing and Forecasted Trade in Lao PDR

Country	Exports (million USD)			Imports (million USD)		
	2009	2015	2025	2009	2015	2025
Cambodia	1.3	2.5	5.7	0.4	0.7	1.4
Thailand	538.9	863.9	1,631.9	1,569.6	2,602.4	5,489.2
Vietnam	214.9	370.8	817.2	118.5	169.9	313.6
Yunnan (China)	38.9	69.5	169.3	51.5	85.0	178.5
Total	794.0	1,306.7	2,624.1	1,740.1	2,858.0	5,982.7

Source: JICA Study Team

Commodity-wise future trade volume was estimated by the regression model, using the GDPs of the home country and other neighboring countries. Table 3.3.3 and Table 3.3.4 show forecasted import and export values. With the exception of food products which rely heavily on population growth, all the commodities were estimated to increase at the same pace as the overall import and export volumes.

Table 3.3.3 Existing and Forecasted Imports and Expansion Factors

Commodity Type	Forecasted Import Values (million USD)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	25	36	71	1.44	2.84
2) Animal Products	18	25	48	1.39	2.67
3) Sugar & Sugar Confectionary	8	7	10	0.88	1.25
4) Fruits & Vegetables	11	19	41	1.73	3.73
5) Animal Feed & Fertilizers	25	39	82	1.56	3.28
6) Minerals & Construction Materials	54	85	174	1.57	3.22
7) Chemical & Plastic & Industrial Materials	635	1,099	2,369	1.73	3.73
8) Manufactured Goods	521	822	1,671	1.58	3.21
9) Petroleum	425	697	1,457	1.64	3.43
10) Wood Products	18	29	59	1.61	3.28
Total	1,740	2,858	5,983	1.64	3.44

Source: JICA Study Team

Table 3.3.4 Existing and Forecasted Exports and Expansion Factors

Commodity Type	Forecasted Export Values (million USD)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	41	46	59	1.12	1.44
2) Animal Products	2	2	4	1.00	2.00
3) Sugar & Sugar Confectionary	0	0	1	1.00	1.00
4) Fruits & Vegetables	34	56	113	1.65	3.32
5) Animal Feed & Fertilizers	0	0	0	1.00	1.00
6) Minerals & Construction Materials	108	178	377	1.65	3.49
7) Chemical & Plastic & Industrial Materials	420	724	1,485	1.72	3.54
8) Manufactured Goods	141	234	473	1.66	3.35
9) Petroleum	5	6	9	1.20	1.80
10) Wood Products	43	58	103	1.35	2.40
Total	794	1,307	2,624	1.65	3.30

Source: JICA Study Team

3.3.3 Freight Distribution

Future trade volume was distributed to the provinces in Lao PDR by the gravity model. This gravity model was formulated with freight generation and attraction of the domestic freight demand and transport distances between traffic analysis zones as the explanatory factors. Using this gravity model, the future import and export volumes to/from Savannakhet Province were estimated as tabulated in Table 3.3.5 and 3.3.6. The expansion factors, estimated from 2009, 2015 and 2025 trade volumes, provided an essential input in the estimation of the future freight volume handled at the SLP. In order to convert freight value (in USD) into freight volume (in tons), the conversion factor was prepared for each commodity type based on the customs data of Laos in 2008/09.

Table 3.3.5 Forecasted Import Volumes and Expansion Factors (Savannakhet Province)

Commodity Type	Forecasted Import Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	1.5	2.2	4.5	1.45	2.92
2) Animal Products	3.0	4.1	7.9	1.36	2.63
3) Sugar & Sugar Confectionary	5.3	5.0	6.7	0.96	1.28
4) Fruits & Vegetables	3.6	6.4	14.0	1.78	3.87
5) Animal Feed & Fertilizers	19.0	30.2	63.8	1.59	3.36
6) Minerals & Construction Materials	81.6	128.7	265.8	1.58	3.26
7) Chemical & Plastic & Industrial Materials	82.9	144.6	313.8	1.75	3.79
8) Manufactured Goods	41.1	65.5	134.3	1.59	3.26
9) Petroleum	67.1	111.2	234.0	1.66	3.49
10) Wood Products	2.2	3.6	7.7	1.62	3.46
Total	307.4	501.6	1,052.5	1.57	3.24

Note: The figures show import volumes from Thailand.

Source: JICA Study Team

Table 3.3.6 Forecasted Export Volumes and Expansion Factors (Savannakhet Province)

Commodity Type	Forecasted Export Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	0	0	0	1.08	1.26
2) Animal Products	0	0	0	1.24	2.13
3) Sugar & Sugar Confectionary	165	165	165	1.00	1.00
4) Fruits & Vegetables	5	9	16	1.57	2.89
5) Animal Feed & Fertilizers	0	0	0	1.18	1.67
6) Minerals & Construction Materials	1	1	2	1.61	3.24
7) Chemical & Plastic & Industrial Materials	73	122	235	1.67	3.21
8) Manufactured Goods	1	1	3	1.60	2.97
9) Petroleum	0	0	0	1.00	1.00
10) Wood Products	31	38	58	1.23	1.88
Total	276	337	479	1.55	2.93

Note: The figures show export volumes to Thailand.

Source: JICA Study Team

CHAPTER 4 SLP DEVELOPMENT POLICY

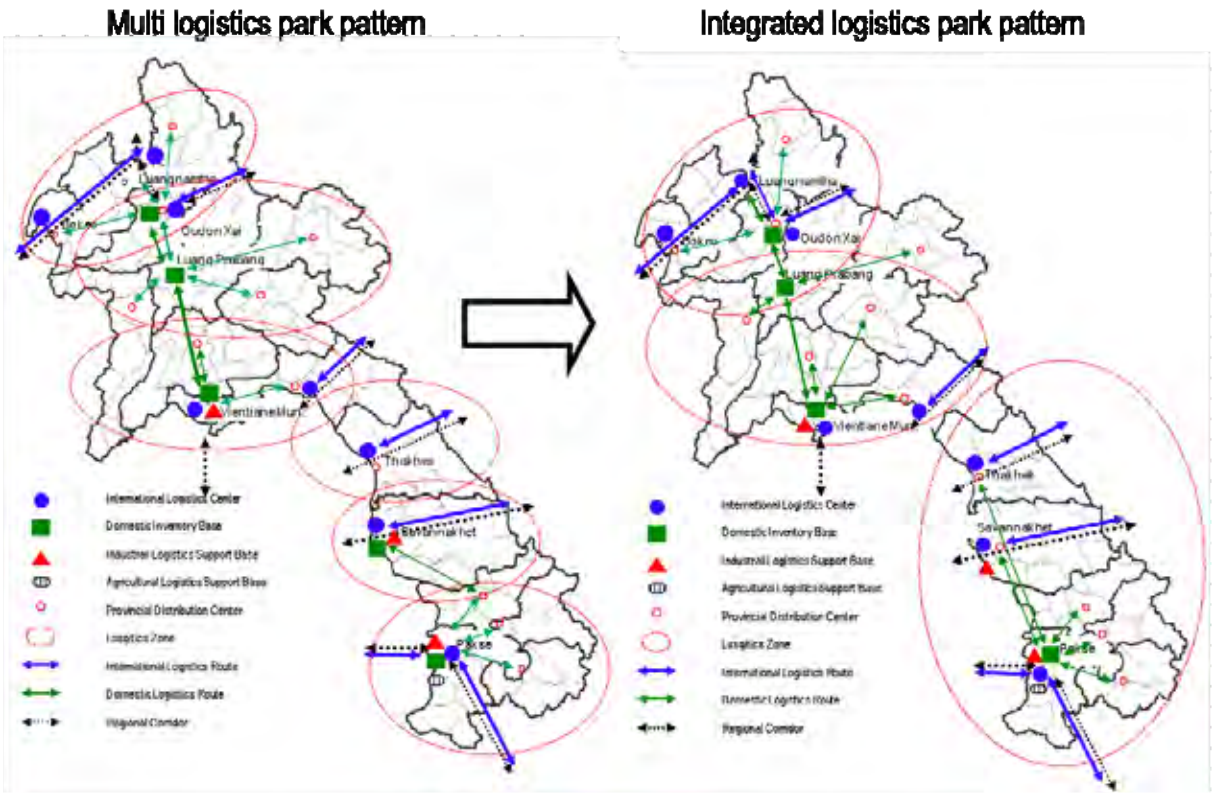
4.1 Project Rationale

4.1.1 Justification of SLP

(1) National Logistics Strategy and SLP

As discussed in a separate volume of this report (Volume 1), the National Logistics Strategy was drafted and proposed to demonstrate the policy direction of logistics development in Lao PDR, modernizing logistics infrastructures and promoting logistics industries. The overall aim of this National Logistics Strategy is to realize Lao PDR's potential for future development through exploitation of its strategic geographic location in the GMS and benefits accrued from cross-border agreements with surrounding countries. This strategy was developed based on the concept that integration of logistics facilities and facilitation of trade are essential in the provision of quality logistics services through a regional hub covering a wide area that includes Lao PDR as well as neighboring countries. Here, the key issue is how to locate integrated logistics parks strategically within Lao PDR.

Functions of Savannakhet Logistics Park (SLP) can be determined from viewpoints of national, regional development as well as local demand. In cognizance of the fact that Savannakhet has been designated as a regional logistics hub, the SLP need not be fully-equipped with logistics facilities like Vientiane Logistics Park (VLP): the SLP should focus on providing limited service targeting transit and export/import cargo (hereinafter referred to "EXIM cargo") handling, container depot and business incubation functions. Instead of Savannakhet, Champasack is expected to become a focal logistics point, dealing with EXIM cargo in the central and southern region of Lao PDR, as proposed in the National Logistics Strategy.



Source: JICA Study Team

Figure 4.1.1 Spatial Development Plan of National Logistics Strategy

(2) Regional Integration and SLP

As proposed in the National Logistics Strategy, integrated logistics facilities should be placed in such a manner that reduces transport costs and also allows transport services to cover wide area. Thakhek and Pakse were candidate locations where the integrated logistics center could be placed. Looking at the geographical location, size of the population and volume of domestic and international trade, the role of Thakhek in terms of logistics is limited and is expected to serve as a regional logistics sub-center like Savannakhet. On the other hand, Pakse is expected to become a focal logistics point, dealing with EXIM cargos in the central and southern region of Lao PDR. The following discussion reveals trade characteristics of the 2 areas: Thakhek and Pakse.

1) Thakhek

Table4.1.1 shows the present and future cargo volume of manufactured goods, one of the major commodities handled at the logistics park. The volume of manufactured goods in Thakhek was estimated as being quite small such that the supply function of these manufactured goods to/from Thakhek should be integrated with either Vientiane or Savannakhet. Although transport lead time between Thakhek and Savannakhet is shorter than that between Thakhek and Vientiane, the difference between these two routes was estimated as being within 3 hours. On the other hand, the volume of manufactured goods in Vientiane was projected as being over 5 times larger than that in Savannakhet in 2015 and over 4 times larger in 2025. As a result, Vientiane is expected to provide logistics services for manufactured goods to/from Thakhek, enjoying its scale merits which might significantly reduce the transport costs to/from Thakhek.

Table 4.1.1 Cargo Volume of Manufactured Goods in Selected Cities (Unit: thousand tons)

City	Year	Domestic	Import	Export	Total
Vientiane	2009	126,356	132,679	7,237	266,272
	2015	166,382	211,520	11,730	389,632
	2025	280,228	433,641	22,567	736,436
Thakhek	2009	10,252	15,985	140	26,377
	2015	14,994	25,260	227	40,481
	2025	31,434	51,482	441	83,357
Savannakhet	2009	24,586	28,729	913	54,228
	2015	35,989	45,571	1,486	83,046
	2025	69,161	93,078	2,882	165,121

Source: JICA Study Team

2) Pakse

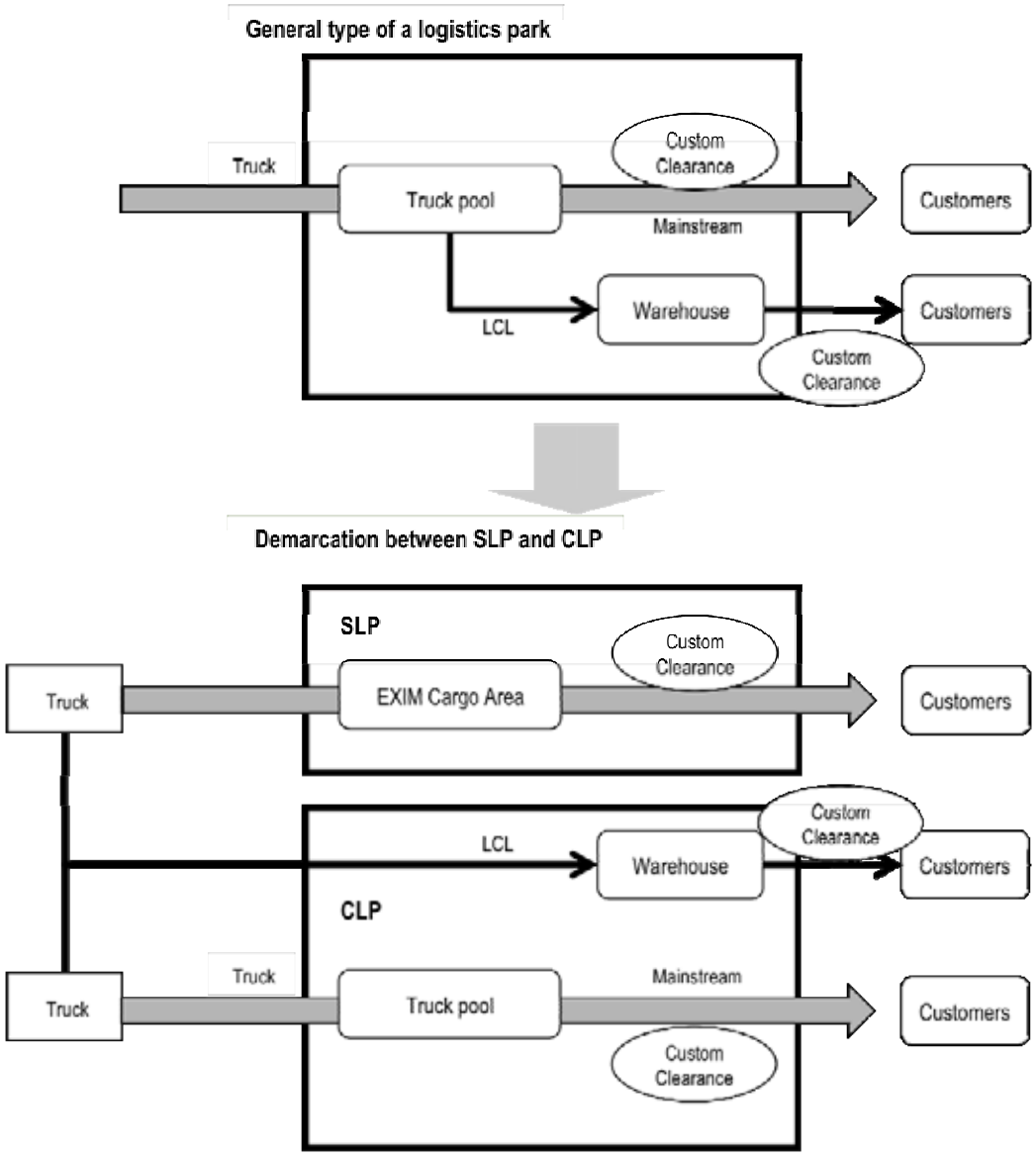
By looking at small amount of cargo volume handled at both Savannakhet and Pakse, it is not realistic to place 2 individual integrated logistics facilities in both cities. Table 4.1.2 shows commodity-wise cargo volume handled at the SLP and CLP and indicates that the inbound cargo volumes of both SLP and CLP were observed as being almost equal. Taking a look at outbound cargo volumes, inbound and outbound cargo volumes at the SLP were estimated as being very distorted, which might contribute to high transport costs. On the other hand, trade in Pakse shows good features in that inbound and outbound cargo volumes are well balanced. In this regard, Pakse could function as an integrated logistics hub which mainly handles EXIM cargo to/from Thailand and provides logistics services covering the central and southern region of Lao PDR.

Table 4.1.2 Present and Future Cargo Volumes at SLP and CLP

Unit: 000 tons

Savannakhet Logistics Park	Inbound			Outbound		
	2,009	2,015	2,025	2,009	2,015	2,025
1) Rice & Cereals	1,281	1,852	3,745	211	227	266
2) Animal Products	2,650	3,616	6,968	0	0	0
3) Sugar & Sugar Confectionary	2,635	2,520	3,370	0	0	0
4) Fruits & Vegetables	104	185	402	17	28	50
5) Animal Feed & Fertilizers	0	0	0	0	0	0
6) Minerals & Construction Materials	5,207	8,212	16,958	35	56	112
7) Chemical & Plastic & Industrial Materials	6,861	11,976	25,984	0	0	0
8) Manufactured Goods	17,905	28,517	58,446	440	703	1,309
9) Petroleum	0	0	0	0	0	0
10) Wood Products	1,957	3,169	6,773	0	0	0
Total	38,600	60,048	122,646	703	1,014	1,738
Champasack Logistics Park	Inbound			Outbound		
	2,009	2,015	2,025	2,009	2,015	2,025
1) Rice & Cereals	3,912	5,656	11,442	1,445	1,560	1,827
2) Animal Products	1,284	1,752	3,375	0	0	0
3) Sugar & Sugar Confectionary	1,707	1,633	2,183	0	0	0
4) Fruits & Vegetables	76	136	295	16,560	26,033	149,761
5) Animal Feed & Fertilizers	13,087	20,826	43,981	0	0	0
6) Minerals & Construction Materials	230	363	750	0	0	0
7) Chemical & Plastic & Industrial Materials	9,396	16,401	35,583	0	0	4,866
8) Manufactured Goods	11,318	18,026	36,942	1,270	2,029	3,758
9) Petroleum	0	0	0	0	0	0
10) Wood Products	2	3	7	9,576	11,776	515
Total	41,012	64,796	134,558	28,851	41,399	160,726

Source: JICA Study Team



Source: JICA Study Team

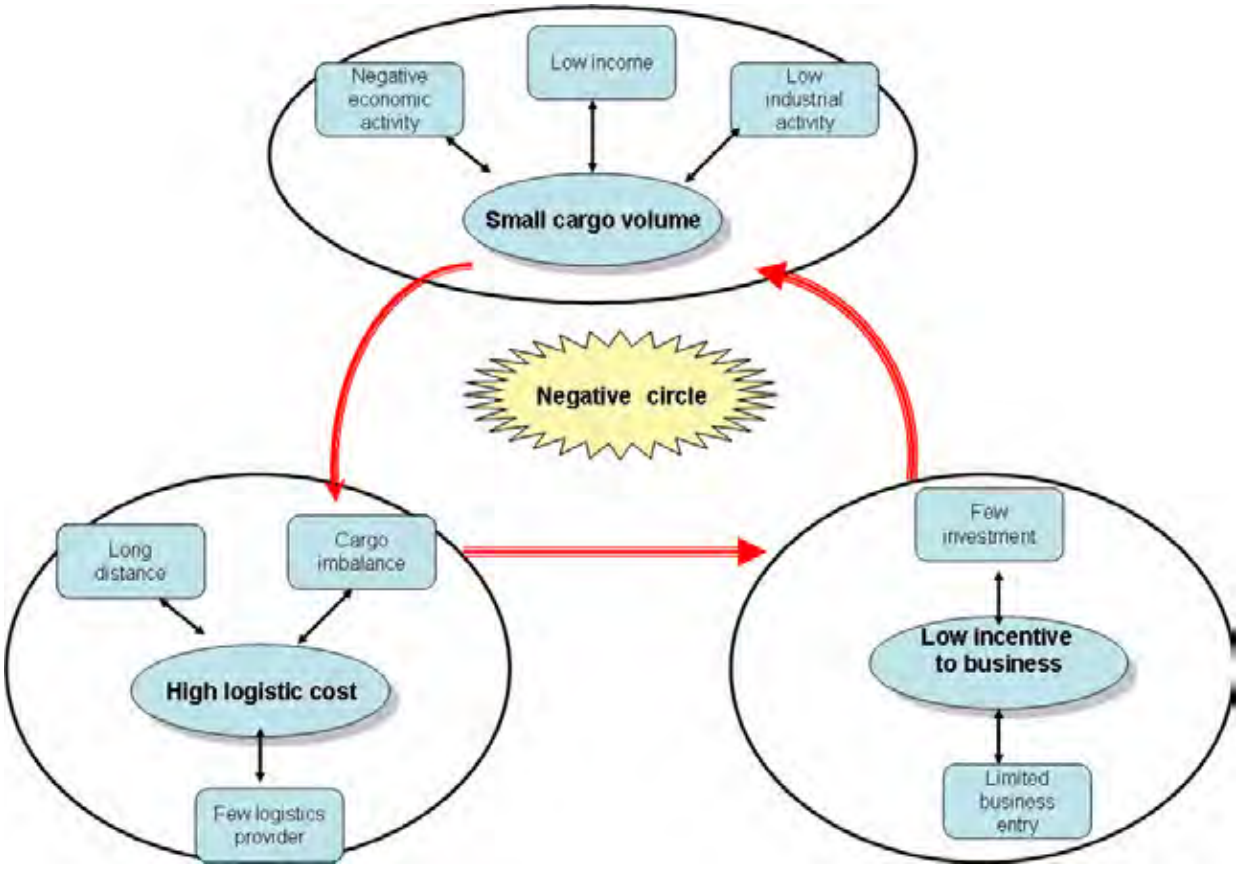
Figure 4.1.2 Illustration of Regional Logistics Integration

Accordingly, the CLP will maintain its function as a regional logistics center and the cargo required for inventory service will be handled at the CLP instead of the SLP. The remaining cargo such as full-truck delivery or direct delivery cargo will still be handled through the SLP. In terms of inventory-oriented cargo such as small-lot delivery including LCL cargo, consignees in Savannakhet can receive such cargo in less time through Pakse than if it were directly delivered from Thailand. It is because the lead time between Savannakhet and Pakse is only 3 hours while the average lead time between Thailand and Lao PDR is more than 9 hours excluding time required for customs clearance. Regional logistics integration between SLP and CLP is illustrated in Figure 4.1.2. Having said that, the SLP would be equipped with the warehouse function, as proposed in Chapter 5 of this report, to deal with the minimal amount of LCL cargo at the SLP.

4.2 Roles of SLP

(1) Issues on SLP Development

It is well acknowledged that the SLP would function as a core logistics hub, providing its service in the central region of Lao PDR along with a huge investment in road infrastructure development, i.e., NR-9. As proposed in the National Logistics Strategy, the SLP is proposed to function as a regional and national logistics hub in future. Looking at the current trade volume in Vientiane, both small cargo volume and cargo imbalance in Vientiane make it difficult for it to have a large scale logistics hub in the short run, likewise with Savannakhet, even in the future. In addition, the newly built Mukdahan ICD could become a competitor with SLP, contributing to a loss in logistics business at the SLP. These incidents are likely to leave a negative impact on development of the SLP as illustrated in Figure 4.2.1.



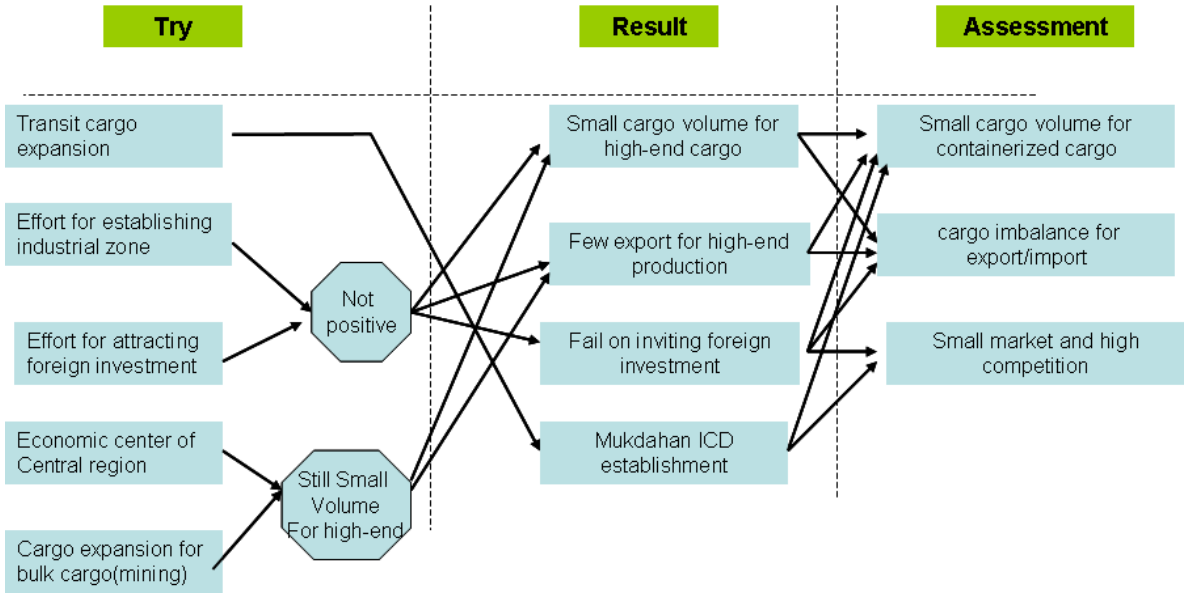
Source: JICA Study Team

Figure 4.2.1 Negative Cycle of Logistic Park Development

(2) Freight Demand and Expected Roles of SLP

Freight demand forecast, as explored in Chapter 3 of this report, indicates that cargo volume handled at the SLP will be quite small, compared to that at the VLP. According to the results of freight demand forecast, the future cargo volume of manufactured goods in Savannakhet was estimated at 16,500 tons in 2025 and will not reach the present volume of manufactured goods (26,500 tons/year) in Vientiane. Cargo volume handled at the SLP will not expand to the extent where a large scale facility is required. In addition, the imbalance of EXIM cargo volume and the

development of Mukdahan ICD[1], which is located near the border crossing with Thailand to handle transit and EXIM cargo, will have negative impacts on logistics business in Lao PDR. Both may contribute to high possibility of high logistics operation costs (due to imbalance in EXIM cargo volume) and severe competitiveness (due to development of Mukdahan ICD). The current situation in terms of logistics in Savannakhet is illustrated in Figure 4.2.2.



Source: JICA Study Team

Figure 4.2.2 Situation Analysis on Logistics in Savannakhet

Under these circumstances, the SLP need not be equipped with full scale integrated logistics facilities due to the limited amount and kinds of cargo to be handled at the SLP. Furthermore, the SLP would provide a limited service unlike the VLP where the following 5 core services would be available: 1) Interface of international trade, 2) Multi-modal facility, 3) Support to industrialization, 4) Incubation of logistics business and 5) Domestic hub. The following items will be the main services provided at the SLP.

- International interface for both EXIM and transit cargo
- Container depot
- Incubation of business providers

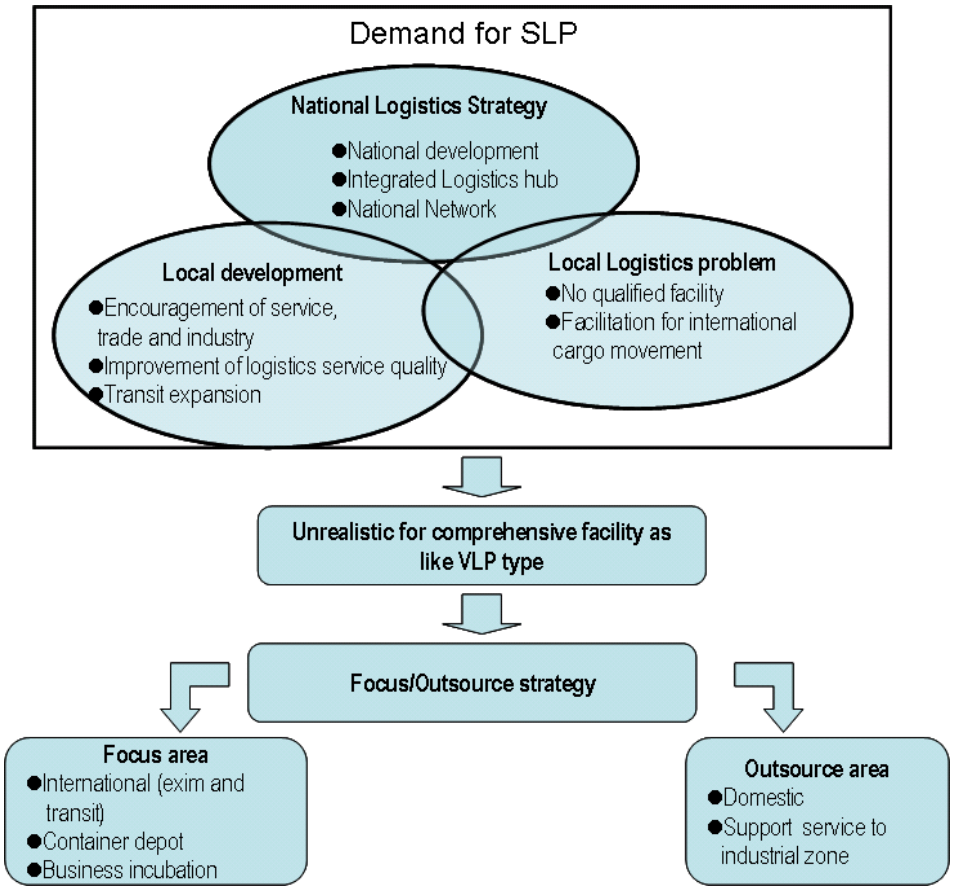
4.3 Development Concept

4.3.1 Overall Concept

As discussed in the previous section, the SLP is proposed to focus on specific logistics services: (1) International interface for both EXIM and transit cargos, (2) Container depot and (3) Incubation of business providers. The overall development concept of the SLP, in contrast with the

[1] The general information on Mukdahan ICD can be available in the website and is summarized as follows: Total Area: 44,000 m^2, Area of Warehouse: 5,600 m^2, Operation Hours: 6:00 – 20:00, CCA Operation Hours: 6:00 – 22:00, Holiday: Nil, Companies Registered: 10 Logistics Companies.

development concept of the VLP, is illustrated in Figure 4.3.1. The logistics services to be focused on and those to be outsourced at the SLP are detailed in Table 4.3.1. As discussed above, the CLP is expected to absorb these outsourced logistics services of the SLP. Having said that, the SLP will be equipped with the warehouse function, as proposed in Chapter 5 of this report, to deal with the minimal amount of LCL cargo at the SLP.



Source: JICA Study Team

Figure 4.3.1 Overall Development Concept of SLP

Table 4.3.1 Services to be Focused on and Outsourced at the SLP

Services to Focus on			Services to be Outsourced		
International function	Import	Direct delivery	International function	Import	LCL
		FCL			Storage
	Export	Direct delivery			Consolidation
		FCL		Export	LCL
	Transit	Trans-shipment			Storage
Container depot	Empty van depot				Consolidation
	Stuffed container yard		Domestic function	Domestic/domestic	Warehouse and inventory
	Returning empty container management			Import/domestic	Warehouse and inventory
			Dedicated service	inventory control	

Source: JICA Study Team

4.3.2 Services to Focus on

(1) Transit

Transit cargo through Savannakhet is projected to increase and will tend to be transported using NR-9, part of the East-West Economic Corridor, between Thailand and Vietnam. Transit cargo can benefit Lao logistics operators by generating business through trans-shipment, documentation and service fees for private operators as well as transit permission fees, tolls, oil facility usage fees and related taxes for public sector.

The key issue pertinent to generation of transit cargo is how to facilitate customs procedure and trans-shipment operation. The equipment required for transit services is available and inexpensive, which can generate profits for transport operators. However, logistics providers in Lao PDR may hesitate to invest in the transit transport business because of less incentives and lower profitability.

Another constraint is stiff competition. As mentioned earlier, the ICD was developed in Mukdahan, Thailand and provides warehouse-oriented services such as Free Zone instead of the transit operations. In order to demarcate logistics business between Mukdahan and Savannakhet, the SLP should focus on the simple trans-shipment operation.

(2) Import and Export

As discussed above, the warehouse-oriented EXIM cargo, which require inventory and dispatch operation, will be handled mainly at the CLP. On the other hand, the direct delivery of EXIM cargo will be one of the focal businesses provided at the SLP. In order to facilitate direct delivery service of EXIM cargo, customs clearance and on-chassis customs clearance system need to be provided at the SLP.

(3) Container Depot

In order to provide a direct delivery service for EXIM cargo, the container depot needs to be developed in the SLP. Although establishment of bonded container depot is ideal, the SLP cannot fully function due to its small amount of cargo volume handled. An alternative business is development of the empty container depot, enabling it to achieve more cost efficient transport by generating backhaul cargo.

It should be noted that use of containers in land transport has become popular in Thailand and Malaysia and is partly observed even in Laos. These containers are owned by the transport operators and/or shippers. And these transport operators and shippers, unlike shipping companies (tend to control use of their containers), tend to use empty container depots to reduce transport costs.

(4) Bulk Cargo Facility

Considering current logistics situation in Lao PDR, especially in Savannakhet, demand for bulk cargo is and will be large; mainly imports of construction materials for infrastructure development. The facility required for bulk cargo is basically the open space yard. This open space yard can be utilized for both bulk cargo and container yard, depending on demand of cargo.

(5) Business Incubation

Some volume of transit cargo is expected to bypass through the SLP. Therefore, there is potential to incubate a new logistics business at the SLP for various types of logistics providers. Examples of businesses to be incubated at SLP are advice for administration improvement and mediation between customers and local forwarders.

4.3.3 Services not Focused on

Unlike the case with VLP, it is suggested that the SLP focuses on providing specific services: it may not focus on the following logistics services.

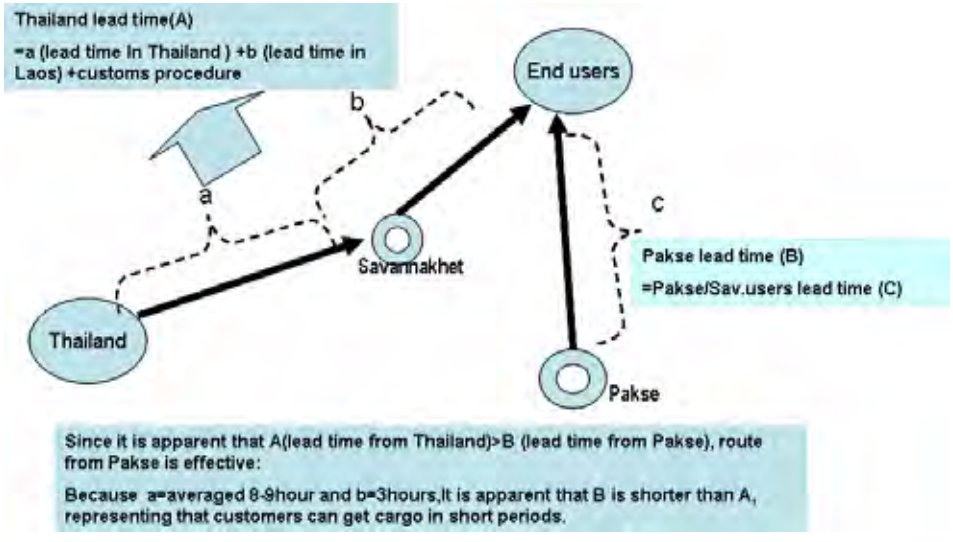
(1) Warehouse-oriented import Cargo

The services required for warehouse-oriented import cargo include inventory, sorting, packing, value added service and related operations. A typical example is categorized as import and domestic delivery of consumption goods and/or JIT (just-in-time) delivery items, which require sorting and re-packing.

The volume of warehouse-oriented cargo in the SLP is and will be very small and will not reach volumes that necessitate warehouse facility. If the warehouse and its inventory function shift to the CLP, the lead time through the CLP will be shorter than that through the SLP as illustrated in Figure 4.3.2.

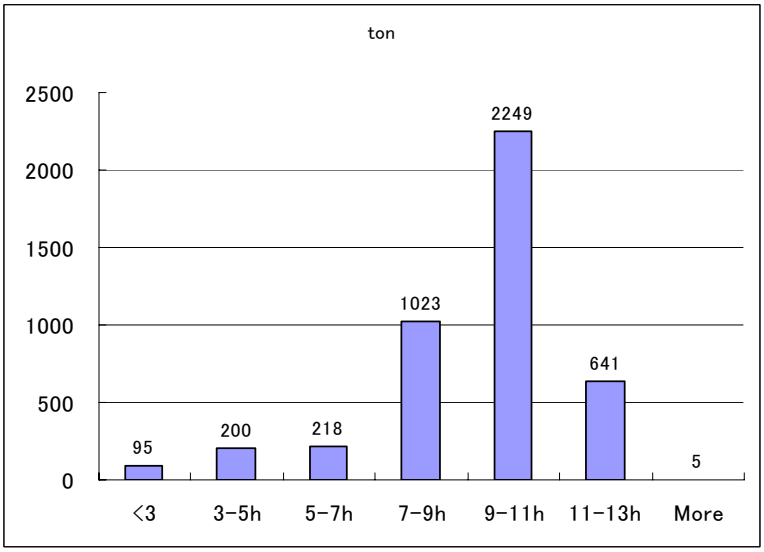
As shown in Figure 4.3.3, only 2% of the import cargo is delivered from Thailand to Lao PDR within 3 hours; 88% is delivered in over 7 hours while 65% takes more than 9 hours. As a result, the total lead time between Thailand and Lao PDR is expected to be more than 1 or 2 days after adding customs clearance time and lead time in Lao PDR.

In contrast, travel time between Pakse and Savannakhet is estimated to be within 3 hours. As such, warehouse-oriented cargo will be imported through the CLP, which contributes to reduction in travel costs, considering scale merits of the cargo traffic.



Source: JICA Study Team

Figure 4.3.2 Methodology to Integrate Facility



Source: JICA Study Team

Figure 4.3.3 Lead Time from Thailand to Savannakhet (daily ton basis)

(2) Support Function of Savan-Seno SEZ

Savannakhet plans to establish 4 Special Economic Zones (SEZs); Site A, B, C and D. Both Site A and C are being developed as industrial parks where domestic and foreign companies/factories invest. Considering its small cargo volume handled and geographical location, the SLP cannot provide dedicated service to these industrial parks. Small volume of export cargo, especially, does not meet the demand for dedicated service; as such, the business is narrowed to only import cargo. Furthermore, the SLP will not be equipped with quality warehouse facility such that warehouse-oriented operations will be outsourced to the CLP.

4.3.4 Services

The detailed services available at the SLP are summarized in the discussion below.

(1) Transit

The transit trans-shipment operation is categorized into following 4 patterns.

- Bag to bag: cargo transferred between vehicles
- Container intact : container transferred between vehicles
- Chassis exchange: both chassis and container switched between vehicles
- Through transportation

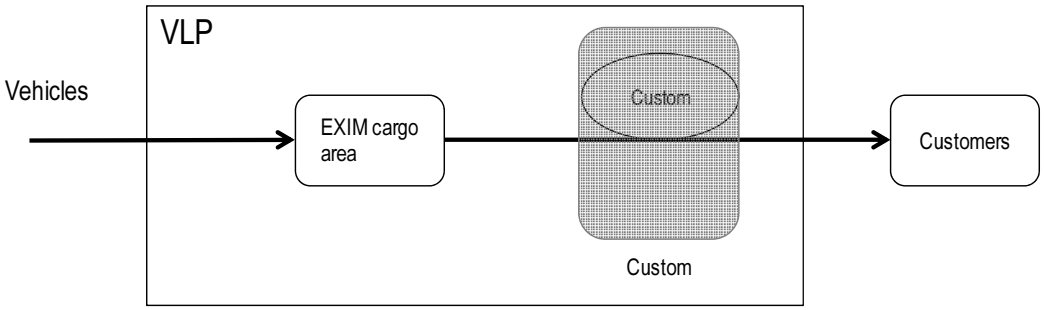
Currently, the most prominent pattern in trans-shipment operations is the container intact pattern, followed by chassis exchange pattern and through transportation. Chassis exchange and through transportation have become mainstream in terms of trans-shipment since no specific equipment, other than open yard space, is required. This open yard space needs to be controlled by the customs and be efficiently managed to avoid idle waiting time and ensure smooth matching of vehicles.

(2) EXIM Service

Direct delivery of EXIM cargo through the SLP requires customs procedure. The SLP needs to adopt on-chassis custom procedure in order to directly deliver the EXIM cargo between shippers and consignees without unloading cargos at the SLP, if the container or truck is fully loaded.

1) Import Function

Import cargo tends to be handled by fully-loaded trucks or containers. Though the current regulations stipulate that import cargo has to be unloaded at designated terminals, Lao Government enacted deregulation law to enable direct delivery of import cargo. The SLP will follow this trend, allowing customs procedure without unloading it. Accordingly, the SLP needs to be equipped with truck parking and/or open waiting space for customs clearance.

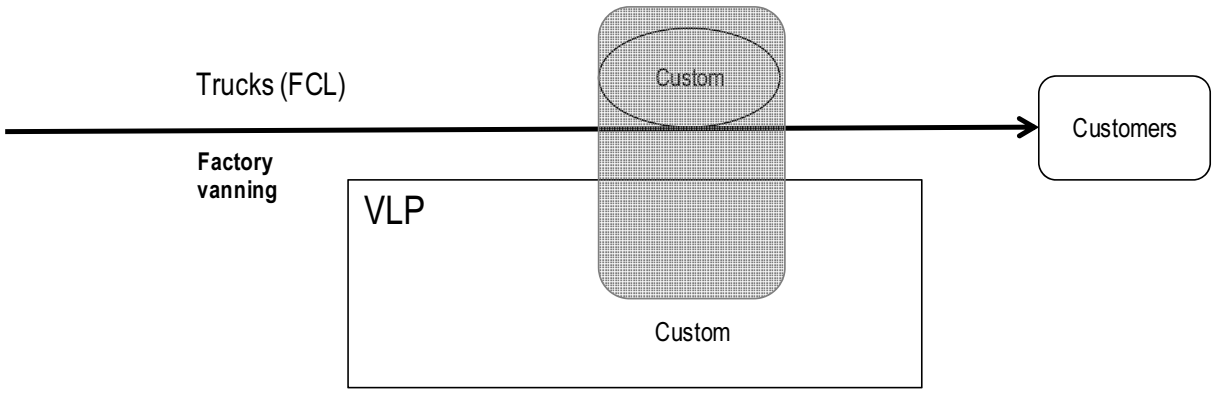


Source: JICA Study Team

Figure 4.3.4 Import Function

2) Export Function

Customs procedures for export cargo were facilitated to a great extent and factory vanning system has become a common practice in Lao PDR. The customs operation needs to be provided at the SLP. The SLP will not be equipped with warehouse facilities: therefore, LCL service will be outsourced to other warehouse operators.



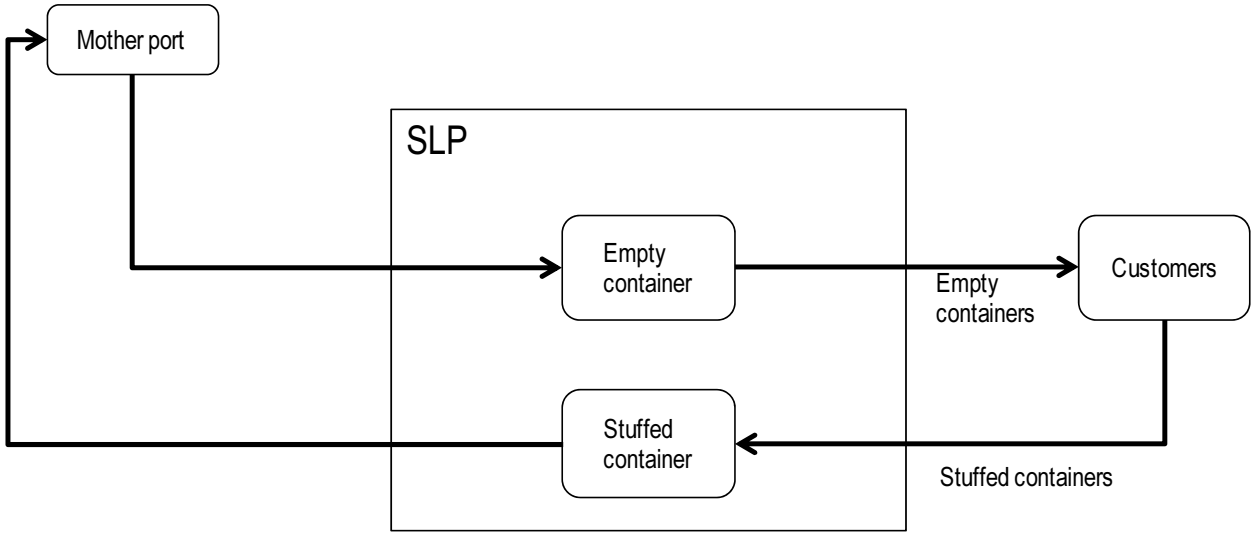
Source: JICA Study Team

Figure 4.3.5 Export Function

3) Container Depot

Container yard (CY) is a place to dispatch and receive bonded or non-bonded containers. Lao PDR has been establishing CY. However, the container owners, such as shipping line, have not been active in Lao PDR mainly because of low cargo volume and low quality inventory control available in Lao PDR (no-returning containers, uncertainty of identifying container location and unreliable return schedule). Accordingly, container turnaround in Lao PDR becomes quite low and container owners lose business profits.

To address this, an empty container depot should be available at the SLP to reduce transport costs associated with containers. It can contribute to cheaper delivery of empty containers. Considering the current situation where empty containers are delivered to/from Thailand, the logistics costs can be reduced by development of empty container depot.



Source: JICA Study Team

Figure 4.3.6 Container Depot Function

4) Warehouse

A large scale warehouse will not install at the SLP because the volume of warehouse-oriented cargo is quite small: the warehouse operations will be outsourced to the CLP. Only limited number as well as function of the warehouse facility will be developed in the SLP in order to handle import/domestic cargo. Yet, these operations can be outsourced to other private warehouses.

4.3.5 Necessary Facilities at SLP

The SLP may function as a regional logistics hub and offer limited logistics service such as trans-shipment and custom clearance service for transit and EXIM cargo. Several logistics facilities are required, which are subject to the type of commodities handled and type of service provided at the SLP. The SLP also needs to be equipped with common facility and management facility. Table 4.3.2 lists facilities necessary at the SLP.

Table 4.3.2 Necessary Facilities in SLP

Function	Service	Facilities
Transit	Customs procedure Trans-shipment	Truck pool(truck terminal, parking lots etc.) CIQ office, Trans-shipment area and equipment
Import	Customs Clearance on Chassis	CIQ office Customs office Open space for customs clearance (warehouse for inventory-oriented cargo)
Export	Customs Clearance	CIQ office, Customs office (Warehouse for LCL)
Container deport	Stuffed container pool (CY) Empty container pool	Open space for container storage Chassis pool, Truck pool
Business Incubation		Administration office
Information Service		
Support & related business		Maintenance shop, Office Container Washing
		Administration office, Temporary parking lots Gate, Buffer, Road (in SLP and access road)

Source: JICA Study Team

4.4 Cargo Volume Handled at SLP

4.4.1 Methodology of Freight Demand Forecast at SLP

The freight demand forecast model, built for the export and import cargo, was originally developed for the national analysis to determine the national logistics strategy. It will also provide essential guidance to foresee the freight demand at micro level, such as the cargo handled in the SLP. Adopting the comprehensive demand forecast model, the methodology of the freight demand forecast for the SLP is summarized below.

- SLP will handle import and export cargo from/to Thailand and transit cargo through Lao PDR from Thailand to Vietnam and vice versa.
- SLP will NOT handle cargo generated to/from SEZs (Site A and Site C) in Khanthabouly District. It is because these SEZs are located near the border with Thailand while the possible location of the SLP is far from these SEZs. Besides, the factories/companies in these SEZs may have logistics facilities and will not use SLP.
- In Khammuane province, the 3rd Friendship Bridge between Lao PDR and Thailand is scheduled to open to the traffic in 2013. This 3rd Friendship Bridge is expected to reduce transport time and distance between Thailand and the northern region of Vietnam, especially Bangkok and Hanoi via NH-8 or NH-12 in Lao PDR. Part of transit cargo through existing 2nd Friendship Bridge will shift to NH-8 or NH-12 after 2013.
- Along the East-West Corridor between Thailand and Vietnam via NH-9, Mukdahan ICD in Thailand has opened and is being operated while another Densavan ICD in Vietnam is planned to open. SLP will handle part of the transit cargo, sharing it among these 2 ICDs.
- Containerization is a worldwide trend. Thus, the commodity-wise future freight demand was categorized by packing type; volumes of general cargo, heavy bulk and petroleum, and container cargo were separately estimated.

4.4.2 Pre-conditions of Freight Demand Forecast

Using the comprehensive freight demand forecast model, built for the national analysis, the freight demand in the SLP was forecasted based on the following pre-conditions.

- Target year was set as Year 2025 in the long term and as Year 2015 in the medium term.
- Adopting the same socio-economic framework, annual GDP growth of 7.5% (from 2011 to 2020) and 7.0% p.a. (from 2021 to 2025) and population growth of 1.7% p.a. (from 2008 to 2025) were applied to the demand forecast model.
- Based on the traffic volume at the 2nd Friendship Bridge and 3rd Friendship Bridge estimated by traffic demand assignment, about 94% of transit cargo from Thailand to Vietnam and 74% of transit cargo from Vietnam to Thailand were shifted to the 3rd Friendship Bridge in 2015. In 2025, the share of the 2nd Friendship Bridge will increase to 42% and 62% respectively.
- The share of SLP against other logistics facilities along the East-West Corridor was assumed as follows. (i) Based on the roadside interview survey, 70% of heavy vehicles observed at Savannakhet custom were registered in Thailand, and 30% were Lao trucks. Accordingly, 70% of transit cargo from Thailand to Vietnam would be handled at Mukdahan ICD, and 30% would be handled at SLP. (ii) Based on the same roadside interview survey, 52% of heavy vehicles observed at Savannakhet custom were registered in Laos. Thus, Transit cargo from Vietnam to Thailand through NH-9 was divided half-and-half between SLP and planned facility at Densavan.
- The current volume of the EXIM cargo was divided into 99 commodities (following HS 2 digits code) and share of cargo at SLP against the total EXIM cargo was estimated by collecting commodities of the EXIM cargo to be handled at SLP (see Table 4.4.1).

Table 4.4.1 Handling Cargo Ratio by Type of Commodity at SLP

Commodity Type	Share of SLP	
	Import	Export
1) Rice & Cereals	83%	100%
2) Animal Products	88%	0%
3) Sugar & Sugar Confectionary	50%	0%
4) Fruits & Vegetables	3%	0%
5) Animal Feed & Fertilizers	0%	0%
6) Minerals & Construction Materials	6%	5%
7) Chemical & Plastic & Industrial Materials	8%	0%
8) Manufactured Goods	44%	50%
9) Petroleum	0%	0%
10) Wood Products	89%	0%
Total	11%	0%

Note: The figures were calculated by C2000 Custom Data.

Source: JICA Study Team

4.4.3 Freight Generation/Distribution

As discussed above, the expansion factors were estimated by import/export/transit and commodity. Using the same expansion factors, the import and export volumes to/from Thailand were estimated, which provided the control total for estimation of the cargo to be handled at the SLP. Table 4.4.2 shows the future import and export volumes in Years 2015 and 2025.

Table 4.4.2 Forecasted Annual Import Volumes (2nd Friendship Bridge)

Commodity Type	Forecasted Import Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	1.5	2.2	4.5	1.45	2.92
2) Animal Products	3.0	4.1	7.9	1.36	2.63
3) Sugar & Sugar Confectionary	5.3	5.0	6.7	0.96	1.28
4) Fruits & Vegetables	3.6	6.4	14.0	1.78	3.87
5) Animal Feed & Fertilizers	19.0	30.2	63.8	1.59	3.36
6) Minerals & Construction Materials	81.6	128.7	265.8	1.58	3.26
7) Chemical & Plastic & Industrial Materials	82.9	144.6	313.8	1.75	3.79
8) Manufactured Goods	41.1	65.5	134.3	1.59	3.26
9) Petroleum	67.1	111.2	234.0	1.66	3.49
10) Wood Products	2.2	3.6	7.7	1.62	3.46
Total	307.4	501.6	1,052.5	1.57	3.24

Note: The figures show import volumes from Thailand.

Source: JICA Study Team

Table 4.4.3 Forecasted Annual Export Volumes (2nd Friendship Bridge)

Commodity Type	Forecasted Export Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	0.2	0.2	0.3	1.08	1.26
2) Animal Products	0.1	0.2	0.3	1.24	2.13
3) Sugar & Sugar Confectionary	164.8	164.8	164.8	1.00	1.00
4) Fruits & Vegetables	5.5	8.6	15.8	1.57	2.89
5) Animal Feed & Fertilizers	0.1	0.2	0.2	1.18	1.67
6) Minerals & Construction Materials	0.7	1.1	2.3	1.61	3.24
7) Chemical & Plastic & Industrial Materials	73.1	122.1	234.7	1.67	3.21
8) Manufactured Goods	0.9	1.4	2.6	1.60	2.97
9) Petroleum	0.0	0.0	0.0	1.00	1.00
10) Wood Products	30.9	38.0	58.2	1.23	1.88
Total	276.4	336.7	479.3	1.55	2.93

Note: The figures show export volumes to Thailand.

Source: JICA Study Team

Table 4.4.4 Forecasted Annual Transit Volumes (from Thailand to Vietnam) without 3rd Friendship Bridge

Commodity Type	Forecasted Transit Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
1) Rice & Cereals	15.3	25.9	56.4	1.70	3.69
2) Animal Products	8.8	14.9	32.4	1.70	3.69
3) Sugar & Sugar Confectionary	42.4	72.0	156.6	1.70	3.69
4) Fruits & Vegetables	12.4	21.0	45.8	1.70	3.69

Commodity Type	Forecasted Transit Volumes (1000 tons)			Expansion Factors	
	2009	2015	2025	2015/2009	2025/2009
5) Animal Feed & Fertilizers	0.0	0.0	0.0	1.71	3.71
6) Minerals & Construction Materials	0.3	0.6	1.3	1.70	3.69
7) Chemical & Plastic & Industrial Materials	5.3	9.0	19.6	1.70	3.69
8) Manufactured Goods	19.5	33.2	72.2	1.70	3.69
9) Petroleum	0.6	1.1	2.3	1.70	3.69
10) Wood Products	0.0	0.1	0.1	1.71	3.71
Total	104.7	177.7	386.6	1.70	3.69

Note: The figures show transit volumes from Thailand.

Source: JICA Study Team

Table 4.4.5 Forecasted Annual Transit Volumes through 2nd Friendship Bridge

Commodity Type	Forecasted Transit Volumes (1000 tons) From Thailand to Vietnam		Forecasted Transit Volumes (1000 tons) From Vietnam to Thailand	
	2015	2025	2015	2025
1) Rice & Cereals	2.4	35.9	0.0	0.0
2) Animal Products	0.9	13.6	0.2	0.8
3) Sugar & Sugar Confectionary	4.3	65.0	0.0	0.0
4) Fruits & Vegetables	1.3	19.2	27.4	118.8
5) Animal Feed & Fertilizers	0.0	0.1	0.0	0.0
6) Minerals & Construction Materials	0.0	0.5	0.0	0.0
7) Chemical & Plastic & Industrial Materials	0.5	8.3	0.3	1.5
8) Manufactured Goods	2.0	30.8	0.5	2.1
9) Petroleum	0.1	0.9	0.0	0.0
10) Wood Products	0.0	0.1	0.0	0.0
Total	11.4	174.3	28.4	123.1

Source: JICA Study Team

Table 4.4.6 Forecasted Annual Handling Volumes at SLP in 2015

	Import	Export	Transit		Total (1000 tons)
			Thailand to Vietnam	Vietnam to Thailand	
1) Rice & Cereals	0.6	0.1	0.7	0.0	1.3
2) Animal Products	1.1	0.0	0.3	0.1	1.4
3) Sugar & Sugar Confectionary	0.8	0.0	1.3	0.0	2.0
4) Fruits & Vegetables	0.1	0.0	0.4	13.7	14.1
5) Animal Feed & Fertilizers	0.0	0.0	0.0	0.0	0.0
6) Minerals & Construction Materials	2.5	0.0	0.0	0.0	2.5
7) Chemical & Plastic & Industrial Materials	3.6	0.0	0.2	0.2	3.9
8) Manufactured Goods	8.6	0.2	0.6	0.2	9.6
9) Petroleum	0.0	0.0	0.0	0.0	0.0
10) Wood Products	1.0	0.0	0.0	0.0	1.0
Total	18.0	0.3	3.4	14.2	35.9

Source: JICA Study Team

Table 4.4.7 Forecasted Annual Handling Volumes at SLP in 2025

	Import	Export	Transit		Total (1000 tons)
			Thailand to Vietnam	Vietnam to Thailand	
1) Rice & Cereals	1.1	0.1	10.8	0.0	12.0
2) Animal Products	2.1	0.0	4.1	0.4	6.6
3) Sugar & Sugar Confectionary	1.0	0.0	19.5	0.0	20.5
4) Fruits & Vegetables	0.1	0.0	5.7	59.4	65.3
5) Animal Feed & Fertilizers	0.0	0.0	0.0	0.0	0.0
6) Minerals & Construction Materials	5.1	0.0	0.2	0.0	5.3
7) Chemical & Plastic & Industrial Materials	7.8	0.0	2.5	0.7	11.0
8) Manufactured Goods	17.5	0.4	9.2	1.0	28.2
9) Petroleum	0.0	0.0	0.0	0.0	0.0
10) Wood Products	2.0	0.0	0.0	0.0	2.0
Total	36.8	0.5	52.0	61.6	150.9

Source: JICA Study Team

4.4.4 Containerization Ratio

Containerized cargo ratio throughput in Lao PDR was estimated by cross country analysis, which incorporated GDP and population in the same way the containerized ratio at Vientiane Logistics Park was estimated.

$$CONT = 3.07^{-6} \times GDP + 0.0343 \times Pop \ (\mathrm{r2} = 0.93)$$

where, CONT: Annual container throughputs (million TEU), GDP: Nominal Gross Domestic Product (million USD), Pop: Population (million)

Applying the annual GDP growth of 7.5% (from 2011 to 2020) and 7.0% p.a. (from 2021 to 2025) and population growth of 1.7% p.a. (from 2008 to 2025), the container traffic in Lao PDR was estimated to reach 0.08 million TEUs, equivalent to 953,000 tons, by 2025. Excluding minerals and petroleum, the trade volume will reach 2,968,000 tons by 2025, meaning that 32% of the general cargo will be transported by containers. Table 4.4.8 shows containerization ratio up to 2025.

Table 4.4.8 Containerization Ratio

Year	2009	2015	2025
Import	9.9%	18.3%	32.1%
Export	5.9%	15.8%	32.1%

Note: Containerization ratio in 2009 was estimated based on the trip generation survey at Thanaleng Warehouse conducted by the Study Team.

Source: JICA Study Team

4.4.5 Packing Type

Commodities to be handled in the SLP can be categorized into 4 packing types: container, general cargo, heavy bulk and petroleum. The containerized ratio by type of commodity is, as shown in

following tables, defined based on the existing Thanaleng Warehouse in Vientiane Capital.

Table 4.4.9 Commodity and Packing Type in 2015

Commodity Type	Packing Type	Containerized Ratio		
		Transit	Import	Export
1) Rice & Cereals	Container, General Cargo	100%	18.3%	15.8%
2) Animal Products	Container, General Cargo	100%	18.3%	15.8%
3) Sugar & Sugar Confectionary	Container, General Cargo	100%	18.3%	15.8%
4) Fruits & Vegetables	Container, General Cargo	100%	18.3%	15.8%
5) Animal Feed & Fertilizers	Container, General Cargo	100%	18.3%	15.8%
6) Minerals & Construction Materials	Heavy Bulk	0.0%	0.0%	0.0%
7) Chemical & Plastic & Industrial Materials	Container, General Cargo	100%	18.3%	15.8%
8) Manufactured Goods	Container, General Cargo	100%	18.3%	15.8%
9) Petroleum	Liquid Cargo	0.0%	0.0%	0.0%
10) Wood Products	Heavy Bulk	0.0%	0.0%	0.0%

Source: JICA Study Team

Table 4.4.10 Commodity and Packing Type in 2025

Commodity Type	Packing Type	Containerized Ratio		
		Transit	Import	Export
1) Rice & Cereals	Container, General Cargo	100%	32.1%	32.1%
2) Animal Products	Container, General Cargo	100%	32.1%	32.1%
3) Sugar & Sugar Confectionary	Container, General Cargo	100%	32.1%	32.1%
4) Fruits & Vegetables	Container, General Cargo	100%	32.1%	32.1%
5) Animal Feed & Fertilizers	Container, General Cargo	100%	32.1%	32.1%
6) Minerals & Construction Materials	Heavy Bulk	0.0%	0.0%	0.0%
7) Chemical & Plastic & Industrial Materials	Container, General Cargo	100%	32.1%	32.1%
8) Manufactured Goods	Container, General Cargo	100%	32.1%	32.1%
9) Petroleum	Liquid Cargo	0.0%	0.0%	0.0%
10) Wood Products	Heavy Bulk	0.0%	0.0%	0.0%

Source: JICA Study Team

4.4.6 Summary of Results of Future Freight Demand at SLP

Table 4.4.11 shows the future freight demand at the SLP and the results of the future demand forecast for SLP cargo can be summarized as follows.

- Forecasted annual handling cargo volume at SLP will be about 36,000 tons in 2015 and 151,000 tons in 2025.
- The share of heavy bulk and general cargo will decrease from 10% and 34% in 2015 to 5% and 14% in 2025 respectively.
- Container cargo will increase from 57% in 2015 to 82% in 2025.

Table 4.4.11 Annual Handling Volume by Packing Type in 2015

Unit: 000 tons

Commodity Type	Petroleum Freight	Heavy Bulk	General Cargo	Container	Total
1) Rice & Cereals	0.0	0.0	0.5	0.8	1.3
2) Animal Products	0.0	0.0	0.9	0.6	1.4
3) Sugar & Sugar Confectionary	0.0	0.0	0.6	1.4	2.0
4) Fruits & Vegetables	0.0	0.0	0.1	14.1	14.1
5) Animal Feed & Fertilizers	0.0	0.0	0.0	0.0	0.0
6) Minerals & Construction Materials	0.0	2.5	0.0	0.0	2.5
7) Chemical & Plastic & Industrial Materials	0.0	0.0	2.9	1.0	3.9
8) Manufactured Goods	0.0	0.0	7.2	2.4	9.6
9) Petroleum	0.0	0.0	0.0	0.0	0.0
10) Wood Products	0.0	1.0	0.0	0.0	1.0
Total	0.0	3.4	12.2	20.3	35.9

Source: JICA Study Team

Table 4.4.12 Annual Handling Volume by Packing Type in 2025

Unit: 000 tons

Commodity Type	Petroleum Freight	Heavy Bulk	General Cargo	Container	Total
1) Rice & Cereals	0.0	0.0	0.8	11.2	12.0
2) Animal Products	0.0	0.0	1.4	5.1	6.6
3) Sugar & Sugar Confectionary	0.0	0.0	0.7	19.8	20.5
4) Fruits & Vegetables	0.0	0.0	0.1	65.2	65.3
5) Animal Feed & Fertilizers	0.0	0.0	0.0	0.0	0.0
6) Minerals & Construction Materials	0.0	5.3	0.0	0.0	5.3
7) Chemical & Plastic & Industrial Materials	0.0	0.0	5.3	5.7	11.0
8) Manufactured Goods	0.0	0.0	12.2	16.0	28.2
9) Petroleum	0.0	0.0	0.0	0.0	0.0
10) Wood Products	0.0	2.0	0.0	0.0	2.0
Total	0.0	7.3	20.5	123.1	150.9

Source: JICA Study Team

4.4.7 Traffic Volume at SLP

The previous discussion reveals how the tonnage of the future cargo handled at the SLP was estimated. The topic discussed in this section is how the traffic demand to transport the estimated cargo demand at the SLP was estimated. First of all, the following analysis estimates the number of trucks necessary to transport the cargo to/from the SLP.

(1) Number of Trucks for SLP Cargo

1) Average Loading Weight by Truck Type

Table 4.4.13 summarizes the average loading weight by truck type, prepared from the results of the trip generation survey at the Thanaleng Warehouse. Considering tonnage of the future freight demand at the SLP, the truck-wise average loading weight was estimated as tabulated in the Table 4.4.14. It should be noted that average loading weight of the container truck was separately

estimated at 24 tons per 40 feet equivalent unit (FEU) from the trip generation survey conducted at the Thanaleng Warehouse.

Table 4.4.13 Average Loading Weight by Truck Type

Unit: tons/truck

Type of Package	2 Axles Bed / Roof Truck	3 Axles Bed / Roof Truck	4 Axles Bed / Roof Truck	Articulated Truck	Tanker	Trailer	Total
(1) Empty							0
(2) Less than 1/4 (25%)							0
(3) 1/4 (25%)		8.0					8.0
(4) 1/2 (50%)	7.2	0.7		15.0			6.6
(5) 3/4 (75%)	10.0	3.3				25.0	18.5
(6) Full (100%)	7.0	8.9	16.2	23.0	23.3	23.4	17.1
Average	7.2	8.5	16.2	22.9	23.3	23.6	16.8

Source: JICA Study Team

Table 4.4.14 Average Loading Weight by Truck Type

Packing Type	3 and more axles	Trailer
Petroleum Freight	12.0	12.0
Heavy Bulk	12.0	24.0
General Cargo	12.0	24.0
Container (40 FEU)		24.0

Source: JICA Study Team

2) Number of International Trucks at SLP

There are 2 types of transport that would be generated from the SLP: domestic and international transport. The following analysis reveals the volume of the international transport (trucks), mainly to/from Thailand, at the SLP.

The number of international trucks at the SLP was estimated by dividing the daily future freight demand by the average loading weight. For export and import cargo, the average loading weight of the trailer was adopted for estimation of international trucks delivering to/from the SLP. Table 4.4.15 summarizes the estimated number of international trucks and indicates that 33 and 46 international trucks will use the SLP to transport export and import cargo in 2015 and 2025, respectively.

Table 4.4.15 Number of International Trucks at SLP

Unit: trucks/day

Year	2015			2025		
Packing Type	Import	Export	Transit	Import	Export	Transit
Heavy Bulk	2	1	2	2	1	2
General Cargo	7	3	0	7	3	0
Container	6	3	9	6	3	22
Sub-total	15	7	11	15	7	24
Grand Total			33			46

Source: JICA Study Team

3) Number of Domestic Trucks at SLP

For estimation of the trucks delivering export and imported cargo to the domestic market in Lao PDR, average loading weights of both truck (for mixed loading cargos) and trailer (for full loading cargos and cargos by railway) were adopted. Table 4.4.16 summarizes the estimated number of domestic trucks and shows that 34 and 52 domestic trucks will use the SLP to transport export and import cargo to the local market in 2015 and 2025, respectively.

Table 4.4.16 Number of Domestic Trucks at SLP

Unit: trucks/day

Year	2015			2025		
Packing Type	Import	Export	Transit	Import	Export	Transit
Full Loading						
Heavy Bulk	2	1	2	2	1	2
General Cargo	7	3	0	7	3	0
Container	6	3	9	6	3	19
Sub-total	15	7	11	15	7	21
Mixed Loading						
Heavy Bulk	0	0	0	0	0	0
General Cargo	0	0	0	1	0	0
Container	0	0	1	0	0	8
Sub-total	0	0	1	1	0	8
Grand Total	34			52		

Note: Mixed loading cargo was assumed to reach at 10% of all the cargo handled at the VLP by 2015 and 20% by 2025.

Source: JICA Study Team

4.5 Layout Concept

4.5.1 Preconditions

(1) Selection of Optimum Location of the SLP

As discussed in Section 4.2, the SLP is expected to handle mainly transit cargo between Thailand and Vietnam and to a certain extent, EXIM cargo distributed to Savannakhet and surrounding provinces. Considering the volume and flow of transit and EXIM cargo at the SLP and availability of the public land, there are 3 options where the SLP could be placed: CCA near the Second Friendship Bridge (Option 1), Site B of the Special Economic Zones (SEZs) (Option 2) and Site C of SEZs (Option 3). Figure 4.5.1shows the 3 candidate locations of the SLP.

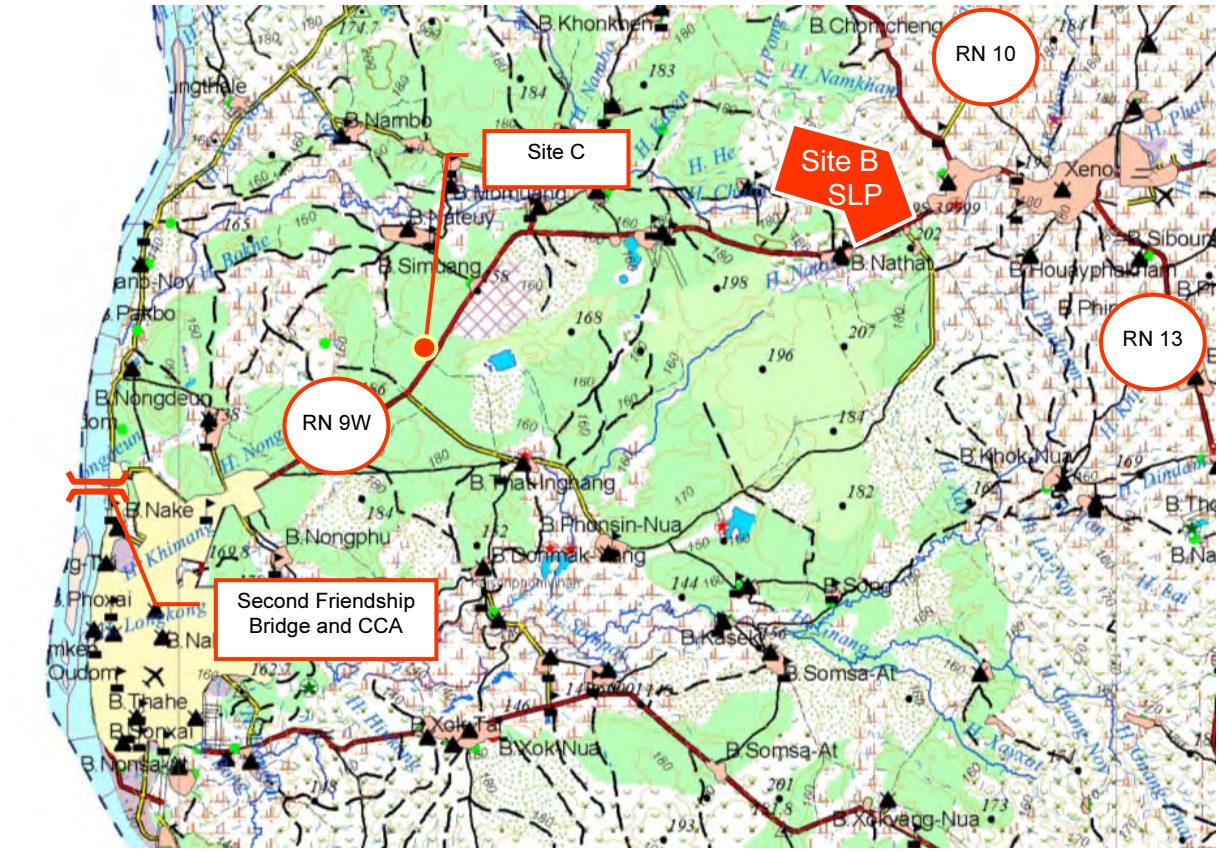
At the initial stage of the site selection exercise, the 3 alternative options of the project site were compared as shown in Table 4.5.1. It was established that Site B (Option 2) was the most optimum site, considering availability of area, landscape, accessibility and future expansion and environmental perspectives. Furthermore, the location of the SLP was decided upon after discussions between MPWT, DPWT, Savannakhet Custom Office and Provincial Office which focused on the conformity of each location with development concept of each site in Savan-Seno SEZ and the available space. As a result, following the preliminary site survey and interviews with the relevant local officials, the optimum location of the SLP was finally determined as Option 2, Site B of the SEZs.

Table 4.5.1 Comparison of Three Options of the Project Site

	Option1: CCA	Option 2: Site B	Option 3: Site C
Topography	C	A	A
Landscape	B	A	A
Accessibility	A	A	A
Consistency with Upper Plan	B	A	C+
Future Expansion	C	A	A
Environment	B	A	A
Land ownership	B	A	B

Note: A: Good, B: Fair, C: Bad

Source: JICA Study Team



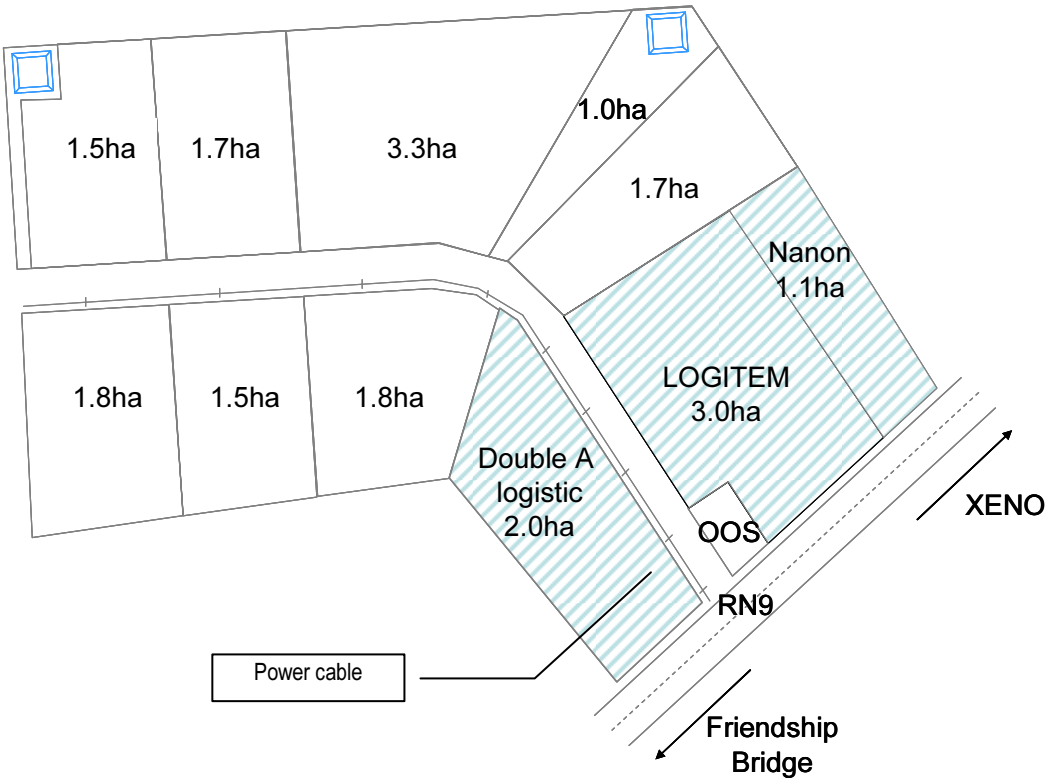
Source: JICA Study Team

Figure 4.5.1 Alternative Locations of SLP

(2) Physical Conditions of Optimum Location of the SLP

The existing land use and future development plan in Option 2, Site B of the SEZs is illustrated in Figure 4.5.2. The following control points of physical planning were identified during the preliminary site survey by the Study Team. Considering these control points, the SLP is proposed to be developed in the western side of the Site B, adjacent to the development area of Thai logistics company (Double A).

- One-Stop service is currently available at Site B.
- Two Thai companies, Nanon and Double A Logistic applied and approved for development of logistics facilities 3 years ago. However, these 2 companies neither started operations nor installed logistics facilities. The future development by these 2 companies is unknown.
- The arrangement of SLP does not use their land, because they may enter it in future.
- Therefore the candidate area for development of the SLP was selected from the 10ha of the land excluding that utilized by the existing logistic company (Logitem), one-stop service and the 2 Thai companies.
- The Site B is currently an open space and there are no constraints for land use and development. Development of the SLP does not adversely affect the environment. There are no squatters identified in the Site B.
- The power line is installed along the approach road to Site B.



Source: JICA Study Team

Figure 4.5.2 Physical Conditions of the SLP

4.5.2 Layout Plan

(1) Preconditions of Layout Planning

As discussed in the previous section, the SLP is expected to provide functional and smooth operation for customers. In this regard, the following considerations are taken into account in planning the layout of the SLP:

- The distance in both traffic/freight flow and flow of the customs procedure should be minimal.

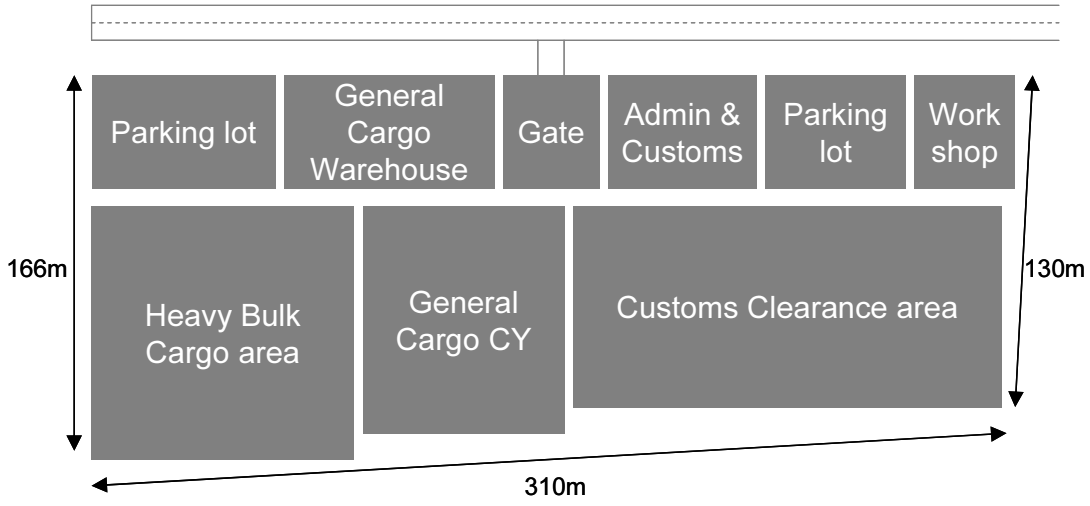
- CY and warehouse should be located in such a way so as to maintain good connectivity by trailer and truck.
- Customs office and customs clearance area should also be located in such a way so as to maintain good connectivity.
- Different commodities and packing types will be separately handled.
- Bonded warehouses for supplying stocks should be located in a functional manner.
- Traffic collision and congestion in/around the SLP should be minimal and appropriate parking lots, in terms of size and location, should be availed.
- Expansion of the SLP should be allowed.

As the first step of layout planning, the location of CY and warehouse was designated. Then, heavy bulk and general cargo area were designated to avoid collision with the cargo handled at CY and warehouse. The location of parking lots was designated, considering the location of CY and warehouse. The location of administration, customs office and customs clearance area was selected to ensure good accessibility to the customers of heavy bulk cargo area, CY, warehouse. Finally, the maintenance workshop and employees' parking lot were placed in the remaining spaces.

Considering the volume of the cargo and types of the commodities handled at the SLP, the area required for development of the SLP was estimated as 5.1 ha in total and details of this estimation of each facility are explained in Chapter 5.

(2) Layout Plan

Based on preconditions of layout planning, a layout plan of the SLP was prepared as shown in Figure 4.5.3. CY was placed at the center of the project site to maintain good access to the general cargo warehouse. Customs clearance area was placed at the east-end of the project site. The heavy bulk cargo area was placed at the west-end of the project site. The administration and customs office were placed at the center, in consideration of operations of customers/operators.

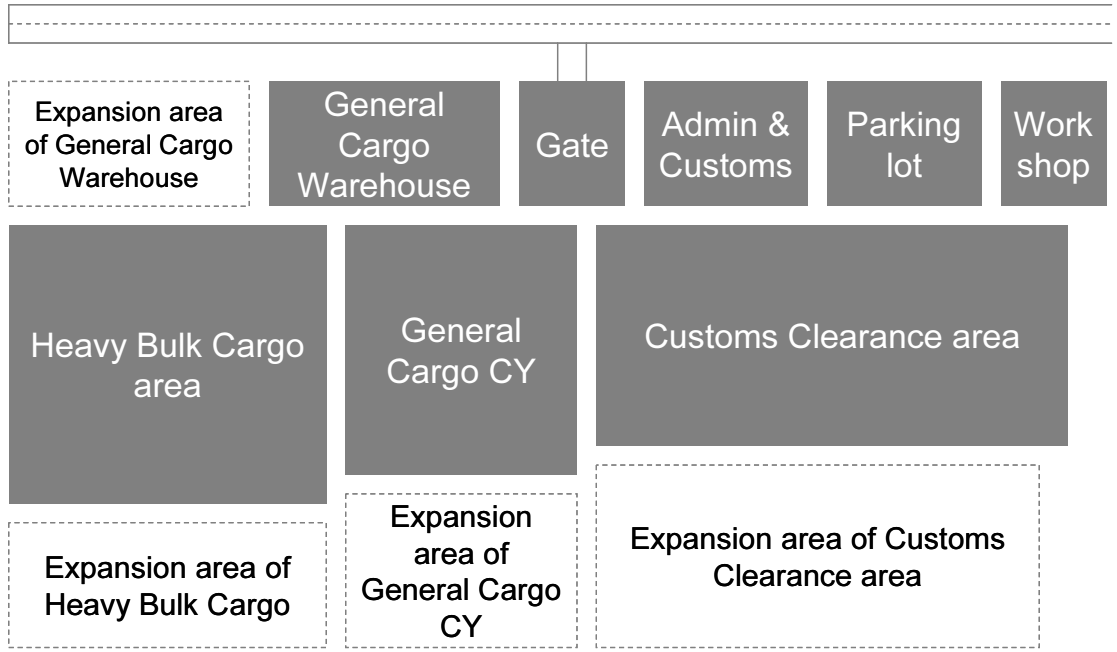


Source: JICA Study Team

Figure 4.5.3 Layout Plan of SLP

4.5.3 Consideration for Further Expansion

The layout plan of the SLP, as discussed above, was prepared based on the volume of cargo and types of the commodities handled at the SLP, with the target year of 2025. Considering availability of the land, geological features of the project site and workability of operations at the SLP, the future expansion of the SLP is proposed as illustrated in Figure 4.5.4.



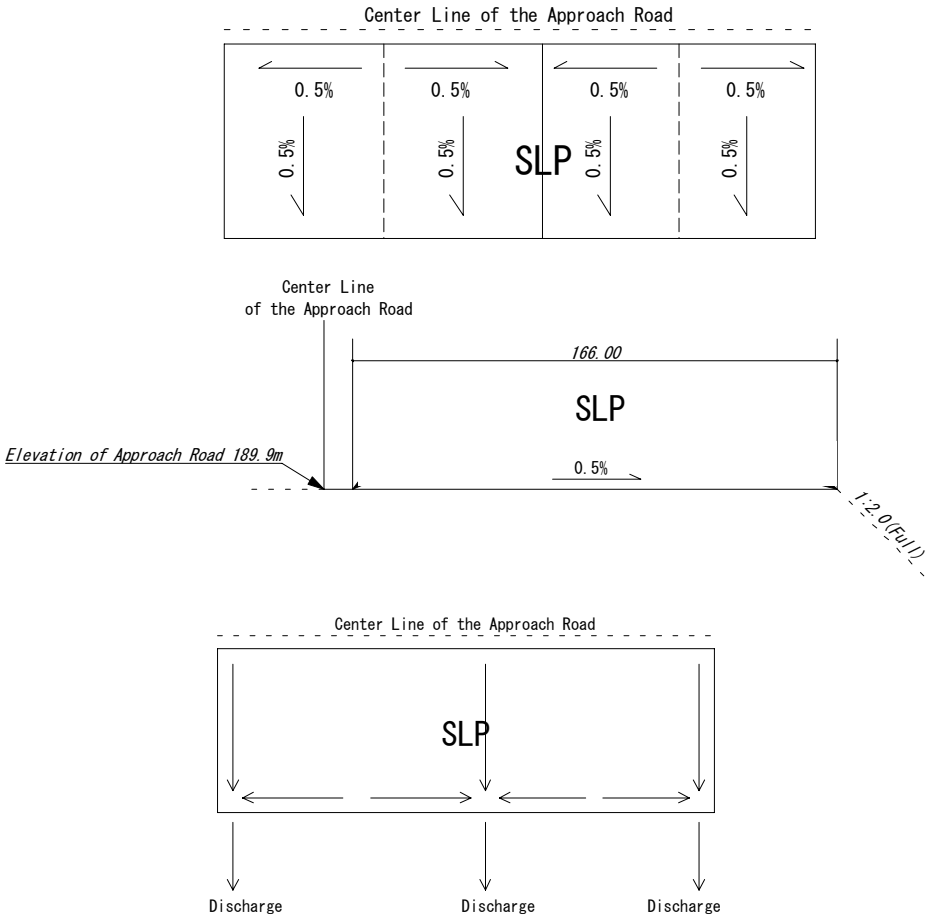
Source: JICA Study Team

Figure 4.5.4 Illustration of Future Expansion of SLP

CHAPTER 5 PHYSICAL DEVELOPMENT PLAN

5.1 Land Preparation Plan

The SLP is planned to be located at the Site B of the SEZ adjacent to the approach road developed to Site B. Length and width of the SLP are 354m parallel to the approach road and 166m respectively. Elevation of the SLP is 189.9m on the average and is at the same level as the approach road to Site B. SLP is designed with a slope of 0.5% down from the approach road to discharge rainfall in SLP. Based on the interviews with the local officials, there is no record of floods in/around the project site of the SLP. Figure 5.1.1 shows plan and section of land preparation for development of the SLP.



Source: JICA Study Team

Figure 5.1.1 Plan and Section of Land Preparation

Table 5.1.1 shows volume of earthworks (both cut and fill). Volumes of cut and fill are quite small and are estimated at about 20,000 m^3 and 18,000 m^3 respectively.

Table 5.1.1 Volume of Earthworks

Earth Work	Unit	Volume
Cut	m^3	19,502
Fill	m^3	18,247

Source: JICA Study Team

5.2 Facility Plan

As discussed in Chapter 4 of this report, the SLP is proposed to be located in Site B of the SEZs in Seno.

This section will study the facility plan of the SLP, estimating the area required for the facilities installed. These facility include custom clearance area, heavy bulk cargo area, general cargo CY area, general cargo warehouse area, container pool area, chassis pool area, parking lot, container washing area, administration and customs, operator's office and maintenance workshop. The major determinant of these facilities is the future cargo volume handled in the SLP. It should be noted that the annual average daily cargo volume, estimated in Chapter 4, was converted to the monthly average daily cargo volume in the peak month, by adding 20% to the annual average daily cargo volume. This average daily cargo volume in the peak month was utilized to estimate the size and design of the facility of the SLP.

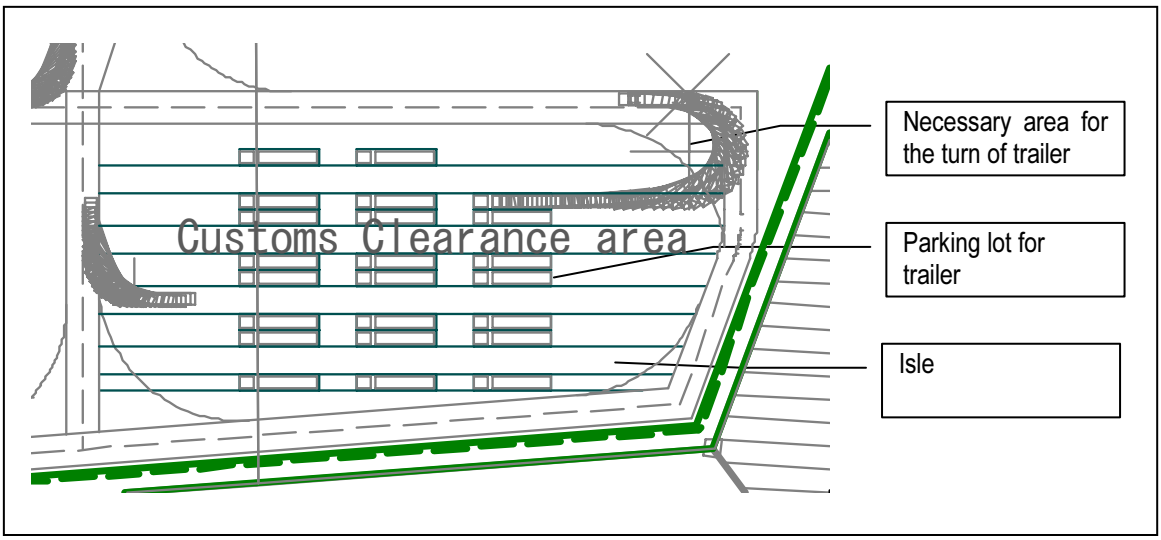
5.2.1 Custom Clearance Area

The floor area for the customs clearance area was estimated based on the number of fully-loaded import and transit containers. The precondition for estimation of customs clearance area was a turnover ratio of 2 times per day. As a result, the floor area for customs clearance area was estimated at 1,300 m^2 in 2025. The layout of customs clearance area is illustrated in Figure 5.2.1.

Table 5.2.1 Floor Area required for Customs Clearance

Item		Unit	Figures in 2025	Note
Container	Import	No	6.0	A
	Transit	No	24.0	B
Fluctuation		-	1.2	C
Turnover ratio		-	2.0	D
Safety factor		-	1.2	E
Subtotal		No	22.0	F: (A+B)*C/D*E
Trailer parking lot		m^2	59.5	G
Customs Clearance area		m^2	1,300.0	H: F*G

Source: JICA Study Team



Source: JICA Study Team

Figure 5.2.1 Layout of Customs Clearance Area

5.2.2 Heavy Bulk Cargo area

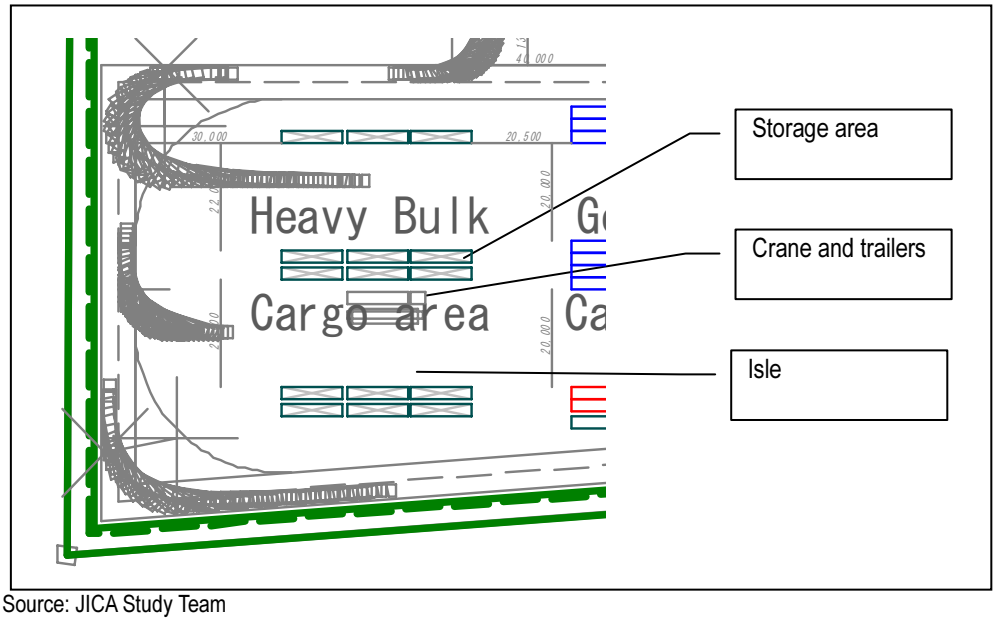
The floor area required for the heavy bulk cargo area was estimated based on the volume of fully-loaded cargo by trailer. The precondition for estimation of heavy bulk cargo area was 3 days of temporary stocks.

As a consequence, the floor area for heavy bulk cargo was estimated at 700m^2 in 2025. The layout of heavy bulk cargo area is illustrated in Figure 5.2.2.

Table 5.2.2 Floor Area required for Heavy Bulk Cargo Area

Item		Unit	Figures in 2025	Note
Trailer	Import	No	2.0	A
	Export	No	1.0	B
Fluctuation		-	1.2	C
Temporary stock days		Day	3.0	D
Safety factor		-	1.2	E
Subtotal		No	13.0	F: (A+B)*C*D*E
Container position		m^2/No	47.3	G
Heavy Bulk Cargo area		m^2	700.0	H: F*G

Source: JICA Study Team



Source: JICA Study Team

Figure 5.2.2 Layout of Heavy Bulk cargo area

5.2.3 General Cargo CY Area

The area for general cargo CY area consists of the general cargo CY, container pool and chassis pool area.

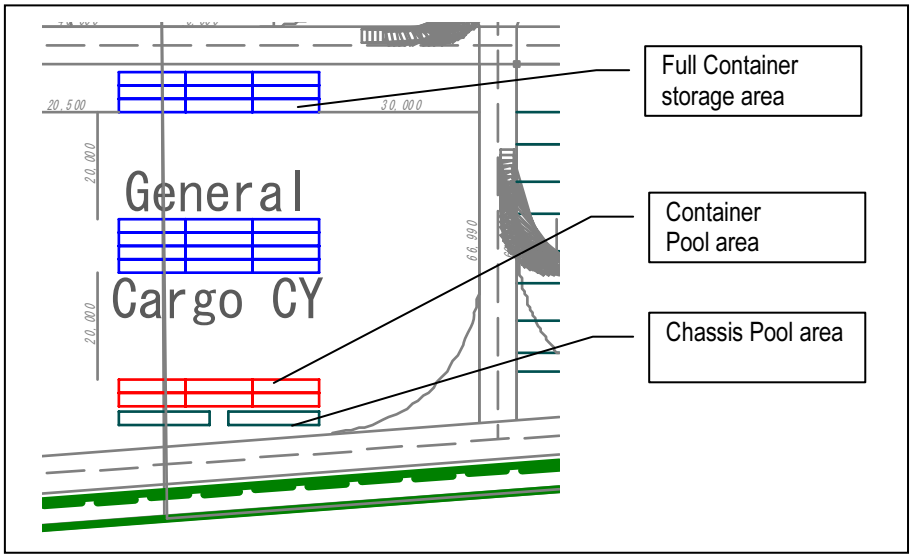
(1) General Cargo CY (Full Container)

The floor area for the general cargo CY (full container) was estimated based on the volume of trailer cargo (import/export of general cargo and container cargo). Like other types of cargo, the precondition for estimation of general cargo CY (full container) area was 3 days of temporary stocks. As a result, the floor area for general cargo CY (full container) was estimated at 700 m^2 in 2025. A layout of general cargo CY (full container) is illustrated in Figure 5.2.3.

Table 5.2.3 Floor Area required for General Cargo CY (Full Container)

Item		Unit	Figures in 2025	Note
Container and Trailer	Import	No	13.0	A
	Export	No	-	B
Fluctuation		-	1.2	C
Temporary stock days		Day	3.0	D
Safety factor		-	1.2	E
Subtotal		No	57.0	F: (A+B)*C*D*E
Container position		m^2	11.0	G, 3 stacks
General Cargo CY area		m^2	700.0	H: F*G

Source: JICA Study Team



Source: JICA Study Team

Figure 5.2.3 Layout of General Cargo CY

(2) Container Pool Area

The floor area for the container pool was estimated based on the volume of export containers. Like the general cargo warehouse, the precondition for estimation of container pool area was 5 days of temporary stocks with 5-stack containers. As a result, the floor area for general cargo CY was estimated at 200 m^2 in 2025.

Table 5.2.4 Floor Area required for Container Pool

Item		Unit	Figures in 2025	Note
Container	Import	No	-	A
	Export	No	3.0	B
Fluctuation		-	1.2	C
Temporary stock days		Day	5.0	D
Safety factor		-	1.2	E
Subtotal		No	22.0	F: (A+B)*C*D*E
Container position		㎡	6.5	G, 5 stacks (13m(L)*2.5m(W)/5)
Container Pool area		㎡	200.0	H: F*G

Source: JICA Study Team

(3) Chassis Pool Area

The floor area for the chassis pool was estimated based on the turnover ratio of the containers. The precondition for estimation of chassis pool area was a turnover ratio of 3 times per day. As a result, the floor area for chassis pool area was estimated at 200 m^2 in 2025.

Table 5.2.5 Floor Area required for Chassis Pool

Item		Unit	Figures in 2025	Note
Trailer	Import	No	-	A
	Export	No	3.0	B
Fluctuation		-	1.2	C

Item	Unit	Figures in 2025	Note
Turnover ratio	-	3.0	D
Safety factor	-	1.2	E
Subtotal	No	2.0	F: (A+B)*C/D*E
Chassis position	㎡	51.0	G
Chassis Pool area	㎡	200.0	H: F*G

Source: JICA Study Team

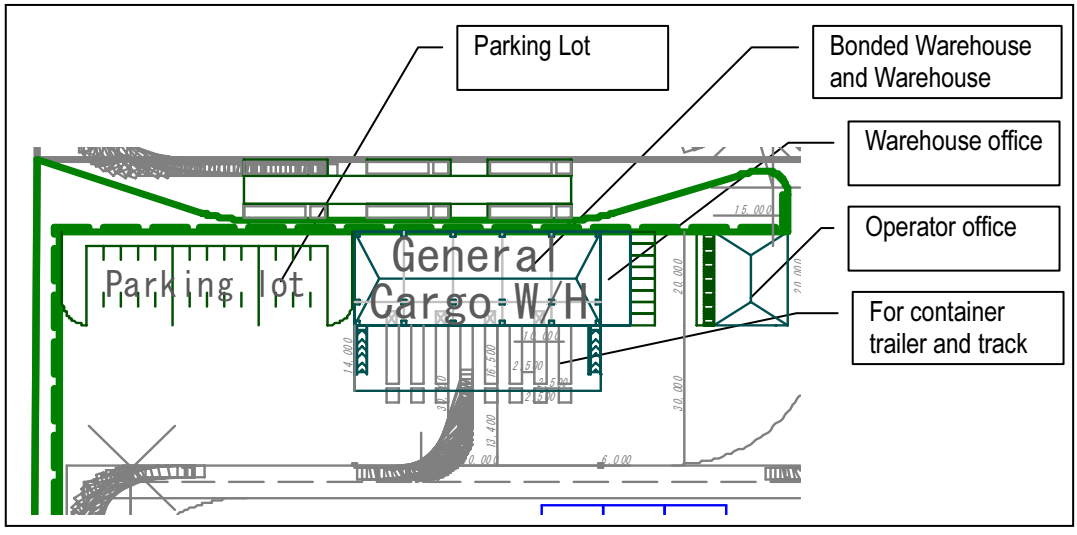
5.2.4 General Cargo Warehouse Area

The floor area for the general cargo warehouse was estimated based on the volume of trailer cargo (import/export and mix-loading). Unlike other types of cargo, the precondition for estimation of general cargo warehouse area was 5 days of temporary stocks. As a result, the floor area for general cargo warehouse was estimated at 900 m^2 in 2025. The layout of general cargo warehouse is illustrated in Figure 5.2.4.

Table 5.2.6 Floor Area required for General Cargo Warehouse

Item		Unit	Figures in 2025	Note
Track & container of mix loading	Import	t	22.8	A
	Export	t	0.4	B
Container of full loading	Import	t	6.0	C
	Export	t	3.0	D
	LCL	t	1.8	E:(C+D)*20%
Fluctuation		-	1.2	F
Subtotal		t	30	G:(A+B+E)*F
Temporary stock days		Day	5	H
Storage unit		㎡/t	2.6	I
Sorting unit		㎡/t	2.6	J
Safety factor		-	1.8	K
CFS area		㎡	900	L:(G*H*I+G*J)*K

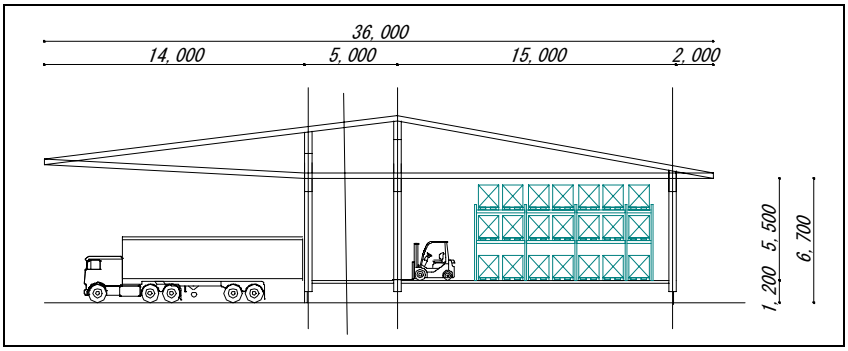
Source: JICA Study Team



Source: JICA Study Team

Figure 5.2.4 Layout of General Cargo Warehouse

The cross-section of the freight station is illustrated in Figure 5.2.5 while the image of the wing-type truck, commonly observed in Lao PDR, is illustrated in Figure 5.2.6. Considering rainy season, the length of warehouse roof should be at least 14 meters.

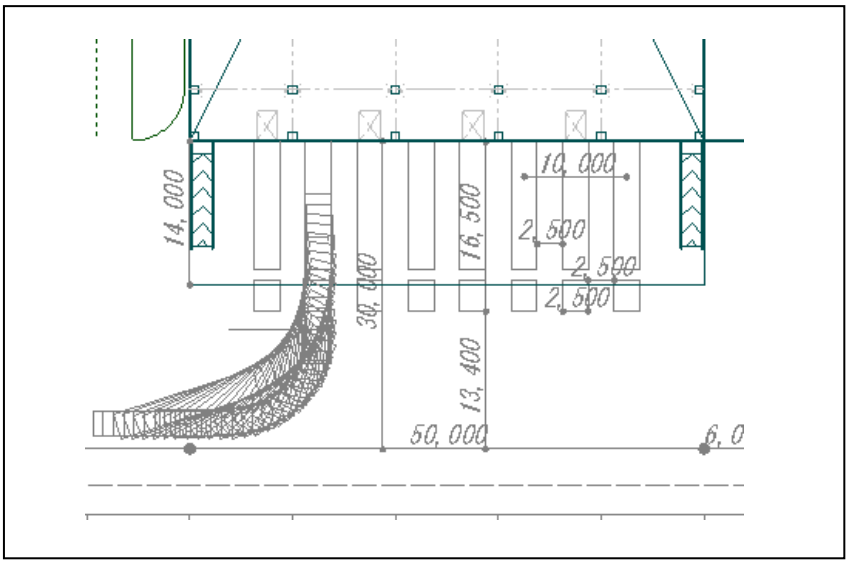


Source: JICA Study Team

Figure 5.2.5 Cross-Section of Warehouse

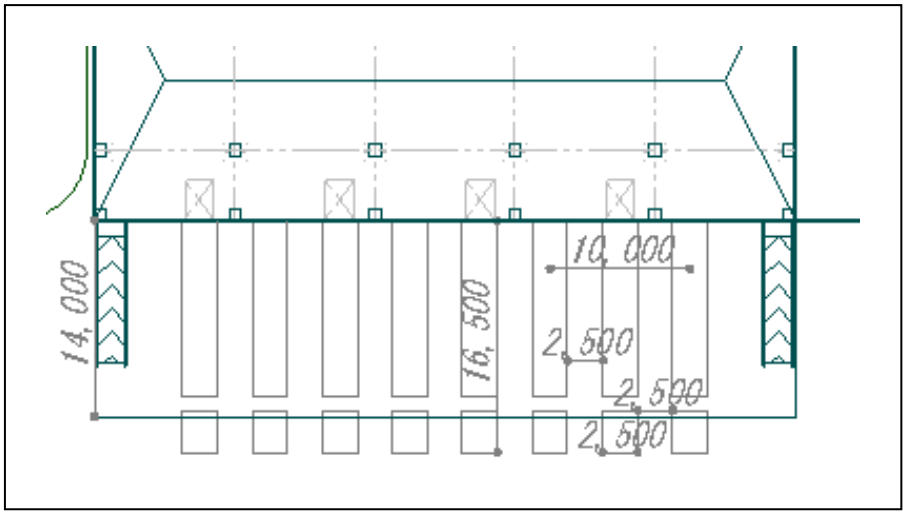
Figure 5.2.6 Image of Wing-Type Truck

Turning radius of the container trailer and pickup/delivery truck and the berth size of the container trailer are illustrated in the following figures.



Source: JICA Study Team

Figure 5.2.7 Turning Radius of Line-haul Truck



Source: JICA Study Team

Figure 5.2.8 Berth Size of Container Trailer

5.2.5 Parking Lot Area

The floor area for the parking lots was estimated based on the number of import/export, transit and domestic vehicles. The precondition for estimation of parking lots was a turnover ratio of 3 times per day. As a result, the floor area for the parking lots was estimated at 2,500 m^2 in 2025.

Table 5.2.7 Floor Area required for Parking Lot

Item	Unit	Figures in 2025	Note
Transit	No	53.0	A
Turnover rate	-	4.0	B, The calculation of the area of Transit assumes a vehicle at 2 rounds per day. The half is assumed as the necessary number of parking lots.
Import & Export	No	45.0	C
Turnover rate	-	3.0	D
Fluctuation	-	1.2	E
Safety factor	-	1.2	F
Subtotal	No	41.0	G: (A/B+C/D)*E*F
Trailer parking lot	㎡	59.5	H
Parking area	㎡	2,500.0	I: G*H

Source: JICA Study Team

5.2.6 Container Washing Area

The floor area for the container washing area was estimated based on the number of containers. The precondition for estimation of container washing area was that 10% of containers would require washing and cleaning. Accordingly, the number of containers to be washed will be 2 FEU per day in 2015 and 3 FEU per day in 2025. Assuming 20 times a day as the turnover ratio, the floor area for container washing area was estimated at 60 m^2 in 2025.

0.4h ＝{0.3 km × 2(round trip) ÷ 20km/h ＋ 3minite/container × 2(O/D) ÷ 60minite/h} × 3container

20ratio =8h/day ÷ 0.4h

$60m^2$ ＝3container÷20ratio×$31.25m^2$/container×safety factor 1.2

5.2.7 Administration and Customs

The floor area for the administration and customs office was estimated based on the number of the workers at these offices. The precondition for estimation of these offices was that the office space required per person is 4.5 m^2 for office use, 7.0 m^2 for conference use and an additional 40% for open spaces. The number of the workers at the administration and customs office was estimated as 20 people in 2025, in consideration of the future cargo volume handled at the SLP. Accordingly, the floor area for administration and customs office was estimated at 330 m^2 in 2025 (In the layout plan, the floor area for these offices was changed to 400 m^2, adjusting the appropriate layout of the SLP).

$330m^2$ = (4.5m^2/person+7.0 m^2/person)×20person×140 %

5.2.8 Operator office

The area for operator office of SLP was calculated at about 600 m^2 per operator. The necessary area for new operator office is about 600 m^2 in 2025, considering an increase in cargo.

5.2.9 Maintenance Workshop

The floor area for the maintenance workshop was estimated based on the number of trucks. The precondition for estimation of maintenance workshop was that 10% of trucks would need maintenance. Accordingly, the number of trucks in the maintenance workshop would be 7 trucks per day in 2015 and 10 trucks per day in 2025. Assuming 2.0 times a day as the turnover ratio, the floor area for maintenance workshop was estimated at 300 m^2 in 2025, considering an increase in cargo.

$300m^2$ =10tracks ÷2ratio×$37.5m^2$/tracks ×safety factor 1.5

5.2.10 Gate and Weight Station

3 gates will be installed in the SLP. A weight station will be installed at each gate to measure cargo weight.

5.2.11 Overall Layout of SLP

Based on the above discussion, the total area required for development of the SLP is summarized in Table 5.2.8. The overall layout of the SLP is illustrated in Figure 5.2.9.

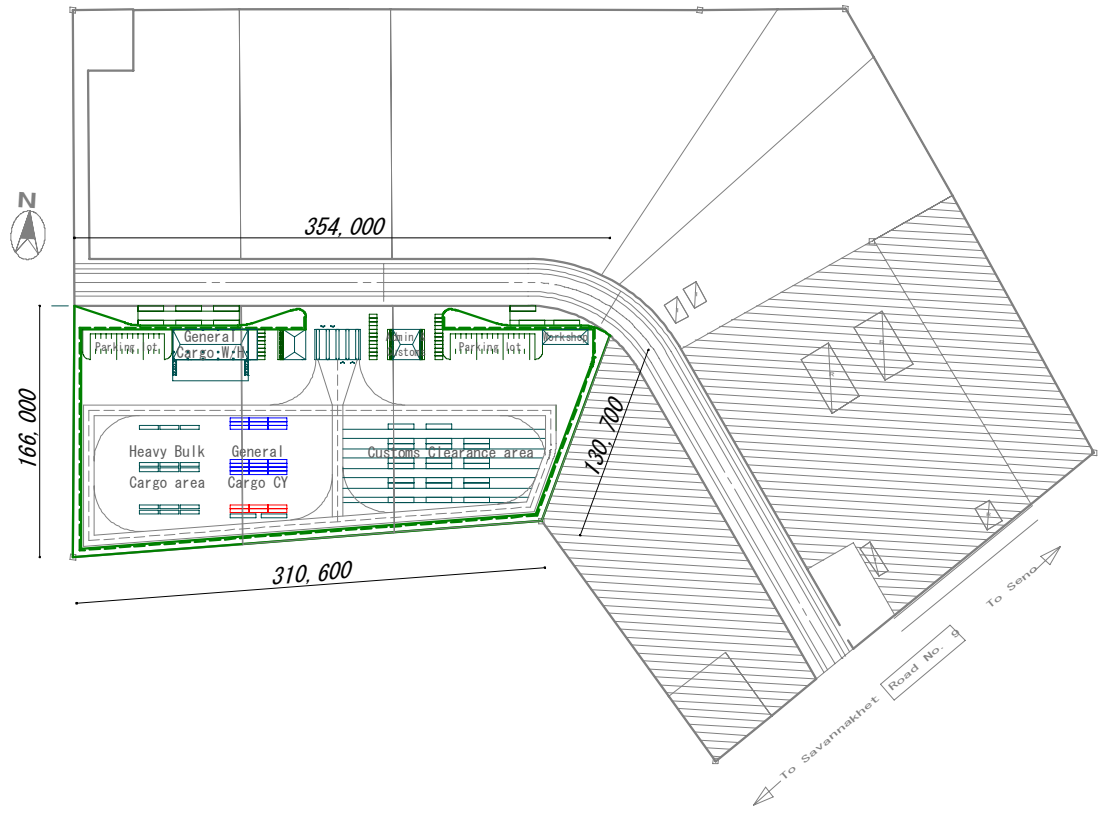
Table 5.2.8 Summary of Total Area required for SLP

Item	Floor area (m^2)	Area (m^2)	Occupancy rate at SLP	Remarks
Customs Clearance area	1,300	8,000		
Heavy bulk Cargo area	700	6,100		
General Cargo CY area	1,100	5,500		CY area includes CY, container pool, chassis pool and container washing area.
General Cargo Warehouse area	900	2,800		Warehouse includes warehouse and warehouse office.

Item	Floor area (m^2)	Area (m^2)	Occupancy rate at SLP	Remarks
Parking Lots	2,500	8,800		Aisle is shared by heavy bulk and general cargo areas
Administration and Customs office	400	3,400		
Operator Office	300	1,800		
Maintenance shop	300	1,600		
Gate and Weight Station	600	2,400		
Buffer area	-	4,300		
Load in SLP	-	5,800		
Others	-	600		
Total area	8,100	51,100		
Total area, excluding parking lot	5,900	42,300	13%	

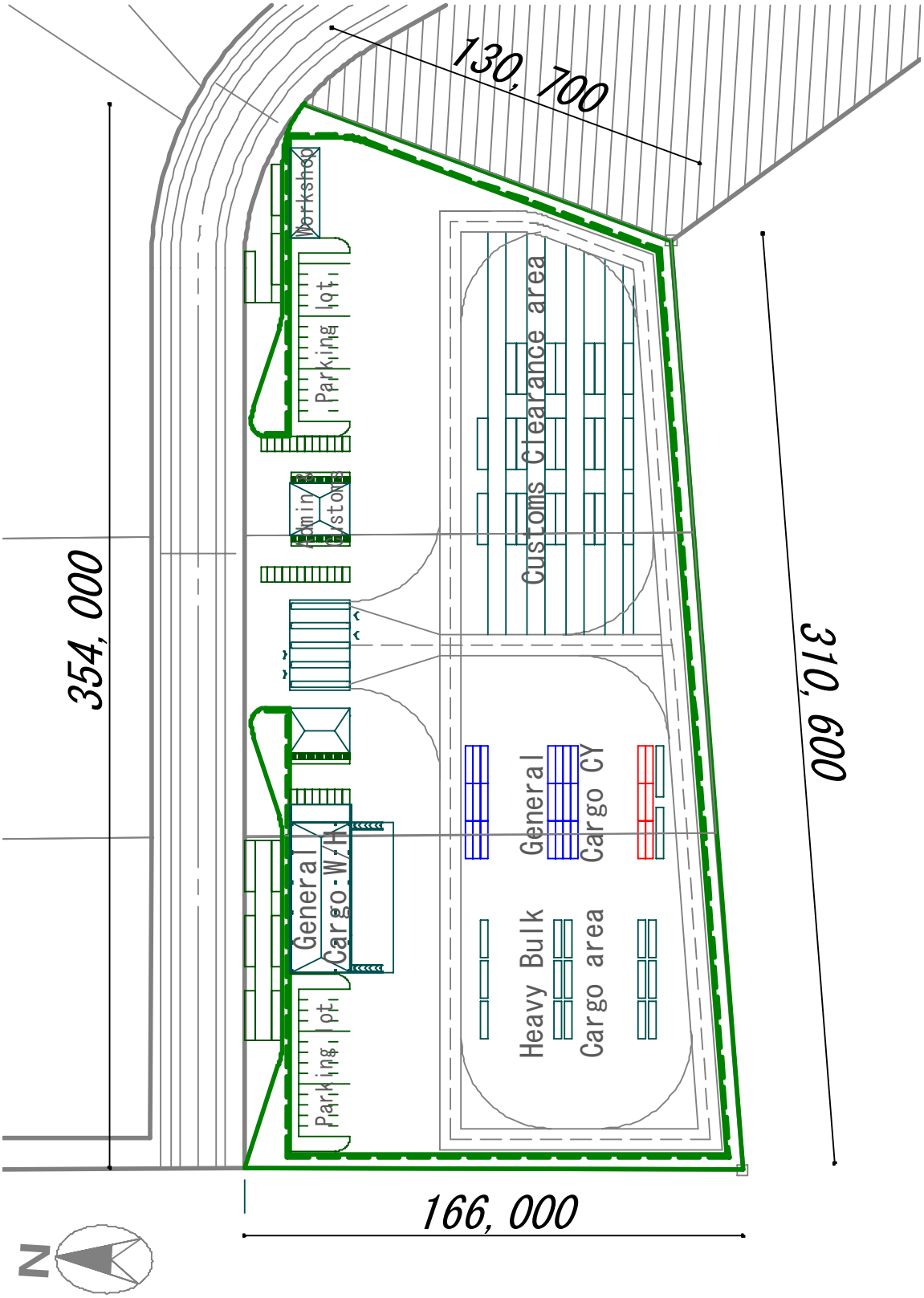
Note Referring to Hironao Takahashi, "Kontena yusou to kontena kouwan",2004, for occupancy rate, rates ranging between 20% and 25% are common. The rate for Lat krabang ICD is about 26% while that for VLP Logistics Park is about 24%.

Source: JICA Study Team



Source: JICA Study Team

Figure 5.2.9 Layout of SLP (1/2)



Source: JICA Study Team

Figure 5.2.10 Layout of SLP (2/2)

5.3 Machine and Equipment

5.3.1 Freight Handling Equipment

(1) Forklift

Forklifts are used for loading and unloading the cargo mainly inside the container. No forklifts are currently in operation at Savannakhet CCA. One forklift may be necessary to be provided at the new SLP since the total cargo will increase by 2 times by 2025. The SLP will have 1 warehouse and therefore one forklift will be used at the warehouse.

Source: JICA Study Team

Figure 5.3.1 Snapshot of Forklift

(2) Reach Stacker

Reach stacker is a heavy-duty vehicle for loading and unloading the container itself, to carry it to CY. At present, there is a container crane observed at Savannakhet CCA. The estimated number of container will reach 16 FEU per day by 2025. Accordingly, one reach stacker will be necessary at the new SLP as estimated below.

1 vehicle =16 containers ×{(3minute /loading +3minute/unloading)÷60minute/h +48.6m/CY×2 round trip÷15,000m/h}×safety factor 1.2 ÷10h/day

Source: JICA Study Team

Figure 5.3.2 Snapshot of Reach Stacker

(3) Crane

A crane is a heavy-duty vehicle for carrying heavy bulk cargo from one vehicle to another. Currently, Savannakhet CCA has no cranes. Although the handling volume of heavy bulk cargo at the SLP will increase by 2 times by 2025, one crane is proposed to be provided at the SLP.

Source: JICA Study Team

Figure 5.3.3 Snapshot of Crane

(4) X-ray Inspection Apparatus

A few types of imported containers need to be X-rayed for inspection of the cargo. The X-ray will be placed near the customs office at SLP.

Source: JICA Study Team

Figure 5.3.4 Snapshot of the car for X-ray inspection (mobile X-ray)

(5) Weight Station

One weight station will be placed at each gate to check both outgoing and incoming trucks.

Source: JICA Study Team

Figure 5.3.5 Snapshot of Weight Station at Thanaleng ICD

5.4 Infrastructure and Utility Plan

5.4.1 Water Supply

The average consumption of water for domestic use and container washing were estimated at 100 liters/person/day for SLP staff and 150 liters/container/day for container washing. The numbers of staff and containers were estimated as shown below based on the future cargo volume in 2025. The consumption volume of water in SLP was, accordingly, estimated at 5.75m^3 per day. Considering water leakage (20%) and peak factor (1.2), 8.63m^3/day of water will be required in the SLP.

Table 5.4.1 Number of Staff, Truck and Container

Items		Number	Remarks
Staff	Custom	20	
	Operator	33	1 operation company
	Total	53	
Container		3	

Source: JICA Study Team

Table 5.4.2 Volume of Daily Water Consumption

Items	Unit Volume	Number	Volume (m^3/day)
Staff	100lt/staff/day	53	5.30
Container	150lt/container/day	3	0.45
Total			5.75

Source: JICA Study Team

Table 5.4.3 Daily Water Demand

No.	Item	Volume (m^3/day)
1	Water Demand	5.75
2	Water leakage (20 %) = 1/(1-0.2)	7.19
3	Peak Factor (1.2) = 2x 1.2	8.63
4	Water Demand Forecast	8.63

Source: JICA Study Team

A water reservoir with a pump will be installed under the ground of the SLP. The recommended volume of a reservoir is above 3m^3 (8hour operation per day: 8.63/3=2.88m3≒3m^3).

No water supply pipe exists in the area surrounding the SLP. A future plan for water supply to the SLP does not exist at present. Therefore, the SLP will develop a water supply facility at the project site of the SLP. A well of 20m depth with a pump and a water purification facility will be installed in the SLP. Hydrants are provided within 50 meters around the building.

Table 5.4.4 Water Supply Facility

Item		Quantity	Remarks
Well	20m	1	With a pump and a purification plant
Water Pipe II	Φ15	200m	Within SLP
Water Reservoir	3m^3	1	Within SLP

Source: JICA Study Team

5.4.2 Electricity

An existing 220V line is located along the access road from NR-9 to the SLP. Electricity to the SLP will be supplied from this 220V line. A 220V line of total length of about 1,160m will be installed under the ground in the SLP.

Table 5.4.5 Electricity Facility

Item		Quantity	Remarks
220V line	Under the ground	1,160m	Within SLP

Source: JICA Study Team

5.4.3 Telecommunications

One administration office, two operator offices, one warehouse and one workshop will be placed in the SLP. Each office will have 1 fixed telephone line and 1 Internet connection. A warehouse and a workshop will have 1 telephone line. A telephone line will be extended to connect to the existing line installed along the NR-9. The length of new telephone lines will reach at about 1,000m.

5.4.4 Drainage

The drainage system is designed to discharge into the existing pond located near the SLP. U-shaped concrete ditches with concrete covers will be installed along roads to collect rainwater within the SLP. A reinforced concrete ditch will be constructed since the axle-loads of the trailers and trucks with the cargo tends to be large.

Volume of flood discharge estimates and capacity of drainage were calculated based on the Road Design Manual (Provisional Use) issued by the former Ministry of Communication Transport Post and Construction, 1996. The flood discharge was estimated using the following equation:

$Q = 1/360 \times C \times I \times A$ (Rational Formula)

where,

Q: Expected flow (m^3/sec)

C: Run-off coefficient

I: Intensity of Rainfall (mm/hr)

A: Area for drainage (ha)

C: Concrete 0.9 (0.80-0.95), Asphalt 0.85 (0.7-0.95)

I: 75mm/h (5 or 10 minute storm with a return period of 2 years)

Capacity of drainage was estimated using the Manning Striker formula.

$Q = K \times A \times R^{2/3} \times S^{1/2} = A \times V$

where,

Q: Discharge (m^3/sec)

A: Cross-section of flow area (m3/sec)

R: Hydraulic radius = A/WP where WP is the wetted perimeter of flow area (m)

V: Water velocity (m/sec)

S: Longitudinal slope of flow

K: Roughness factor (1/n)

n: Roughness coefficient (concrete: 0.015)

The total length of drainage by size is shown in Table 5.4.6.

Table 5.4.6 Length of Drainage by Size

Drainage Size	Length (m)	Remarks
300 x 300	780	U-shaped reinforced concrete with cover
500 x 500	370	U-shaped reinforced concrete with cover

Source: JICA Study Team

5.4.5 Sewage Treatment

A centralized sewer treatment system was adopted considering environment for not only the SLP but also its surrounding area. This sewage collection system is designed to collect only domestic wastewater (5.75m^3/day of wastewater from staff in the SLP). Wastewater generated from each building will gravitate to the treatment plant installed in the SLP.

The sewage treatment volume was estimated as being 90% of the water supply volume. Seepage of ground water into sewage pipe was also considered.

Q = Q1 x 90% x 1.1

where,

Q: Sewage Volume (m^3/day)

Q1: Water volume (=5.175m^3/day)

1.1: Encroaching ratio

Q : 5.175 x 0.9 x 1.1 = 5.123 ≒6m^3/day

Treated wastewater will be discharged into the existing pond. The required quality of treated wastewater is as follows:

Table 5.4.7 Quality of Treated Wastewater

Parameter	Wastewater (mg/l)	Treated Water (mg/l)
BOD	200	20
SS	250	50

Source: JICA Study Team

Figure 5.4.1 Sewerage Treatment Facility

Facilities and their quantities for this centralized sewerage treatment system are summarized below.

Table 5.4.8 Facilities of a Centralized Sewerage Treatment System

Items		Quantity
Drain Pipe	ϕ150	350m
Sewerage Treatment Tank	6m^3/day	1 piece

Source: JICA Study Team

5.4.6 Access Road

As part of the project, the access road of the SLP needs to be paved to ensure mobility of the heavy vehicles to/from the SLP. Referring to the design of the SEZ (Site-B), the access road is planned with around 640 m length and 16 m width. The location and typical cross section of the access road are illustrated in the following figures. It should be noted that like the SLP itself, the land of access road of the SLP was already purchased by the SEZA. It should also be noted that the access road of the SLP is an earth road.

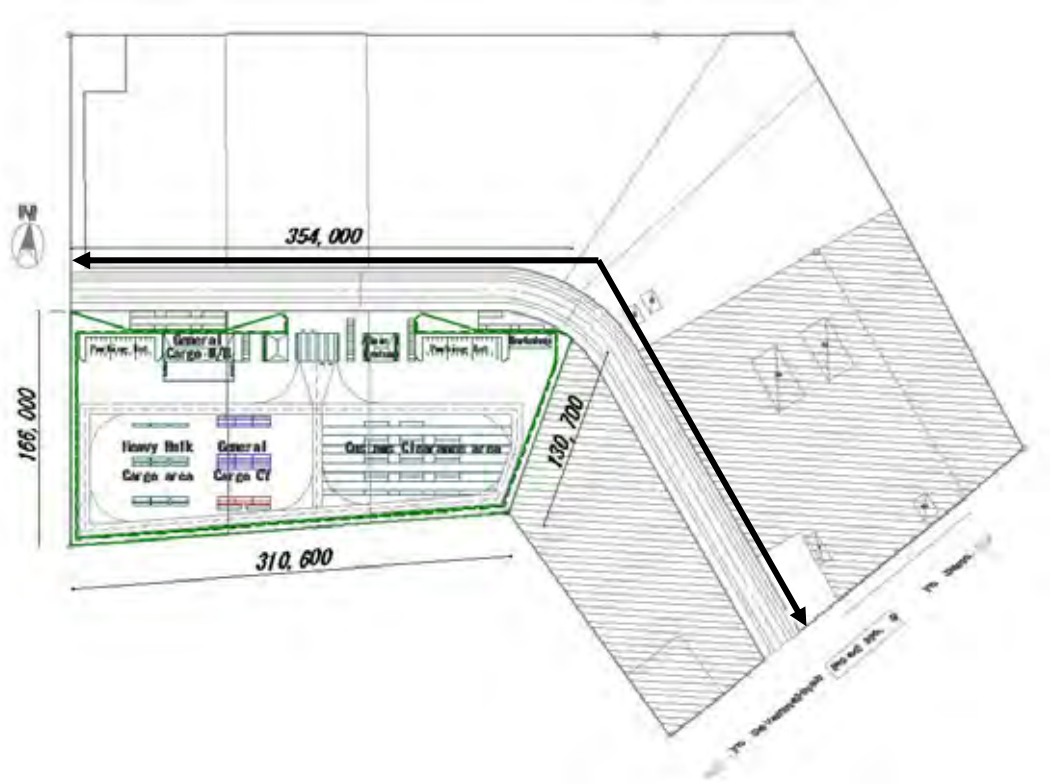


Figure 5.4.2 Location of Approach Road (showing by arrow)

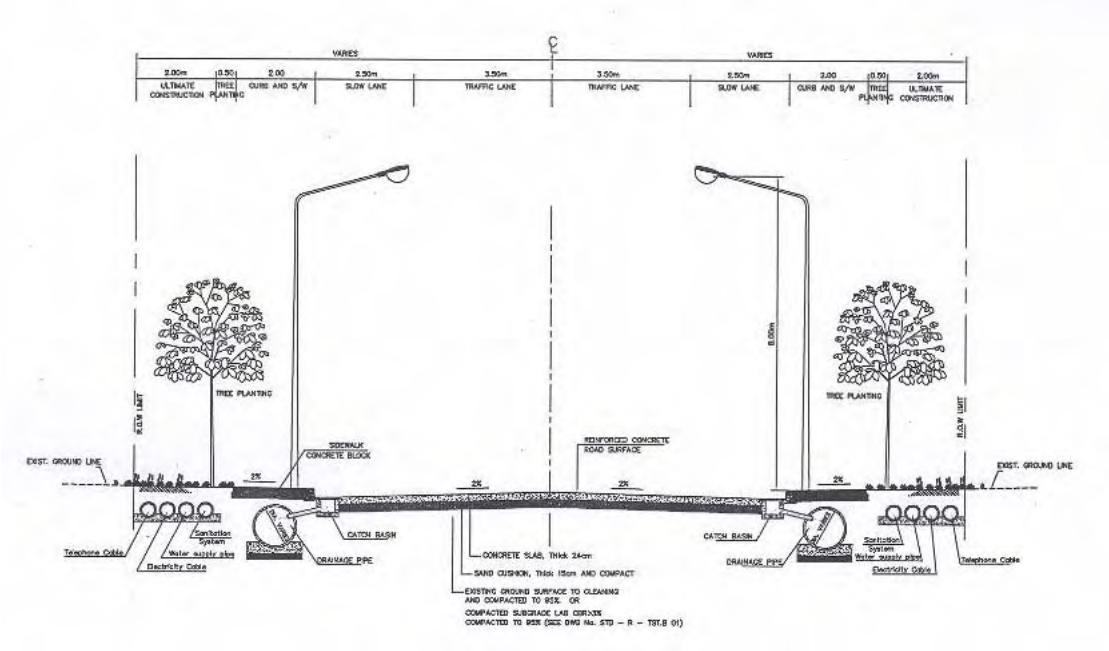


Figure 5.4.3 Cross-Section of Approach Road

5.5 Project Cost

Project cost consists of construction cost, administration cost, consultant cost and contingency. These costs were estimated as of November 2009, and the following exchange rate was applied.

USD1.00=JPY93.57=LAK8506.61 =THB33.84

Construction of SLP consists of land preparation works, building works and access road works. Table 5.5.1 shows individual and total construction costs. Construction cost of land preparation works, building works and access road works were estimated to be about USD 2.3 million, USD 0.8 million and USD 0.6 million, respectively. Total construction cost was estimated to be about USD 3.8 million.

Taxes such as import tax and value added tax were not included in the Project Cost. The Article 52 of Law on Investment Law (2010) stipulates incentives pertaining to import tax and other taxes. Tax exemptions on materials and equipment for Logistics Parks are included among the incentives. The Article 10 of Law on Value Added Tax stipulates tax exemptions on materials and equipment for aid projects. This process is not tax refund but tax exemption.

Administration costs and consultant costs were estimated as 3% and 7% of total construction cost, respectively. Contingency was estimated as 10% of the sum of the construction cost and the consultant costs. As a result, administration cost is USD 0.1 million, consultant cost is USD 0.3 million, and contingency is USD 0.4 million. The total project cost is thus USD 4.6 million.

Table 5.5.1 SLP Project Cost

Items		Total Cost	Foreign Portion and Local Portion			Remarks
			Foreign	Local	Local	
		(USD)	(USD)	(USD)	(LAK1000)	
1	Land Preparation Works	2,302,020	1,547,212	754,808	6,420,859	
2	Building Works	834,320	641,990	192,330	1,636,076	

Items		Total Cost	Foreign Portion and Local Portion			Remarks
			Foreign	Local	Local	
		(USD)	(USD)	(USD)	(LAK1000)	
3	Access Road Works	640,932	502,096	138,836	1,181,025	
4	Total Construction Cost	3,777,272	2,691,298	1085,974	9,327,960	1+2+3
5	Administration Cost	113,318	-	-	-	3% of 4
6	Consultant Cost	264,409	-	-	-	7% of 4
7	Contingency	404,168	-	-	-	10% of 4+6
8	Total Project Cost	4,559,167	-	-	-	4+5+6+7

Source: JICA Study Team

Table 5.5.2 SLP Project Cost (Civil Works)

Item		Unit Cost (US$)		Quantity	Amount (US$)	Remarks
Preparatory Works		0.26	/m^2	51,000	13,260	Site cleaning and grubbing
Earthworks	Excavation	1.50	/m^3	19,502	29,253	Sand with Soil
	Filling	4.50	/m^3	18,247	82,112	Sand with Soil
	Slope Protection	2.50	/m^2	1,240	3,100	Grass
Pavement	within LP （t=25cm）	50.00	/m^2			Reinforced Concrete Pavement (thickness=25cm)
	within LP （t=15cm）	35.00	/m^2	38,707	1,354,745	Reinforced Concrete Pavement (thickness=15cm)
	Road within LP	30.00	/m^2	5,250	157,500	Asphalt Concrete Pavement (thickness=10mm+30mm+30mm)
Utilities	Drainage I	200.00	/m	370	74,000	U-shaped Reinforced Concrete Ditch with Cover (500x500)
	Drainage II	150.00	/m	780	117,000	U-shaped Reinforced Concrete Ditch with Cover (300x300)
	Drain Pipe I	30.00	/m	900	27,000	VP ϕ＝150mm
Utilities	Centralized Treatment	6,000.00	/piece	1	6,000	Treatment Volume:6m^3
	Well	20,000.00	/piece	1	20,000	20m deep with a pump and a purification plant
	Water Tank	100,000.00	/piece	1	100,000	Underground, Volume:58m^3
	Water Pipe I	10.00	/m	350	3,500	VP ϕ＝15mm
	Electricity (Line I)	80.00	/m	1,160	92,800	220v line （underground within SLP）
	Electricity	950.00	/piece	45	42,750	Streetlight
	Telecommunication	120.00	/m	500	60,000	Fiber Optic Cable
Green	Grass	3.00	/m^2	4,375	13,125	
	Tree	5.00	/m^2	4,375	21,875	
Others	Fencing	100.00	/m	840	84,000	H＝1.7m～2.0m
Total of Civil Works					2,302,020	

Source: JICA Study Team

Table 5.5.3 SLP Project Cost (Building Works)

Item	Description	Unit Cost (US$/m^2)	Quantity (m^2)	Amount (US$)
Warehouse (FS)	Slate Structure High-Rise Floor Load=3t/m^2 H=5.5m from Floor Shutter Slope for a fork lift	220.0	1,000.0	220,000.0
Operator office	Slate Structure	250.0	420.0	105,000.0
Administration office	Reinforced Concrete	250.0	400.0	100,000.0
Gate	Reinforced Concrete	200.0	600.0	120,000.0
Maintenance Workshop	Slate Structure	110.0	300.0	33,000.0
Parking	with Roof	80.0	204.0	16,320.0
Weighbridge		120,000.0	2.0	240,000.0
Total of Building Works			2,720.0	834,320.0

Note: The figures shown above is not identically same to those summarized in Table 5.2.8 because the first figures show is estimated based on the actual layout plan and the latter shows the minimum area required for each facility.

Source: JICA Study Team

CHAPTER 6 MANAGEMENT AND OPERATION PLAN

This chapter aims at delineating overall management and operation scheme of SLP through ascertaining various tasks required for management and operation of SLP.

6.1 Actions to Success SLP

The SLP will be a public inter-modal facility with both road and rail transport and will act as a cross-border facility to provide CIQ service. In addition, the SLP will be a unique facility to stimulate logistics business in Savannakhet by providing certain privileges. In this regard, SLP should not only be recognized as a business-oriented facility but also as a strategic facility in national logistics development in Lao PDR. Success of SLP means realization of objectives of logistics policy such as reduction in transport costs, smooth and stable cross-border movement as well as self-sufficiency. The following 3 words will be key to achieving the success:

- Collaboration
- Efficiency
- Stimulation

SLP has multi-functions such as CIQ, truck transport and private logistics businesses, such that it is essential for SLP development to involve several governmental agencies and private companies. In this regard, "**Collaboration**" among the stakeholders is vital for establishment, management and operation of SLP.

On the other hand, "**Efficiency**" indicates several efficiencies to be realized in SLP. First of all, SLP should be the facility to offer efficient logistics services in terms of speed, safety and security, reliability and cost. For this purpose, SLP must be a financially efficient business for private sector. It is of great importance for SLP to ensure private involvement in order to realize efficient services in SLP.

Private involvement, in particular involvement of foreign logistics investor, is vital to realization of high quality logistics services in SLP. "**Stimulation**" measures for foreign investment should be taken into account. There are 2 incentives for SLP. One is to designate SLP as a Specific Economic Zone (SPEZ), which is delineated in "Law of Investment Promotion". Investments into designated areas such as the SPEZ can receive several tax privileges. Two is to designate SLP as a Common Control Area (CCA). This will allow provision of Single Stop- Single Window service at SLP.

6.2 Project Formulation

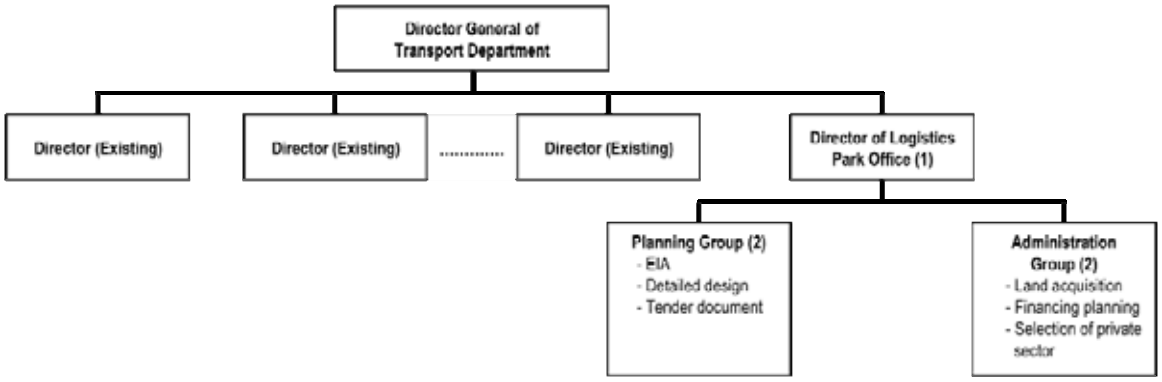
Prior to establishment of SLP, there are several important activities to be undertaken in order to realize SLP. These are:

6.2.1 Establishment of SLP Office in MPWT

There are many actions required to be done prior to implementation of SLP project. Department of Transport under MPWT has been responsible for overseeing the SLP project up to now. However, there isn't any permanent office to handle SLP matters as a secretariat office. It is of great necessity to set up SLP office or SLP unit dedicated to project formation activities for SLP. The office would carry out at least the following tasks:

- EIA
- Detailed design and tender documentation
- Financing planning
- Tender management
- Development of SLP management plan in details
- Selection of private investors

The SLP office would be a new section dedicated to the SLP project for limited time basis until completion of construction of SLP. The office would have 1 director at the same level as existing directors under Director General of Transport Department. Under the director, the office would have 2 groups, namely: administration group and technical planning group as shown in Figure 6.2.1. The number of staff in SLP office would be 5 persons in total.



Source: JICA Study Team

Figure 6.2.1 SLP Office in MPWT

6.2.2 Designation of SLP as SPEZ

The Lao government revised the "Law on Investment Promotion "to stimulate foreign investment

into Lao PDR in July 2009. The law aims at providing several incentives for investment into designated areas such as SPEZ and Special Economic Zones[1] (SEZs). Both SEZ and SPEZ are approved and managed by the national steering committee consisting of Deputy of Prime Minister, Minister of Planning and Investment, Minister of Industry and Commerce, Minister of Public Works and Transport, Minister of Finance, Minister of Justice and Vice Minister of National Land and Management Authority. The secretariat for the committee is established at Ministry of Planning and Investment.

The SLP Office in MPWT should take all necessary actions to clarify the status of Savan-Seno SEZ in the new law and take necessary actions to improve attractiveness of SLP to private investors. Since the new investment law stipulates that SPEZ include logistics parks as well as industrial estates and tourism complexes, it is highly likely that SLP will be designated as a SPEZ. However, the Decree on Special Economic Zone is still being prepared; therefore, it is not certain what kind of conditions need to be fulfilled for a facility to be designated as SPEZ.

If the SLP is not designated as a SPEZ, it will not have bonded function. Besides, the investment procedures for tenants entering the SLP would be complicated as well.

6.2.3 Designation of SLP as Common Control Area (CCA)

CCA is a fundamental scheme to allow provision of Single Stop-Single Window service at the designated Indochina corridors. The function of cross-border procedure at SLP is a fundamental service provided at the SLP which presents an opportunity to add more value to SLP. The designation of SLP as a CCA would allow provision of Single Stop-Single Window service at SLP in the future, under the existing bilateral agreement on cross-border transport with Thailand. Long discussions with Thailand and difficult coordination within concerned government agencies in Lao PDR may be needed, however it would be beneficial to SLP by enabling it to secure volume of handling goods and foreign investment until free trade is realized within ASEAN.

6.3 Organization Plan

6.3.1 Participants

SLP will be a multi-modal facility providing multi-services including CIQ, warehousing and trans-loading and inventory management. SLP accordingly needs several participants to smoothly provide services. In this regard, the involvement of the following organizations in the SLP is required:

Project Owner:	Owner of Savannakhet Logistics Park who will develop or give concession to private company to develop SLP, and take initiative in coordinating with relevant government agencies
SLP SPEZ Management Committee:	A committee consisting of SLP-MC, Project Owner, Savannakhet Province, and MPWT to supervise SLP as SPEZ.

[1] In the new law, SEZ is defined as an area which is more than 1000 ha, and independent economic and financial system with special incentive(s), and SPEZ is defined as areas such as industrial zone, export promotion zone, tourism zone, ICT development zones and national border zones. Both SEZ and SPEZ are designated by the Government of Lao PDR.

Savannakhet Logistics Park Management Company (SLP-MC):	A third party to be responsible for total operation and maintenance services for SLP: contracted by project owner under the laws of Lao PDR
Transport Operator	A company to utilize SLP to handle their goods at the module of a tenant
CIQ provider:	Custom, Immigration and Quarantine office
Utility Provider:	An authority to provide utility services such as electricity supply, water supply and telecommunications
Ministry of Planning and Investment (MPI):	Major role in designating SLP as SPEZ

6.3.2 Overall Organizational Structure

SLP-MC will be contracted by the project owner and will operate and maintain the SLP as the representative of the project owner under the supervision of the project owner. The management of SLP contains various tasks. Some of them will be performed by SLP-MC, while the other will be contracted out by SLP-MC to appropriate service providers. Actual logistics business will be carried out by tenants of SLP, who will be selected by the SLP-MC.

The overall organization of the SLP management is illustrated in Figure 6.3.1.

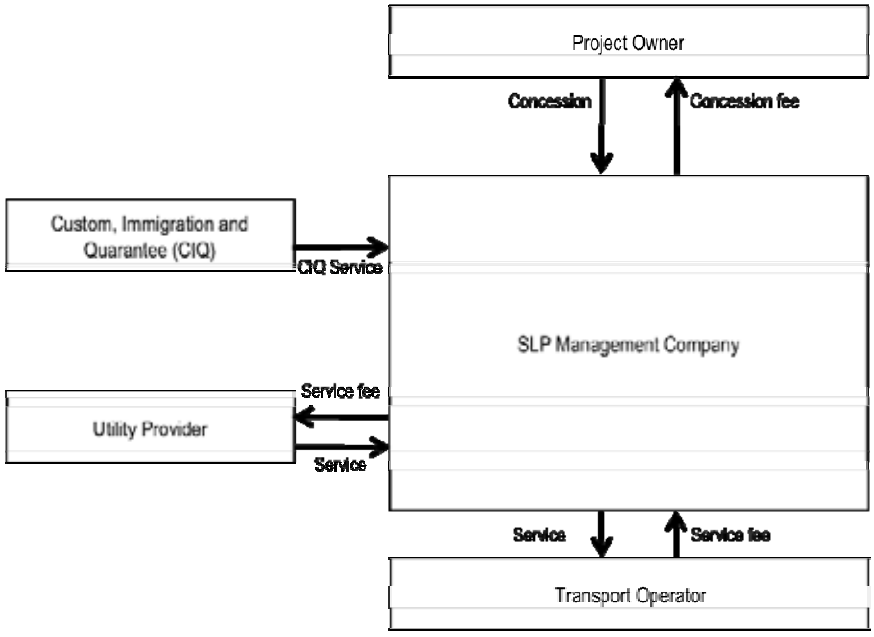


Figure 6.3.1 Overall Management Structure of SLP

6.3.3 Project Owner

(1) Function of Project Owner

The project owner is an authority to plan, develop and manage SLP during the planning, construction and management and operation stages. The project owner will have authority to:

- Own land and facilities in SLP
- Give SLP policy
- Select and supervise SLP Management Company (SLP-MC)
- Concur with SLP-MC on selection of tenants for SLP.

(2) Potential Candidate of Project Owner

The SLP will be a public inter-modal facility with both road and rail transport and will act as a cross-border facility to provide CIQ service. The SLP will also be a key facility to encourage logistics-oriented business in GMS by facilitating international logistics. In this regard, SLP should be recognized not only as a business-oriented facility but also as a strategic facility in national logistics development in Lao PDR. It is accordingly natural that the project owner of VIP should be government agency. As potential project owner, first refusal should be accorded to the **Ministry of Public Works and Transport (MPWT)**, which is responsible for administration of cross-border facilitation as well as transport and logistics. MPWT should directly manage SLP to enforce its own development strategy.

On the other hand, there are some significant potential candidates for the role of project owner, namely: Savan-Seno SEZ Authority, Ministry of Industry and Commerce (MOIC), Ministry of Finance (MOF) and Savannakhet Province.

Savan-Seno SEZ Authority is responsible for management of the SEZ sites, and currently, it directly manages site B. However, the authority does not have experience in management of logistics facilities. Besides, the role of the authority is not clear in the new law on Investment Promotion

According to the new “Law on Investment Promotion”, the Ministry of Planning and Investment (MPI) plays a major role in approving and managing SEZ and SPEZ. MPI has a relationship with SLP which is constructed in the Savan-Seno SPEZ.

The Ministry of Industry and Commerce (MOIC) has experience in managing the ICD at Thanaleng as project owner. MOIC may have accumulated certain know-how relevant to supervision of concession scheme in ICD business when it was the project owner at Thanaleng ICD.

The Ministry of Finance (MOF) is the current project owner of Thanaleng ICD, “Thanaleng Warehouse State Enterprise”. MOF may accumulate certain know-how relevant to supervision of ICD business from this experience. MOF has another advantage in that customs procedures at SLP could be more flexible to adjust since they fall under its jurisdiction.

Lastly, Savannakhet Province can also be the project owner of SLP.

Among these organizations, MPWT, Ministry of Finance and Ministry of Industry and Commerce have the potential to develop and operate SLP as analysis of rationale of each potential project owner in Table 6.3.1 reveals. Although the project owner will be determined by discussions among these ministries, the JICA Study Team evaluated the MPWT to be the most appropriate organization given the leading role it played in logistics policy formulation among the ministries and in CBTA meetings.

Table 6.3.1 Rationale of Potential Project Owner

Potential Project Owner	Rationale	Advantages	Disadvantages
Ministry of Public Works and Transport (MPWT)	• Public agency • Responsible for transport, logistics and cross-border transport	• Will properly reflect national logistics policy/strategy to SLP management • Know-how to manage project implementation	
Savan-Seno SEZ Authority	• Public agency • Major role in managing Savan-Seno SEZ	• Managing entity of Savan-Seno SPEZ • Current management body of the site B	• No experience in similar project • No responsibility in road transport and facility management • Uncertainty with the new law on Investment Promotion
Ministry of Planning and Investment	• Public agency • Major role in approving and managing SEZ and SPEZs	• Approve and manage SPEZ • Harmonization with policies on SEZ and SPEZ	• No experience in similar project • No responsibility in road transport and facility management
Ministry of Industry and Commerce	• Public agency • Experience in managing Thanaleng ICD with Concession	• Project experience • Harmonization with industrial development	• Limited knowledge/ involvement in SLP project • Limited influence over transport and logistics business society
Ministry of Finance	• Public agency • Experience in managing Thanaleng ICD with state enterprise	• Authority to manage customs • Project experience • Harmonization with improvement of Customs	• Limited knowledge/ involvement in SLP project • Limited influence over transport and logistics business society
Savannakhet Province	• Public agency • Near project site	• Easy legal process as regards project land • Experience in infrastructure and utility development, and land development projects with concession	• Limited knowledge/ involvement in SLP project • Limited experience in similar projects • Limited influence over transport and logistics business society

Source: JICA Study Team

6.3.4 SLP Management Company (SLP-MC)

(1) Functions of SLP-MC

The SLP-MC is a single management and operation body of SLP. The SLP-MC engages in actual logistics works in SLP and is also responsible for maintenance of utility and infrastructure and safety, security and environment of SLP. The following are the fundamental functions of SLP-MC.

1) General Affairs

As a single organization of SLP, the SLP-MC needs to serve as administration and secretariat of business entity with the following major tasks:

- Billing and Accounting
- Procurement and contract management
- Personnel affairs; and
- Legal matters and public relations.

2) Asset Management

SLP-MC is responsible for maintenance and operation of infrastructure, utilities and buildings in

SLP. The specific tasks inlude:

- Maintenance of infrastructure, utilities and buildings in SLP
- Implementation of drainage, sewerage treatment and solid waste disposal service.

3) Environment Monitoring

SLP-MC is responsible for environmental monitoring and protection of SLP through the following major tasks:

- Developing environmental monitoring plan
- Regular and periodical environmental monitoring
- Issuing cautions, recommendations, and orders to improve environment.
- Reporting results of environmental monitoring to WREA.

4) Safety and Security

SLPMB is responsible for safety and security in SLP. SLP-MC will provide:

- Security service at SLP
- Coordination with all tenants, the concerned government agencies and local authorities to cope with any natural disaster and emergency.

(2) Potential Candidates of SLP-MC

The SLP should provide high quality logistics services to support the industries at Savan-Seno SEZ. The SLP-MC will not be the actual logistics service provider to transport operators but will be required to generate good business environment for tenants and transport operators, and will be expected to clear troublesome situations in SLP quickly and reasonably. The SLP-MC accordingly requires high levels of skill in business management and operation: hence, the involvement of private sector is essential for the role of SLP-MC. For the private involvement, there are several options such as:

- Concession to private sector
- Joint venture between project owner and private sector
- State enterprise
- Project owner

Concession to private sector is the most reliable method in selecting most capable entity to undertake management business of SLP. It is also the most reliable method to realize high quality logistics services with high level of flexibility to accommodate changes in demand on service. The private concessionaire of SLP-MC can be flexible by either sub-contracting logistics business to tenants or doing logistics business directly, depending on business model. Concession fee to be paid to the project owner is one of the most important criteria in evaluation of prospective concessionaires. The concessionaire will also maintain flexibility as regards nature of formulating entity i.e. the concessionaire may execute duties of SLP as either single foreign company (ies), joint venture between foreign company (ies) and domestic company (ies) or consortium of domestic companies etc. A scheme will be required to maintain right amount of intervention so as to preserve public nature of SLP.

In Lao PDR, the institutional framework for Public Private Partnership such as outsourcing operation of public facilities to private sector has not been established as yet. However, such scheme can be introduced on ad hoc basis. For example, operation of the existing Tanaleen ICD was outsourced to a private company from 1998 to 2008, and operation of the Wattay International Airport is operated by a joint venture between Lao PDR and Japan. The bidding process for an operator for Michi-no-eki (road side station) which is being constructed by ASEAN Integration Fund is on-going. Hence, the SLP-MC could be selected from private sector by following the same procedure.

On the other hand, the SLP-MC could also be set up as either a joint venture between Lao government/ state enterprise and foreign investor or as a state enterprise. The SLP-MC duties could also be assigned to the project owner.

The Joint venture method involves establishment of new entity for SLP-MC by conglomeration of Lao public sector and a private company into a single entity that satisfies qualification criteria. This has the advantage in that it combines good aspects of private management with the good aspects of public involvement. The public involvement should be minimized, but it is advantageous in enforcing certain level of intervention in SLP management in pursuit of public interests in emergency and special cases.

The state enterprise is an ordinal method that used to be applied in Lao when the Lao government carried out a particular project. The project owner will organize a new state enterprise or assign an existing state enterprise the role of SLP-MC. The Thanaleng warehouse is currently managed by a state enterprise. This method has the advantage of soundness of project implementation based on plenty of experience in Lao PDR; however, under such a method, it is doubtful that international standards of logistics services would be realized in SLP.

The last option is a case where the project owner acts as the SLP-MC. The project owner will re-arrange its organization structure and assign a section/ department the role of carrying out management activities.

The comparison of advantages and disadvantages of the different formulations of SLP-MC is shown in Table 6.3.2.

Table 6.3.2 Comparison of Potential Types of SLP-MC Entities

	Concession	Joint venture	State Enterprise	Project Owner
Characteristics	• Award concession to private company • Private company is flexible in formulation of entity	• Joint venture between Lao government/state enterprise and private company	• The project owner establishes new state enterprise or assigns an existing state enterprise the role of SLP-MC	• Project owner establishes new section in own organization.
Public Involvement	• Lower public involvement • Need certain scheme to preserve right of intervention in management	• Medium public involvement	• Full public involvement	• Full public involvement
Business Efficiency	• Higher efficiency in performance is expected.	• Higher efficiency in performance is expected.	• Doubtful with limited experience • Management committee may be needed to offset private sense of business.	• Doubtful with limited experience • Management committee may be needed offset private sense of business.

As a consequence, the best possible method seems to be that in which the Project owner assigns private concessionaire or establishes joint venture with private sector, preferably a foreign investor ,to act as SLP-MC.

6.4 CIQ Services

CIQ service will be done by several responsible agencies such as Customs Department, Immigration Department and Quarantine Office at SLP. The SLP-MC will provide CIQ office at its own expense to operate as CIQ branch office in SLP. CIQ officers will be seconded from the responsible agencies to SLP.

6.5 Responsibility of Construction and Maintenance of Infrastructure, Utilities and Buildings

6.5.1 General

Infrastructure, utilities and buildings in SLP are basically developed by the project owner and are provided to the SLP-MC. Necessary infrastructure and utilities outside SLP that provide connections to existing main lines will be transferred to concerned agencies. SLP-MC will be responsible for maintenance works of infrastructure, utilities and buildings in SLP, while the infrastructure and utilities transferred to the concerned agencies will be maintained by those agencies.

6.5.2 Utilities

(1) Water Supply

Water supply is solely done by Savannakhet Water Supply Enterprise (normally referred to as “Nam Papa Savannakhet (NPS)”). NPS will be responsible for supplying water to the area. However, a developer has to connect water supply pipeline to main line of NPS at his/her own expense. Accordingly the project owner of SLP has the responsibility of constructing the entire water supply system including the water supply system inside the SLP and the connection to main line outside the SLP. After completion, the water supply system outside SLP will be transferred to and maintained by NPS while the water supply system in SLP will be owned by the project owner and maintained by SLP-MC.

Water used in the buildings is charged depending on the amount used. However, water used in common area should be borne as a cost item under the administration cost of SLP-MC, which may be inclusively collected in the concession fee. For water used in the buildings, NPS will collect water charge directly from tenants.

(2) Electricity Supply

Electricity supply is solely done by Enterprise D’electricite du Lao (EDL) in Savannakhet. EDL will be responsible for supplying electricity to the area. However, a developer has to connect main electricity line to EDL’s main line at his/ her own expense. Accordingly, the project owner of SLP will be responsible for constructing the entire electricity supply system including electricity supply

system inside the SLP and the connection to main line outside SLP. After completion, the electricity supply system outside SLP will be transferred to and maintained by EDL while the electricity supply system inside the SLP will be owned by the project owner and maintained by SLP-MC.

Electricity used in the buildings will be charged depending on the amount used. However, electricity used in the common area should be borne as a cost item under administration cost of SLP-MC, which may inclusively be collected in concession fee. For electricity used in the buildings, EDL will collect electricity charges directly from tenants.

(3) Telecommunications

Telecommunications is solely done by Enterprise of Telecommunications Lao (ETL) in Savannakhet. ETL will be responsible for supplying telecommunications and IT services to the area. However, a developer has to connect main telecommunications line to ETL's main line at his/her own expense. Accordingly, the project owner of SLP will be responsible for constructing the entire telecommunications system including telecommunications system inside the SLP and the connection to main line outside SLP. After completion, the telecommunications system outside SLP will be transferred to and maintained by ETL while the telecommunications system inside the SLP will be owned by the project owner and maintained by SLP-MC.

ETL will collect usage charge by itself directly from tenants, depending on the amount of telecommunications used by each tenant.

(4) Drainage

Drainage will be provided by the project owner in SLP and maintained by the SLP-MC. The cost of maintenance will be shared with tenants and will be included in the concession fee paid by the SLP-MC.

(5) Waste Water Treatment

Waste water treatment system will be independently provided in SLP. The project owner will provide it while its operation and maintenance will be done by SLP-MC. The cost of maintenance will be shared with tenants. The amount discharged from buildings will determine charges to be paid. The SLP-MC will collect charges directly from tenants.

(6) Solid Waste Disposal Service

Tenants should be responsible for solid waste management independently. SLP-MC will introduce private solid waste management company to the tenants, and the tenants will directly enter into contract with the private solid waste management company.

6.5.3 Buildings and Facilities

(1) Facilities in Common Area in SLP

The project owner of SLP will be responsible for constructing all buildings and facilities in SLP. After completion, SLP-MC will be responsible for maintenance of buildings and facilities at his own

expense.

(2) Buildings in Modules

The project owner of SLP will be responsible for constructing all buildings and facilities in module as well. After completion, the SLP-MC will be responsible for maintenance of those buildings and facilities in the modules at his own expense.

Table 6.5.1 summarizes responsibilities in development and maintenance of infrastructure, utilities and buildings.

Table 6.5.1 Responsibilities in Development and Maintenance of Infrastructure, Utilities and Buildings in SLP

Facility in SLP	Outside SLP (connection with main line)	Common Area in SLP	Inside Module
Water Supply	Construction • SLP Project Owner Maintenance • Savannakhet Water Supply Enterprise (Nam Papa)	Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Electricity Supply	Construction • SLP Project Owner Maintenance • EDL	Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Telecommunications	Construction • SLP Maintenance • ETL	Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Drainage		Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Waste Water Treatment		Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Solid Waste Disposal		Responsibility • SLP-MC	Responsibility • SLP-MC
Buildings (facilities) in SLP		Construction • SLP Project Owner Maintenance • SLP-MC	Construction • SLP Project Owner Maintenance • SLP-MC
Equipment in SLP		Procurement • SLP Project Owner Maintenance • SLP-MC	Procurement • SLP-MC Maintenance • SLP-MC

Source: JICA Study Team

6.6 Operation of SLP

6.6.1 Operation Time

(1) SLP Operation Hour

SLP will provide 24 hours service with no holidays.

(2) CIQ Operation Hour

Working hours of CIQ office at SLP will be from 8 am to 8pm during weekdays. It will remain closed during weekends (Saturday and Sunday).

6.6.2 Security Control

Security and safety control shall be implemented strictly by SLP-MC. The important points of security are gate control, property security and traffic safety.

(1) Gate Control

At the gate, security shall be maintained. The security at the gate shall check people and cars.

(2) Property Security Management

SLP-MC has the general obligation to safeguard and make appropriate use of the SLP 's property and equipment in SLP. SLP will be enclosed by fence. The SLP-MC must ensure that there are reasonable security measures implemented to prevent theft, damage or misuse of property and equipment.

(3) Traffic Safety

The SLP-MC shall establish traffic control rules and carry out measures for traffic safety within SLP.

6.6.3 Fire Fighting

SLP-MC will take the necessary measures for the safety of SLP, and follow the laws and regulations relevant to fire fighting and emergencies in Lao PDR.

(1) Government Coordination

SLP-MC will establish a proper fire fighting and emergency system for SLP-MC in close cooperation with the responsible agencies.

(2) Rules and Regulations for Emergency

SLP-MC will formulate the regulations for emergencies in SLP-MC and manage, supervise and guide the fire prevention and fighting activities. SLP-MC should propose the rules and regulations for emergency to the Project Owner and await their approval.

(3) Emergency Protocol

SLP-MC should establish protocol for emergency situations i.e. it should allocate responsibilities and organize information network for emergency situations.

6.6.4 Environmental Management

SLP-MC should have overall responsibility in preserving good environment in SLP and preventing pollution and damage on neighboring peoples from activities of SLP. In this regard, the SLP-MC must assist, consult and monitor tenants to meet the environmental standards by doing the following:

- Providing updated information on environmental regulations and related analyses and interpretations that guide the tenants to acquire better understanding.
- Periodical monitoring of quality of water discharged from SLP as well as air and noise.
- Liaison of complaints regarding environmental matters from neighboring peoples
- Presenting necessary reports to WREA.

CHAPTER 7 ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

7.1 Current Conditions of Savannakhet Province

7.1.1 Natural Environment

Savannakhet Province is located in the southern part of Lao PDR and has the second largest population in the country. It is located along the East-Western Corridor. The western side of Savannakhet Province is adjacent to Thailand over the Mekong River while the eastern side shares a mountainous area with Viet Nam. Towards the eastern side, the elevation becomes gradually higher. Sepone District, the northeastern part of the Province, has abundant minerals such as gold and copper and mining industries have already been developed by Lao and foreign companies.

(1) Climate

Savannakhet Province, where the project site is located, enjoys 2 seasons: the rainy season from May to October and the dry season from November to April. Annual average rainfall in Savannakhet is 1543.1 mm per annum during the period between 1951 and 2008. In 2009, temperature in Savannakhet Province ranged from 9.0 to 39.0 degrees Celsius, and average humidity was recorded between 68 and 89%.

Table 7.1.1 Meteorological Characteristics of Savannakhet Province (2009)

Station: Savannakhet Airport (Attitude: 144.1m)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum temperature (°C)	31.5	39.0	38.2	37.9	35.0	34.5	33.2	34.0	35.2	33.2	37.2	32.6
Minimum temperature (°C)	9.0	19.1	10.0	19.0	19.7	23.0	21.8	22.0	21.8	18.0	11.0	10.0
Average temperature (°C)	19.6	26.4	27.5	28.3	27.2	28.2	26.9	26.5	26.8	25.7	23.7	28.5
Evaporation (mm)	112.6	128.7	116.1	104.1	103.9	94.7	73.6	56.8	56.7	78.6	96.2	92.5
Humidity (%)	72	69	73	75	83	83	86	88	86	82	77	75
Rainfall (mm)	0.0	0.0	42.8	164.6	348.9	244.6	166.9	119.8	179.9	30.6	0.0	0.0

Station: Seno (Attitude: 185.0m)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum temperature (°C)	31.0	37.5	38.1	36.0	35.0	34.1	37.6	34.0	34.5	31.2	35.0	33.0
Minimum temperature (°C)	9.0	15.0	14.5	19.5	19.5	22.5	21.5	23.2	22.0	22.4	11.1	13.5
Average temperature (°C)	19.2	25.8	27.2	33.0	28.0	27.7	26.4	27.4	27.7	26.3	23.1	22.3
Evaporation (mm)	149.9	167.4	161.6	159.9	120.4	93.3	66.4	40.1	50.7	111.7	153.1	137.2
Humidity (%)	68	71	75	78	80	85	89	86	84	77	71	75
Rainfall (mm)	0.0	0.0	14.0	52.1	201.6	133.5	208.0	138.9	159.4	38.3	0.0	0.0

Source: Water Resource and Environment Office, Savannakhet, 2010

Table 7.1.2 Mean Annual Rainfall in Savannakhet Province (1951 – 2008)

	Rainfall (mm)	Note
Annual	1543.1	
Rainy Season	1448.8	May- October
Dry Season	142.9	Nov - April

Source: Disaster Management System in Lao PDR, prepared by Department of Meteorology and Hydrology, Water Resource and Environment Authority, 2009

(2) Topography

The topography of Savannakhet Province varies from lowland plains along the Mekong River to foothills and mountains. The average elevation above sea level varies across the province, from 100 meters above sea level (asl) in the west to about 1,300m asl in the east.

Savannakhet Province is defined by two major geological characteristics, namely: Mz2 over most of the Province and Mz1 over part of the western and middle areas. Areas categorized into Mz2 are mostly red continental sandstones and clays called Indosinias Superiueres with lagoonal mud rocks in the upper levels bearing evaporate units of halite and gypsum. On the other hand, Mz1 is defined as mostly continental sequence with local shallow – water marine faces persisting from Upper Palaeozoic. Continental red clay arenite with occasional thin coal seams and conglomerates in paralic intercalation middle Triassic marine limestone units which occur at the base of this interval and are interbedded with clays.

Other than those, there are different categories identified in the northern east area, namely cPz2, gPR and Pz1. cPz2 is mostly shallow shelf sea sequence of muddy limestone and some continental, and gPR consists of granitoid plutons of the truongson belt (g); alkali granites, some migmatites and tonalities, while Pz1 is deep-water marine volcano sedimentary sequence.

(3) Hydrology

Savannakhet Province is located along with the Mekong River. The tributaries of the river run over the Province. Table 7.1.3 shows a record of the annual water level of the Mekong River in 2008 and indicates that the highest level was recorded at 11.60m in August while the lowest was recorded at 0.00m in April. According to the records obtained from the Mekong River Committee (MRC), the flood alarm water level at the Savannakhet Station along the Mekong River is 12.00 m and the flood water level is 13.00 m. Since 1992, the water level at the station has not exceeded this alarm level. Thus, there seems little possibility of flood disasters along the Mekong River in Savannakhet Province. Having said that, in 2009, around 2,500 households in 29 villages along the Xe Bang Hiang River in Sepone and Nong Districts of Savannakhet Province were heavily affected by that flood disaster.

Table 7.1.3 Annual Water Level of the Mekong River in Savannakhet (2008)

Altitude of the Station: 155.0 m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum water level (m)	0.68	0.58	0.17	0.55	2.28	8.13	9.49	11.60	9.03	7.72	5.35	2.12
Minimum water level (m)	0.15	0.12	0.05	0.00	0.21	2.31	5.43	8.62	6.66	3.50	2.21	0.93
Mean water level (m)	0.35	0.30	0.12	0.20	1.23	5.43	7.90	10.22	8.07	5.28	3.76	1.48

Source: Department of Meteorology and Hydrology, Water Resource and Environment Authority, 2009

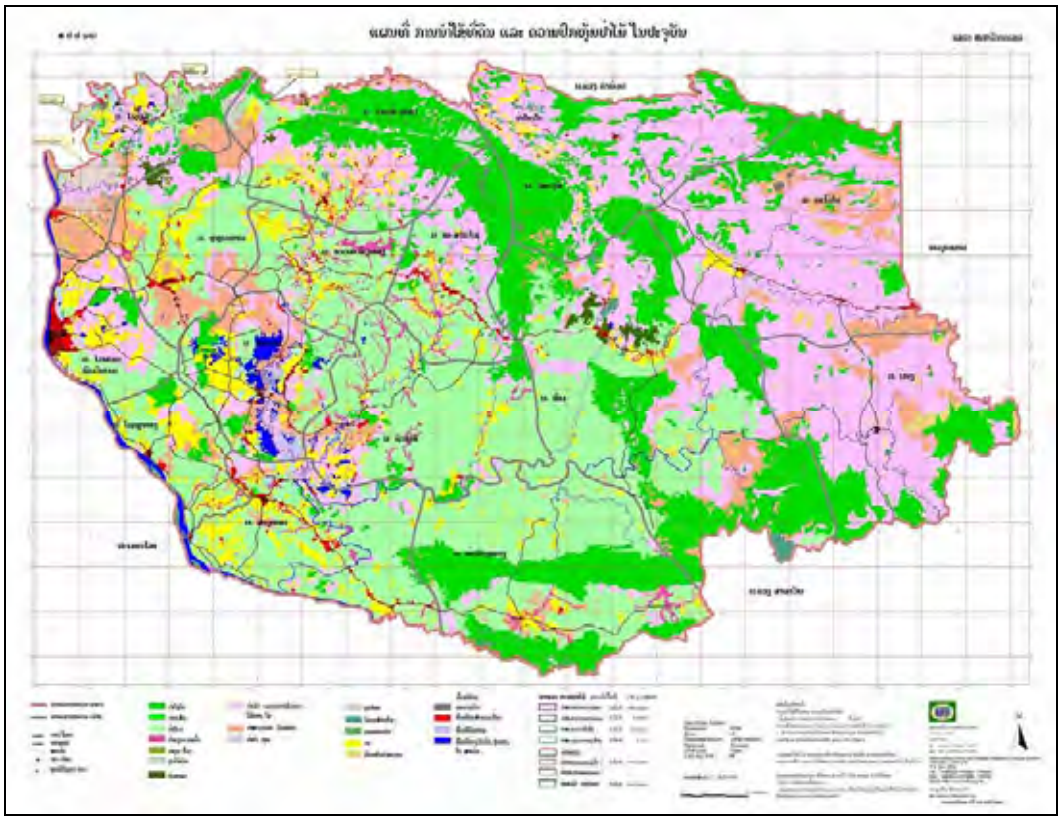
(4) Land Use

Table 7.1.4 shows the composition of forest area in Savannakhet Province in 2002 and the land use in 2009 is shown in Figure 7.1.1.

Table 7.1.4 Land Use in Savannakhet Province as of 2002

Land Use	Percent (%)
Current Forest	56.5
Potential Forest Area	29.8
Other Wooded Areas	0.8
Agriculture Land	9.2
Other Non-forest Areas	3.6
Total	100.0

Source: Assessment of Forest Cover and Land Use, Ministry of Agriculture and Forest, 2005



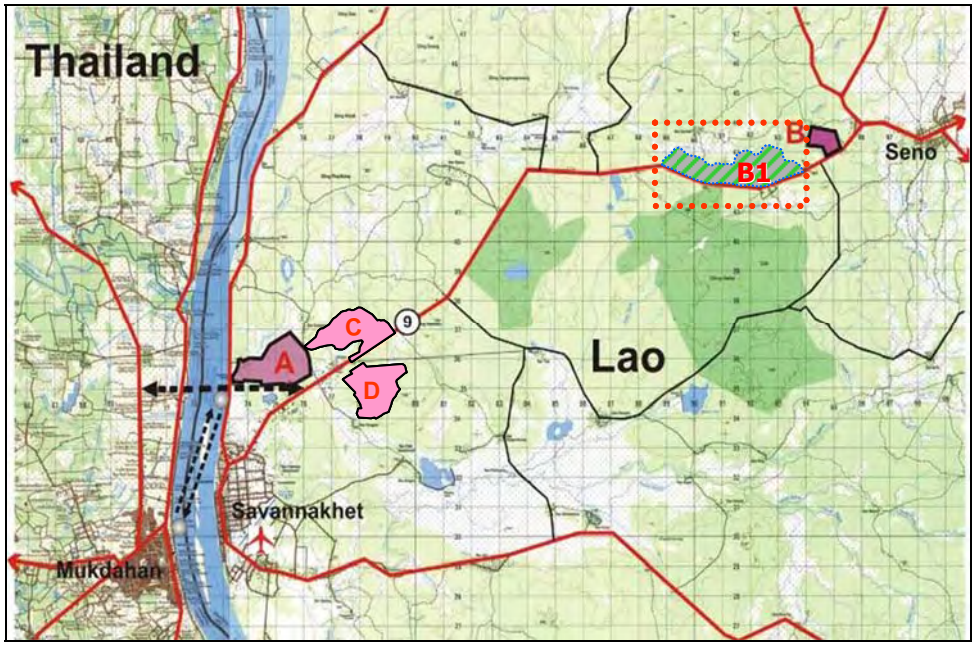
Source: National Agriculture and Forest Resource Institute, 2010

Figure 7.1.1 Land Use in Savannakhet Province (2009)

Along the NR-9, the Savannakhet Province plans to establish four Special Economic Zones (SEZs); Site A, Site B, Site C and Site D, as shown in Figure 7.1.2.

Site A is located close to the Second Friendship Bridge and is designated for commercial sector development. Site B was originally planned for development of logistics park and the SLP was finally proposed to be located this Site B. Site C exists along the NR-9 and has been developed by a joint enterprise of a Malaysian company and the Savannakhet Economic Zone Agency (SEZA). The enterprise has been promoting industrial development and encouraging Lao and foreign

investments. As of February 2010, 13 companies in various industries have signed land concession contracts with the enterprise and the necessary land preparation works have been carried out. Site D is a relocation area for people who resided in the SEZ and have been displaced on account of development of the SEZs.



Source: Savan-SENO Special Economic Zone Authority, 2009

Figure 7.1.2 Location of SEZ

(5) Nature and Biodiversity

Table 7.1.5 shows the coverage of forest areas in the Savannakhet Province in 2008.

Table 7.1.5 Coverage of Forest Area in Savannakhet Province

Items	Area (ha)	Percent (%)
Forest area	1,298,800	59.65
Potential forest	436,100	20.03
Dry Dipterocarp	30,400	1.40
Evergreen forest	264,200	12.13
Natural forest	147,900	6.79
Total	2,177,400	100.00

Source: Statistical Yearbook 2008 Savannakhet Province, Savannakhet Province, 2009

In Savannakhet Province, there are 3 National Protected Areas (NPAs) and Provincial Protected Areas with a total area of 19,300 ha as shown in Table 7.1.6. In addition, according to the interview with the district office, there aren't any district protected areas in and around the Project Area.

Table 7.1.6 List of Protected Areas in Savannakhet Province

No	Items	Total Area (ha)	Village/District Location	Category
1	Phou Xarng Hae	109,900	Atsaphone, Vilabuly and Thaphalanxay Districts	National Protected Area
2	Dong Phou Vieng	197,000	Phine, Nong and Sepone Districts	National Protected Area
3	Xay Bang Nouan	45,000	Thapangthong and Songkhone Districts	National Protected Area
4	Protection forest for water resource	108,020	N/A	Protection Forest
5	Dong Ka Phor	51,625	Phine, Thaphalanxay and Xonbuly Districts	National Productive Area
6	Dongseethouan	150,883	Thapangthong and Songkhone Districts	National Productive Area

Source: JICA Study Team with reference to Lao PDR Environment Monitor (2007), World Bank and Province Data

The Province has some extinct flora and fauna; however, they are not observed to exist in the Project Area. As for the flora, there are 3 species identified, namely “Kheuna Haem”, “Hark Lendorn” and “Dork Pherng”. On the other hand, some valuable animals, such as Chinese three-striped box turtle, tiger and monkey, are still likely to exist in the protected areas. Besides, Lao-oriented deer and region-specific animals are identified and protected by the Agricultural and Forestry Division in the Province.

(6) Air Quality

In Savannakhet Province, no official surveys of air quality have been conducted as yet. Hence, the comparison of air quality in Vientiane Capital and Savannakhet Province will be effected by comparing their traffic volumes. The traffic volume is a major influential factor for air quality, especially SOx and NOx. Table 7.1.7 compares traffic volumes which were recorded in Vientiane Capital and Savannakhet Province.

According to this table, the traffic volume in Savannakhet Province is far less than that in Vientiane Capital. This implies that the air quality in Savannakhet Province is better than that in Vientiane Capital. Table 7.1.8 shows air quality in Vientiane Capital in 2002: it is evident that each parameter of air quality in Vientiane Capital falls below the international standards.

Table 7.1.7 Annual Traffic Volume
(Vientiane Capital: Jan. – Dec.2008 / Savannakhet Province: Jan. – Dec.2008)

Target	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Total
Vientiane Capital (No. 18.64 km Sythong Bridge, Rd. 13S)	1,279	305,857	35,240	22,382	44,994	12,111	421,863
Savannakhet Province (Tool road station no.22 Km 35 (Rd. 13))	3,557	141,143	60,027	53,581	26,738	3,923	289,299

Note: Group 1: Tuk Tuk; Group 2: Sedan, Jeep. Pick-up; Group 3: Sontheo Van and Bus (of less than 7 passengers); Group 4: Bus (for only 8 – 35 passengers), Light truck (of less than 7 tons); Group 5: Bus (for more than 36 passengers) and Heavy truck (of more than 7 tons); Group 6: Other heavy trucks

Source: MPWT, 2010

Table 7.1.8 Air Quality in Vientiane Capital (2002)

Parameter	Unit	Range of Results	Average of Results	International Standards
Total suspended particulates (TSP)	mg/m^3	0.082 – 0.296	0.165	0.33
Particulate matter (PM 10)	mg/m^3	0.040 – 0.089	0.068	0.12 – 0.35

Parameter	Unit	Range of Results	Average of Results	International Standards
Sulfur dioxide (SO_2)	mg/m^3	0.025 – 0.276	0.108	0.32 – 0.36
Nitrogen dioxide (NO_2)	mg/m^3	<0.001-0.057	0.014	0.30

Source: Lao PDR Environment Monitor (2007), World Bank

(7) Water Quality

Table 7.1.9 shows the quality of water that flows from the Mekong River to the Nakae Water Plant, located in Khanthabouly District. Samples were obtained at the intake point of the Mekong River. A recent study pointed out that the salinity of groundwater is relatively high around the Seno City. If groundwater will be used for construction and operation works in the Project Area, it is highly recommended that water quality analysis be conducted prior to the Project.

Table 7.1.9 Water Quality of Savannakhet

Parameters	Unit	Range	Average	Standard
pH	-	7.0 – 7.27	7.15	6-8.5
Turbidity	NTU	1.09 – 4.31	2.43	<10
Cl_2	mg/L	0.1- 0.25	0.20	<0.20

Source: State-owned Water Supply Company (Nam Papa) Savannakhet, 2010
Decision on the Management of Quality Standards for Drinking Water and Household Water Supply, stipulated by Department of Hygiene and Prevention, Ministry of Health, 2005

(8) Noise and Vibration

As discussed above, the traffic volume in Savannakhet Province is far less than that in Vientiane Capital. Assuming proportional relationships between traffic volume and noise and vibration levels, noise and vibration levels might be much lower than those in Vientiane Capital. Looking at the noise levels in Vientiane Capital shown in Table 7.1.10, parameters of noise in Savannakhet Province will not exceed the international standards.

Table 7.1.10 Noise in Vientiane Capital (2002)

Parameter	Unit	Range of Results	International Standards
$L_{eq}8$ (average over 8 hrs)	dB(A)	60.1 – 63.0	60 – 70 dB(A)
L_{max} (maximum level)	dB(A)	79.5 – 85.0	< 70 dB(A)

Source: Ambient Air and Noise Monitoring in Vientiane Municipality (September 2002 – February 2003), Danida National Capacity Building Project

(9) Archaeological and Heritage Resources

A literature review by the Study Team could not find any archaeological and heritage resources in the Project Area. The area surrounding the Project Area was also found not to have anything worth preserving in the form of historical and cultural ruins, buildings and assets.

7.1.2 Social Environment

(1) Population Structure

As social indicators of Vientiane, the total area, population and population density of Vientiane Capital in 2005 is shown in Table 7.1.11.

Table 7.1.11 Population and Population Density in Savannakhet Province (2008)

Area	Area (km^2)	Population	Male	Female	Density (person/km^2)
Lao PDR	236,800	6,000,379	2,993,041	3,007,338	25
Savannakhet Province	21,774	872,159	N/A	N/A	40

Source: Statistical Yearbook 2008 Savannakhet Province, Savannakhet Province, 2009

As for the ethnic composition in Savannakhet Province, Lao-Thai and Mon-Khmer are dominant. Lao-Thai group lives all over the Province, especially in the eastern area while the Mon-Khmer group lives in the western area. Despite such ethnic diversities, the main spoken language in the Province is Lao, the official language used in the compulsory education.

(2) Social services

1) Water supply

The average water supply accessibility of the locals was 10.68% in 2008 in Savannakhet Province. To grasp the Province's general trends of sources of water for drinking and cooking, Table 7.1.12 shows the results obtained in the Census in 2005.

Table 7.1.12 Apportionment of Sources of water for Domestic Use in Savannakhet Province

Area	Piped water in/out side	Well/ Borehole protected	Well /Borehole unprotected	River, stream or dam	Mountain source	Rain water from tank	Other	Not stated	Total
Lao PDR	12.9 %	22.0 %	23.8 %	20.5 %	19.1 %	0.1 %	0.6 %	0.9 %	100.0 %
Savannakhet Province	9.4 %	31.2 %	37.6 %	14.7 %	5.3 %	0.3 %	1.0 %	0.5 %	100.0 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

Over the Savannakhet Province, the Water Supply State Enterprise, called Nam Papa Savannakhet, provides water supply services. As for the water management in each district, each district office is responsible for district-based water supply management. While Khanthabouly District abstracts water mainly from the Mekong River, the main water source in Outhoomphone District is groundwater which is abstracted by digging boreholes. Pipeline networks in Outhoomphone District have been developed especially in residential areas and the Project Area would be covered with that network system.

Table 7.1.13 Water Supply Service in Khanthabouly and Outhoomphone Districts

Items	Khanthabouly (2009)	Outhoomphone (2008)
Size of Population in the service area	74,795	20,121
Serviced Population	72,065	11,291

Items	Khanthabouly (2009)	Outhoomphone (2008)
No. of Serviced Households	10,919	2,848
Service Cover Rate (%)	96	56
Volume of Water Produced (m^3)	6,894,713	681,517
Volume of Water Consumed (m^3)	4,865,280	378,917
Percentage of Non-revenue Water (%)	20	9.6
Volume of Non-revenue Water (m^3)	1,378,943	65,434

Source: State-owned Water Supply Company (Nam Papa) Savannakhet, 2010

2) Electricity

The electricity service in the Province is provided by Electricite du Laos (EdL), Savannakhet, and major sources of electricity in the Savannakhet Province are Thailand, Vietnam and Khammuane Province. Around 90 % of the electricity in the Savannakhet Province is imported from Thailand. On the other hand, the EdL, Savannakhet, supplies electricity not only in Savannakhet Province but also in Saravane and Khammuane Provinces.

Table 7.1.14 shows the distribution of electricity in Savannakhet Province and also shows that the non-electrified rate is relatively lower than that at the national level.

Table 7.1.14 Distribution of Electricity in Savannakhet Province

Area	With Electricity through Public Grid		Own generator	Car Battery	Not Electrified	Not stated	Total
	Own meter	Share meter					
Lao PDR	38.9 %	10.8 %	1.0 %	6.5 %	41.2 %	1.6 %	100.0 %
Savannakhet Province	42.9 %	10.4 %	0.5 %	6.6 %	38.5 %	1.1 %	100.0 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

3) Solid Waste management

In Savannakhet Province, public and private waste collection services work only in limited areas, especially in populated residential areas. The service providers tend own their landfills. For example, in Khanthabouly District, Urban Development Administration Authority (UDAA) is responsible for waste collection: the volume of waste it collects amounts to about 25 – 30 tons per day. UDAA's landfill is about 16 ha in size. The UDAA also owns and operates 3 trucks. People who are not provided with such services tend to burn waste in their residential lots.

In Outhoomphone District, there is a 10 ha landfill site managed by a private operator on a concession with the District Government. The private operator owns 2 trucks and collects household waste of about 2 – 3 tons per day.

4) Sanitation

Sewerage treatment in Savannakhet Province is managed by each district. In case of Khanthabouly District, the current sewerage treatment systems are operated by UDAA of Savannakhet Province. The main toilet facilities in the District involve separate treatment of sewage by each household or building whereby pour-flush or dry latrines are used together with septic tanks for black water disposal and soak-pits for grey water disposal. These septic tanks and soak-pits overflow into nearby drainage system. According to the statistics in the year 2005,

around 22.5% of households in the Province have access to proper toilet facilities as shown in Table 7.1.15. Other households still have no wastewater treatment system. Wastewater is generally discharged directly into drainage systems or is infiltrated into the ground without any treatment. Due to such insufficient systems, wastewater from houses and factories pollutes the soil and groundwater.

In Outhoomphone District, only the residential areas have a sewerage collection pipeline: however, it doesn't have any treatment system. Furthermore, only the households lying along the collection pipeline are connected to it: and these are very limited. As for toilet systems, as of December 2009, Department of Health, Savannakhet Province, reported that 37.21% of the total households had toilets attached to houses in the Savannakhet Province, while 72.46% of households in Khanthabouly District and 55.84% in Outhoomphone District had their own toilets.

Table 7.1.15 Types of Toilets in Savannakhet Province

Area	Number of Households	Modern Toilet	Normal Toilet	Other	None	Not stated	Total
Lao PDR	952,386	1.8 %	38.5 %	8.9 %	49.0 %	1.6 %	100.0 %
Savannakhet Province	130,399	0.8 %	21.7 %	1.7 %	74.4 %	1.3 %	100.0 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

5) Health

Savannakhet Province has public health facilities as shown in Table 7.1.16.

Table 7.1.16 No. of Public Health Facilities in Savannakhet Province (2007/2008)

Provincial Hospital	District Hospital	Dispensary	Pharmacy
1	14	105	

Source: Statistical Yearbook 2008 Savannakhet Province, Savannakhet Province, 2009

6) Education

Lao PDR has various native languages as well as ethnic groups, while its official language is Lao. Reflecting the distribution of ethnic groups and their languages over the country, literacy gaps were identified. According to the result of the census in 2005 as shown in Table 7.1.17, the literacy rate in Savannakhet Province is lower than that at national level while the rate of "Never been to school" among children above six years old is higher than the national rate as shown in Table 7.1.19. In Lao PDR, children aged six years have to enroll in compulsory primary education.

Table 7.1.17 Literacy Rate for Population Aged 15 Years and Above in Savannakhet Province

Area	Female	Male	Total
Lao PDR	63.2 %	82.5%	72.7 %
Savannakhet Province	59.2 %	78.5 %	68.5 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

Table 7.1.18 No of Schools in Savannakhet Province

Types	Creche	Primary 1st – 5th	Secondary 6th – 12th	Vocational Edu. and College
Government	N/A	N/A	N/A	4
Private				5
Total	215	1,155	145	9

Source: Statistical Yearbook 2008 Savannakhet Province, Savannakhet Province, 2009

Table 7.1.19 School Attendance for Proportion Aged 6 Years and Above in Savannakhet Province

Area	Never been to school	At school	Left school	Unknown	Total
Lao PDR	22.8 %	28.4 %	46.7 %	2.1 %	100.0 %
Savannakhet Province	28.1%	25.3 %	45.4 %	1.2 %	100.0 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

(3) Economic activities

Like other areas in Lao PDR, most of the population in Savannakhet Province engages in agriculture. However, in consideration of industrial development in the SEZ and Sepone Mining, population working in the commercial and industrial sectors is projected to increase.

Table 7.1.20 Occupational Distribution of Economically Active Population in Savannakhet Province

Area	Economically active population	Distribution of occupation					Total
		Farmer	Fisherman	Livestock farmer mainly	Mixed farmer	Non-farm activity	
Lao PDR	2,738,892	64.3 %	0.1 %	0.2 %	14.0 %	21.5 %	100.0 %
Savannakhet Province	305,407	62.9 %	0.0 %	0.1 %	17.3 %	19.7 %	100.0 %

Source: Results from the Population and Housing Census 2005 (2006), Steering Committee for Census of Population and Housing

7.1.3 Detailed Social Environment (District Level)

The Project Area is located in Outhoomphone District in Savannakhet Province. The existing profile of the district is summarized in Table 7.1.21.

Table 7.1.21 Existing Profile of the Outhoomphone District in Savannakhet Province

Item		Outline
1. Area of District		100,000 ha
2. No of villages		69
3. Population	Male	43,537
	Female	42,466
	Total	86,003
4. Public infrastructure conditions	Water supply	13 villages (1,830 water meters) are provided with water supply services by Nam Papa. Service cover ratio is 56% as shown in Table 7.1.13.
	Electricity	64 villages are provided with electricity by EdL.
	Solid Waste	There is one dumping site and collecting service is conducted by 1 private company.

Item		Outline
	Wastewater /sewerage	No sewerage treatment facility.
	Telecommunication	
5. Health	No. of hospitals	2
	No. of dispensaries	26
6. Education	No. of crèche	14
	No. of primary schools	79
	No. of secondary schools	13
	No of vocational education institutions and colleges	0
7. Economic activities		Main activity is agriculture which accounts for 70% of the whole district's economy. Additionally, there is one big company dealing in wood products.

Source: JICA Study Team

7.2 Assessment of Savannakhet Logistics Park

7.2.1 Scoping

An area proposed for the Project is around 5.1 ha in total, consisting of the Savannakhet Logistics Park (SLP) and access roads, connecting with the NR-9. An area for the SLP is proposed inside the Site B, a part of the Special Economic Zone. The SLP will be equipped with customs clearance on chassis, heavy bulk cargo area, general cargo area, parking lots, administration and customs office, operator office, maintenance shop, gate and weight station, and basic infrastructure including water supply, sewerage, drainage, electricity, and telephone lines.

Taking the detailed specifications of the Project into consideration, the scoping result is shown in Table 7.2.1. In addition, Table 7.2.2 shows current conditions related to infrastructures at the proposed site of SLP.

Table 7.2.1 Scoping Matrix for the Savannakhet Logistics Park (SLP) Project

Item			Rating	Description	Recommended actions by the Project Owner in the next phase
Social Environment	1	Involuntary Resettlement	D	A few houses are observed around the Project Area, however no house is observed inside the Area.	Identification of land use and land ownership of project-affected people (PAP) Social survey Stakeholder meetings
	2	Local Economy such as Employment and Livelihoods, etc	B (Construction)	Increase in construction vehicles, traffic jam and increase in employment opportunities may be expected during the construction phase.	Social survey Stakeholder meetings
			D (Operation)	Increase in employment opportunities may be expected in the construction and operation phases.	
	3	Land Use and Utilization of Local Resources	D	The Project Area was originally planned to be developed as a site for a logistics park. Therefore, the Area was almost empty, but land preparation work such as deforestation may need. Some impacts on local resources may be expected.	Social survey Stakeholder meetings
	4	Social Institutions such as Social Infrastructure and Local Decision - making Institutions	C	In the Project Area, social institutions may not work at the moment.	Social survey Stakeholder meetings
	5	Existing Social Infrastructure and Services	B (Construction)	In the Project Area, basic infrastructure services, such as water supply, drainage and sewerage, are not provided, though electricity distribution lines exist. These services may require being opened up prior to the construction phase. New implementation of those facilities may affect the Area.	Social survey Stakeholder meetings
			D (Operation)	After construction of infrastructure service, there may be no further impact.	
	6	The Poor, Indigenous and Ethnic people	C	Though there are only a few households and a school around the Project Area, there isn't any household in the Area. Therefore, no impact on existing livelihoods around the Area is expected	Social survey Stakeholder meetings
	7	Mal-distribution of Benefits and Damage	C	Due to the existence of households around the Project Area, mal-distributions may occur.	Social survey Stakeholder meetings
	8	Cultural heritage	D	None	None
	9	Local Conflicts of Interest	C	At the moment, the Project Area has no private-owned houses since it is legally owned by the SEZA.	Social survey Stakeholder meetings
	10	Water Usage or Water Rights and Communal Rights	C	The land ownership is allocated to the SEZA and water supply service can be provided because water pipe runs underground along the road: it is presumed that there aren't any communal rights and water rights.	Social survey Stakeholder meetings
	11	Sanitation	B	Effluent from the construction works and operation of the park may affect the Project Area and its adjoining areas in terms of sanitary conditions.	Social survey Stakeholder meetings
	12	Hazards (risk) Infectious Diseases such as HIV/AIDS	C	Increase of the influx and efflux of people may lead to infectious diseases in and around the Project Area.	Social survey Stakeholder meetings
	13	Accidents	B	Traffic accidents may increase due to the increase in traffic volume, especially in terms of construction machinery. Traffic accidents may increase due to the increase in traffic volume.	Traffic survey Stakeholder meetings

Item			Rating	Description	Recommended actions by the Project Owner in the next phase
Natural Environment	14	Topography and Geographical Features	B	Most of the Project Area has been prepared and is flat. Some areas are still required for land preparation works, especially embankment and deforestation works.	Topographic Survey Environmental Management Plan (EMP)
	15	Soil Erosion	B	Around the Project Area, hill-slopes exist. There is possibility that the land preparation works, especially embankment, will affect the present soil conditions especially over the hill-slopes.	Soil and sediment survey EMP
	16	Groundwater	D	Water pipe runs underground along the road. To get water supply service will be effected by connecting the pipe. Therefore, groundwater is not necessary for the Project Area.	Water quality Survey EMP
	17	Hydrological Situation	C	The existing hydrological systems may not be affected. However, the hydrological situation may be affected as a result of land preparation works.	Water quality survey EMP
	18	Coastal zone	D	No coastal zone exists.	None
	19	Flora, Fauna and Biodiversity	C	Some bushes exist in the Project Area and it may be necessary to cut them as part of land preparation works. The Area is not categorized into any protected area. Effluents from the Area like daily waste and wastewater may affect biological conditions.	Flora and fauna survey EMP
	20	Meteorology	D	No meteorological impact.	None
	21	Landscape	C	Positive and negative impacts may arise due to change of land use from the present emptiness to a logistics park.	Landscape impact estimation
	22	Global Warming	C	Carbon dioxide may be discharged by working machinery and vehicles.	Greenhouse effect gasses estimation
Pollution	23	Air Pollution	B (Construction)	Deterioration of air quality may occur due to construction machinery and vehicles.	Air quality survey EMP
			B (Operation)	Deterioration of air quality may occur due to traffic congestion in/around the Project Area.	
	24	Water Pollution	B (Construction)	Water pollution may occur due to the efflux of wastewater from the construction works.	Water quality survey EMP
			B (Operation)	It will be impossible to connect sewerage system. Wastewater will be treated independently at the site. Water pollution may occur due to the efflux of wastewater from the operation of the Park.	
	25	Soil Contamination	B (Construction)	Land preparation, especially embankment and deforestation works, may affect the present soil conditions.	Soil and sediment survey EMP
			B (Operation)	Effluents discharged from facilities in the Project Area may affect soil conditions in and around the Park.	
	26	Waste	B (Construction)	Construction works may generate waste and sludge. This may lead to water pollution and offensive odors in and around the Project Area.	Waste emission estimation EMP
			B (Operation)	Waste and sludge may be generated from the operation of the Park and people's activities in/around the Project Area.	
	27	Noise and Vibration	B (Construction)	Construction machinery and vehicles may generate noise and vibration in and around the Project Area.	Noise and vibration survey EMP
			B (Operation)	Noise due to traffic congestion may increase beyond present levels.	
	28	Ground Subsidence	D	Water will be supplied by the connecting to water mains. Ground subsidence may be avoided by not using groundwater.	None
	29	Offensive Odor	C	Effluents, such as waste and wastewater, may generate offensive odor.	Odor emission estimation EMP
	30	Bottom Sediment	C	No impact on sediments is expected.	Soil and sediment survey EMP

Evaluation Categories A: Serious impact is expected. B: Some impact is expected. C: Extent of impact is unknown. (Examination is needed. Impacts may become clear as study progress.) D: No impact is expected. EIA is not necessary.
Source: JICA Study Team

Table 7.2.2 Current Conditions Related to Infrastructure at the Site of SLP

Type	Conditions
Water supply	Water pipe runs underground along the road. Water supply service will be acquired by connecting to the pipe.
Electricity	Electricity can be provided with 220 voltages. Need to make sure transformer to use it exists.
Solid Waste	It will be required that solid wastes from the site are collected by the private company for dumping.
Wastewater /sewerage	It will be impossible to connect sewerage system. Wastewater will be treated independently at the site.
Telecommunication	Optic fiber cable is provided along the road facing the site, and it may be ready for use sometime. However, it is not available at the moment.

Source: JICA Study Team

7.2.2 Proposed Environmental Management Plan

Based on the scoping results and the present situation of the Project Area, the following items need actions against anticipated impacts on environment. Here, those actions are proposed as part of the environmental management plan which is shown in detail in Table 7.2.3.

Table 7.2.3 Proposed Environmental Management Plan

Items	Proposed action as part of Environmental Management Plan
Topography and Geographical Features	- to ascertain how much impact on topographic structures in the Project Area will occur by using the results of topographic (measurement) survey to be conducted; however, most of the area has been prepared and is flat - to mitigate the impacts on topographic structures mainly in terms of landscape features from the viewpoints along the road by means such as reforestation and greenery on the site and slopes around existing pond
Soil Erosion and Bottom Sediment	- to verify how much runoff will flow from the site especially during the construction phase and to ensure that it at least meets the water quality standards - to take measures to mitigate soil erosion by means such as making sedimentation ponds or greenery during the construction phase - to implement sediment control through regular monitoring and maintenance during the construction and operation phases
Groundwater Water Pollution	- to ascertain how much groundwater will be used during construction and operation phases despite availability of water supply service at the site - to take measures to prevent contaminations by solid waste and wastewater which may consist of concrete and other chemicals - to implement treatment of wastewater through treatment facility such as a septic tank at the site - to implement regular monitoring of water quality, if necessary, to take added measures to mitigate water pollution
Flora, Fauna and Biodiversity	- to ensure local workers do not harvest or hunt any forest resources of not only plants but also animals at the adjoining vegetative site - to take measures to improve natural environment by means such as reforestation and greenery at the site
Air Pollution	to verify how much air pollution will be discharged during operations at the site especially at the construction phase so to ensure that air quality standards are at least met - to set and implement rules during construction and operation phases with respect to equipment maintenance, equipment operating procedures, utilization of vehicles which emit lower pollutants and gases, and avoidance of concentration of vehicles during operations - to implement regular monitoring of air quality, if necessary, to take added measures to mitigate air pollution
Soil Contamination	- to take adequate measures on wastewater and solid waste to ensure that the pertinent standards are met (refer to water pollution and waste)
Waste	- to implement collection of solid waste discharged from the site and transferring it to single

Items	Proposed action as part of Environmental Management Plan
	dumping site located in the district by using collecting service conducted by a private company - to implement treatment of wastewater by using treatment facility such as a septic tank at the site - to take measures to minimize liquid and solid waste especially during construction phase
Noise and Vibration	- to implement appropriate measures to minimize noise generated throughout construction phase, such as determining operating hours and avoidance of concentration of vehicles at times of operation - to notify relevant stakeholders around the site of possibilities of generating noise and making some disturbance
Offensive Odor	- to implement appropriate solid waste management during construction and operation phases (refer to waste)
Accidents	- to verify the possible accidents that may occur at the site and to plan preventive action and procedures against occurrence of such accidents on site prior to the construction phase - to ascertain how the contractor will handle, store safely and utilize hazardous materials - to implement programs for all the workers instructing them on how to handle fuel, lubricating oil, hydraulic fluids and any other hazardous chemicals - to list equipments to be used on site by construction workers in emergency cases

Source: JICA Study Team

7.2.3 Outline of the Draft Resettlement Action Plan

In addition to the environmental management plan, the Project Owner will be required to prepare the resettlement action plan. In order to do so, the following actions need to be taken into account as detailed in Table 7.2.4.

Table 7.2.4 Further Actions Required of Project Owner In Finalizing Resettlement Action Plan

Items	Actions required to fulfill the item	Description of the present situation
1. Introduction	- Description of project components - Summary description of adverse impacts and asset acquisition	This section should be written after the actions are considered.
2. Census and socioeconomic survey results	- Reviewing census and socio-economic baseline survey of all the people and/or households affected by the Project (PAPs) - Categorizing and Numbering of PAPs by type and degree of impacts - Preparing the inventory of assets of PAPs and/or households to be affected	No households were observed in the Project Site in the survey because the land was originally designated as a logistic park. There are some households in the adjoining area: these will not be affected by this project. When the Project Plan is finalized, a detailed survey is recommended to ascertain the land legal status.
3. Compensation entitlement criteria	- Establishing the cut-off date for entitlement eligibility - Examining and determining the methodologies for assessment of compensation for PAPs' assets	At the moment, the type and degree of impacts are not certain such that compensation description and measures to mitigate are also unclear.
4. Relocation plan (if necessary)	- Conducting consultations among the Project Owner, PAPs and stakeholders in the process of formulating relocation plan - Determining criteria for relocation and provision of replacement land which is satisfactory to the PAPs' given the state of original land - Selecting sites for PAPs' relocation by conducting the assessment and feasibility studies of alternative sites - Calculating administrative relocation cost	As mentioned above, there are some households in the adjoining area. They will not be affected by the project; therefore, it seems that there will be no need for relocation plan.

Items	Actions required to fulfill the item	Description of the present situation
5. Income restoration measures (as necessary)	- Planning an economic rehabilitation plan for restoring income and livelihoods lost on account of the Project - Implementation of the plan - Institutional set-up to carry out activities proposed in the plan	Though detail survey will be required, income restoration measures might not be needed since there aren't any households which seem to get income from or around the Project Area except the companies in the site.
6. Public participation, consultation, disclosure and grievance redress mechanism	- Setting up grievance redress mechanism to guarantee women's assets, property and land-use rights, and to ensure the restoration of income and living standards - Establishing grievance redress committee	Project Owner needs to discuss with local authorities on how to coordinate information disclosure process and establish compensation systems
7. Organization setup	- Setting up and planning for training and capacity building	In addition to no.6, Project Owner also needs to discuss with local authorities on how to set up organization for training and capacity building.
8. Monitoring and supervision	- Establishing external monitoring and evaluation systems by independent organizations	The organization to be discussed in no.7 will also be responsible for monitoring and supervision.
9. Cost estimates and budget	- Estimating resettlement costs, covering formulation of resettlement plan, compensation, relocation, income restoration, administrative and monitoring costs	Resettlement costs are important for estimating cost and budget. Estimates will be made after information listed above has been collected.
10. Implementation arrangements	- Preparing timetable and procedure for implementation of all activities	Timetable and procedure will be prepared.

Source: JICA Study Team, with reference to Technical Guidelines on Compensation and Resettlement in Development Projects (2005), STEA

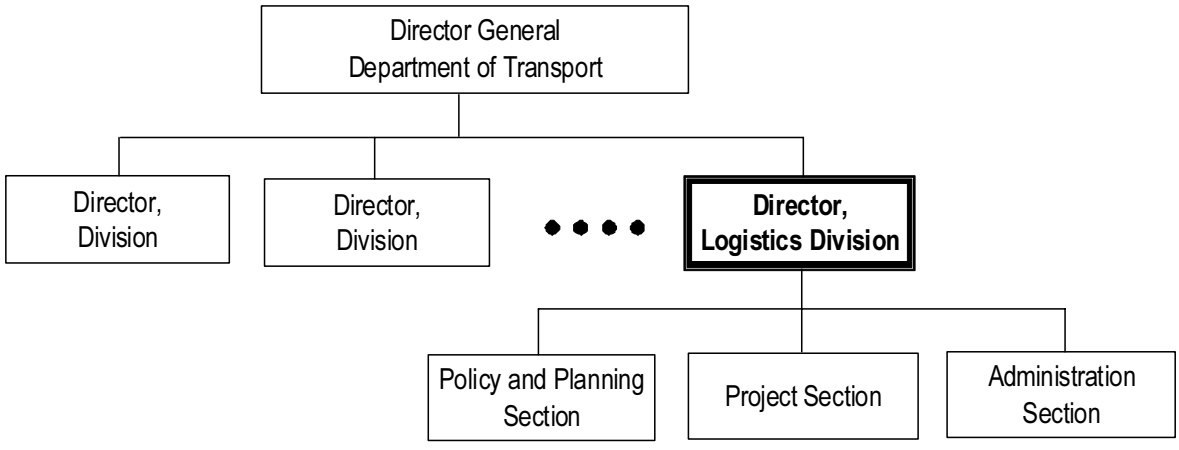
CHAPTER 8 PRELIMINARY IMPLEMENTATION PLAN

8.1 Implementation Body

As described in Chapter 6, Department of Transport of Ministry of Public Works and Transport will be the project owner and implementation body of the SLP project. Logistics Division is recommended to be newly established under the Department of Transport who will dedicate policy, planning and administration of logistics including logistics park development project. After establishment, the Logistics Division should be responsible for planning and implementing VLP, SLP and CLP projects with the following tasks:

- Project preparation (EIA, land acquisition, detailed design and tender documentation, management plan)
- Coordination with other agencies concerned
- Financing planning
- Selection of SLP-MC

Major tasks of Logistics Division will shift from logistics park development to realization of other actions under the national logistics strategy, and shift to be the organization which takes care of managing and supervising logistics parks and logistics businesses in the logistics parks.



Source: JICA Study Team

Figure 8.1.1 Logistics Division in MPWT (same as previous Figure 6.2.1)

8.2 Implementation Schedule

Implementation process is divided into the following four stages: preparatory stage, design stage, construction stage and operation stage. As indicated in Figure 8.2.1, it takes 64 months to complete SLP from commencement of the preparatory stage.

8.2.1 Preparatory Stage

This stage starts with building of consensus to develop SLP, and Lao PDR Government will establish organization for the management of SLP project. The government will also have to investigate and decide financing plan, and carries out a procedure for financial arrangement. Preparation to start design works is also important work in this stage. This stage may take 12 months period. The followings are the major works during this stage:

- Consensus building for development of SLP
- Determination of financing plan
- Determination of project owner
- Preparation of loan application
- EIA and Land Acquisition
- Compilation of TOR and tender documents for selection of consultants
- Procedure for financial arrangement

8.2.2 Design Stage

The government will take consultant section works including finalization of TOR and tender). The selected consultant will conduct detailed design for access road, land preparation, building, facilities and utilities. In the end of the detailed design, the consultant will prepare bid documents for contractors. Total months for the design stage will be 27 months with contract negotiation and concurrence process from donor. The followings are the major works during this stage:

- Short list and finalization of TOR of consultants
- Selection of consultants (including tender, contract negotiation, concurrence from donor etc.)
- Detailed design
- Preparation of bid documents

8.2.3 Construction Stage

The selected contractor will start construction of access road, and conducting land preparation and building and facility works. On the way of the construction works, the consultant will prepare bid documents and select operators. After clearance of the construction works, machines and equipment for operator will be installed. This stage may take 16 months period. The followings are the major works during this stage:

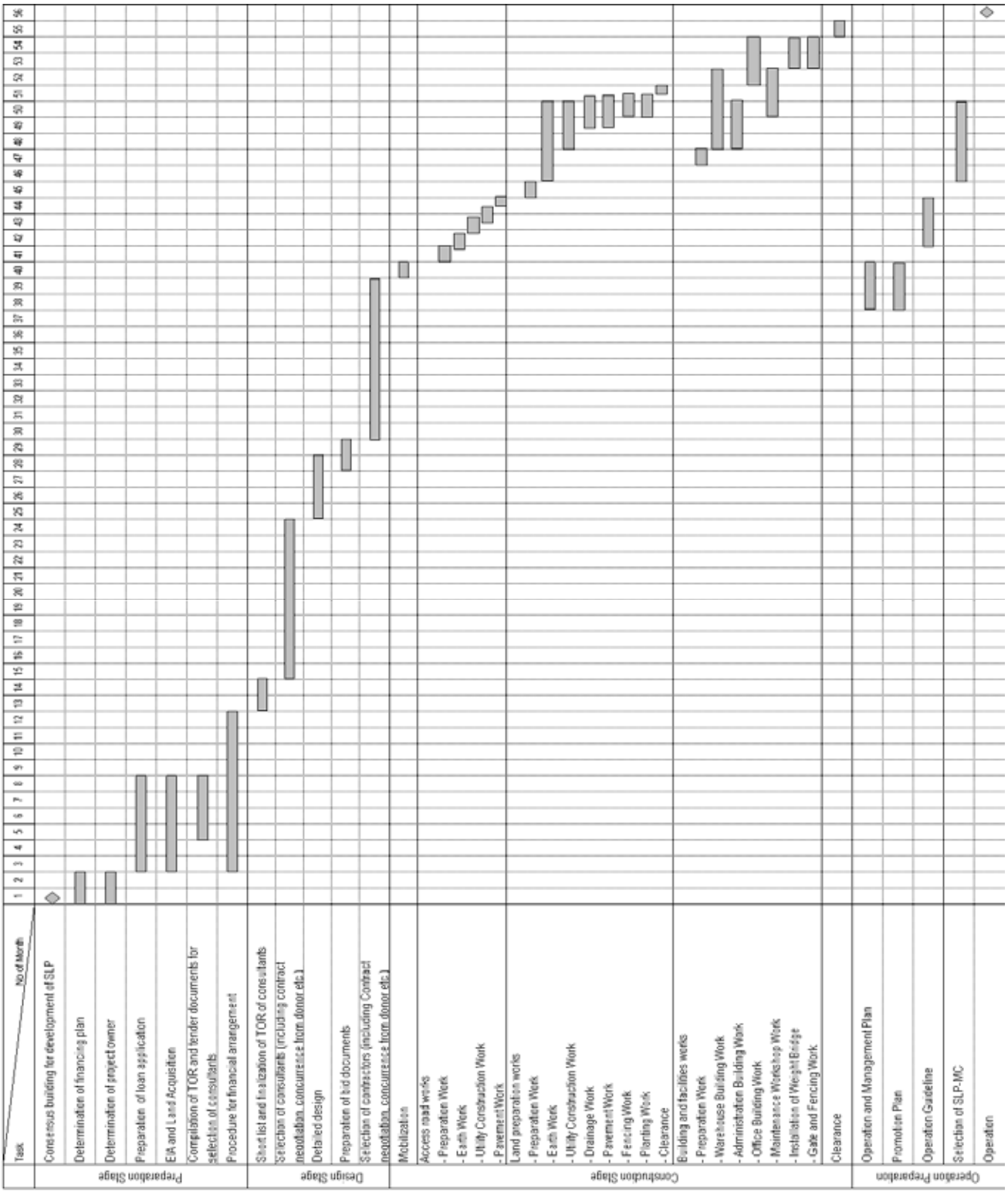
- Selection of contractors (including Contract negotiation, concurrence from donor etc.)
- Mobilization

- Access road works
- Land preparation works
- Utility construction Work
- Building and facilities works
- Gate and fencing works
- Machine installations
- Clearance

8.2.4 Operation Preparation Stage

In parallel with construction, project owner will select a company or a group which will work as SLP-MC. Selected SLP-MC will select tenants of SLP who directly provides logistics services to users. Selected tenants will install necessary machines and equipment for transshipment service, etc before starting operation of SLP. Total months in this stage will be 9 months. The followings are the major works during this stage:

- Operation and Management Plan
- Promotion Plan
- Operation Guideline
- Selection of SLP-MC
- Selection of tenants
- Operation



Source: JICA Study Team

Figure 8.2.1 Implementation Schedule

8.3 Project Package for Implementation

8.3.1 Project Lots

Although the SLP consists mainly of two components such as SLP itself and access road, the work volume of SLP project is limited compared to that of VLP. So that, the SLP should not be divided into project lots but be carried out with only one project.

Table 8.3.1 shows work item, components and their brief spec. and quantity in brief.

Table 8.3.1 Work Item, Components and quantity by Lot

Lot No.	Work Item	Contents	Summary (Quantity)	Cost (US$)
Lot 1	Civil Works	• Preparatory Work • Earth Work • Pavement • Utilities (Drainage, Waste Water, Water, Electricity, Telecommunication) • Green • Others	• Working Area: 5.1ha (already roughly developed) • Earth Volume: 19,500m3 of Excavation, 18,200m3 of Filling (including earth work of railway construction) • Pavement: 4.4ha in SLP • Drainage: 1.2km • Waste Water: 0.9km pipes and a treatment plant • Water supply: 350m pipes, a 20m depth well with a purification plant and a water tank • Electricity: 1,200m for 220v, and 45 poles for electricity and light • Telecommunication: 500m of telecommunication line • Tree Planting and Green: 0.4ha • Fencing: 0.8km	2,302,020
	Building Construction	• Warehouse • Office • Maintenance Shop • Parking • Weighbridge • Gate	• Freight Station (FS): 1,000m2 • Operator Office: 420m2 • Administration Office: 400m2 • Maintenance Shop: 300m2 • Parking: 200m2 of parking area with roofs • Weighbridge: 2 • Gate: 1 gates (each gate has 2entrances and 2 exits)	834,320
	Access Road Construction	• New Road Construction I • (Pavement work on an existing non-paved road)	• Length & Width: L=640m, W=16.0m • Working Area: 10,200m2 • Earth Volume: No earth work • Pavement: 7,700m2 • Drainage: 1,300m of concrete ditch • Street Light: 43 poles	640,932

Source: JICA Study Team

8.4 Required Consultants Service

8.4.1 Necessity and Scope of Consultant Service

SLP is proposed to provide high quality and capacity of logistics services in Savannakhet in accordance with increased volume of freight cargo through the friendship bridge in future. SLP is also an indispensable facility to implement the national logistics strategy of “integration of cargo flow” and “business stimulation”. Accordingly, the success of SLP depend only on the

construction and operation of SLP but also on the mitigation of empty return cargo as well as the realization of competitive and transparent logistics market and participants (domestic and foreign logistics businesses). Looking at the current capacity of Lao government and relevant private businesses in Laos, it unfortunately seems not to be achieved by their own capacity. It is therefore necessary to have a consultant to technically support Lao Government to carry out SLP with relevant institutions.

In this regard, there seems to be at least two aspects of consultant services to be attached such as:

- Consultant service for SLP development (hard component)
- Consultant service for management, operation and necessary institutions (soft component)

(1) Consultant service for SLP development (hard component)

The consultant will be responsible for all technical matter to construct SLP and provide with technical advices to the project owner (maybe MPWT or Savan-Seno SEZ Authority) for their division makings. The scope of the consultants for this purpose is listed up below:

- Review of capacity and demand
- Basic design
- Detailed design
- Cost estimate
- Preparation of tender documents
- Tender management and evaluation supports
- Construction supervision (check of shop drawings, control of construction schedule, coordination between project owner and contractors, cost management, quality control, liaison to donor etc.)

(2) Consultant service for management, operation and necessary institutions (soft component)

The consultant will be responsible for developing proposals on necessary institutions, organization and schemes to efficiently operate SLP as well as to sufficiently perform along the national logistic strategy (of mitigation of empty return cargo as well as the realization of competitive and transparent logistics market and participants), and for assisting MPWT to take necessary actions to realize them. The scope of the consultants for this purpose is listed up below:

- SLP Operation and management plan
- SLP promotion plan
- Supports to set-up organization of SLP
- SLP operation guideline
- Preparation of tender documents for SLP management company
- Tender management and evaluation supports for SLP management company
- Advice on management and operation after operation of SLP

8.4.2 Anticipated Inputs of Consultants

(1) Anticipated Consultants and their TOR

The following experts shall be at least considered to be included in the consultant tem to carry out the scope of service described in the previous section. There are

- Team Leader
- Deputy Team Leaders (hardware, software, and local)
- Highway Engineer (foreign
- Water Supply and Drainage Engineer (foreign and local)
- Architect (for SLP facility) (foreign and local)
- Cost Estimator (foreign and local)
- Document Specialist (foreign)
- Resident Engineer (for construction supervision) (foreign and local)
- Transport Planner (foreign)
- Economist (foreign)
- Organization Specialist (foreign and local)
- Operation and Management Specialist (foreign and local)
- Investment Promotion Specialist (foreign and local)

Table 8.4.1 TOR by Expert for SLP Project

Experts	Foreign/Local	TOR
Team Leader	F	• Overall management of study Team • Liaison to project owner and donor • Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents • Tender management and evaluation supports • Construction supervision • SLP Operation and management plan • SLP promotion plan • Supports to set-up organization of SLP • SLP operation guideline • Preparation of tender documents for SLP management company • Tender management and evaluation supports for SLP management company • Advice on management and operation after operation of SLP
Deputy Team Leader (soft)	F	• Assistance to Team Leader • Review of capacity and demand • SLP Operation and management plan • SLP promotion plan

Experts	Foreign/Local	TOR
		• Supports to set-up organization of SLP • SLP operation guideline • Preparation of tender documents for SLP management company • Tender management and evaluation supports for SLP management company • Advice on management and operation after operation of SLP
Deputy Team Leader (local)	L	• Assistance to Team Leader • Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents • Tender management and evaluation supports • Construction supervision
Highway Engineer	F	• Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents
Water Supply and Drainage Engineer	F	• Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents
Water Supply and Drainage Engineer	L	• Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents
Architect (for SLP facility)	F	• Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents
Architect (for SLP facility)	L	• Review of capacity and demand • Basic design • Detailed design • Cost estimate • Preparation of tender documents
Cost Estimator	F	• Cost estimate • Preparation of tender documents
Cost Estimator	L	• Cost estimate • Preparation of tender documents
Document Specialist	F	• Preparation of tender documents • Tender management and evaluation supports • Preparation of tender documents for SLP management company
Resident Engineer (for construction supervision)	F	• Tender management and evaluation supports • Construction supervision • Preparation of tender documents for SLP management company
Resident Engineer (for construction supervision)	L	• Tender management and evaluation supports • Construction supervision • Preparation of tender documents for SLP management company

Experts	Foreign/Local	TOR
Transport Planner	F	• Review of capacity and demand
Economist	F	• SLP Operation and management plan • SLP promotion plan • Preparation of tender documents for SLP management company • Tender management and evaluation supports for SLP management company • Advice on management and operation after operation of SLP
Organization Specialist	F	• SLP Operation and management plan • Supports to set-up organization of SLP • SLP operation guideline
Organization Specialist	L	• SLP Operation and management plan • Supports to set-up organization of SLP • SLP operation guideline
Operation and Management Specialist	F	• SLP Operation and management plan • Supports to set-up organization of SLP • SLP operation guideline
Operation and Management Specialist	L	• SLP Operation and management plan • Supports to set-up organization of SLP • SLP operation guideline
Investment Promotion Specialist	F	• SLP Operation and management plan • SLP promotion plan • SLP operation guideline • Preparation of tender documents for SLP management company • Tender management and evaluation supports for SLP management company • Advice on management and operation after operation of SLP
Investment Promotion Specialist	L	• SLP Operation and management plan • SLP promotion plan • SLP operation guideline • Preparation of tender documents for SLP management company • Tender management and evaluation supports for SLP management company • Advice on management and operation after operation of SLP

Note: F: Foreign expert, L: Local expert

Source: JICA Study Team

(2) Work Volume by Expert

To carry out the consultant service above described, the following inputs shall be taken into account as shown in Table 8.4.2. Approximately 17 MM of foreign exports and 24 MM of local experts shall be necessary for carrying out the “hard component”, while approximately 8 MM of foreign exports and 4 MM of local experts shall be necessary for carrying out the “soft component”. Accordingly foreign expert shall be required 25, man-months of total inputs, while the local consultants shall be required 28 man-months of total inputs

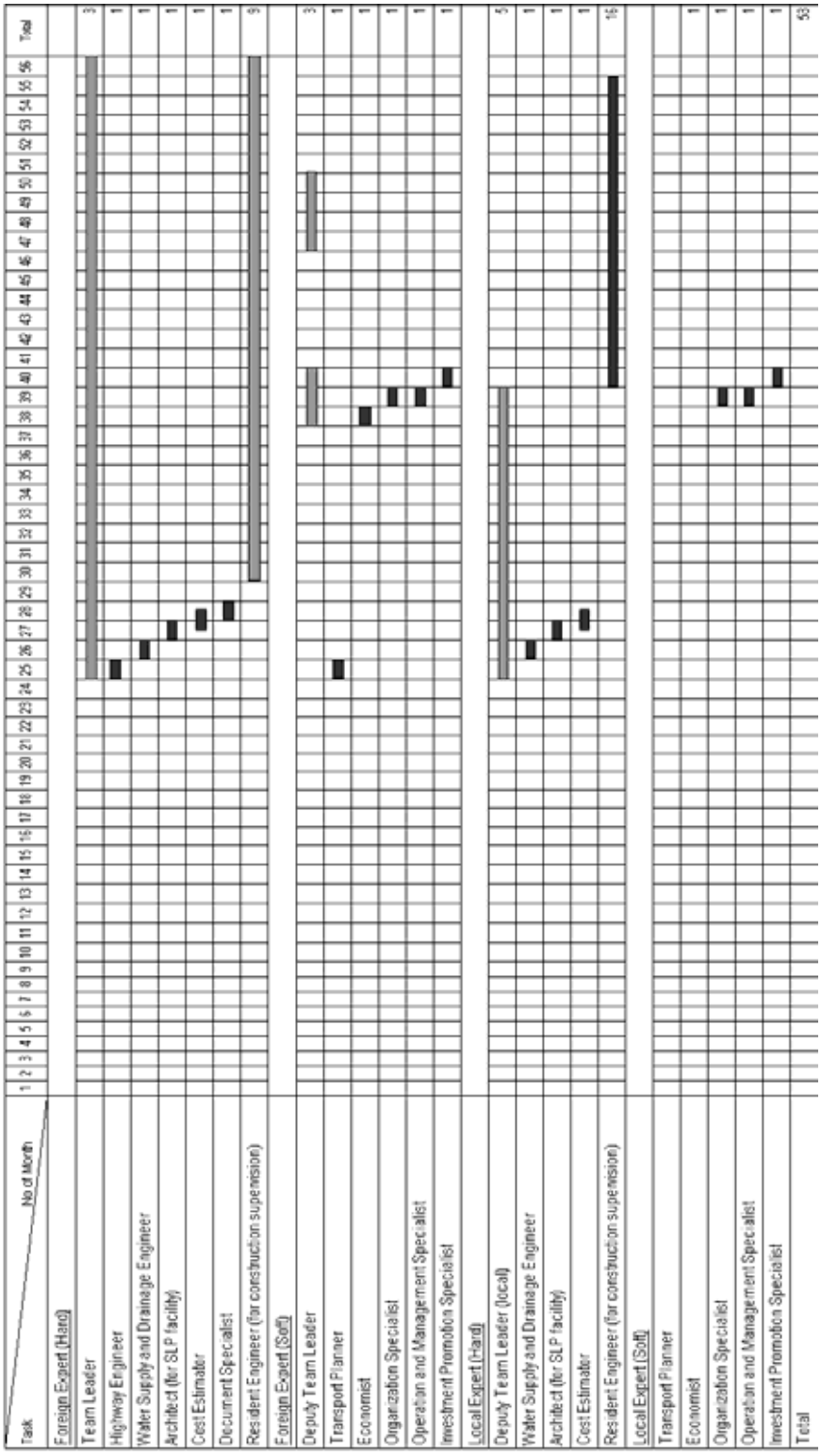
Table 8.4.2 Anticipated Inputs for "Hard Component" and "Soft Component" of SLP Project

	SLP Development (Hard Component)		SLP Relevant Institutions (Soft Component)	
	Foreign	Local	Foreign	Local
Team Leader	3			
Deputy Team Leader		5	3	
Highway Engineer	1			
Water Supply and Drainage Engineer)	1	1		
Architect (for SLP facility)	1	1		
Cost Estimator	1	1		
Document Specialist	1			
Resident Engineer (for construction supervision)	9	16		
Transport Planner			1	
Economist			1	1
Organization Specialist			1	1
Operation and Management Specialist			1	1
Investment Promotion Specialist			1	1
Total	17	24	8	4

Source: JICA Study Team

(3) Anticipated Consultants Input Schedule

Consultant assignment schedule is temporarily taken into account as shown in Figure 8.4.1.



Source: JICA Study Team

Figure 8.4.1 Consultant Assignment Schedule (Temporary)

CHAPTER 9 ECONOMIC AND FINANCIAL APPRAISAL

9.1 Operation and Effect Indicators for SLP Project

The following items were set as indicators to assess performance and effects of the SLP Project.

- Cargo handling volume (tons/day),
- Number of handling trucks and trailers (vehicles/day)

Figures in Table 9.1.1 indicate performance in 2009 and targets in 2018.

Table 9.1.1 Operation and Effect Indicators for SLP Project

	Unit	2018	Remarks
Cargo Handling Volume	000 ton/year	55.2	Estimated from demand forecast in 2015 (35,900 ton, Table 4.4.6) and 2025 (150,900 ton, Table 4.4.7).
No of handling trucks and trailers	Vehicles/day	73	Estimated from cargo handling volume in 2015 and 2025, under an assumption that vehicle transportation volume is 24 tons for full loading and 12 tons for mixed loading. Nos of vehicles are 67 in 2015 and 98 in 2025.

Source: JICA Study Team

9.2 Financial Analysis

9.2.1 Introduction

In this section, financial feasibility of SLP Project was first analyzed followed by the separate assessment of financial feasibility of the 2 organizational bodies of SLP. The organizational bodies are the Project Owner and SLP-MC, and the roles of each body were explained in Chapter 6. In order to assess financial feasibility, the discount cash flow method was adopted with the Financial Internal Rate of Return (FIRR) used as an evaluation indicator (IRR method).

9.2.2 Basic Assumptions

The basic assumptions were specified as follows:

(1) 'With-project' and 'without-project'

In the "with-project" case, the SLP development project would be implemented, and the activities at the warehouse at CCA would be perfectly substituted by the SLP. On the other hand, the

"without-project" case means that the SLP development project would not be implemented while the warehouse at the border point at the 2nd Friendship Bridge would be used at current capacity in the future.

(2) Conditions to calculate project revenue

The freight volumes and the numbers of 2-axle trucks, 3-axle trucks and trailers at SLP were calculated for 2015 and 2025. The freight volumes and numbers of vehicles in other years were determined by interpolation and the financial revenue was then calculated annually.

(3) Implementation Schedule

The implementation schedule presented in section 6.8 was used in this analysis. The JICA Study Team assumed that consensus building for development of SLP would start in January 2011 while the construction works of SLP would be completed in March 2014. From April 2014, the SLP would start full operations.

(4) Project Life

The project life is 20 years after the start of operations i.e. operations of SLP would start in April 2014 and end in December 2033.

(5) Price

The project cost as of November 2009 was used in this analysis. The exchange rate was determined from the average rate in the 3rd quarter of 2009: USD 1.00 is equivalent to JPY 93.57, LAK 8,507.61 and THB 33.84.

9.2.3 Financial Analysis of SLP Development Project

In this section, the Financial Internal Rate of Return of SLP project was calculated under the assumption that the project implementation body was a single unit (project FIRR). In this case, project revenue and cost items indicated in Table 9.2.1 were identified to calculate IRR.

Table 9.2.1 Cash Inflow and Cash Outflow to Calculate Project FIRR

Cash Outflow	Construction Cost of SLP, Investment Cost for Cargo Transshipment, O&M Cost for SLP
Cash Inflow	Revenue from Transport Operator

Source: JICA Study Team

(1) Project Revenue

Major revenue from SLP project would be from trans-shipment charges and storage charges. Unit tariffs of trans-shipment and storage were set as indicated in Table 9.2.2. These tariffs were gleaned from tariffs in Lat Krabang and Leam Chabang Port.

The trans-shipment charges consist of lift-on/lift-off charge and stuffing/unstuffing charge. In case of a trailer with imported cargo, the containers[1] would be trans-shipped to another trailer or trucks

[1] It is assumed that a trailer has two 20' containers.

at SLP. If the containers were trans-shipped to another trailer, the lift-on/lift-off charge would be collected twice when the containers are lifted off and lifted on. In addition to the lift-on/lift-off charge, the stuffing/unstuffing charge would be collected twice when cargo inside the container is trans-shipped. In case of a truck with imported cargo, the cargo would be trans-shipped to another truck at SLP. In this case, only the stuffing/unstuffing charge would be collected twice when cargo is unloaded and loaded. In case of a truck or trailer with transit cargo, the vehicle would merely stop at SLP for the CIQ process without any trans-shipment of cargo.

The storage charge consists of storage charge at warehouse, heavy bulk cargo area and general cargo CY area. Extra cargo movement charge is collected when cargo is moved from/to warehouse.

Other revenue items are parking fee and container wash charge. All vehicles that use the SLP will pay a parking fee which is THB 33 per vehicle.

The 4th column and 5th column of Table 9.2.2 indicate volumes of tariff items and revenues in 2025. The total revenue will amount to USD 1,179,000 in the year.

Table 9.2.2 Tariff Items and Revenue in 2025

Tariff Items	Unit Price (THB)	Handling Volumes in 2015	Handling Volumes in 2025	Revenue in 2015 (USD 000)	Revenue in 2025 (USD 000)
Lift-on/lift-off charge	400 per 20' container	27 containers per day	48 containers per day	166	246
Stuffing/unstuffing charge	1,200 per 20' container	44 containers per day	44 containers per day	811	821
User charge of warehouse	10 per ton	5 tons per day	23 tons per day	2	9
Extra cargo movement	350 per 20' container	2 containers per day	2 containers per day	2	10
Parking fee	33 per vehicle	69 vehicles	98 vehicles	17	25
General cargo storage charge	160 per 20' container per day[2]	38 containers per day	38 containers per day	47	47
Heavy bulk storage charge	160 per 20' container per day[3]	6 containers per day	6 containers per day	7	7
Container wash charge	300 per 20' container per day	6 containers per day	6 containers per day	14	14
Total	-	-	-	1,067	1,179

Source: JICA Study Team

(2) Project Expenditure

Annual disbursement of the total development cost which includes the total construction cost, administration cost, consultancy cost and contingency is indicated in Table 5.6.1. The development cost is distributed as indicated in Table 9.2.3 under the project implementation plan presented in Figure 6.7.1.

Table 9.2.3 Annual Disbursement of SLP Development Cost

Unit: USD 000

	2011	2012	2013	2014	Total	Remarks
Total Construction Cost	-	-	3,588	189	3,777	-
Administration Cost	38	38	38	-	113	3% of Total Construction Cost

[2] Containers and cargo which are placed at CY will be charged from the 4th day of storage.
[3] Containers and cargo which are placed at bulk cargo area will be charged from the 4th day of storage.

Consultant Cost		159	106	-	264	7% of Total Construction Cost
Contingency	-	16	369	19	404	10% of Total Construction Cost and Consultant Cost
Total of Financial Cost	38	212	4,101	208	4,599	-

Source: JICA Study Team

Table 9.2.4 Investment Cost for Trans-shipment

Unit: USD 000

Items	Unit Price	Numbers (Unit)	Total
Crane	300	1	300
Forklift	30	9	270
Reach Stacker	450	1	450
Total	-	-	1,020

Source: JICA Study Team

Other investment items for SLP are cranes and forklifts purchased by SLP-MC as indicated in Table 9.2.4. The investment amounts to USD 1,020,000 in the first year of operations, and this trans-shipment equipment will be replaced every 10 years.

As regards operations and maintenance expenditure, major items will be expense on wages of SLP-MC personnel and costs of diesel fuel for crane and forklifts. These costs were calculated as shown in Table 9.2.5. Annual cost of these items amounts to USD 403,300. The other item is utility charge for the SLP-MC working area and public space. Utility cost at the SLP-MC working area is included as an indirect cost of SLP-MC, and was assumed to be 30% of personnel expenses and diesel fuel. It amounts to USD 121,000 per year. Utility cost at public space of SLP was assumed to be 1% of total development cost. The cost amounts to USD 45,600 per year.

Table 9.2.5 Operation and Maintenance Costs

	Unit Price (USD 000/year)	Persons	Amount (USD 000)	Remarks
Manager	100.0	1	100.0	
Assistant Manager	24.0	2	48.0	
Office Staff	6.0	6	36.0	
Operator	6.0	18	108.0	
Worker	2.4	30	60.0	
Diesel fuel			51.3	USD0.7 x 4 liter x 7 hours x 260 days x 10 cranes/forklifts
Sub-total			403.3	
Total cost including indirect cost utility charges, etc)			524.4	30% of indirect cost

Source: JICA Study Team

(3) Calculation of Project FIRR

Table 9.2.6 indicates annual revenue, annual expenditure and net cash flows to calculate FIRR. The following assumptions were applied when revenue and cost items were listed.

- Operation of SLP will start in March 2014. Therefore 10/12 of revenue and cost amounts were listed for 2014.

- In the final year of operation, residual value (USD1,471,000) of SLP was listed. The amount was calculated from amount of land preparation works (USD2,302,000) and access road work (USD640,932) with the assumption that lifetime of the land preparation works was 40 years[4].
- Revenue amount increases from 2015 to 2025 in accordance with increase in handling volume. After 2025, the revenue would remain constant. On the other hand, O&M costs would be constant for the entire duration of operation and maintenance period.

As indicated in the final row of Table 9.2.6, the calculated project FIRR is 7.3%.

Table 9.2.6 Calculation of Project FIRR

Unit: USD 000

Years from start of Construction	Years from start of Operations	Year	Cash Inflow	Cash Outflow			Net Cash Flow
			Revenue	Develop-ment Cost	Investment for Trans-shipment Equipment	O&M Costs	
1		2011		38			-38
2		2012		212			-212
3		2013		4,101			-4,101
4	1	2014	871	208	1020	475	-832
5	2	2015	1,067			570	497
6	3	2016	1,074			570	504
7	4	2017	1,081			570	511
8	5	2018	1,089			570	519
9	6	2019	1,097			570	527
10	7	2020	1,121			570	551
11	8	2021	1,129			570	559
12	9	2022	1,138			570	568
13	10	2023	1,154			570	584
14	11	2024	1,169		1020	570	-420
15	12	2025	1,179			570	609
16	13	2026	1,179			570	609
17	14	2027	1,179			570	609
18	15	2028	1,179			570	609
19	16	2029	1,179			570	609
20	17	2030	1,179			570	609
21	18	2031	1,179			570	609
22	19	2032	1,179			570	609
23	20	2033	1,179	-1,471		570	2,080
					Project FIRR		7.3%

Source: JICA Study Team

(4) Sensitive Analysis

The following items are risks to the project:

- Fluctuation of cargo handling volume which brings about fluctuation of annual revenue,
- Fluctuation of operation and maintenance costs, and
- Shortage of project funds

[4] The sum of land preparation work (USD2,302,000) and access road work (USD640,932) is USD2,943,000. USD2,943,000 x 20 / 40 = USD1,471,000 million.

Table 9.2.7 indicates changes in Project FIRR precipitated by these risks which are denoted by changes in annual revenue, annual expenditure and investment expenditure

Table 9.2.7 Results of Sensitivity Analysis

Cases	Increase in Annual Revenue (10%)	Decrease in Annual Revenue (10%)	Increase in Annual Expenditure (10%)	Decrease in Annual Expenditure (10%)	Increase in Investment Expenditure (10%)	Decrease in Investment Expenditure (10%)
Project FIRR	9.9%	4.7%	7.1	7.5	6.3	8.4

Source: JICA Study team

An increase in annual revenue would have a large impact on the Project FIRR. The Project FIRR would increase to 9.9% in response to a 10% increase in annual revenue. On the other hand, the impact of changes in annual expenditure is limited. The Project FIRR would drop by 1.0% in response to a 10% increase in investment expenditure.

9.2.4 Financial Analysis for Project Owner and SLP-MC

In this section, FIRRs of the Project Owner and the SLP-MC are calculated separately. The cash outflow and cash inflow items for the Project Owner and the SLP-MC were compiled as shown in Table 9.2.8 and 8.2.9, respectively. These tables indicate that the FIRRs of the Project Owner and the SLP-MC depend on the annual amount of concession payment, which is paid by the SLP-MC to the Project Owner.

Table 9.2.8 Cash Outflow and Cash Inflow for Project Owner

Cash Outflow	Construction Cost of SLP
Cash Inflow	Concession payment from SLP-MC

Source: JICA Study Team

Table 9.2.9 Cash Outflow and Cash Inflow for SLP-MC

Cash Outflow	Investment Cost for Trans-shipment Equipment O&M Costs for SLP, Concession payment to Project Owner
Cash Inflow	Revenue from Transport Operators

Source: JICA Study Team

Table 9.2.10 shows cash inflow, cash outflow and net cash flows used to calculate FIRR for Project Owner. Concession payment from SLP-MC which is expressed as “Revenue” was set at USD 340,000 annually in this table. Cash outflow is the construction cost of SLP shown in Table 9.2.6. The FIRR for the Project Owner was calculated as 5.5% in this analysis.

Table 9.2.10 Calculation of FIRR for Project Owner

Unit: USD 000

Years from Start of Construction	Years from Start of Operations	Cash Inflow	Cash Outflow	Net Cash Flow
1			38	-38
2			212	-212
3			4,101	-4,101
4	1	340	208	132
5	2	340		340
6	3	340		340
7	4	340		340

Years from Start of Construction	Years from Start of Operations	Cash Inflow	Cash Outflow	Net Cash Flow
8	5	340		340
9	6	340		340
10	7	340		340
11	8	340		340
12	9	340		340
13	10	340		340
14	11	340		340
15	12	340		340
16	13	340		340
17	14	340		340
18	15	340		340
19	16	340		340
20	17	340		340
21	18	340		340
22	19	340		340
23	20	340	-1,471	1,811
		FIRR for Project Owner		5.5%

Source: JICA Study Team

Table 9.2.11 shows cash inflow, cash outflow and net cash flows used to calculate FIRR for SLP-MC. Concession payment from the SLP-MC to Project Owner which is included in "O&M Costs" was set at USD 340,000 annually in this table. The same figures for revenue and investment cost for trans-shipment equipment used in Table 9.2.6 were also used here. The FIRR for SLP-MC was calculated as 11.6% in this analysis.

Table 9.2.11 Calculation of FIRR for SLP-MC

Unit: USD 000

Years from Start of Construction	Years from Start of Operations	Cash Inflow	Cash Outflow		Net Cash Flow
		Revenue	Investment for Trans-shipment Equipment	O&M Costs	
1					0
2					0
3					0
4	1	871	1020	1,098	-1,247
5	2	1,067		910	157
6	3	1,074		910	164
7	4	1,081		910	171
8	5	1,089		910	179
9	6	1,097		910	187
10	7	1,121		910	211
11	8	1,129		910	219
12	9	1,138		910	228
13	10	1,154		910	244
14	11	1,169	1020	910	-760
15	12	1,179		910	269
16	13	1,179		910	269
17	14	1,179		910	269
18	15	1,179		910	269
19	16	1,179		910	269
20	17	1,179		910	269
21	18	1,179		910	269

Years from Start of Construction	Years from Start of Operations	Cash Inflow	Cash Outflow		Net Cash Flow
		Revenue	Investment for Trans-shipment Equipment	O&M Costs	
22	19	1,179		910	269
23	20	1,179		910	269
		FIRR for SLP-MC			11.6%

Source: JICA Study Team

Table 9.2.12 indicates changes in the FIRRs of the Project Owner and the SLP-MC in response to changes in concession payments by the SLP-MC. If the SLP-MC paid USD400,000 per year, the FIRR of the Project Owner would increase to 7.1%, while the FIRR of the SLP-MC would drop to 4.9%. On the contrary, if the SLP-MC paid USD 280,000 per year, the FIRR of the Project Owner would drop to 3.8%, while the FIRR of the SLP-MC would increase to 16.3%.

Table 9.2.12 Changes in FIRRs for Project Owner and SLP-MC based on Concession Payments

Annual Concession payment (USD 000)	280	300	320	340	360	380	400
FIRR for Project Owner (%)	3.8	4.4	5.0	5.5	6.1	6.6	7.1
FIRR for SLP-MC (%)	18.9	16.3	13.9	11.6	9.3	7.1	4.9

Source: JICA Study team

The key figures that influence the setting of an appropriate amount for annual concession payment are the opportunity costs of capital which are indicated by interest rates for the Project Owner and the SLP-MC. Since the Project Owner is a government entity, the government bond rate would be the most appropriate indicator. However, the government of Lao PDR does not issue government bonds such that this indicator is unavailable. Therefore, interest rates for loans from international financial institutions may be used instead.

On the other hand, the SLP-MC which would be a private company or a joint venture, will raise funds to cover part of investment outlay using loans from private financial institutions.

Table 9.2.13 shows USD LIBOR (6 month) which is a base for lending rate of the World Bank and ADB, USD SIBOR (3 month), and USD loan (3 to 6 years) at commercial banks in Lao PDR. USD LIBOR and USD SIBOR are very low but USD loan rate at commercial banks is nearly 10%. Therefore it is necessary to secure an FIRR of more than 10% for the SLP-MC.

The government of Lao PDR can procure a soft loan from international financial institutions. For example, Yen Loan to Lao PDR would give very soft conditions: interest rate of 0.01% and loan period of 40 years including a 10-year grace period.

Table 9.2.13 Interest Rates for LIBOR, SIBOR and USD in Lao PDR

Major Reference Rates	Rate (%)
USD LIBOR (6 month) as of 30 June 2010	0.75250
USD SIBOR (3 month) as in June 2010	0.54
USD Loan of Commercial Banks (3 to 6 years)	9.10

Source: BBA LIBOR Web Page, Singapore MAS Web Page and Bank of Lao PDR Web Page

9.3 Economic Analysis

9.3.1 Introduction

The objective of Economic Analysis was to assess the economic effect of the SLP Project from the perspective of the national economy and to clarify economic feasibility of the project. The discount cash flow method was adopted in this analysis and the Economic Internal Rate of Return (EIRR) was used as an evaluation indicator (IRR method).

9.3.2 Basic Assumptions

As regards the basic assumptions for this economic analysis, the same assumptions applied in 9.1 were applied here. The economic benefit of the project is expressed by the differences in economic benefits of “with-project” case and “without-project” case.

9.3.3 Economic Benefits

(1) Assessment of the economic effect

By implementing the SLP project, the following economic effects will be realized:

- Creation of value added at SLP,
- Opportunity cost of cargo,
- Opportunity cost of vehicles (trucks and trailers), and
- Stable provision of consumer goods and production goods to Lao people and Lao companies.
- Improvement of investment environment by reducing logistics costs in Savannakhet Province, and
- Development of logistics industry at Savannakhet Province

Out of these economic effects, items excluding stable provision of goods were identified as economic benefits. The detailed explanation of each economic benefit and its amount are presented in the following sections. The stable provision of consumer and production goods is very important from the perspective of steady national economic development; however, it is not regarded as an economic benefit due to complexity of computation.

(2) Creation of Value Added

After completion of SLP, the quality of services would improve and handled volume would increase as well. The incremental amount of value added was calculated to quantify the Value Added. If the logistics industry had already developed in Lao PDR, it would not be appropriate for the value added generated at SLP to be included as an economic benefit. Another logistics facility would handle the cargo in case the SLP Project was not implemented. However, the logistics industry in Lao PDR is a developing industry and the SLP would be the only logistics facility in its area[5].

[5] Value added generated by operators of logistics facility and train operators was included as one of the economic

Additional revenue and expenditure of cargo handling service was analyzed in section 9.2.3. The incremental amount of value added was calculated by the subtraction of annual O&M costs and estimated value added at the existing warehouse at CCA area from the annual revenue.

Expected value added in 2025 was estimated to be USD 1,179,000. From the existing service and volume of cargo handled at the warehouse at CCA, the value added at the existing warehouse was estimated to be USD 236,000, 20% of SLP in 2025. Therefore, the additional value added in 2025 would be USD 943,000. It would increase from USD 557,000 in 2015 but would remain constant from 2025 until 2033.

(3) Opportunity Cost of Cargo

If SLP is not developed, the number of trucks and trailers coming to the warehouse at CCA would exceed its capacity. Currently, it takes 0.75 hours for a truck or trailer to load and unload cargo; however, it would take more time when the number of trucks increases in the future. As a result, trucks and trailers would have to wait longer to load and unload. In this situation, the waiting time for trucks and trailers and their cargo would amount to losses in terms opportunity cost. If SLP were to be completed, such opportunity cost would be recovered.

Table 9.3.1 Number of Trucks and Trailers and Opportunity Cost of Cargo

	Unit	2015	2020	2025
No of Trucks (2-axles)	Vehicles/year	0	1	1
No of Trucks (3-axles)	Vehicles/year	30	30	30
No of Trailers	Vehicles/year	37	48	67
Differences in waiting times between 'with-project' and 'without-project' cases	Hours/vehicle	1.18	2.67	23.25
Unit Opportunity Cost of Cargo (2 axis)	USD/hr	0.39	0.39	0.39
Unit Opportunity Cost of Cargo (3 axis)	USD/hr	1.08	1.08	1.08
Unit Opportunity Cost of Cargo (Trailers)	USD/hr	2.73	2.73	2.73
Time Value of Cargo	USD 000	41	114	1,306

Source: JICA Study Team

Table 9.3.1 shows number of trucks and trailers, differences in waiting times between 'with-project' and 'without-project' cases, unit of time value of cargo and total time value of cargo. The rows from the second to the fourth show changes in number of vehicles (2-axle trucks, 3-axle trucks and trailers) in 2015, 2020 and 2025. The 5th row shows the differences in waiting time between 'with-project' and 'without-project' cases. The Queue Method was applied to measure the time. The rows from sixth to eighth show unit opportunity cost of cargo. It was calculated from the OD survey conducted by the JICA Study Team. The last row shows the total time value of cargo. It will increase from 41,000 in 2015 to 1.3 million in 2025 in accordance with increase in difference in waiting times and number of trucks and trailers. Since capacity of SLP was set to meet freight demand in 2025 and unit opportunity cost of cargo is constant, the opportunity cost of cargo will be constant after 2025.

(4) Opportunity Cost of Vehicles

As is the case with cargo, the difference in waiting times for trucks and trailers between

benefits in the guidelines prepared by Ministry of Land, Transport and Infrastructure.

'with-project' case and 'without-project' case was also identified as an economic benefit of the project. Table 9.3.2 shows unit opportunity cost of vehicles. Some parameters such as, the number of trucks and trailers, and differences in time savings are the same as those for the opportunity cost of cargo. The unit opportunity cost of trucks and unit opportunity cost of trailers will increase in similar manner to that shown in the ADB Transport Sector Strategy Study. The unit opportunity cost of trucks/trailers will continue to increase after 2025 at an annual rate of 3.7%. The values of opportunity cost will be USD 1.45 per hour for a trailer, USD 1.22 per hour for a 3-axle truck and USD 0.80 per hour for a 2-axle truck in 2033.

The 4th row of the table shows total time value of vehicles. It will increase from USD 14,000 in 2015 to USD 606,000 in 2025. After 2025, the time value will continue to increase due to increase in unit opportunity cost of vehicles.

Table 9.3.2 Opportunity Cost of Vehicles

	Unit	2015	2020	2025
Unit Opportunity Cost of Trucks (2-axles)	USD/hr	0.41	0.50	0.60
Unit Opportunity Cost of Trucks (3-axles)	USD/hr	0.63	0.76	0.91
Unit Opportunity Cost of Trailers	USD/hr	0.75	0.90	1.08
Total Time Value of Vehicles	USD 000	14	46	606

Source: JICA Study Team

9.3.4 Economic Cost

(1) Estimation of Economic Investment Cost

Economic investment cost was calculated from financial investment cost presented in section 5.6. Contingency of the financial investment cost was excluded, and non-trade portion of the investment cost was converted by use of standard conversion factor (hereinafter referred to SCF). According to the "Study on Integrated Distribution Center in Savannakhet and Vientiane in Lao PDR", conducted by JETRO, the SCF was calculated as 96.4%. This value was applied in the analysis.

Table 8.3.3 shows the economic investment cost of SLP Development Project. Total economic investment cost would be USD 4.1 million, 90% of the financial investment cost. Annual cost was distributed in accordance with Project Implementation Schedule presented in the section 6.7.

Table 9.3.3 Economic Investment Cost of SLP Project

Unit: USD 000

Items	1	2	3	4	Total
Construction Cost			3,551	187	3,738
Administration cost	38	38	38		113
Cost for Consultant Service		159	106		264
Annual Total Cost	38	196	3,695	187	4,116

Source: JICA Study Team

The other investment item is cargo trans-shipment equipment such as crane, forklifts and reach stacker. The investment amount would be the same as that shown in Table 9.2.4, and the equipment would have to be replaced every 10 years.

(2) Operation and Maintenance Costs

Operation and maintenance (hereinafter referred as O&M) costs for economic analysis consist of O&M costs of SLP-MC. Most O&M cost items are the same as those in the financial analysis indicated in Table 9.2.5; however, the handling of personnel cost for workers (unskilled labor) was different. Salaries for workers (around 25 persons in total) were excluded from operation and maintenance costs because the monthly salary for workers (USD200 per month) was higher than the minimum wage (LAK 638,000), and the SLP project would generate new employment which exceeded economic cost for unskilled labor. O&M costs of SLP-MC would be disbursed every year after start of operations in 2014.

9.3.5 Calculation of EIRR

Table 9.3.4 shows economic benefit, economic cost, net cash flow and EIRR.

Table 9.3.4 Cash Flow for Calculation of EIRR

Years from Start of Construction	Years from Start of Operations	Economic Benefit			Economic Cost			Net Cash Flow
		Opportunity Cost of Cargo	Opportunity Cost of Vehicle	Additional Value Added	Economic Construction Cost	Investment Cost for Trans-shipment	O&M Costs	
1					38			-38
2					196			-196
3					3,695			-3,695
4	1	26	10	557	187	1020	421	-1,035
5	2	41	14	853			506	403
6	3	50	18	859			506	421
7	4	56	21	865			506	436
8	5	69	26	871			506	460
9	6	84	33	878			506	489
10	7	114	46	897			506	551
11	8	143	59	903			506	600
12	9	224	96	910			506	725
13	10	340	150	923			506	907
14	11	581	262	936		1020	506	253
15	12	1,306	606	943			506	2,349
16	13	1,306	629	943			506	2,372
17	14	1,306	652	943			506	2,395
18	15	1,306	677	943			506	2,420
19	16	1,306	702	943			506	2,445
20	17	1,306	728	943			506	2,471
21	18	1,306	755	943			506	2,498
22	19	1,306	783	943			506	2,526
23	20	1,306	812	943	-1,455		506	4,011
							EIRR	14.7%

Source: JICA Study team

The items from the 4th column to the 6th column are economic benefits calculated in section 9.3.3 while those from the 7th column to 9th column are economic costs calculated in section 9.3.4. In the final year of operation, residual value of economic construction cost which is USD1,455,000 is

listed[6]. The 10th column shows net cash flow.

The EIRR calculated from the net cash flow is 14.7%.

9.4 Conclusion on Financial and Economic Analyses

9.4.1 Financial Analysis

(1) Project FIRR

The Project FIRR, for scenario where SLP Project was conducted by a single implementation body, is 7.3%. Since the loan rate for US dollar from 3 to 6 years is 9.1%, the project would not be financially attractive if a private company were to develop and operate the facility. In addition to that, the SLP Project also faces significant risk because the amounts of annual revenue and expenditure are huge in comparison with the initial investment. Therefore, the project should be conducted under cooperation between public and private sectors.

(2) FIRR for Project Owner

The FIRRs for Project Owner and SLP-MC depend on the concession payment from the SLP-MC to the Project Owner every year. If the SLP-MC disburses USD 320,000 annually, the FIRR for Project Owner would be 5.5%. If the Project Owner, a government entity, procures development funding from international institutions, such an FIRR would be enough to justify the implementation of the SLP Project.

(3) FIRR for SLP-MC

FIRR for SLP-MC is 11.6%. In order to invite SLP-MC, which is a private company or a joint venture, a certain level of FIRR is needed. As mentioned above, the loan rate for US dollar from 3 to 6 years is 9.1%. Considering risk factors, an FIRR of more than 10% would be favorable to attract the private sector. The FIRR for SLP-MC exceeds 10%; hence, the project component of SLP-MC is financially feasible.

9.4.2 Economic Analysis

The EIRR was calculated as 14.7%, which is higher than the opportunity cost of capital of 12%. Therefore, the SLP Development Project is viable from an economic perspective.

9.4.3 Recommendations on Financing

As described above, the SLP Development Project would not be financially feasible if a loan from private lending institution were used. However, the project would be financially feasible if a soft loan were applied. One major candidate for the soft loan is the Yen loan. The loan conditions of the Yen loan for Lao PDR is the most favorable. The conditions include an interest rate of 0.01% and a loan period of 40 years, which includes a 10-year grace period. If the Yen loan were applied

[6] Listing residual value of economic construction cost in the final year of operation and maintenance period is mentioned in the guidelines prepared by Ministry of Land, Transport and Infrastructure. The calculation is USD2,911,000 x 20 / 40 = USD1,455,000.

for the project, the project would progress onward towards successful implementation.

CHAPTER 10 CONCLUSIONS

SLP project is rationalized by the Lao National Logistics Strategy, National and Provincial Social and Economic Development Plan and the urgent requirements of improvement on the current shortage of functional ICD facilities in Savannakhet Province.

SLP should focus on specific logistics services, namely: (1) international interface for both export/import and transit cargo, (2) container depot and (3) incubation of business providers. Since demand on warehouse-oriented import cargo, which is linked to the domestic transport service and the support function of Savan-Seno SEZ is limited, services pertinent to such cargo should not be focused on.

It is appropriate that the SLP be located at the Savan-Seno SEZ Site B which is consistent with the development concept of Savan-Seno SEZ. The land has already been set aside such that it is possible to start the project without any obstacles.

SLP is expected to handle around 580 tons of cargo per day in 2025. It is expected to deal with traffic of approximately 98 trucks a day. SLP will provide services that include; CIQ, inventory management and trans-shipment with container yard and container freight station. Total area of SLP will be 5.1 ha. The SLP total project cost was estimated to be 4.6 million USD, comprising 3.8 million USD of construction cost and 0.8 million USD of miscellaneous costs.

Private participation is essential to realizing good management and operation in SLP. Lao Government shall assign the project owner of SLP, who will in turn assign an SLP management company to take care of operations, management and cargo handling at SLP.

As regards economic and financial feasibility, SLP is a viable project in terms of the national economy. The EIRR which is 14.7% exceeds the opportunity cost of capital (12%). The Project FIRR and FIRR for SLP-MC are 7.3% and 11.6%, respectively, which are adequate enough to attract the private sector. In order to secure participation of private sector, Lao PDR Government should prepare measures to mitigate project risks. The FIRR for project owner is 5.5%. The project would thus be financially feasible if a soft loan such as the yen loan were used for the project.

Accordingly, it is deduced that SLP project is a financially, technically and environmentally feasible project.