

**STRATEGY DEVELOPMENT FOR CROSS-BORDER TRANSPORTATION
OF BEER PRODUCTS FROM THAILAND TO MYANMAR: A CASE
STUDY OF A THAI BREWERY**




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Thesis entitled “Strategy Development for Cross-Border Transportation to bring Beer
Products from Thailand to Myanmar: A Case Study of a Thai Brewery”

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for the Master of Science Degree in Logistics and Supply Chain of Naresuan
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ABSTRACT

The purpose of this thesis is to focus on studying the barriers to the importation of Thai products to Myanmar and the criteria for the modes of transport. Cross-border transportation is the main mode of transport from Thailand to Myanmar these days. The two countries intend to nearly triple their bilateral trade by 2015. Meanwhile, with the opening and rapidly developing economy of Yangon in Myanmar which has attracted foreign investment, Myanmar is Thailand's second-largest cross-border trading partner after Malaysia. However, there are few studies that have analyzed the status of cross-border transportation and assessed its performance.

The thesis is organized as follows. Firstly, it assesses the selection criteria of cross-border transportation for products from Thailand to Myanmar by summarizing a review of the literature and in-depth interviews, from which 6 key criteria for the selection of transport routes are chosen, namely, cost, time, reliability, safety, accessibility and flexibility. Then a time/cost-distance model is adopted to compare the time and costs of each transport route from Thailand to Myanmar to find out which provides the optimal transport route and the logistical strategy of companies for an appropriate case study. After both a quantitative and qualitative analysis, the findings of the research clearly demonstrate that the "road-sea" combination via Ranong Port in Thailand is the most competitive in term of costs while the "all-road" option offers the

fastest transit time. In the final chapter, the limitations of this research are explained and a proposal is made for a further study.



LIST OF CONTENTS

Chapter	Page
I INTRODUCTION.....	1
Background.....	1
Border trade between Thailand and Myanmar	2
Rationale for the Study	4
Objectives of the Study	8
Scope of the Study.....	8
Basic Assumptions	9
II LITERATURE REVIEW	11
Intermodal Transport Corridors.....	11
Transportation Infrastructures	12
Customs Regulations	13
Transportation in GMS.....	14
Transportation criteria	16
Time/ cost-distance Methodology	20
SWOT Analysis.....	23
Summary of the review	24
Summary of criteria for the selection of transport routes.....	24
The limitations of previous studies	29
The originality of this thesis	29
III RESEARCH METHODOLOGY	30
Research Flowchart	30
Quantitative Analysis	32
Data required	32
Model Set-up	33
Qualitative Approaches	36
Questionnaire.....	37

LIST OF CONTENTS (CONT.)

Chapter	Page
In-depth interviews.....	38
SWOT analysis.....	45
IV A CASE STUDY.....	48
Introduction to companies interviewed	48
Transportation routes.....	53
V RESULTS AND DISCUSSION.....	57
Results of the analysis	57
Results from the Quantitative Approach.....	57
Transportation Routes from Bangkok -Yangon	57
Introduction to transport route via Mae Sot border	59
Analysis of transportation time and cost	60
Comparative analysis of transport routes	67
Benefits in cross-border infrastructure projects	71
Results from the Qualitative Methods.....	73
Questionnaire and In-depth Interview.....	73
Analysis of the data and the general condition of the routes	75
Related laws and policies.....	77
Results from the Case Study by a SWOT analysis	77
Discussion.....	83
Discussion of the optimal route.....	83
The optimal route suitable for the case study company	84
VI CONCLUSION.....	86
REFERENCES	90
APPENDIX	96
BIOGRAPHY	119


LIST OF TABLES

Table	Page
1 Summary of the criteria from literature review	25
2 Summary of Companies and Criteria	44
3 The distance, time and cost of R1 via Mae Sot border.....	61
4 The distance, time and cost of R2 via Singapore	63
5 The distance, time and cost of R3 via Ranong	65
6 Summary of results.....	70
7 Criteria and rating used by Transportation Company for the selection of transport routes.....	74
8 Myanmar-Thailand Bilateral Trade, 2000-2012 (\$).....	97
9 Thailand's Top Ten Products Exported to Myanmar, 2012	98
10 Advantages and Disadvantages of each mode.....	101
11 Distance and the condition of route via Mae Sot	108
12 Distance and the condition of route via Singapore.....	108
13 Distance and the condition of route via Ranong	109

LIST OF FIGURES

Figures		Page
1	Thailand's Cross-border Trade Values with Myanmar at Border Checkpoints Compared to Total Trade, 2009-2012(B million)	3
2	Research flowchart	31
3	Road versus rail alternatives.....	33
4	Combined transport, road-rail	34
5	Combined transport, road-rail-sea	35
6	Multimodal transport, from origin to destination	36
7	SWOT Analysis matrix	47
8	Transport routes via Mea Sot, Singapore, Ranong and Dawei.....	59
9	Transportation time of R1 via Mae Sot border.....	61
10	Transportation cost of R1 via Mae Sot border	62
11	Transportation time of R2 via Singapore	64
12	Transportation cost of R2 via Singapore.....	64
13	Transportation time of R3 via Ranong	66
14	Transportation cost of R3 via Ranong.....	66
15	Comparative analysis of transportation time (3 routes)	67
16	Comparative analysis of transportation cost (3 routes)	68
17	Transportation time of R4 via Dawei	69
18	Transportation cost of R4 via Dawei.....	70
19	Case Study's transportation system	78
20	SWOT matrix of the case study company	80
21	Strategy of the case study company	81
22	Myanmar-Thailand Bilateral Trade, 2000-2012.....	98
23	Thailand's Top Ten Products Exported to Myanmar, 2012.....	99
24	Benefits of the Asean Economic Community (AEC).....	100

LIST OF ABBREVIATIONS



AEC	=	Asean Economic Community
FDI	=	Foreign Direct Investment
EDI	=	Electronic Data interchange
CCA	=	Common Control Area
GMS	=	Greater Mekong Subregion
EWEC	=	East-West Economic Corridor
ESCAP	=	United Nations Economic and Social Commission for Asia and the Pacific
CBTA	=	Cross-Border Transport Agreement
ICD	=	Inland Clearance Depot
CNF	=	Cost and Freight
WH	=	Warehousing
3PL	=	Third Party Logistics
PRC	=	People's Republic of China
LOA	=	Length Overall
MITT	=	Myanmar International Terminals Thilawa
MIPL	=	Myanmar Integrated Port
BOT	=	Build-Operate-Transfer
ADB	=	Asian Development Bank
NDC	=	National Distribution Center
RDC	=	Regional Distribution Center
KPI	=	Key Performance Indicator
ITD	=	Bangkok-based Italian-Thai Development

CHAPTER I

INTRODUCTION

Background

International merchandise trade in Asia has fully rebounded from the effects of the global economic crisis and intraregional trade is now growing. It is expected that this trend will continue with China taking the major share of exports and imports (ESCAP, 2011a). This continuing trend of trade growth needs a new paradigm to improve the efficiency and the cost-effectiveness of the transportation system. One of the emerging transportation concepts is the development of intermodal transport corridors that encompass various modes, logistics services and transport processes.

For Thailand's trade with its immediate neighbors, it is interesting to observe an impressive growth and the patterns of border trade. Undoubtedly, Thailand is one of Myanmar's biggest trading partners. In 2012, the total trade value reached \$6.78 billion, with exports totaling \$3.36 billion and imports totaling \$3.42 billion (Table 8, Appendix A). Thailand is the largest importer of goods from Myanmar and the second largest source of imported goods to Myanmar. Thailand has a trade deficit with Myanmar due primarily to natural gas imports of around \$3.5 billion, or more than 95% of Thailand's total imports from Myanmar. Without natural gas, Thailand would have a large trade surplus with Myanmar. In 2012, Thailand's top ten products exported to Myanmar included diesel fuel, gasoline, alcoholic beverages, non-alcoholic beverages, fabric and yarn, palm oil, instant noodles and instant food, iron and steel, cosmetics, perfumes, soaps, vehicle tires. Of these imports to Myanmar alcoholic beverages are worth 4,877 million baht as 15% of total imports which is about the same proportion as gasoline which is second only to the first and non-alcoholic beverages worth 3,993 million baht which are the third and fourth largest imports from Thailand, respectively. See Table 9 and Figure 23 in Appendix A.

Statistics show that Thailand is one of Myanmar's biggest trading partners, and, in particular, Thailand is the largest importer of goods from Myanmar, as shown in Table 8 and Figure 22 (see Appendix A). We can conclude that both imports and exports represent a general growth in the last two decades.

Because of the rising trade between Thailand and Myanmar transportation plays an important role. Currently, the cross border route is the main means of transportation of products from Thailand to Myanmar, therefore this thesis will study the methods of cross border transportation to take products from Thailand to Myanmar.

Border trade between Thailand and Myanmar

It is interesting to observe the impressive growth in and the patterns of border trade of Thailand trade with its immediate neighbors. The first initiative is related to a metamorphosis taking place in Myanmar that has encouraged countries, including India, to take a more proactive role in its engagement. The Indian government has been pursuing a Look East Policy with regard to Myanmar's economic development and its connection by land to mainland Southeast Asia as a new reality. Thailand is also seeing important changes, sought also by Myanmar and India, to work on possible new connecting routes, such as a new highway linking the three countries to unlock the potentials of northeast India, Myanmar, Thailand, and the rest of Southeast Asia. In the meantime, Thailand has recently announced its new strategic border crossings with Myanmar in 2013: Mae Sai in Chiang Rai, Mae Sot in Tak, Phu Nam Ron in Kanchanaburi, and Koh Song in Ranong.

With the increasing importance of cross-border trade for Thailand, the country has continuously improved its trade and transport facilitations at the border checkpoints. Notable improvements include a change of customs services and ultimately a new electronic customs system. Also, cross-border trade with Myanmar is particularly important. Figure 1 illustrates cross-border trade with Myanmar at each border checkpoint compared with the total amount of trade.

Moreover, to support the GMS program, Thailand and Myanmar have a plan to develop Mae Sot (Thailand) and Myawaddy (Myanmar) along the EWEC (East West Economic Corridor) and Mae Sai (Thailand) and Thachileik (Myanmar) into a special economic zone. Figure 1 illustrates the cross-border trade with Myanmar at each border checkpoint compared with the total amount of trade.

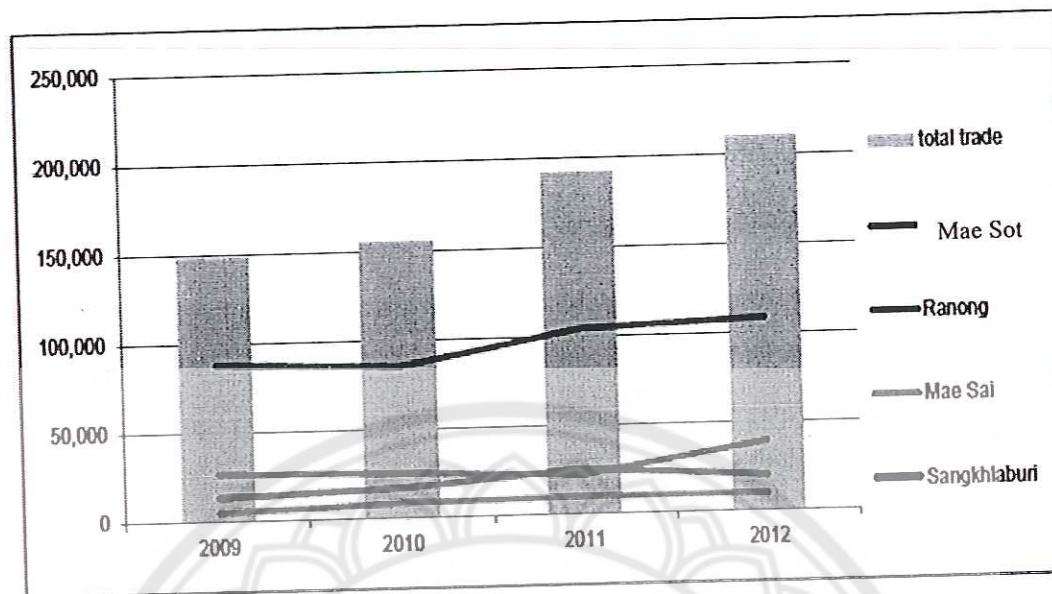


Figure 1 Thailand's Cross-border Trade Values with Myanmar at Border Checkpoints Compared to Total Trade, 2009–2012 (B million)

Source: Ministry of Finance, 2014

Moreover, to support the GMS program, Thailand and Myanmar have a plan to develop Mae Sot (Thailand) and Myawaddy (Myanmar) along the EWEC and Mae Sai (Thailand) and Thachileik (Myanmar) into a special economic zone. Apart from physical infrastructure projects, the special economic zone will contain industrial estates, warehouses, and customs one-stop services to facilitate export and import activities between Myanmar and Thailand. As a result of a meeting on the development of the Mae Sot special economic zone in February 2013, the Thai Minister of Interior appointed the governor of Tak province to improve the facilities and capacity of the Mae Sot border crossing and customs checkpoint and to create a one-stop service by 2015. Also, Thailand has decided to establish three permanent border crossings between Thailand and Myanmar. The border crossings include the Kio Pha Wok checkpoint in Chiang Mai province, the Ban Huai Ton Nun checkpoint in Mae Hong Son province, and the Ban Phu Nam Ron checkpoint in Kanchanaburi province.

Myanmar is one of 10 member countries in ASEAN and Myanmar has recently eased border restrictions, so together with the recent increase in the Thai-Myanmar trade, there are good reasons why a study of Thai-Myanmar trade and transportation

routes is important. Nowadays, transport modes between Thailand and Myanmar mainly rely on road transport, and waterway transport accounts for a small portion for other modes which are not very developed. However, selecting an optimal route is very important as it can reduce cost and shipping time, thereby bringing greater efficiency to the companies concerned. Hence, a study of the related regulations and barriers for exports to Myanmar are important and this will enable criteria to be established for selecting the main transportation routes. Therefore, this paper presents the following four research objectives:

Rationale for the Study

Cross-border transportation is the main mode of transport from Thailand to Myanmar. Cross-border trading, which accounts for 85% of the total bilateral trade between Thailand and Myanmar, increased by an average of 25% over the past few years. The two countries intend to nearly triple their bilateral trade by 2015. Meanwhile, Myanmar is Thailand's second-largest cross-border trading partner, after Malaysia. Myanmar is opening the country up and a rapidly developing economy in Yangon has attracted foreign investment in Myanmar. However, there are few studies that have analyzed the status of cross-border transportation as well as assessing its performance. This paper assesses the selection criteria for the cross-border transportation of products from Thailand to Myanmar. It utilizes a time-cost-distance approach to assess and compare the advantages of cross-border transportation and other modes. Based on the results, this paper will identify the advantages of each route. Finally, policy recommendations to improve physical infrastructure and minimize non-physical barriers to reduce the transportation cost and transit time to enhance operational efficiency of cross-border transportation is offered which will be useful for transportation companies and investors.

Undeniably, international trade is crucial to all national economic developments. Therefore each country has been trying to promote their volume of trade and investment through their national policies, trade treaties, including the establishment of bi-and-multilateral agreements. World trade is an important part of the economic development of the global economy. Countries depend on trade to increase sales of their domestic products in global markets, and for emerging economies, trade is an important means for their economic development. Naturally, the volume of trade

between two countries depends on the attractiveness of the exporting country and the needs of the importing country. When an importing country has several potential supply sources, the distance and the associated costs of crossing the borders, transporting the goods, and the customs and duties levied are important determinants of the volume of bilateral trade between trading partners.

Furthermore, under the Asean Economic Community (AEC), a single regional common market of ASEAN countries will be created by 2015. The regional integration's objective is to create a competitive market of over 600 million people in ASEAN countries: Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. There will be free flow of goods, services, investment capital and skilled labor following the liberalization. These will include tariff reductions and streamlining of certain administrative procedures. Many businesses have begun preparing themselves three years ahead of time to meet the challenges and opportunities of the Asean Economic Community (AEC).

Consequently, the development of an efficient logistics system will have significant relevance to the modes of travelling and it will provide a key to the promotion of trade flow between remote areas. When there are talks about trade facilitation, particularly logistics, sea freight is the major channel used in exports accounting for over 90 percent of all transnational trade around the world. However, this trend might change in the near future. The construction of roads linking countries from Southwest China to ASEAN members are due to be completed by the establishment of the Asean Economic Community in 2015, and the East Asian Community in 2020.

A study of cross-Border and domestic road infrastructure together can reduce transport costs and lead directly to increased trade. Reduced transport costs can also indirectly raise foreign direct investment (FDI) by reducing transaction costs involved in intra-firm vertical integration structured to exploit varied comparative advantages across countries. Increases in FDI, in turn, can further increase regional trade, and add to the direct effect of reduced transport costs achieved through improvements in the road infrastructure in border areas. If this becomes reality, this would define a cycle of cross-border infrastructure development, trade, and investment that fosters increased trade and economic growth. Therefore, many researcher and entrepreneurs believe that land transportation, particularly cross-border roads, will be an undeniable choice for cargo

trade to ASEAN Countries in the near future, especially after the anticipated establishment of the Asean Economic Community (AEC) and the East Asian Community.

Moreover, some other study have found that differences in logistics performance are driven in part by the poor quality of physical infrastructure services, such as roads, rail, waterways, port services, and interfaces (Subramanian and Arnold, 2001). Often inadequacies are caused by (nontariff) policy and institutional constraints- such as procedural red tape, inadequate enforcement of contracts, poor definition and enforcement of rules of engagement, delays in customs, delays at ports and border crossings, pilferage in transit, and highly restrictive protocols on the movement of cargo. Driven by economic liberalization and technological developments, the decentralization of production, marketing, and distribution activities worldwide offer developing countries tremendous opportunities to participate in world markets. Participating in global supply chains can improve countries' access to markets and stimulate investment, enhancing employment opportunities. In the meantime, to improve the development of the logistics industry in ASEAN countries, the importance of cross-border trade for Thailand must be recognized, especially as the country has continuously improved trade and transport facilities at the border checkpoints. Notable improvements are a change of custom procedures from manual operation to electronic data interchange (EDI) customs services and, ultimately, to electronic customs systems.

Obviously, there are many benefits for various fields in ASEAN countries as a result of the establishment of the Asean Economic Community (AEC) including border crossing facilitation. In the near future, the border trade between ASEAN countries will implement paperless, single window and a Common Control Area (CCA) which can reduce logistics activities and save transport time to improve efficiency. The benefits of the establishment of the Asean Economic Community (AEC) are summarized in Figure 24 (see Appendix A).

In addition, Myanmar has just opened up the country although it has an inadequate infrastructure and poor logistics systems. However, Myanmar has the potential to become a prime transportation hub in Asia and to serve as a gateway between South Asia, Southeast Asia, and East Asia. It shares land borders with the PRC to the north and northeast, the Lao People's Democratic Republic (Lao PDR) and

Thailand to the east and southeast, and Bangladesh and India to the west and northwest. Strategic investments in transport infrastructure are urgently needed because existing transport links between Myanmar and its neighbors are limited and substandard.

Various bilateral and multilateral programs are developing transport links to make the most of Myanmar's elongated shape, which features a 2,800-kilometer coastline with access to sea routes through the Bay of Bengal and major inland waterways. Physical connectivity with Myanmar's coastline and to the Indian Ocean has become a priority for Myanmar's neighbors. Their primary objective is to establish alternative shipping routes to reduce their dependency on the Straits of Malacca. As a result, Myanmar's infrastructure program is also focused on constructing deep-sea ports and on strengthening north-south connectivity via roads, railways and inland waterways. These unique opportunities are clear and tangible, and physical connectivity projects to facilitate trade and investment through new transport and other infrastructure development will foster trade between Thailand and Myanmar.

Furthermore, the company chosen for a case study in this thesis wants to transport beer products into the ASEAN market, especially the Myanmar market in the future. So the company will need to know the transport cost of each leg of the transport route and the consumption requirements of the Myanmar market. The author interviewed personnel in transport companies in Thailand to collect data and use a Time/Cost-Distance Model to compare the time and cost of each transport route and, furthermore, the author used a SWOT to analyze the logistics strategy of the company in the case study.

The significance of this thesis is to focus on studying the barriers to the importation of Thai products to Myanmar and the criteria of transport modes. The author uses the a Time/Cost-Distance Model to analyze the transportation time and cost of each mode of transportation, and also conducts a case study to substantiate the results. Finally, some suggestions are made to help transport operators in Thailand.

In addition to the above-mentioned reasons, the theoretical studies also show that cross border transportation has become a crucial issue. So this study will provide useful and important information on this topic.

Objectives of the Study

1. To study the barriers to the importation of Thai products to Myanmar.
2. To assess the competitiveness of cross-border transportation compared with other modes of transportation of beer products to Myanmar.
3. To study the alternatives to cross-border transportation for the importation of Thai beer to Myanmar.
4. To develop a logistics strategy for the importation of beer products from Thailand to Myanmar.

Because Myanmar's import and export policies change frequently, there are many difficulties and barriers for exporters and shippers. And another problem is the local refugee protection fees so a study of the barriers to the importation of products to Myanmar must take into account the local situation as well as to know how to avoid unnecessary trouble. In addition, a study of the transportation route must assess shipping costs, time and other criteria of each transportation route which can help in selecting the optimal transportation route to reduce cost and shipping time. Finally, when these results are combined with the analysis of a case of a Thai Brewery which ships beer products to Myanmar, it should be possible to establish what difficulties and kinds of barriers will be faced and to show what opportunities exist for the future.

Scope of the Study

Since an analysis of the entire beer industry and marketing in Myanmar is too large an area for a single research study, the author had focused on only the cross border rules regulation for the transportation beer products from Thailand to Myanmar, the road infrastructure of the two countries, and the costs and the development of a logistics strategy. The point of origin for this study is Bangkok, Thailand and the destination point is Yangon, Myanmar for two reasons. On the one hand, most industries and transportation companies are gathered in Bangkok and Thailand's largest port is located in Bangkok which makes transportation more convenient and fast. On the other hand, Myanmar's economic and political reforms that began in 2011 have opened up more opportunities for economic cooperation and connectivity enhancement between ASEAN and South Asia. At the same time, Myanmar is deemed as a desirous target market for beer products for many dealers worldwide and Yangon is the largest city with

a population of over five million in Myanmar and it is the industrial and commercial center of the country. In addition, Yangon is Myanmar's main domestic and international hub for air, rail, and ground transportation and there are many imported beer products which are sold in Yangon. The study is primarily concerned with the Mae Sot border crossing and it considers both land and water transport. Moreover, transportation plays a major role in the economy. It increases production efficiency and it is linked to the logistics system. Vehicles should be suitable for easy transport of goods and services. Because of the limited infrastructure of Myanmar, this thesis focuses on the transportation of general cargo by only road and water transportation. As there is no rail transport and only a little air transport at present between Thailand to Myanmar, so rail transport, air transport and pipeline transport are not considered within the scope of this study.

Accordingly, the scope of the study can be simply summarized as follows:

1. An analysis of the related procedures and barriers of beer products imported to Myanmar.
2. A comparison of the competitiveness between cross-border transportation and other modes. An analysis of the cost, lead time, flexibility and other criteria of each mode.
3. An analysis of the optimal transport routes from Thailand to Myanmar.
4. The development a logistics strategy for the company in our case study to transport beer products from Thailand to Myanmar.

Basic Assumptions

1. It is assumed that beer products are a general cargo.

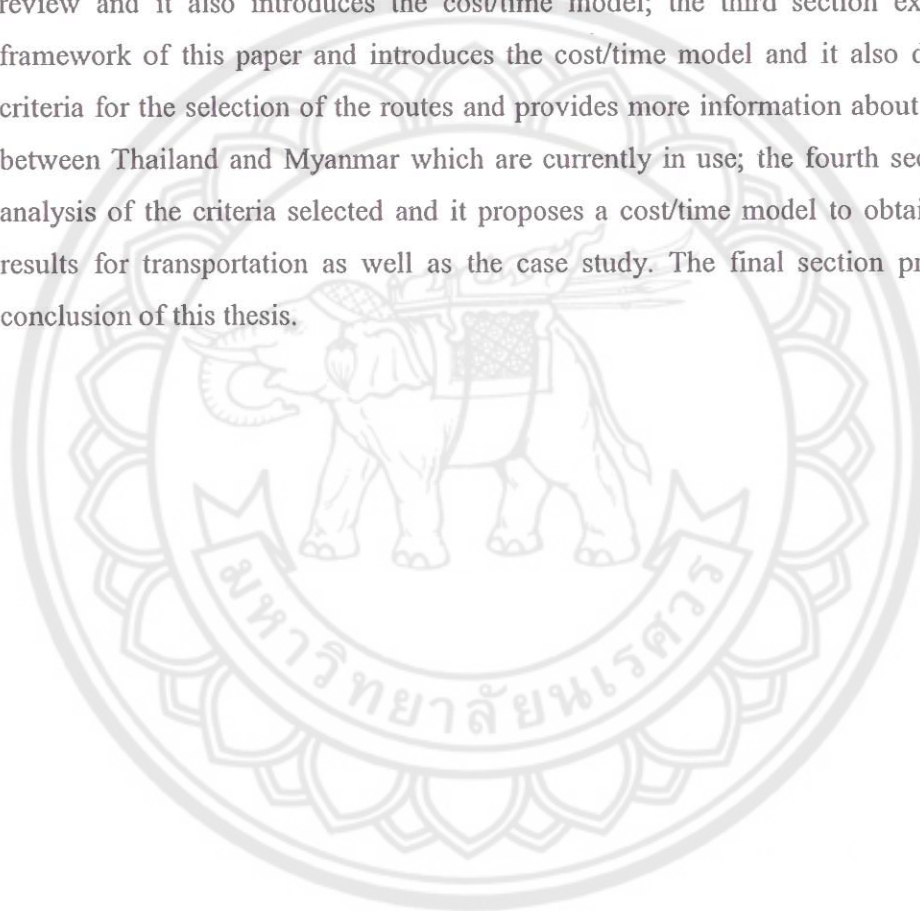
The data collected is for general cargo (cost and time) but not beer products per se. The data is used for an analysis of each transportation route from Thailand to Myanmar by using a time/cost model. For the purposes of this study the author assumes beer products are a general cargo.

2. Assumptions using a Cost/Time Model under the same conditions.

The roads from Bangkok to the Thai-Myanmar border are essentially the same for each leg of the journey and they consist of 4 lanes from Bangkok to the border and from the border to the interior of Myanmar the roads consist of 2 lanes, with steep

gradients, rugged terrains, and on both sides of the border there are mountains so the speed inside Thailand is essentially the same which is why the transportation costs and the time are also the same. Moreover, based on the speed of ocean shipping is the same so the transportation cost and time are same. Furthermore, the cost of customs is also the same. The border and road conditions are shown in Appendix D.

This paper is divided into five sections, the first section describes the background, objectives and scope of the study; the second section is the literature review and it also introduces the cost/time model; the third section explains the framework of this paper and introduces the cost/time model and it also defines the criteria for the selection of the routes and provides more information about the routes between Thailand and Myanmar which are currently in use; the fourth section is an analysis of the criteria selected and it proposes a cost/time model to obtain the best results for transportation as well as the case study. The final section presents the conclusion of this thesis.



CHAPTER II

LITERATURE REVIEW

Cross-border transportation is the main mode of transport from Thailand to Myanmar. Cross-order trading, which accounts for 85% of the total bilateral trade between Thailand and Myanmar, increased by an average of 25% over the past few years. The two countries intend to nearly triple their bilateral trade by 2015. Meanwhile, Myanmar is Thailand's second-largest cross-border trading partner, after Malaysia. Myanmar has recently relaxed its border restrictions and there is a rapidly developing economy in Yangon that is attracting foreign investment. However, there are few studies that have analyzed the status of cross-border transportation or assessed its performance. This thesis assesses the criteria for the selection of products being transported from Thailand to Myanmar. It utilizes a time-cost-distance approach to assess and compare the advantages of cross-border transportation as well as other modes. On the basis of these results, this thesis identifies the advantages of each route. Finally, policy recommendations to improve physical infrastructure and minimize non-physical barriers to reduce transportation costs and transit time which will improve the operational efficiency of cross-border transportation are proposed which will be useful for transportation companies and exporters. For the purpose of this thesis, the author conducted a literature review with regard to the following aspects: intermodal transport corridors, transportation infrastructures, customs regulations, transportation in GMS, transportation criteria and research methodology. The latter adopted a time/cost-distance methodology and a SWOT analysis.

Intermodal Transport Corridors

The development of intermodal transport corridors is essential to serve the existing trade flow. It is even more important for landlocked countries as intermodalism would improve connectivity of inland area to ports, markets, and production centers. The World Bank's overall transport strategy includes the promotion and the development of multimodal transport corridors and logistics services (World Bank,

2008). The development of integrated intermodal transport in Asia is one of the main components of the transport program adopted for Asia and the Pacific (ESCAP, 2012a).

With the rapid growing international trade volume, international transport also needs to use multiple modes of transportation (train, ship, truck, and air) to increase the efficiency of logistics. Janic (2008) argues that the intermodal freight transport corridors that use road and rail are competitive alternatives to road use only for freight transport of medium to long-distance transportation hauls.

Although there have been concerted efforts to develop international highways and railways in Asia, there remain many road sections and railway lines to be improved (ESCAP, 2006, 2008). Infrastructure development along the intermodal transport corridors has not reached the same level in many parts of Asia. Additional barriers to cross-border movement still exist in Asia because of physical bottlenecks and nonphysical constraints. These inefficiencies in the transport system have an adverse impact on the economic development particularly in landlocked and transit developing countries.

An international intermodal transport movement involves at least one border crossing from one country to another that can expedite the movements of goods and people across international borders. A study has been conducted of potential road and rail land transport corridors linking Central Asia and Europe (United Nations, 1997).

Intermodal transport enables cargo to be consolidated into economically large units (containers, bulk grain railcars, etc.) by optimizing the use of specialized intermodal handling equipment to effect high-speed cargo transfer between ships, barges, railcars, and truck chassis using the least labor to increase logistic flexibility, reduce delivery times, and minimize operating costs.

Transportation Infrastructures

Standard and quality of infrastructure, underdevelopment of logistics infrastructure and services, limited availability of multi-modal transport services and relatively high costs of international transport services for small cargo are often seen as barriers for the growth of intermodal transport. Development of modern intermodal logistics centers as well as improvement in operations could consolidate freight for the international market in sufficient volumes and allocate them to the most efficient

transportation mode. A cost model was applied in the UK–Greece corridor and it was argued that it could contribute towards a wider discussion on freight mode choice (Beresford A., 1999). A decision support tool can assist logistics service providers to select optimum multimodal routes; such a tool was developed to optimize transportation routing within GMS countries (Kengpol, Meethom and Tuominen, 2012).

Customs Regulations

Many studies have identified issues related to customs clearance and delay at the border as a major constraint in the transport process along a corridor. The World Bank found that more than 50% of transit time is lost by waiting at borders when an analysis of the Almaty–Europe (through Moscow) corridor was conducted (World Bank, 2005). Walker, et al. (2004) identified bottlenecks restricting the use of intermodal freight transport linking Western Europe with Central and Eastern Europe, analyzed various policies and prioritized those for reducing bottlenecks (Walker, van Grol, Rahman and Lierens, 2004). Raballand, Kunth, and Auty stated that the increase in transportation cost and time and border-crossing problems are some of the reasons for trade imbalance and low trade volumes between Central Asia and Europe (Raballand, Kunth and Auty, 2005). Islam, Dinwoodie, and Roe explored impediments to developing efficient multimodal transport in Bangladesh and concluded that streamlining customs procedures and provision of door-to-door service by shippers were essential to improve the efficiency of operation (Islam, Dinwoodie and Roe, 2006).

Even though international and transit trucks are allowed to cross borders in Central Asia, there are different procedures to gain entry/exit permits for crossing borders and various unofficial charges required to accelerate the border crossing and clearance process. There are cases of reciprocal charges levied on trucks originating from a particular country (IRU (International Road Transport Union), 2000). This makes the time required to cross borders in Central Asia unpredictable and unofficial payments are often cited as one of the reasons for increasing transportation cost. For example, USCC found that the cost of trucking from Asia to Europe using land transport routes can be 3 to 4 times higher than sea transportation, even though they are not comparable (USCC, 2006).

In a study by Angela Mariani (2012) the bulk wine trade, the re-export of wine and the exposure of trade flows to trade barriers are also analyzed in detail (Angela, Eugenio Pomarici, and VascoBoatto, 2012). Finally, on the basis of the dominant trend in wine consumption and changes in the supply chain, the critical issues arising from analysis are examined, with the need for further research being underlined. According to the literature (ICE, 2010; Wine Institute, 2010; Winemakers' Federation of Australia, 2010), the technical barriers of major concern for the wine trade are as follows: (i) wine labelling regulations; (ii) wine- making practices; (iii) maximum residue limits of agrichemicals: they differ between countries both in level and approved use on products; (iv) certification and testing procedures.

Transportation in GMS

Xia based on the China - ASEAN Free Trade Area and the Greater Mekong Subregion Economic Cooperation broad prospects for development in the context of Sino-Thai bilateral trade, on the basis of an analysis of Sino-Thai rice trade and the logistics situation and existing problems, the lowest overall costs of logistics and transport for the overall objective to the transport distance, transport costs, transport time for the two indicators calculated from data model, resulting in the optimal choice of routes (Xia, 2012).

The Greater Mekong Subregion (GMS) is a region covering China and Southeast Asia and rich in natural resources and cultural diversity where many ethnic minorities live cross borders. During the regional integration in the GMS, it is necessary to give full play to the function and role of transport integration, in order to promote regional economic integration and the prosperity and development of upland ethnic minorities in the region (Zhao, 2010).

Lei analyzes the problems of Guangxi's participation in the highway cross-border facilitation transport cooperation in the Greater Mekong sub-region by analyzing the status of it and conducting deep research. Some proposals about coordination with the GMS countries, domestic coordination, and construction of the highway, port construction, clearance facilitation, industry associations and enterprises are put forward on the basis of domestic and international experience (Lei, 2013).

Shi analyzes the logistics cost structure of border trade in coastal provinces in China, and the comparative analysis of the total logistics costs before and after the integration, and puts forward the idea of the core cities of the cross-border sub-regional transport logistics and integration: firstly, determine the logistics and transport; secondly, construct regional border crossing systems; thirdly, fabricate a regional cross-border trade transportation channel. As an example, Shi takes Northeast China - Russia, Xinjiang - Kazakhstan, Yunnan - Burma, Guangxi - Vietnam cross-border sub-regional transport and logistics integration, to carry out a practical exploration (Shi, 2012). The aim is to eventually form logistics and transport networks "of the core "hub - hub - border crossings", reduce the logistics transport costs and the total cost of border trade. Clark et al. show that port efficiency plays a significant part in determining transport cost (Clark, Dollar and Micco, 2004).

Fujimura (2006) and Norihiko who investigate the impact of cross-border transport infrastructure on the economies of the Greater Mekong Subregion (GMS) propose that cross-border infrastructure (by any means) is the most important factor. Fujimura proposes that cross-border and domestic transport infrastructure together can reduce trade costs and lead directly to increased trade and investment. Reduced trade costs can also indirectly induce increased foreign direct investment (FDI) mainly through intra-firm vertical integration. He tried to find the empirical relationships between measures of cross-border road infrastructure, trade, and FDI between GMS countries. He also sought additional reductions in trade costs and increases in trade flows associated with investments in cross-border road infrastructure. He used a trade equation, the FDI equation, and cross-border infrastructure equations in his estimation model (Fujimura and Norihiko, 2006).

Another research study of Fujimura (2004) is concerned with regional economic integration, especially in transport infrastructure and trade facilitation. This work conceptualizes the causal relationships among cross-border transport infrastructure, trade costs, trade and investment, and economic growth. It discusses further about institutional and financing issues. According to Manabu (2004), asymmetric benefit-cost distribution may arise due to differences in geography, economic size, institutional history and the capacity of linked economies in GMS.

Thapana Bunyapavitra proposes more specifically that the use and development of a railway spider network would be the most sustainable way for traveling between Thailand and China in the future. He believes that the logistics system among countries in this region after becoming a union will be developed to a more advanced railway network with high-speed trains travelling across borders as seen in Europe. This type of transport will promote a commonwealth of all nations by: decreasing travelling time, creating employment and income distribution, increasing the limits of freight per round, diminishing fuel consumption (oil and gas), and serving international operations, such as the Olympic Games or summits (Thapana, 2012).

A different point of view is offered by Thapana and Ruth (2009) who maintains that road transportation is still the most reasonable choice for Thailand. Ruth uses a comparison of the infrastructure between Thailand and other countries to show that the road system in Thailand is the readiest compared to other modes of transportation as rail, sea, and air.

Aside from the development of cross-border infrastructure, Chairat Sanguansue (2010), deputy director of Thailand's Department of Land Transport, proposes that laws and regulations are also important. The promotion and continuation of international cooperation policy should be considered the most sustainable way. He affirms that AEC and GMS has promoted a great progress on logistics, particularly between mainland Southeast Asia and Southwestern provinces of China. The Greater Mekong Subregion Cross-border Transport Agreement (GMS CBTA) is one of the key apparatuses that pave the way for international logistics liberalization serving an economic community by 2015.

Transportation criteria

In this thesis, the author studies transport corridors which include three aspects: transport type, transport mode and transport route.

Since it is possible to use more than one road, the freight of products to customers must be ordered according to the road selected. With regard to freight transport, determining the type of transport will enable companies to provide service with minimum cost and maximum service quality, thus planning for a particular route makes transport planning important.

The main purpose of determining transport type must be to make use of all transport types in a balanced manner. Every transport type has its advantages and disadvantages as compared with others and sometimes these will bring additional costs. So it is necessary to determine at which point a compromise between the services provided and the costs arising can be reached.

Previous studies about choosing transport types, for example, Debmallya & Mukherjee, who studied how to determine an equilibrium point, took into account a variety of factors which are linked closely to each other in choosing suitable transport types. In choosing the optimum equilibrium point, Debmallya Chatterjee and Dr. Bani Mukherjee included factors, such as cost, speed, quality, comfort, fruitfulness, flexibility, protecting the environment, minimum amount of energy used, easiness of maintenance and repair of facilities (Debmallya and Mukherjee, 2010).

Furthermore, the criteria for choosing transport type should include speed, time spent in transport, availability, reliability, frequency and capacity factors (Wang and Elhag, 2006). In addition to these specifications, energy consumption, setting up a transport web, initial investment and operation costs, safety and comfort are all factors that can be added.

When freight transport service is examined, it is seen that a lot of factors influence vehicle type selection. These are total logistic costs, physical specification of the goods transported, characteristics of transport type, and specifications of vehicle type (CUTR, 2000). Freight transport is characterized by these variables.

Economy, speed, safety and comfort in passenger and freight transport are the specifications which must be sought in every transport type. In addition to these, other main elements which must be considered when preferring transport type are environment pollution at the lowest level, the amount of energy resources existing in the country, and at the same time its consumption of minimum energy per passenger-km or per ton-km, simplicity of facilities and maintenance and repairs (Mahmoodzadeh, Shahrabi, Pariazar and Zaer, 2007).

In choosing a vehicle type, sectors can vary from one another. For example, significance levels of decision variables for textile sector were listed as transport time, cost, reliability, and availability (Gursoy, 2003). Different transport systems can be used in carrying out transport operations.

Moreover, the related research of the criteria for choosing a transport mode has been explored by Cook, Peter, Das, Sanjay, Aeppli, Andreas, Martland, and Carl. They discuss the main factors that determine the choice of freight mode in India. The results are summarized in a survey based on the Logistics Cost Model of Shipper Behavior (Cook, et al., 1999).

Vieira (1992) modeled eight categories of logistics costs: order and handling costs, transportation charges, loss and damage costs, capital carrying cost in transit, inventory carrying cost at destination, unavailability of equipment costs, service reliability costs, and intangible service costs. Total logistics costs must be estimated first then used in a demand model.

The Logistics Cost Model Framework uses data on commodity characteristics, customer characteristics, and modal characteristics.

The important needs of Indian customers were ranked. Reliability was ranked as the most important, followed by availability and price.

Customer perceptions were ranked regarding the important needs of road versus rail transport. Road transport was ranked higher than rail for every category. Customers perceive that roads are more likely to provide a satisfactory means of transport.

When comparing different commodities, there are important needs scores for selected factors. For example, price is the most important factor for coal, while transit time is the most important factor for food grains.

The above commodity group industries rated their satisfaction with rail services for the same selected factors. Rail scores were much less and also generally out of line with original important needs. For example, consumer durables showed that rail was meeting its needs with respect to price and transit times, but not for reliability or availability.

This thesis uses a formal approach to identify and justify the attributes to be used when conducting freight route/mode choice studies using stated preference techniques.

The top five ranked attributes are cost/price/rate, speed, transit time, reliability, characteristics of the goods, and service (unspecified).

This article documents how intermodal shipping firms are trying to re-establish their image away from typically poor service. Rail has been the key player in creating this tarnished image and it is rail that will have to improve if intermodal firms are to increase their market share in the future.

Burlington Northern and Santa Fe Railroad (BNSF) offers for a premium a moneyback guarantee for domestic intermodal shipments. Even though this is only on lanes BNSF knows it can perform well on, it sends a signal to customers that the company is serious about being on time. Guarantees have also helped other intermodal companies land new customers.

Reliability is a lot harder to guarantee when railroads have to work together. It is often found that with interline shipments, reliability is not as high as with single line shipments.

Load centering (a place where containers are combined according to final destination) has shown to improve transit times and performance.

Intermodal firms are also listening to customers who have been unhappy about the way intermodal companies have been doing business. Changes in truck size and weight limits may cause a reduction in truck costs because fewer trips would be needed. Other costs such as warehousing, order processing, and loss and damage may also be reduced. Decreased truck costs may cause a change in mode choice and a switch from rail to truck. For short distance truck shipments (under 200 miles), rail and truck do not compete. Commodities that are both truck and rail competitive would be potential switch markets if truck size and weight limits increased. Examples of these are paper products, pulp and allied products, food and kindred products, lumber and wood products, primary metal industry products, and waste and scrap. Two-thirds of rail shipments are not truck competitive as they move bulk commodities in large quantities. Railroads are a decreasing cost industry. They face high fixed costs that decrease per unit as output increases as they are spread over more units. Railroads increased their market share particularly in intermodal freight during 1994. Bulk commodities are the mainstay of the U.S. railroad freight transportation market share. In order to expand market share, Class 1 carriers looked into logistics support and services and just-in-time operations. The return on railroad investment was 9.4 percent in 1994 compared to 7.1 percent in 1993. Consensus among rail industry observers is that the railroads have

exhausted the efficiencies that can be wrung from their existing plant. Any future productivity gains will require massive capital investment.

About 30 percent of the value and 56 percent of the commodity tonnage are shipped between places less than 50 miles apart. This is why it is not surprising that trucks are the dominant mode of freight transportation. Rail usually ships bulky commodities over long distances, and accounts for the highest proportion of total ton-miles of freight transportation (39 percent).

In general, trucks dominate shorter trip lengths with lower lane densities and longer trip lengths, and higher lane densities are dominated by rail. Lower value products traveling longer distances are dominated by rail and higher value goods traveling shorter distances are dominated by truck.

Furthermore, there are some research studies relating to the choice of the criteria for transport route as in the content analysis study done by Cullinane and Toy in 2000, in which they combed 75 articles which are related to route preference in freight transport and in the list of the number of usages in decision variables' model structure; the first five criteria were listed as fruitfulness of shipment time, speed, cost, loss and deficit (Cullinane and Toy, 2000).

Time/ cost-distance Methodology

Banomyong (2000) used a time/cost distance methodology to explore the various alternative routes and methods available to garment exporters in Lao PDR, a land-locked country in South East Asia, when exporting to the European Union. Lao exporters are dependent on the transport systems in place in neighboring countries (i.e. Vietnam, Thailand, Malaysia and Singapore) for transit purposes. A multimodal transport cost-model is used to illustrate and clarify multimodal transport routing alternatives. A confidence index is also introduced for each route, transport modes and nodal links. Five routing alternatives are presented in this thesis and it is shown that the most frequently utilized route via Bangkok (Thailand) is not necessarily the most competitive in terms of time and cost, while the route via Port Klang (Malaysia) potentially offers a better alternative for Lao garment exporters.

Banomyong researched a cost model of multimodal transport, which was originally proposed by Boerne (1990) and developed by Beresford and Dubey (1990).

The model is stand-alone and flexible enough to be applied to any operational circumstances and to a supply chain of any length. The validity of this model is tested against a real case in international freight logistics, namely the export of goods from Vientiane in Lao PDR to Singapore. Lao PDR, as the sole land-locked country in South East Asia, is dependent on the infrastructure available in neighboring countries for fast and efficient international distribution channels. The main elements of the model are as follows: cost, time, distance, transport mode and intermodal transfer. The model is tested using real data over a series of alternative routes between Vientiane and Singapore. The selection of one transport mode or combination of modes will have a direct impact on the performance of Lao PDR logistics channels. Depending on the mode or the combination of modes chosen, the efficiency of the logistics system will be affected. Interviews were used in order to obtain data from Laotian exporters, logistics service providers, and international shipping lines. The research findings clearly demonstrate that the “road-sea” combination via Bangkok Port in Thailand is the most competitive in term of costs while the “all-road” option offers the fastest transit time (Banomyong and Beresford, 2001).

Madan , Regmi, and Shinya Hanaoka (2012) have produced a research study of intermodal transport that uses various modes, links and transport nodes which are gaining more importance these days in Asia. However, there are not many studies that analyze the status of intermodal transport corridors as well as assessing their performance. This paper assesses the infrastructure and operational status of two important intermodal transport corridors linking North-East and Central Asia namely: Korea–China–Central Asia; and Korea–China–Mongolia–Russian Federation. The corridors use maritime, road and rail modes for the transportation of goods. The status and condition of physical infrastructure such as road, railway, ports, intermodal transfer and border crossing facilities as well non-physical bottlenecks for freight transport operations are examined. It utilizes a time–cost–distance approach to assess and compare the performance of intermodal transport corridors. Based on the findings, this paper identifies issues and challenges for the development and operation of intermodal transport corridors in North-East and Central Asia. Finally, policy recommendations to improve physical infrastructure and minimize non-physical barriers to enhance operational efficiency of the intermodal transport corridors are offered which can be

useful for other countries and parts of Asia the “UNESCAP Time/Cost – Distance Methodology” is a graphical representation of cost and time data associated with transport processes. The purpose of the model is to identify inefficiencies and isolate bottlenecks along a particular route by looking at the cost and time characteristics of every section along a route.

The “UNESCAP Time/Cost – Distance Methodology” enables policy makers to: compare - over a period of time - the changes of cost and/or time required for transportation on a certain route; compare and evaluate competing modes of transport operating on the same route; and compare alternative transport routes. The objectives of the Time/Cost – Distance Methodology is for a Trade Facilitation Project of which the main objectives of the data collection exercise are: to gather sufficient data on the costs and time involved in transporting goods along specific routes identified as priority corridors; to analyze the data using graphical representations to help policy makers decide how to best address bottlenecks, remove constraints, and improve efficiency on these specific routes.

The benefits of the time/cost – distance methodology are simple to use: they provide a ‘snap-shot’ of the present situation; they can track changes over time; they allow a comparison of alternative routes; they can be understood by all; they present a powerful instrument for international cooperation; they can be utilized to measure and assess the performance of any transport corridor (unimodal or intermodal); they include both transport (road, rail, inland waterway, maritime) and intermodal transfer (ports, rail-freight terminals, inland clearance depots) as well as cost and time components.

Updates on a time/ cost-distance methodology can offer guidance on the preparation for applications which are consensus building; survey methods and data sources, institution selection, commodities selection (top 5), seasonality factors; and routes and means of transport.

Guidance on data collection is provided in the form of trip diaries; independent surveys; interviews; demonstration runs; database; satellite positioning records; data validity; data processing; graph development and templates; and detailed composition of bottlenecks.

In this thesis, a time/cost-distance approach is adopted to compare the cost and time of each transport route between Thailand and Myanmar. Furthermore data has been

collected by means of in-depth interviews from transport companies in Thailand which transport Thai products to Myanmar

SWOT Analysis

Traditionally, the SWOT framework is used due to its inherent assumption that managers can plan the strategy of their companies' resources with respect to their environment (Novicevic, Harvey, Aurty and Bond III, 2004). A SWOT analysis is very simple and flexible which means it only requires people to understand the nature of the company or the industry it operates instead of requiring specific technical skills or training. According to Mehta (2000), the benefits of a SWOT analysis are: 1) it can improve the quality of a company's strategic planning even it lacks marketing information systems 2) Ideally, it helps marketing managers integrate all kinds of information efficiently 3) It allows collaboration between managers in different functional areas (Mehta, 2000). As a result, the top manager who has the right to make decisions must be sure that the objectives of a company or project are attainable and available when using the SWOT framework. If the consequence is negative, another objective will be proposed to replace the former one.

In addition, the standard SWOT matrix (see Figure 7) is a classic method to evaluate the internal factors of a company such as its strengths and weaknesses, while taking consideration into opportunity and threats which are external to a company to determine their impact on the company's marketing efforts (Mehta, 2000). Novicevic (2004) also states that SWOT has been used as a managerial tool for marketing planning, however, its main functional approach is to determine the existing internal and external elements.

Ji Liu and Yuanyuan Wen (2012) focus on a 3PL company (DHL) to examine what reasons or factors make it one of the most successful logistics companies in the world, and what competitive advantages DHL can gain through an external and internal analysis of its marketing strategy. Finally, the SWOT analysis can be used to summarize the company's strengths, weaknesses, opportunities and threats. Therefore, this thesis uses the SWOT analysis to define the strengths, weaknesses, opportunities and threats of the case study that has been selected as an example of the logistics strategy used by

a transportation company. There has been little research using a time/cost-distance model and a SWOT analysis to analyze transport routes so this is innovative research.

From the above literature review and the results of research conducted in the same field as this thesis, it is now possible to establish the scope of the research: from the micro perspective, using the time/cost-distance model to construct a model of evaluating a comprehensive data including cost and service level, the average shipping time, reliability, transport capacity, accessibility, and security. The various factors influencing the enterprise transportation mode selection combined with the evaluation of experts, by means of a case study, will enable us to focus on manufacturing enterprises or logistics enterprises in transportation, and show us how to make a choice of the most suitable model for the mode of transportation.

This thesis is, therefore, an empirical research study which has collected entrepreneurial outlooks, facts, and related information so as to propose feasible ideas in developing a Thailand-Myanmar logistics system which will lead to an increase in mutual trade and investment.

Summary of the review

In conclusion, there is hardly any research related to the barriers to the importation or exportation of products from Thailand to Myanmar. Some researchers have studied some of the criteria for the selection of transportation routes, but this thesis studies the barriers to the importation or exportation of products from Thailand to Myanmar and it uses a qualitative analysis to select the key factors that relate to the criteria for the selection of transportation routes and it then adopts a time/cost-distance model to analyze each of the transportation routes between Thailand and Myanmar. Finally, an actual case study is illustrated. The topic of this thesis is of great importance and will be very useful to the shippers of products from Thailand to Myanmar for the following reasons.

1. Summary of criteria for the selection of transport routes

The selection of an optimal transportation route is one of the most important factors in supply chain and logistic planning. Furthermore, the selection transportation route is a complex, multi-criteria decision problem. The decision makers have to face and take into account many criteria, such as cost, delivery time, safety, and accessibility

in the process of choosing the best route. Under these criteria, there must be a selection between motorways, seaways, airways, pipelines, railways and also intermodal modes.

From information obtained from the literature review, the author has made a summary of the factors for establishing a transport route in Table 1. On this basis, the main topics of interest and the frequency of common themes found in the literature have been formulated. The criteria used for the selection of transport routes are: "cost, time, reliability, safety, access and flexibility".

Table 1 Summary of the criteria from literatures review

Criteria	Cost	Time	Reliability	Safety	Risk	Capacity	Accessibility
Author(year)							
Cullinane and Toy (2000)	x	x		x	x		
Gürsoy (2003)	x	x	x				x
Zhao, Zan Yang, Zhongzhen Yang, Feng (2005)	x	x	x				x
Liu, Yang (2006)	x	x		x		x	x
Wang & Elhag (2006)	x		x	x		x	x
Xie, Zhang, Ji (2006)	x	x		x			
ANCIAUX, Kun YUAN (2007)	x	x			x		
Mahmoodzadeh (2007)				x			
Umut R. Tuzkaya , Semih (2008)	x		x	x	x		
Ko, H.J. (2009)	x	x	x	x			
Bani Mukherjee (2010)	x						
Eren Özceyla (2010)	x	x		x			x
Mustafa Gursoy (2010)	x	x		x			
Athakorn Kengpol, WarapojMeethom, (2012)	x	x			x		
Xia, Zhang (2012)	x	x	x				
Eugene Kopytov, Dmitry Abramov (2013)	x	x	x				
Halim Kazan, Cihan Çiftci (2013)	x		x	x		x	x
Yang, Liu, Han (2013)	x	x					x
	17	13	8	10	4	3	7
Total No. of Papers	18						

Table 1 (cont.)

Criteria	Traceability	Flexibility	Distance	Cargo value	Cargo volume
Author(year)					
Cullinane and Toy (2000)					
Gürsoy (2003)					
Zhao, Zan Yang, Zhongzhen Yang, Feng (2005)					
			x	x	x
Liu, Yang (2006)					
Wang & Elhag (2006)					
Xie, Zhang, Ji (2006)					
		x			
ANCIAUX, Kun YUAN (2007)					
		x			
Mahmoodzadeh (2007)					
Umut R. Tuzkaya , Semih (2008)					
	x	x			
Ko, H.J. (2009)					
Bani Mukherjee (2010)					
		x			
Eren Özceyla (2010)					
	x	x			
Mustafa Gürsoy (2010)					
Athakorn Kengpol, WarapojMeethom, (2012)					
Xia, Zhang (2012)					
		x	x		
Eugene Kopytov, Dmitry Abramov (2013)					
Halim Kazan, Cihan Çiftci (2013)					
Yang, Liu, Han (2013)					
		x	x		
	2	7	3	1	1
Total Papers					
	18				

Table 1 (cont.)

Author(year)	Criteria	Product characteristics	convenience	Transportation frequency	speed	Suitability
Cullinane and Toy (2000)					×	
Gürsoy (2003)						
Zhao, Zan Yang, Zhongzhen Yang, Feng (2005)				×		
Liu, Yang (2006)						
Wang & Elhag (2006)				×		
Xie, Zhang, Ji (2006)			×		×	
ANCIAUX, Kun YUAN (2007)						
Mahmoodzadeh (2007)					×	
Umut R. Tuzkaya , Semih (2008)		×			×	
Ko, H.J. (2009)						
Bani Mukherjee (2010)					×	
Eren Özceyla (2010)						
Mustafa Gürsoy (2010)			×		×	
Athakorn Kengpol, WarapojMeethom, (2012)						
Xia, Zhang (2012)			×			
Eugene Kopytov, Dmitry Abramov (2013)						
Halim Kazan, Cihan Çiftci (2013)					×	×
Yang, Liu, Han (2013)			×			
		1	4	2	7	1
Total Papers		18				

In conducting the review, information pertaining to the key factors that affect freight mode choice and where each factor comes into play during the decision making process were noted. In conclusion, those factors that hold high potential for influence through policy intervention are listed. This review of relevant studies found that many factors affect the choice of a freight mode. Researchers have examined freight demand characteristics, cross elasticities, freight costs, commodity characteristics, modal characteristics and customer characteristics, and all have shown the potential to

influence mode choice. It is consistently found that trucks dominate short trip lengths and higher value goods, while rail dominates long trip lengths with bulky, low-value products. Cost benefits often have to be weighed against customer service and satisfaction for many commodities where time constraints exist. For commodities with time constraints and/or service guarantees, it is typical that trucks are the preferred mode of transportation due to speed, flexibility, and reliability.

In seeking an appropriate set of policies, it is recognized that fairness appears to be hard to balance between the freight rail and truck interests. A broad range of issues from emissions standards to taxes is debated. Funding and subsidies are the key topics disagreed upon in the freight industry. Railroads feel truckers receive a hidden subsidy because they use highways that are a public infrastructure. Along with hidden subsidies, trucks are also seen as benefiting from lower levels of maintenance, funded on a “pay as you go” basis. Trucking companies do not have the large up-front infrastructure costs of rail transport and public authorities maintain the highways they use. Trucking companies often include sales tax on truck parts such as tires, which is an argument used to help deny any hidden subsidies. It must be noted that no quantitative measure of the benefits received by truckers has been established. It is also argued that governments should not support freight railroads since it is inappropriate to support a private company using taxpayer’s money. These arguments weigh heavily on policy intervention decisions needed to obtain the optimal mode split.

This literature review collected information from many diverse sources. It has presented is a summary of relevant scholarly research, accompanied by journal articles and documents from relevant associations. Documents from relevant associations are of specific interest in sourcing views on subsidies and funding. A total of 18 papers are presented and are categorized as follows: 4 association papers and 14 journal articles.

Considerable literature is available covering the issue of mode-choice factors with the aim of determining where public expenditure can best achieve improvements to facilitate the movement of freight. Typically, such improvements have been determined through the use of technical models, reviews of regional plans, estimates of economic growth and public forums. Common opinion across the authors reviewed was that a more thorough understanding of the mode-choice factors from a shipper’s

perspective combined with the more traditional approaches would provide an even clearer picture of where best to direct public expenditure.

2. The limitations of previous studies

From the above literature review it can be said that the limitations of previous studies are just restricted to qualitative analysis or analysis. When the quantitative data is insufficient to reflect the status of the entire logistics and transportation process, the studies use qualitative analyses, but these are subject to a lack of objectivity.

3. The originality of this thesis

Firstly, by using quantitative and qualitative analyses to study a variety of transportation routes between Thailand and Myanmar, this thesis presents a comprehensive and objective approach to show the status of transport routes between Thailand and Myanmar; however, previous studies just use a qualitative or quantitative analysis. This study is the first to present a detailed case study which will help to establish useful criteria for future research.

Secondly, no previous studies have investigated the transport for the brewery industry, so this research represents a new attempt to help the brewery industry to open up markets in Myanmar.

CHAPTER III

RESEARCH METHODOLOGY

Research Flowchart

This research uses both quantitative and qualitative research methods, which means that the quantitative research method uses a time/cost distance model and the qualitative research methods uses a questionnaire, in-depth interviews and a SWOT analysis. The reason for combining the quantitative and qualitative research methods is that they can play a complementary role in solving the transport problems. Because the time/cost-distance model can only be used to analyze the time and cost criteria, we need to use other methods to analyze the other criteria. This thesis also uses a questionnaire and in-depth interviews to collect and analyze the data. Finally, we use a SWOT analysis to analyze the case company's logistics strategy.

In this thesis, a literature review and empirical work on Thai transport companies are carried out. In the section dealing with the theoretical framework, important theories and the literature regarding external and internal analyses were necessary to fulfil the purpose of this thesis. On the other hand, the empirical data collection is mainly based on interviews. Furthermore, the company's reports and official website are regarded as additional sources to gather more information. Overall, an analysis of the information from the interviews and the literature are used to answer the research questions.

Generally, the qualitative method uses non-numerical data. There are several methods that can be adopted to collect qualitative information, for instance, structured interviews, reflexive journals, and analysis of documents and materials. (Walliman, 2005). The qualitative method is also used in this thesis to discuss the competitive advantages of the company used for the case study.

From the time/cost-distance model we can obtain information about routes from origin to destination, including border crossings, mode of transport for each leg (e.g. road, rail, sea, air), and distance, time and cost for each leg/mode. So this research adopts a time/cost model to analyze the cost (transportation cost and border cost) and the times of journeys from Bangkok to the border, time at the border, and the time from

the border to Yangon. In addition, this model also allows national stakeholders to track time and cost issues along transport routes. Thereby it helps to identify barriers and bottlenecks in international transport. In short, the author uses this model to answer 3 objectives:

1. To study the barriers the importation of Thai products to Myanmar
2. To assess the competitiveness of cross-border transportation compared with other modes of transportation for the importation of beer products to Myanmar
3. To study the alternatives for cross-border transportation for the importation of beer products to Myanmar.

Thus the author has developed a framework to answer the research problems and to achieve the research objectives. The logic of the research methodology is illustrated in Figure 2.

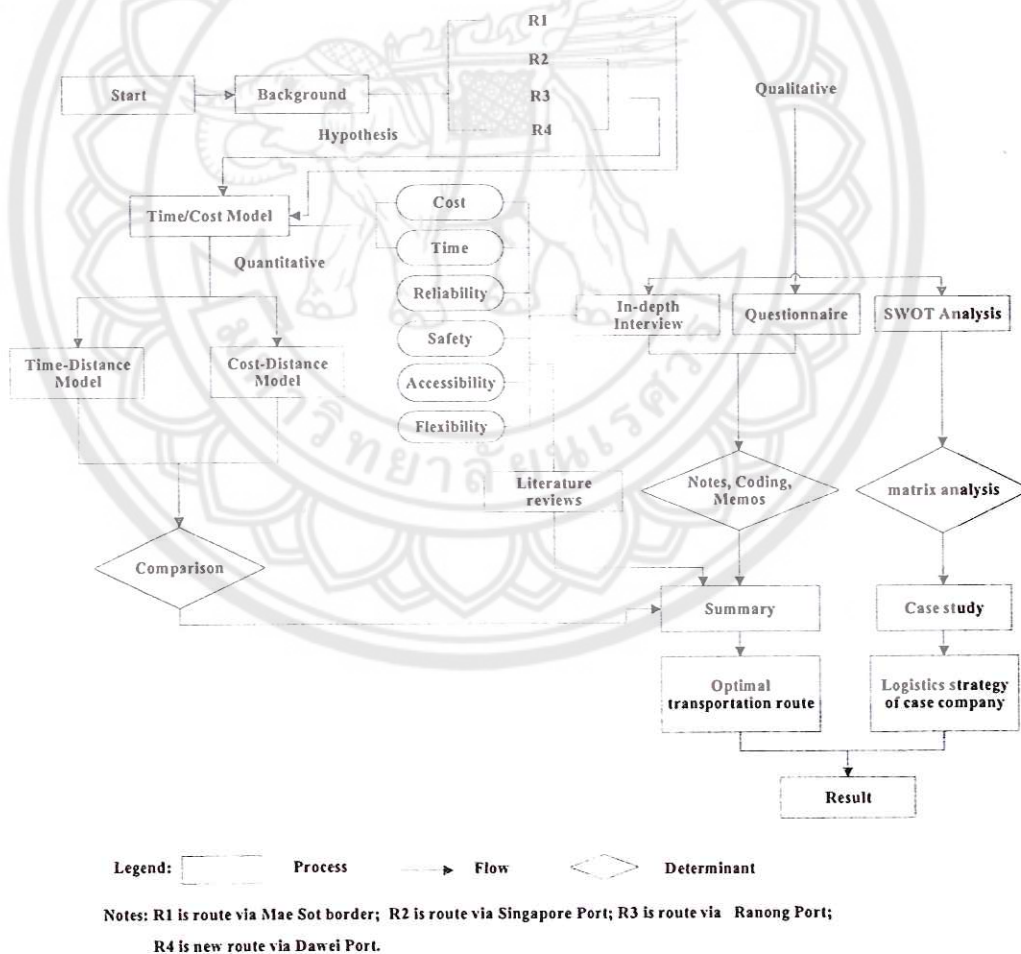


Figure 2 Research flowchart

The main aim of this paper is to obtain the objectives by means of the following steps:

First, the author reviews related theories from journals and books;

Second, the author collects the primary data from in-depth interviews of the personnel in the case study

Next, a time/cost-distance model is adopted for the analysis of the time and cost of each transportation route from Thailand to Myanmar;

Finally, a SWOT analysis is applied to the logistics strategy of the company in the case study.

Quantitative Analysis

1. Data required

In this research, the author defines time, cost and distance as below:

Time: The time factor includes the transportation time from origin to destination and storage time in the yard or warehouse. So the time factor is relative to the speed of the vehicle and the distance from origin to destination. The storage is influenced by the distribution system and machine operation efficiency. If the distribution system is more advanced and the machine operation is more efficient, the storage time is less.

Cost: All the cost factors that are realized in the transportation process.

The overall transportation cost includes transportation charges, loading and unloading charges and storage cost. The transportation charge is influenced by many factors. For example, if the fixed cost relative to the transportation volume makes up a large proportion of the transportation charge, the frequency of the transportation will influence the charge. If the carriers increase the frequency of transportation, the fixed cost will decrease. The transportation charge is also lower when the capacity of the vehicle is larger.

C1: Cost of transshipping the freight from one mode to another at the transshipment points.

C2: Cost of damages to freight incurred at the transportation or transshipment stages.

C3: Communication costs among the points of the transportation network which provide coordinated transportation.

C4: Transportation costs realized between the supply and demand points.

Distance: The distance has some influence on the choice of transportation mode. The shippers and carriers should consider whether the distance is within the economical distance in order to save cost, because every transportation mode has an economical distance.

The transportation route from Thailand to Myanmar is divided into three legs in this thesis and further details are provided in Tables 11-13 (see Appendix C).

2. Model Set-up

Four developmental stages of UNESCAP

Stage 1: Competition between only two modes of transport.

Stage 2: a combination of transport modes, where the cost of transport by combining both modes is less expensive than just road transport and slightly more expensive than rail transport.

Stage 3: Combined transport, road-rail-sea.

Stage 4: Multimodal transport, from origin to destination

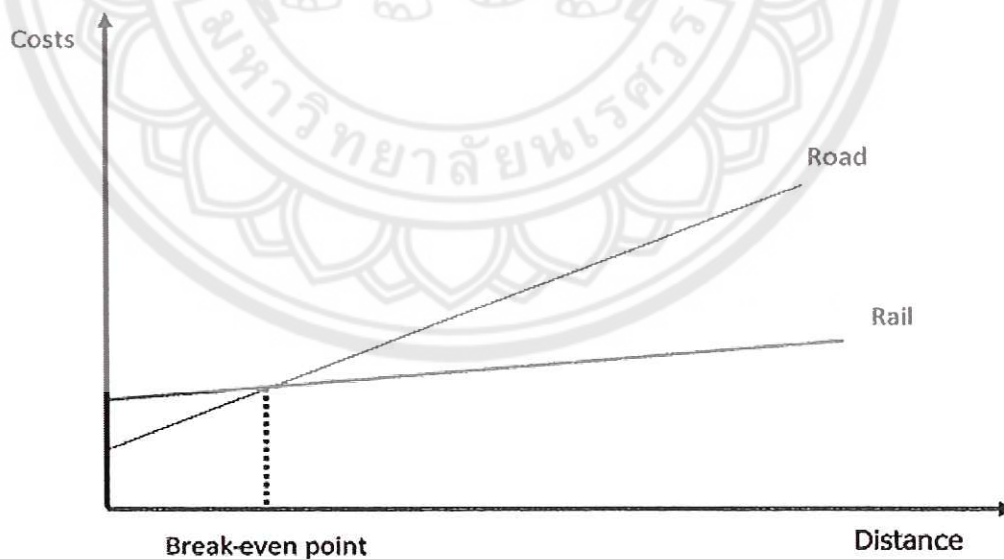


Figure 3 Road versus rail alternative

Source: Maria, 2012

The distance and cost/time data are plotted on the x-axis and y-axis, respectively. Initially, road transport may be cheaper than rail transport over shorter distances, due to the initial costs (or time) required to transport the goods to the railway station. However, as the distance increases, the two lines cross and beyond this point, rail transport has a lower per kilometer cost than road transport, as indicated by the flatter slope.

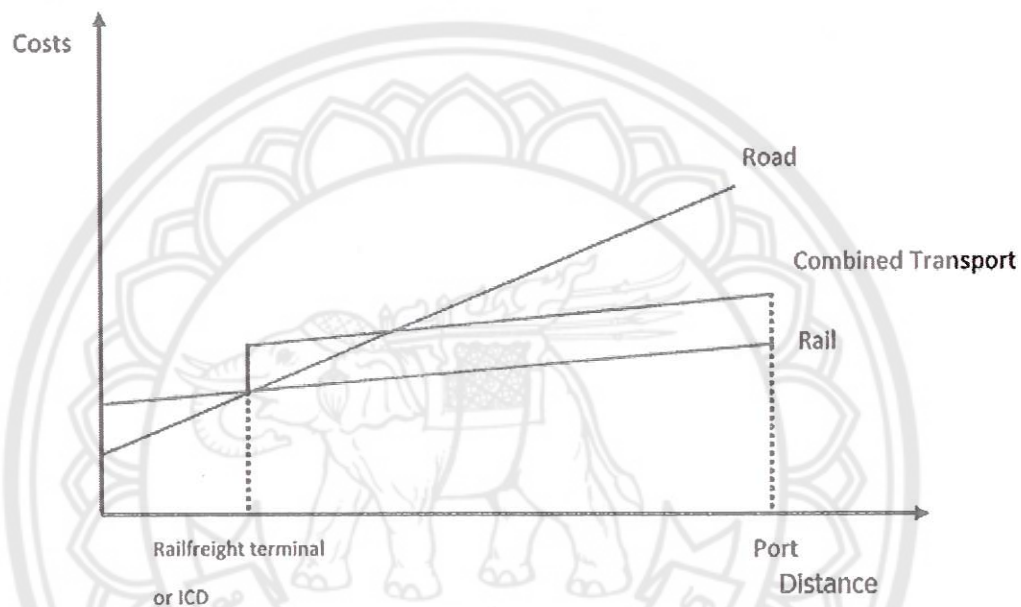


Figure 4 Combined transport, road-rail

Source: Maria, 2012

In the first part of the journey, it is cheaper to transport the goods by road rather than by rail. However, if the distance to be travelled is further than the break-even distance, transport by rail becomes more economical. An intermodal transfer can be arranged at the closest rail freight terminal or inland clearance depot (ICD). The vertical step in figure 3 represents the costs (or time) involved when goods are transshipped from road to rail at the rail freight terminal or ICD. The cost of rail transport, in reality, has not increased, but the cost of the intermodal transfer is reflected in the combined transport cost from that point on.

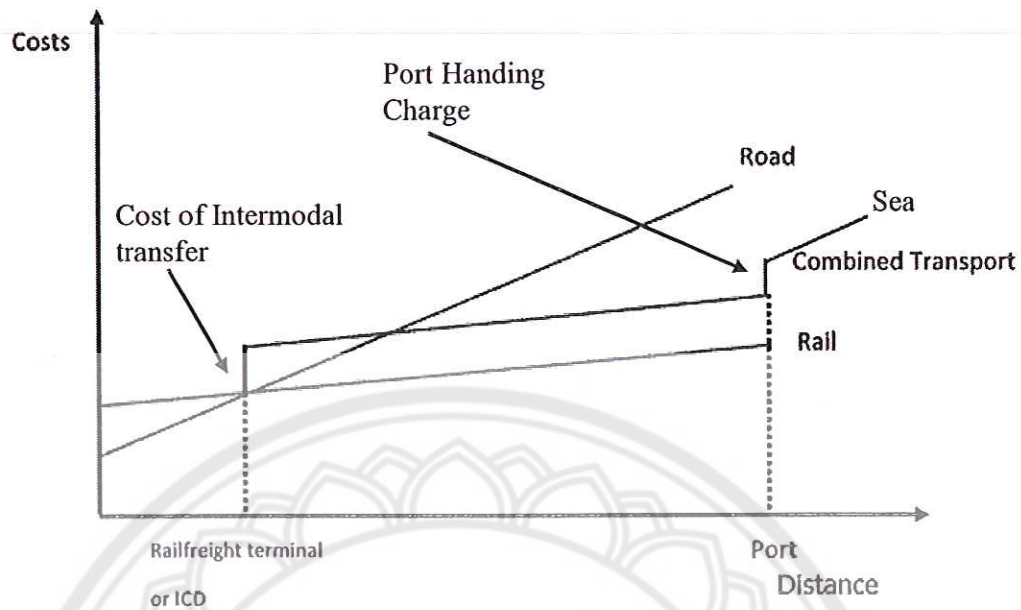


Figure 5 Combined transport, road-rail-sea

Source: Maria, 2012

Since the overwhelming majority of traded goods are transported by sea, the most likely destination for the freight in transit will be a seaport, where the goods will be transferred onto seagoing vessels. The additional costs (or time) incurred at the port are represented by the second vertical step. Thus, cumulative costs from the origin to the port are the sum of the cost of rail transport to the ICD plus the cost of intermodal transfer at the ICD plus the cost of rail transport from the ICD to the port plus the handling charge at the port.

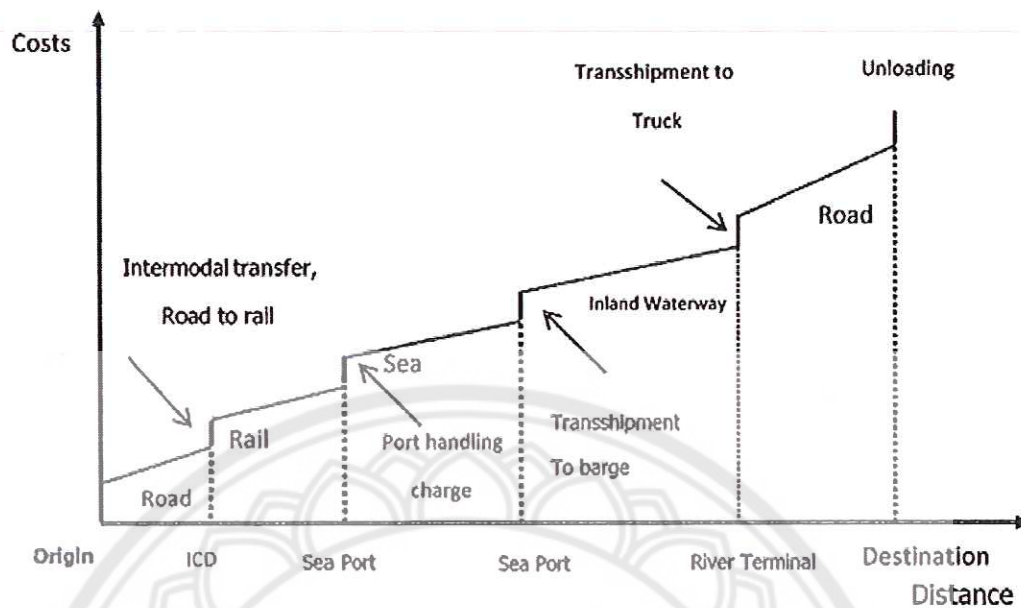


Figure 6 Multimodal transport, from origin to destination

Source: Maria, 2012

The final stage shows that numerous modes of transport may be involved for goods to be moved door-to-door. At each intermodal transfer point there will be a cost (or time) increase represented by a vertical step. Should a border crossing occur along the route, the border crossing charges (and time spent) can be represented by another vertical shift upwards in the cost curve at that point, which can be added to the other costs.

In this thesis, a time/cost-distance model is adopted to compare the cost and time of each transport route between Thailand and Myanmar. The data has been collected from transport enterprises in Thailand which transport Thai products to Myanmar by giving in-depth interviews to the personnel involved.

Qualitative Approaches

Since the time/cost model only provides information about time and cost, it does not reflect the entire transportation process, so some important information cannot be shown, for example, reliability, safety, risks, and capacity. Therefore it is also

necessary to use a qualitative analysis combined with a descriptive analysis to find the information that is not reflected in the time/cost model.

1. Questionnaire

A questionnaire is simply a 'tool' for collecting and recording information about a particular issue of interest. It is mainly made up of a list of questions, but should also include clear instructions and space for answers or administrative details. Questionnaires should always have a definite purpose that is related to the objectives of the research, and it needs to be clear from the outset how the findings will be used. Respondents also need to be made aware of the purpose of the research wherever possible, and should be told how and when they will receive feedback on the findings. In order to obtain the data to solve the problems, the author designed five steps for initial consideration: question content, phrasing and response format; question sequence and layout; pre-test (pilot) and revision; and a final questionnaire. If the pre-test (pilot) and revision prove to be unsatisfactory, it is necessary to restart question content, phrasing and response format step repeatedly. In this thesis, the questionnaire is divided into two categories which are the basic information about the interviewee (position, working age, etc.) and information about the company used for the case study. The questions are about the criteria for selecting transport routes and how the choices are made. Furthermore, the questions are also related to the common barriers and bottlenecks experienced by the transportation of cargo from Thailand to Myanmar. The data obtained provides the answers to objective 1, which is to study the barriers to the importation of Thai products to Myanmar.

The questionnaire was submitted to transportation companies who transport cargo to Myanmar because the research topic studies transportation routes from Thailand to Myanmar and so these transport enterprises can help answer the questions well. There were only five companies in all because in Thailand there are very few transport enterprises which provide transport services from Thailand to Myanmar directly. In fact, we know that only one company ships directly to Myanmar via cross-border transport at present and others companies just transport to the Thai-Myanmar border and from there it is transported to an agent in Myanmar. These companies have been engaged in transport from Thailand to Myanmar for a long time and they are large transport companies in Thailand.

The author designed 20 questions for the questionnaire which took about 30 minutes to complete. This thesis used partially close-ended question to ask including rated responses. Thus, the author came to understand the interviewees and the companies very well. A precursor to analysis is the coding, entry and checking of data. It should also be noted that a question on the questionnaire may require more than one variable to specify the data collected by that question. From the result of the questionnaire we expected to get information about some of the criteria, such as convenience, cargo value, cargo volume, and product characteristics. The details of the particular criteria are shown in Appendix B.

2. In-depth interviews

In-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation. The process for conducting in-depth interviews follows the same general process as is followed for other research: plan, develop instruments, collect data, analyze data, and disseminate findings (Carolyn Boyce, Evaluation, Palena and Senior Evaluation, 2006). In this thesis, the questionnaire was divided into two categories which were external factors and internal factors include the cost, time and strengths, weaknesses, opportunities, and threats to the five companies interviewed. Thus, we used a time/cost-distance model to analyze each transport route from Thailand to Myanmar and then can we selected the optimal route. In addition, we used a SWOT analysis to establish the logistics strategies of the companies which would help us to answer objectives 2, 3 and 4.

The questionnaire subjects was submitted to transportation companies who transport cargo to Myanmar because the research topic studies the transportation routes from Thailand to Myanmar and those transport enterprises could help to answer questions related to the topic. There were five companies because in Thailand there are very few transport enterprises which provide a transport service from Thailand to Myanmar directly these companies are referred to as Company A, Company B, Company C, Company D and company selected for the case study. The details of each company will be described in below.

As part of the qualitative methodology, case studies have been widely utilized in recent research. Ngram Viewer's (2004) findings show that during the period

1980 to 2008, the frequency use of “case study research” shows a distinct upward trend in contrast to the other three competing methods, namely “survey research,” “experimental designs,” and “random assignment”, even though the absolute level is still lower than those of the other terms (K.Yin, 2104).

The areas covered include numerous areas or research. The use of case studies is becoming an increasingly respected research strategy in the areas of management studies and planning sciences (Scholz and Tietje, 2002). Case studies are even found in economics, business and international business, which allows investigators to focus on a “case” and retain a holistic and real-world perspective-such as studying organizational and managerial processes (K.Yin, 2104). The major strength of the case method is theory building and identifying new variables and relationships not envisaged in the original research. There are few research studies reported that use a case methodology and our goal here includes providing a greater depth of understanding of the key criteria for choosing transport routes and the logistics strategy of the company used for the case study.

In qualitative data analysis, codes are used especially in Grounded Theory, in which the terms code and coding appear in several different forms, including open codes, axial codes, and selective codes as well as in combination with other elements, such as substantive codes, key codes, and theoretical codes (Strauss and Corbin, 1996). The term code was originally used in quantitative research approaches; in Grounded Theory, coding refers to analyzing, naming, categorizing, and theoretically organizing the data, which is in the sense of the second point mentioned by Bernard and Ryan (2002). Thus, because of the different tasks associated with the different phases of the analysis process, codes are sometimes referred to as categories; at other times, they represent initial, ad-hoc concepts that may be further developed into categories later in the analysis process. From the results of the in-depth interviews we expect to get information about criteria, such as reliability, safety, capacity, accessibility, and flexibility. The details of the criteria are shown in Appendix B.

The case study design follows replication logic. A case study consists of a single or a multiple case study, if you study two or more organizations in the same manner, you would have an embedded, multiple-case study (Yin, 2012). For multiple case studies, each case study must be carefully selected to achieve replication of results

(K.Yin, 2014). The empirical evidence for the work comes from a 3PL service provider study that involved a multiple-case study method (Stefansson, 2006; Fredriksson, 2007; Sraboti, 2012).

The choice of semi-structured interviews was deliberate since open-ended questions allow interviewees to develop their views and ideas and also lead to the identification of unforeseen research dimensions. The chosen design enabled the researchers to collect in-depth information on the identification of criteria for choosing transport routes and to summarize the logistics strategy of company used for the case study.

Unlike quantitative research, in-depth interviews which are also known as a semi-structured method (a semi-structured interview) is one of the main methods of data collection usually adopted in quantitative research. Before conducting the interviews, researchers are required to design the outline of the interviews and a basic framework according to the problems and the purpose of the research. In the course of the interview, the interviewer can be flexible about the order of the interview outline based on the actual situation of the interview because the topics and the focus may change in the course of the interview. At the same time, it is also important to allow the respondents time to adjust to the interview process and its direction (Sun, 2012).

In the literature review, numerous research studies were reviewed by the author, and several key criteria for the selection of transport routes are summarized in Table 1.

Sampling: In social science research, researchers can only choose one part of the samples for personnel study instead of interviewing all respondents one by one since the population of the respondents is too large. Sampling in social science research can be divided into two categories: probability sampling and non-probability sampling (Sun, 2012). Since detailed and in-depth materials are required in research, interviews focus on quality rather than the quantity of interviews. Therefore, flexible non-probability sampling is chosen, which can sample the respondents for providing the maximum amount of information.

Methods of sampling include purposive sampling, diversity sampling and snow-ball sampling method (Jin and Zeng, 2013). For in-depth interviews, researchers should not focus on the number of samples, but focus on whether the sample can answer

the research questions more completely and relatively accurately. Due to the relatively small sample, purposive sampling is utilized for ensuring that interviews are conducted with those who can provide the most important information relating to the research questions.

However, no matter what method is adopted, the researcher should know when they have interviewed enough respondents. To answer the question 'How to determine if the number of respondents is enough?' we refer to Seidman, who explains that there are two criteria for "Enough" namely 1) sufficiency and 2) saturation of information. It is concluded that the signal for enough respondents: 1. a sufficient number to reflect the range of cases in a similar structural and social condition; 2. the interviewer begins to hear the same information reported, and no new and important topic appears any more. It is not limited to the number of in-depth interviews, but rather to reach the goal of information saturation (Seidman, 2006).

The emphasis of this research work was placed on investigating the key criteria for selecting transport routes and analyze time and cost of each route by Time/cost-distance model, in addition, analyzing the logistics strategy of the case study company by SWOT analysis. For this reason, we strove to find typical medium to large size organizations transport industries which transport Thai products from Thailand to Myanmar in order to make a contrast between the chosen cases.

The cases include 5 companies (namely Company A, Company B, Company C, Company D and case company) with Company A transporting Thai products from Thailand to Myanmar by itself and there is a branch in Yangon at present, however, other companies cannot transport Thai products to Myanmar directly, but just transport products to the border where they are then transferred agents in Myanmar. Currently, there are few transport companies that transport Thai products to Myanmar by themselves directly. For this reason the case study company intends to open the AEC market, especially the Myanmar market.

Data collection: In-depth interviews is the art of questioning and listening; quality of an interview is associated with the interview techniques. In general, the interviewer can start from some basic questions in order to establish a relaxed atmosphere and dialogue rhythm. Then they can lead to the opening questions slowly and question further when the key point appears, allowing the respondents the

opportunity to give their opinion of some important issues, and to express themselves fully and freely. Methods of questioning can be categorized into three types which include specific questions, open-ended questions and probing questions.

Firstly, specific questions refers to a specific number, amount and some detailed information. If the respondents are unable to answer some questions, the author can offer him or her a range of choices in order to grasp the real situation. Example 1 below gives some questions that researchers use at the beginning of the interview, in order to get more detailed information about the specific background of each case.

Example 1: Specific questions.

Question: In your view, what are the specific barriers in terms of government regulations for the transportation of Thai products to Myanmar?

Answer: Barriers that are encountered are customs and transportation processes including road infrastructure (road in Myanmar is wide 6m) and vehicle equipment. In addition, some sections of the road in Myanmar can only provide one lane in one direction per day and other barriers are frequent changes of laws and regulations without any notice.

The second type is open-ended questions. Specific questions are closed questions which may lead the respondent lose interest and not lead to an in-depth discussion. Therefore, open-ended questions are one of the most useful types of questions. Open-ended questions whose characteristics are adequate information and a reliable context refer to questions which do not have concrete answers and allow the respondent to think and give their opinion freely and flexibly. However, too many open-ended questions may lead respondents to miss the point of the dialogue and become confused. Therefore, it should be noted that interviewers ought to combine specific questions with the open-ended questions in order to make an active and relaxed atmosphere which will make the interview more effective.

Example 2: Open-ended questions.

Question: In your view, what are the strengths and weaknesses of your company?

Answer: Our company has a distribution network that covers the whole country. Further, our company provides a supply of trucks and has a vision to expand the transport fleet. Moreover, our company also provides short time delivery, safety

insurance service with hi-tech equipment. It brings customer satisfaction and high efficiency. Therefore, balancing sustainability efforts with customer expectations can be achieved by our company. Weakness: the company has a lack of skilled and experienced employees and the assessment by KPI. For example, the employees are not proficient in the Myanmar language. On the other hand, in transport, the company does not have their own shipping team and uses drivers who are not experienced in transportation and responsibility, and not skilled in transport accessibility. In addition, the company lacks sufficient IT to support good management of loading and transport volume. In comparison with its competitors the company lacks liability insurance. This could easily result in the loss of customers. The most serious problem is price. Indeed, the company is more expensive than its competitors. Also, in some areas, the quality of service is difficult to guarantee. Some of the staff have a bad attitude which could have a significant influence on the company image.

The third type of question is probing questions. Probing questions recommend the interviewer to ask more detailed, in-depth and complete questions based on the answer to the previous question. It can also ask specific questions for more detailed information, and open-ended questions for clarifying the facts and to discuss the main point issue. Probing questions are the main difference between in-depth interviews and the quantitative approach, as they are the soul of the in-depth interview, thus the quality of the total interview depends on the quality of the probing questions.

Example 3: Probing questions

Question: According to the company's policy, what are the key criteria for the selection of a transport route?

Answer: The key criteria for the selection of a transport route is that sometimes the company has to adjust to the real situation in order to make the operation more efficient. Actually, the company usually chooses the criteria of time and cost for the selection of the transport route.

Question: You say these criteria are essential, how important are they? Can you give the degree of importance for each of the criteria according to the range from very unimportant to very important?

Answer: Most companies believe that time and cost are important criteria and other criteria are adjusted based on the real situation. Currently, from the Thailand

border to Myanmar the road conditions and infrastructure are of a poor standard so safety, reliability, capacity should be considered.

Analysis: In order to prove the consistency between the issues in real case with the factors found in the literature review, the interview questions are based on the literature review with the factors built-in. Besides, another purpose is for the authors to figure out new factors beyond those found in the previous research.

After the in-depth interview, a large amount of text material is collected, and it is recommended that researchers should finish recording all the information obtained. Initial material management analysis can help to adjust the interview outline and research direction, and then to delete non-related issues. At the same time, new issues or points can be added in the following interview so that the amended outline can reflect social issues and reality more (Sun, 2012).

In this study, 4 steps for the materials management are utilized. At first, the materials of each case are categorized by the selection criteria that are summarized from the literature review. Then the important issues and key sentences are screened out to represent the standpoint of the respondents. Thirdly, the key words that are summarized from the text are used to complete the tables in order to compare the same factors for different situations. Finally, regular patterns and characteristics are shown in Memoing below:

Table 2 Summary of Companies and Criteria

	Cost	Time	Reliability	Safety	Risk	...
Company A						
Company B						
Company C						
Company D						
Case Company						

Memoing: As coding is the key procedure for the analysis of the interview materials, memoing is an important step to writing up an in-depth interview. During the

process of interview and data compilation, researchers should write memos to keep records for their own opinion on research, especially related people, events, ideas, thoughts and concepts and themes of confusion, which will constitute a blueprint for writing, and also to lay a solid foundation for the formal writing up of the in-depth interviews. The role of the memo is to combine different concepts, themes, events and stories together to explore the logical link between them, so that one is able to construct an emotional and rational understanding of the respondents' social life and social environment on the basis of extensive interviews (Charmaz, 2006).

Since the characteristics of a memo are extempore and prepare the author for writing up at a later stage, a memo should also reflect the tracks of the researcher's thoughts and a theoretical construction process. However, since the understanding of the thesis must rely on the reader's systematic and theoretical understanding of the research, the interview materials will be categorized and developed through the process of theory building, concept identification and analysis (Sun., 2011). The author's thinking and understanding of question is a process from question to the relevant answers, while the process from writing the memos to the final paragraphs of the article is an accumulation process.

The author designed about 20 questions for the questionnaire which requires about 90 minutes to administer. In order to obtain the key factors for the selection of the respective transport routes, the author uses purposive sampling and snow-ball sampling to interview representatives of the transport companies Thailand. This process led to a good understanding of the different companies. It should also be noted that a question on the questionnaire may provide information that belongs to more than one variable.

In order to achieve the objectives of the research, 5 semi-structured interviews (3 face to face interviews, 2 by telephone) were given to the managers from the logistics division of 6 companies during the period from April to October 2015 in Thailand. Also the author was able to read the relevant company documents. For each of the 5 cases, both primary and secondary data were collected.

3. SWOT analysis

The SWOT analysis is a strategic planning tool used to evaluate the strengths, weaknesses, opportunities and threats of a company. It provides information

that is helpful in matching the company's resources and capabilities to the competitive environment in which it operates.

Strengths: characteristics of the business or project that give it an advantage over others. Strengths describe the positive attributes, tangible and intangible, internal to an organization.

Weaknesses: characteristics that place the business or project at a disadvantage relative to others. Weaknesses are aspects of the business that detract from the value offered by the company or place it at a competitive disadvantage. It is necessary to enhance these areas in order to compete with competitors.

Opportunities: elements that the business or project could exploit to its advantage. Opportunities are external factors that represent ways in which the business is likely to prosper.

Threats: elements in the environment that could cause trouble for the business or project. Threats include external factors beyond one's control that could place strategy, or the business itself, at risk. Since it is not possible to have control over these, it is important to have contingency plans to address them if they should occur.

The resulting SWOT matrix contrasts the results of the internal analysis (strengths and weakness) and the external analysis (opportunities and threats) to define strategic fields of action. Thus, the application of a SWOT analysis is therefore instrumental in strategy formulation and selection. It uses open-ended questions to conduct interviews and collect the data from the interviews and then uses a SWOT analysis to define the strategy of a company.

Identification of SWOTs is important because they can inform later steps in planning to achieve the objectives. First, decision makers should consider whether the objectives are attainable. If the objectives are not attainable, the objectives must be revised and the process repeated.

Users of a SWOT analysis must ask and answer questions that generate meaningful information for each category (strengths, weaknesses, opportunities, and threats) to make the analysis useful and find their competitive advantages. The SWOT analysis in a social work practice framework is beneficial because it helps organizations decide whether or not an objective is obtainable and therefore enables organizations to set achievable goals, objectives, and steps to further social change or community

development effort (Quincy, 2013). It enables organizers to take visions and produce practical and efficient outcomes that effect long-lasting changes, and it helps organizations gather meaningful information to maximize their potential. Completing a SWOT analysis is a useful process regarding the consideration of key organizational priorities, such as gender and cultural diversity, and fundraising objectives. The results are often presented in the form of a matrix as below:

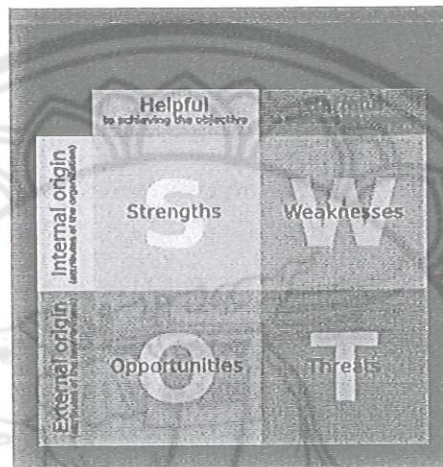


Figure 7 SWOT Analysis matrix

Source: Novicevic, et al., 2004

The questionnaire was developed for use with the personnel of the company used for the case study. The questions were designed specifically for the case study company, but it can also be used with other transport companies.

CHAPTER IV

A CASE STUDY

Introduction to companies interviewed

To answer the research objectives, it is necessary to have an overview of Thai-Myanmar transport logistics and routes. For this reason, this thesis has collected data from several approaches, conducting in-depth interviews with related persons to develop a comprehensive view of the overall situation and introduce some of the companies interviewed that were mentioned in chapter 3. In this chapter, we describe and introduce the companies interviewed, but the author will focus on introducing the a case study of the companies using transportation routes from Thailand to Myanmar at present, which includes the main border passes and sea p of Thailand and Myanmar.

1. Introduction to Company A

The mother of A Group was founded in 1975, and it has gained experience through transportation between factories and warehouses, product distribution to many wholesalers and retailers, moving service for factories, offices, houses and many government agencies.

A Group has three branches which include Trans Logistics Co., Ltd., A Logistics Co., Ltd. and A Professional Transport Co., Ltd. A Logistics Co., Ltd. Was founded in 2001 to provide cross-docking service to over 2,000 vendors who trade with superstores. Delivery is made every day through a nationwide distribution network. Consolidation operates over an area of 35,000 sqm. Based in Putthamonton and Romklao Truck Terminals. Company A 1989 can offer specific types of truck when a customer requests goods to be picked up at a factory and delivered to warehouses or stores. Different destinations may need different kinds of trucks for deliveries. There are 2 types of transportation service include trucks assigned to a customer's factory or warehouse and provide transportation to distribution centers (DC).

These 2 types of transportation service can support each other, for example, when the order is too small for a full truck load, such an order can be delivered through DC at Putthamontol or Romklao for lower lead time and cost.

Company A was the first company that provided a service to transport Thai cargo into Myanmar. Its cargo is mainly general cargo. The major commodities exported by Company A to Myanmar are consumer goods (canned fruit juices, canned fish, snacks) (60%); raw materials (pipeline, cement) (30%) and electronic products (IT) (10%). The main destination of Company A is Yangon at present, but it is expanding its cross-border transport between Myanmar-India and Myanmar-China this year. Transport modes that Company A mainly uses to transport to Myanmar are: Cross-Border (80%), Sea (15%) and Air (5%).

The mission of Company A is giving opportunities to skilled workforce combining with business partners of different strengths to provide satisfactory integrated logistics services to customers and to develop Thai logistics system to compete in the international market.

The interviewee of Company A was the Business Development Manager of A Logistics Myanmar Co., Ltd. was conducted on 20th, April, 2015 in Bangkok.

2. Introduction of Company B

Company B is one of the world's leading manufacturers of cylinder valves, regulators and brass fittings for a wide range of applications.

Company B is an award winning company which was founded in 1987 and is based in Patumthani, near Bangkok, Thailand, where they employ about 800 people in a modern factory. They are the only Thai manufacturer whose products comply with all the necessary international standards and their production facility is TPED approved, granting products to bear a pi-mark.

B Logistics Management Co., Ltd., a subsidiary of Company B Distribution Business, is a leading Third Party Logistics Provider (3PL) in Thailand. Before the financial crisis hit Thailand in 1997, B Logistics was a part of Siam Cement Co., Ltd. responsible for transportation. After having gone through painful organization restructuring processes, B Logistics was repositioned as a free enterprise and became a logistics provider company. It was named "Bangsue Transportation Co., Ltd." in 1998 and later changed to "Cementhai Logistics Co., Ltd." in 2000. It then changed to "B Logistics Management" in 2007 in order to comply with the group company's (S) brand linkage after it was considered to be one of the core businesses of Company B.

B Logistics is dedicated to offering total logistical support and transportation of products both locally and internationally. The efficient management of transportation, shipping routes as well as warehouse and hubs backed up by advanced IT systems ensures quality service that meets all the specific needs of customers. This has earned the company trust and acceptance from an increasing number of customers over the years.

B Logistics considers its value as products and services to offer to customers. The combination of main activities stated below are designed and implemented based on the requirements of each customer. There is a linkage of systems starting from the customer's requirements to implementation, followed up by a system and update process to ensure sustainable customer satisfaction. The services of B Logistics are: transportation, warehouse, product handling, logistics solution design, stock pile, cross border terminal, ESC Service, VMI, customs and formality services, and a cross border service.

The vision of B Logistics Management is that by the year 2015 it will be the Dominant Logistics Provider with sustainable development. It will serve strategic customers in ASEAN, focusing on bulk, full truck load and consolidated segments. The company ensures high value services through operational excellence, advanced technology development at partnership level.

As a service provider, Company B is one of the companies that transport cement from Thailand to Myanmar by using ocean shipping nowadays. It is also a large company in Thailand which is open to the markets of other ASEAN countries. The interviewee of Company B was the Overseas Business Manager and the interview was conducted on 11th, May, 2015 in Bangkok.

3. Introduction to Company C

Company C. was the first air express operator to provide overnight delivery from Thailand to Europe and Asia and has become number one in express and logistics in Thailand by offering customers a comprehensive range of logistics solutions.

Since 1969, Company C has employed more than 285,000 people and provides its service to 220 countries all over the world. For its contributions in the past 40 years, Company C has become the global leader of the international express and logistics industry.

As a result of its knowledge of the global internet and the local market, Company C provides professional services in express, air freight and ocean shipping, ground transportation and international postal service areas. In addition, supply chain and enterprise information solutions are two important business issues which Company C deals with in connection to logistics and enterprise solution services.

According to the growing British network shopping market, Company C Mail launched a new cross-border service for American electronic retailers and mail-order companies which is known as Track UK. As a personal parcel delivery service, Track UK offers customers a cheap, speedy, mail-tracking and customer-oriented service which fulfils the needs of American companies. Along with this service, Company C finds another way to help customers to expand their international business. Nowadays, more than 32 countries use its mail-tracking service. (Company C official website).

According to Mrs. D, Company C's most recent task is to focus on developing its Asian market. Company C has built six distribution centers in Hong Kong, Singapore, Bangkok, Seoul, Sydney and Tokyo.

4. Introduction of Company D

Company D has been established for 15-years (since 1994). With a strong industrial base and long-term experience in the field of transportation, the organization always seeks to improve the quality of services and fleets performance to meet their customers' needs for flexibility, trustworthiness, and safety at a reasonable price range to generate the greatest amount of customer satisfaction.

Company D is a commodities truck transport carrier. Two types of transport services are provided by Company D:

Full trucked load service: Company D transports commodities throughout the Kingdom of Thailand and also shipped across Thailand's border (Mae Sot, Tak) to Myawadi, Myanmar.

Partial Truck Load service: Company D has a direct route from Bangkok to Mae Sot, Tak and distributes to customers' places within service areas and Company D also has warehousing for customers who need temporary storage place. Company D provides services with Burmese-speaking and English-speaking staff to serve customers at its warehouse.

5. Introduction to the Company used for the Case Study

Thailand's first brewery was founded in 1933 by Phraya Bhirom Bhakdi. For over 80 years, the privately owned company has been a renowned beer and beverage producer, managed by 3rd. and 4th. generations of the descendants of the founder together with professionals from different fields.

At present, the company has expanded and diversified its business interests into manufacturing, packaging, agriculture, real estate, food and restaurants, as well as retail fashions, which comprise over 50 affiliated companies.

As an integral part of Thai society, the company is proud of its reputation as a good corporate neighbour. The company actively participates in local environmental support programs, offers scholarships to those attending Thailand's 25 colleges and universities, as well as providing educational opportunities for the children of the company's employees. Furthermore, the company also provides medical assistance and disaster relief under the Phraya Bhirombhakdi Foundation.

Thailand carries out ad valorem duties rate of 60% for beers products, falling to 20% in 2005, 12% in 2007, 5% in 2009 and zero tariff in 2010; for specific duty of 25 baht/liter it fell to 8.33 baht per liter in 2005, 5.0 baht/liter in 2007, 2.08 baht/liter in 2009 and zero in 2010. Ad valorem duties rate of sparkling wine is the same as for its beer products; but specific duty of 18.2 baht/liter fell to 6.67 baht per liter in 2005, 4.0 baht/liter in 2007, 1.67 baht/liter in 2009 and zero tariff in 2010.

This company also wants to seize the good opportunities as mentioned above to expand the ASEAN market. The company transports to Yangon more than other provinces in Myanmar with about 70% of the company's exports to Myanmar because Yangon has the largest population and it is near to the border with Thailand, so transport is relatively easy and convenient. In the future, the company will establish a beer factory in Myanmar or set up a joint venture to produce beer locally.

The company was established on 9 Sep. 2010 and it employs about 300 employees. The company is a logistics service provider in Thailand, which provides nationwide transportation in Thailand; WH & distribution as warehousing, stock & inventory management, cross docking, repacking, supply chain solution; import-export as sea/air, cross border, container haulage and customs clearance. Moreover, the company expects to become the logistics solution for specialists in consumer products

within the ASEAN market. To prepare for the opening up of the ASEAN market the company will work with customers and business partners to develop and improve its logistics network within Thailand and with its neighbors.

For companies trading in alcohol products, customers can receive goods at a factory or a warehouse by themselves or request the company to send products directly to a customer's warehouse which is called "Cost and Freight (CNF)" and the company charges 2.00 Baht per carton for transportation cost. Non-alcoholic products can be sent directly to customers by cash van from BRA warehouses which are established in every province. The alcohol selling process is via e-commerce to receive orders and the company then sends the products to agents directly or transfers to a warehouse after confirmation.

Moreover, from 2009 to 2013, the transport costs of the company increased year after year, but after 2013 there was a clear downward trend. This shows how the company's executives started to attach importance to the role of transportation cost that can reduce the total cost because, nowadays, transportation costs account for a significant proportion of the total logistics costs. From 2011, the company shipped products to customers directly and in 2014 case company consolidated its warehousing and products as well as establishing in 2015 a regional distribution center (RDC) and a national distribution center (NDC). The purpose of this was to reduce costs.

The company's master plans for the years 2015-2018 are to become 3PL and improve the performance of their logistics system in preparation for the development of a domestic warehouse and transport network system, expanding the network to areas along the border and in Myanmar, Cambodia, as well as finding business partners, preparing staff, and reducing warehouse and transport costs.

Transportation routes

Nowadays, there are five transport modes which are road, water, rail, air and pipeline. The details of each mode and its advantages and disadvantages are defined in Table 10 (see Appendix B). The researcher has studied and gathered information about the international shipping routes from Thailand to Myanmar. As air transport between Thailand and Myanmar is little used at present and rail transport has a poor transport infrastructure in Myanmar, this thesis has only studied the two modes of land and marine

transport. Because the research only considers general goods transportation, therefore pipeline transport has not been taken into account. Thence, the routes that have been researched for this study are as follows:

1. Transport routes

A route 1 via Mae sot border

Bangkok - Pathum Thani – Ayutaya -Nakhonsawan - Kamphaeng Phet – Tak– Mae Sot (Thailand border) – Myawaddy (Myanmar border) – Kyondoe – Pha An – Thaton- Kyaikto - Bago – Yangon

B route 2 via Singapore

Bangkok – Laem Chabang port - Singapore –Yangon Port

C route 3 via Ranong

Bangkok – Ranong port – Yangon Port

2. Transport route through major cities in Myanmar, such as: Hpa an, Thaton Kyaikto, Bago, and Yangon

3. The major sea ports and border

Laem Chabang Port. 1,602 vessel calls, 36.88% decrease, 17,634 million tons of cargo volume, 5.30% increase, and 1.584 million TEUs of containers throughput, 4.42% increase. (PAT Joined Ranong Province Establishing Ranong Port –Yangon Sister Port, 27th Petanque Port Open, the Biggest-Ever; PAT news)

Ranong Port. 105 vessel calls, 128.26% increase, 71950 metric tons of cargo volume, 244.46% increase. (PAT Joined Ranong Province Establishing Ranong Port –Yangon Sister Port, 27th Petanque Port Open, the Biggest-Ever; PAT news)

Yangon Port.

The old port of Yangon is situated at Latitude 16 47 N and Longitude 96 15 E on the Yangon river about 17 nm or 32 km inland from Elephant Point on the Gulf of Martaban. The old port has been considerably developed recently and Yangon port now extends both west of and south of the old port in a mixed management and ownership model whereby both government run ports or terminals operate side by side with privately run terminals.(YANGON PORT- INFORMATION SHEET; Capt. Ahmed Ruhullah Henderson Myanmar (Representative Office of Henderson Marine Bangladesh Ltd)).

Mae Sot border

Mae Sot is a district in western Thailand that shares a border with Myanmar to the west. It is notable as a trade hub and for its substantial population of Myanmar migrants and refugees. The town is part of Tak Province and is the main gateway between Thailand and Myanmar. As a result, it has gained notoriety for its trade in gems and teak, as well as black market services, such as people trafficking and drugs. Neighbouring districts are (from north clockwise): Mae Ramat, Mueang Tak, and Phop Phra. The Moei River serves as a natural border between Mae Sot and the Myanmar town of Myawaddy.

Trade with Myanmar constitutes the largest portion of Mae Sot's economy. It has an established market for commodities such as wholesale gems and teak. Most of the town's service industries are supported by Myanmar migrants who work in sweatshops and factories throughout the region. The Thai-Myanmar Friendship Bridge is the primary gateway for trade with Myanmar. The Friendship Bridge is about 300m long. The border region is several kilometres west of central Mae Sot, and includes the Rim Moei Market that deals in imported goods and woodwork. The town is a hub of black markets in smuggling, people trafficking, and narcotics. Pictures of the sea port, border and transport routes between Thailand and Myanmar are shown in Appendix D.

CHAPTER V

RESULTS AND DISCUSSION

This section is based on a qualitative analysis combined with a quantitative analysis and a case study analysis, the results of which will provide the information necessary to make recommendations the most suitable modes and routes of transport between the case study company Thailand and Myanmar.

In order to analyze the route potential of the four routes which are through Mae Sot, Dawei, Ranong and Dawei. The research is divided into three sections. Firstly, to analyze the substantial factors which include shipping cost, time and distance by using the time/cost-distance methodology. Secondly, by result of a summary of the literature review to design the questions for the in-depth interviews ,therefore, selection factors for transport route, for example, transportation cost, transportation time, distance, reliability, capacity, security, and convenience as in Table 7. Finally, to adopt SWOT analysis and Descriptive Research in order to help analyze the logistics strategy of the case study company.

Since existing transport modes, water way, highway, railway, air way and pipelines, have different characteristics, market adaptability and advantages, different service attributes of them can be found. Every kind of freight has its own suitable transport mode and shippers have different degrees of satisfaction when choosing different transport modes. If the degree of satisfaction of a shipper on a transport mode is higher than another, shippers think that the utility of the former is better than that of the latter, vice versa. So the evaluation and choosing probability of shippers and carriers for the five transport modes are discussed and studied based on the economics and the characteristics of the cargoes.

Next, this thesis introduces each route between Thailand to Myanmar and the author will analyze and compare the cost and time of each route by using a cost/time model.

Results of the Analysis

1. Results from the Quantitative Approach

1.1 Transportation Routes from Bangkok -Yangon

Thailand will be a major beneficiary as it has a high degree of economic complementarity with Myanmar. Thailand faces aging demographics and maturing domestic demand growth across many industries. On the other hand, Myanmar has a young population that represents a potential source of sustained growth across many sectors. The gap in minimum wages between Thailand and Myanmar also suggests a range of low-cost manufacturing opportunities for Thai companies, especially as connectivity with Myanmar improves. As Thai companies relocate manufacturing plants to Myanmar, the latter can be expected to benefit from technology transfer and increased capital in the form of machinery and technical knowledge.

Myanmar's existing ports, including Yangon, are river ports and not deep enough for larger conventional and container vessels. To cope with growing maritime trade and the emergence of larger vessels for seaborne traffic, the Myanmar Port Authority has earmarked sites for construction of deep-sea ports, including the Kyaukphyu area in Rakhine State, Kalegawk in Mon State, and Dawei and Bokpyin in the Taninthayi region.

The Dawei deep-sea port project is part of a planned, fully-integrated industrial zone that will include an industrial estate and petrochemical complex supported by a cross-border road link from Dawei to Thailand. The port will be expected to accommodate up to 300,000 dead weight tonnage (DWT) vessels. The capacity will be intended for 250 million tons of cargo throughput. Terminals for a wide range of cargo (containerized, break bulk, dry bulk, liquid bulk, and liquefied natural gas) will be included. The Dawei deep-sea port project will function as an integrated logistics hub with intermodal freight transport capabilities. A rail link from Dawei–Yangon–Mandalay–Muse (with further connection to the PRC railway system to Kunming) is under evaluation. The Dawei port will have an important role in promoting regional economic integration. The eastern coastline of Dawei lies at the end of the GMS southern economic corridor and offers strategic benefits to an industrial zone seeking connections to South and Southeast Asia.

Yangon Port is the premier port in Myanmar, handling about 90% of the country's exports and imports. It is accessible to vessels of 167-meter length overall (LOA), 9-meter draft, and 15,000 DWT. The Thilawa port area is accessible to vessels of 200-meter LOA, 9-meter draft, and 20,000 DWT. To improve accessibility to Yangon's port areas for bigger vessels and expand capacity to handle growing seaborne cargo traffic, the Myanmar Port Authority has been taking initiatives to improve the Yangon River access channel and to establish the industrial zone at Thilawa port as a special economic zone (SEZ). Its facilities include Myanmar International Terminals Thilawa (MITT) and Myanmar Integrated Port (MIPL); new berths with palm oil storage tanks are under construction. MITT and MIPL are situated midway between the entry of the Yangon River and the inner ports. Given that there is more draft at MITT and MIPL, larger vessels can dock at their ports and can be loaded with more cargo than at the inner ports. Also at MITT, the arrival and departure of containers are more efficient due to the location of a rail terminal inside the facility. The target market for the SEZ will be local investors from Myanmar as well as foreign investors from Japan, the Republic of Korea, the PRC, Singapore, Thailand, Malaysia, and other countries (Min and Kudo, 2012).

Nowadays, there are 4 main transport routes for the transportation of Thai products from Bangkok, Thailand to Yangon, Myanmar which are via Mea Sot border, Mea Sai border, Dawei and Ranong. Meanwhile, the author summarizes the rated criteria selection transport route from the review of previous studies and analyzes the cost and time of each route in order to find the most suitable transport route. The 4 routes are shown in Figure 8.

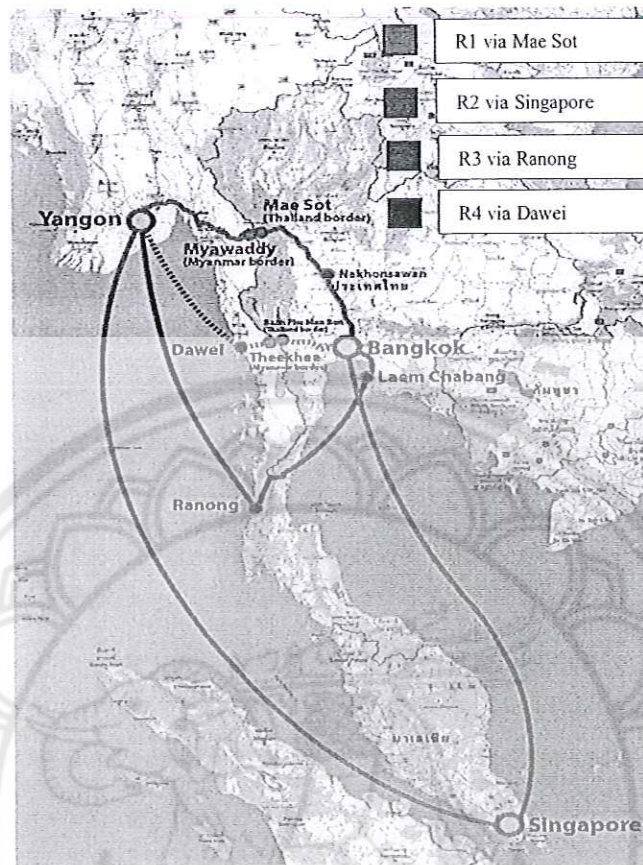


Figure 8 Transport routes via Mae Sot, Singapore, Ranong and Dawei

1.2 Introduction to transport route via Mae Sot border

Transport route via Mae Sot border through AH2 highway until Tak city and changed AHI across Mae Sot border Thailand side into Myawaddy Myanmar side and changed NHI in Myanmar until Yangon city which is to the main cities as Bangkok, Ayutaya, Nakhonsawan, Tak (Thailand), Kyondoe, Pha An, Thaton, Kyaikto, Bago and Yangon (Myanmar). This route has distance about 950 km that takes around 75 hours to transport. Most roads in Thailand are paved roads with 4 lanes 20 meters wide and the terrain is flat but in Myanmar there are potholes in the roads and there are 2 lanes about 7 meters wide with no pavement. Both sides of the road are forests interspersed with agricultural areas such as rice fields, and rubber trees. The cement factory is located between the Thaton city and Hpa-an. There are tolls along the way

when pass in or out the city (locals keep the money to improve roads and bridges). The toll rates will vary on each border and the size and type of vehicle.

The route is used as a trade route transport by cargo trucks from Mae Sot, Thailand to distribute goods in Myanmar. Between Kawkaireit and Tenasserim Mountain Myawaddy coast with distance 33 km is very dangerous and there are frequent accidents because of earth and rocks falling from the mountain sides. Because the route is steep slopes up-down and winding along mountainside. Slurry is a malfunctioning interspersed with gravel and there are no shoulders beside the road and some sections have landslides which require caution. The trip takes about 3 hours because there is one-way traffic in some areas and the direction of the traffic is toggled on alternating days (even and odd days).

The distance and the road condition from Thailand to Yangon, Myanmar through Mae Sot border, through Singapore Port and Ranong Port in each range is summarized in Table 11-13 (see Appendix C).

1.3 Analysis of transportation time and cost

This research studies and analyzes transportation time and cost of the four routes mentioned above and the studies transport products are general merchandise, therefore, calculates the cost and time of general merchandise transport with the 45 feet container. The author has collected preliminary data from transport entrepreneurs to analyze the transport cost and time so as to get the most realistic figures. The results of the analysis are divided according to the routes as follows:

1.3.1 Route 1 via Mae Sot border

To study transport route from Thailand to Myanmar pass Mae Sot border find, the origin is Bangkok (Thailand) and the destination is Yangon (Myanmar) with a total distance around 947 km and takes about 123 hours which takes 120 hours to transport and 3 hours at customs (Table 3 and Figure 9,10).

Taking the data into the model, both the time and cost could be illustrated as below Figures 9 and 10. Both charts demonstrate clearly that transport via the border consumes time and cost to an unbalanced percentage compared with distance. In terms of the time and cost in total, 39% to 41% time and 31% to 34% cost is consumed at border –crossing, although the distance of border takes only 0.5% in total length of this route.

Table 3 The distance, time and cost of R1 via Mae Sot border

Detail	Route				Total
	Bangkok Thailand	Mae Sot border	Myawaddy border	Yangon Myanmar	
Distance (km)	497			450	947
Transportation time (H)	48			72	120
Transportation time (Baht)	29900			61200	91100
During the customs clearance (H)		1	2		3
Customs fees and charges		1500	2800		4300
Total cost (Baht)					95400

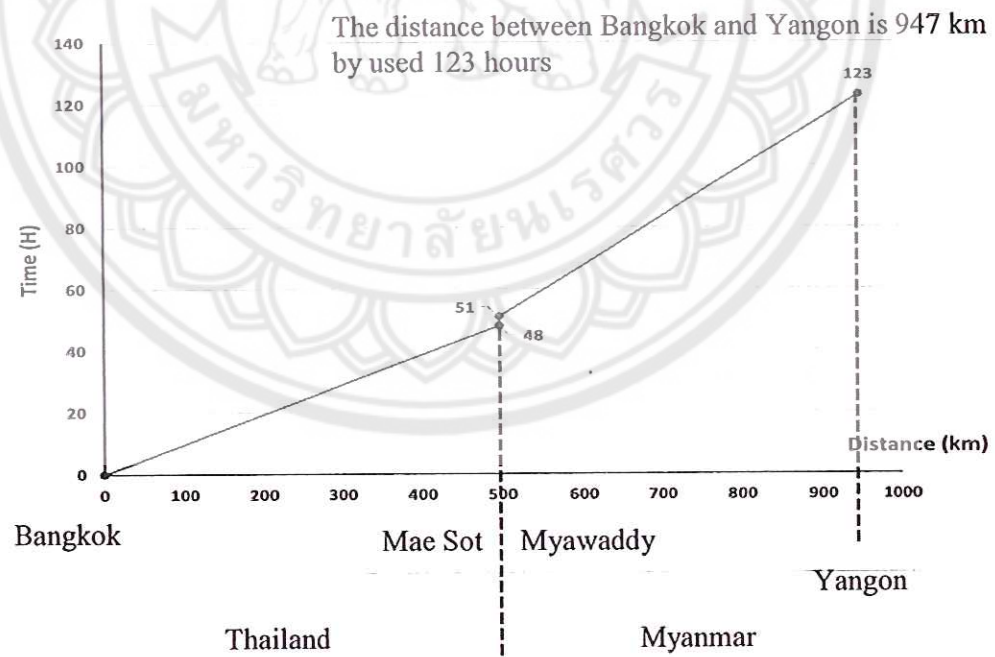


Figure 9 Transportation time of R1 via Mae Sot border

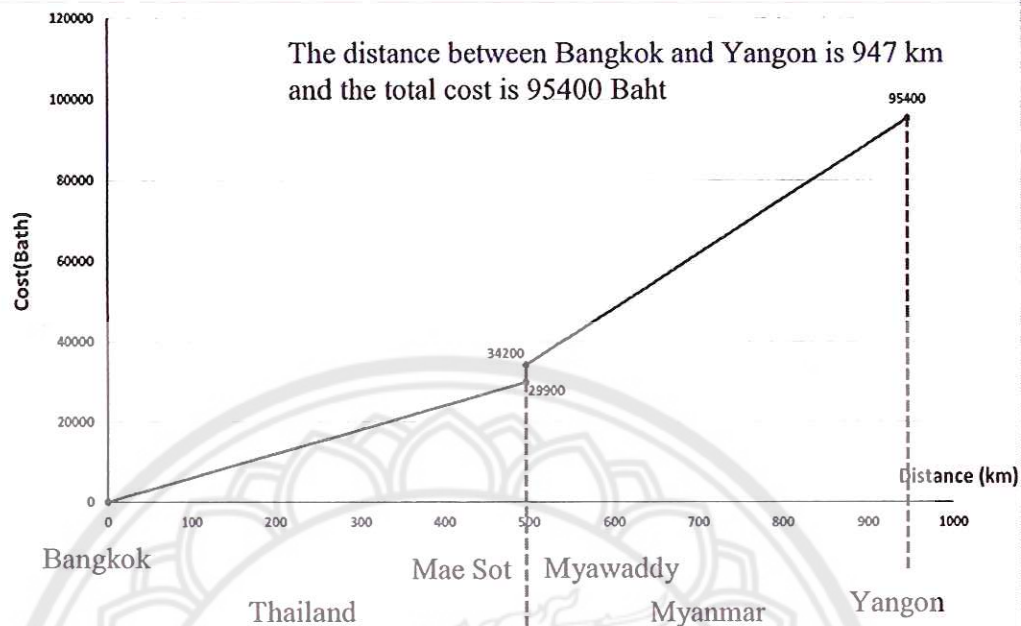


Figure 10 Transportation cost of R1 via Mae Sot border

Figure 9 shows the time-distance chart of freight transport between Bangkok and Yangon. Both charts demonstrate clearly that transport via the border consumes time and cost to an unbalanced percentage compared with distance. In terms of the time and cost in total, 39% to 41% time and 31% to 34% cost is consumed at border-crossing, although the distance of border takes only 0.5% in total length of this route. The route takes a total of 5.13 days to deliver cargo covering a distance of 947 km. As seen in Figure 9, the bottlenecks in the transport route are represented by time delays (vertical offsets) at Mae Sot border and in the area of Myanmar. The total clearance and transshipment process at Mae Sot border takes 3 hours including document processing. However, from the Myawaddy border to Yangon is shorter than Bangkok to Mae Sot but it takes longer transport time because in the Myanmar there is one day one way that leads to take more time to transport in Myanmar. The part of Myawaddy border to Yangon takes 72 hours to deliver cargo covering a distance of 459 km. The section of Bangkok to Mae Sot takes 48 hours with 497 km because in the Myanmar there is one day one way that leads to more time to transport in Myanmar.

Moreover, Figure 10 shows cost-distance chart of freight transport between Bangkok and Yangon. In Thailand the average cost of transportation of 1 TEU of cargo within Thailand from Bangkok to Mae Sot border by road is about 29,900 Baht, 30% of total cost. And the cost of border is 4300 Baht per TEU for border crossing, customs clearance and transshipment process. Furthermore, in Myanmar the average cost of transportation is 61200 Baht, 64% of total cost, even if the distance in Myanmar is shorter than in Thailand.

1.3.2 Route 2 via Singapore

Table 4 The distance, time and cost of R2 via Singapore

Detail	Route			Total	
	Bangkok Thailand	Laem Chabang	Singapore Port		Yangon Myanmar
Distance (km)	126		791	1117	2034
Transportation time (H)	2		80	112	194
Transportation time (Baht)	8000		12190	17210	37400
During the customs clearance (H)			48		48
Customs fees and charges		2000		3000	5000
Total cost (Baht)					42400

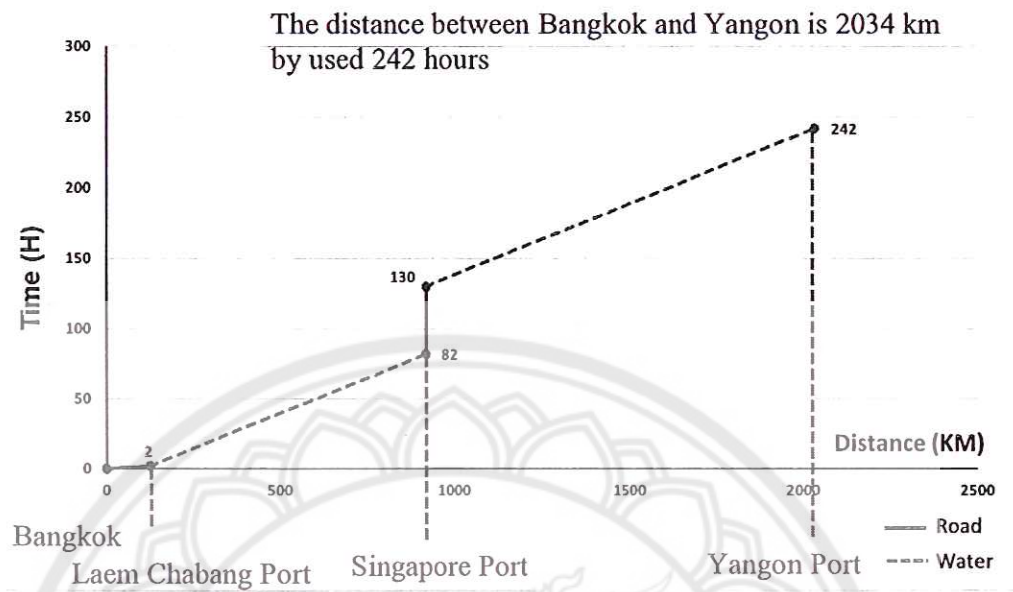


Figure 11 Transportation time of R2 via Singapore

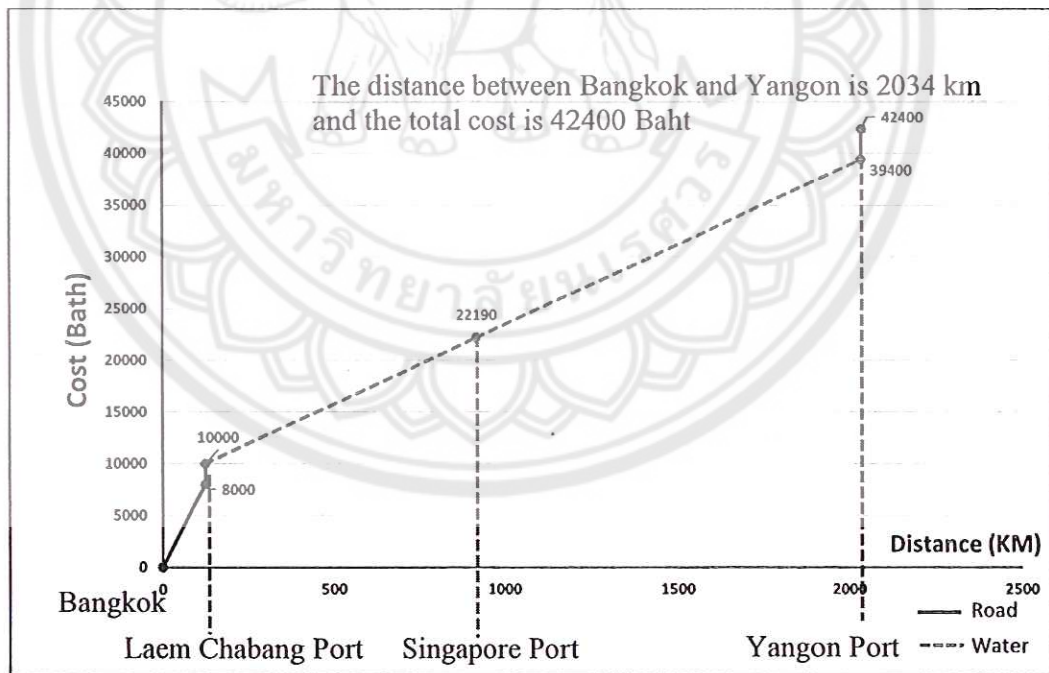


Figure 12 Transportation cost of R2 via Singapore

Figures 11 and Figure 12 show the time-distance, cost-distance of freight transport between Bangkok and Yangon by multiple modes of transport. The mode of transport used for Bangkok-LaemChabang Port is road and LaemChabang Port-Singapore port until Yangon port is maritime. The route takes a total of 10-11 days to deliver cargo covering a distance of 2034 km and spend total cost is about 42400 Baht wherein 2000 Baht is the cost for customs at Singapore port and 3000 Baht at Yangon port. The process of loading and unloading, documentation, customs clearance and transshipment at Singapore port take a total of 2 days, a time-consuming process in this route. This information was obtained from the Perma Shipping Line Company. The roads of Bangkok to border Thai-Myanmar traffic are essentially the same in each leg which from Bangkok to the city of border is 4 lanes and from city of border to border is 2 lanes, has steep gradients, rugged terrains, both sides are mountain so the speed inland of Thailand also essentially the same the reason why the transportation cost and time are calculated for R1. The border and road conditions are show in Appendix D.

1.3.3 Route 3 via Ranong

Table 5 The distance, time and cost of R3 via Ranong

Detail	Route			Total
	Bangkok Thailand	Ranong Port	Yangon Myanmar	
Distance (km)	600		1090	1690
Transportation time (H)	8		72	80
Transportation time (Baht)	36100		21000	57100
During the customs clearance (H)		24		24
Customs fees and charges		2000	3000	5000
Total cost (Baht)				62100

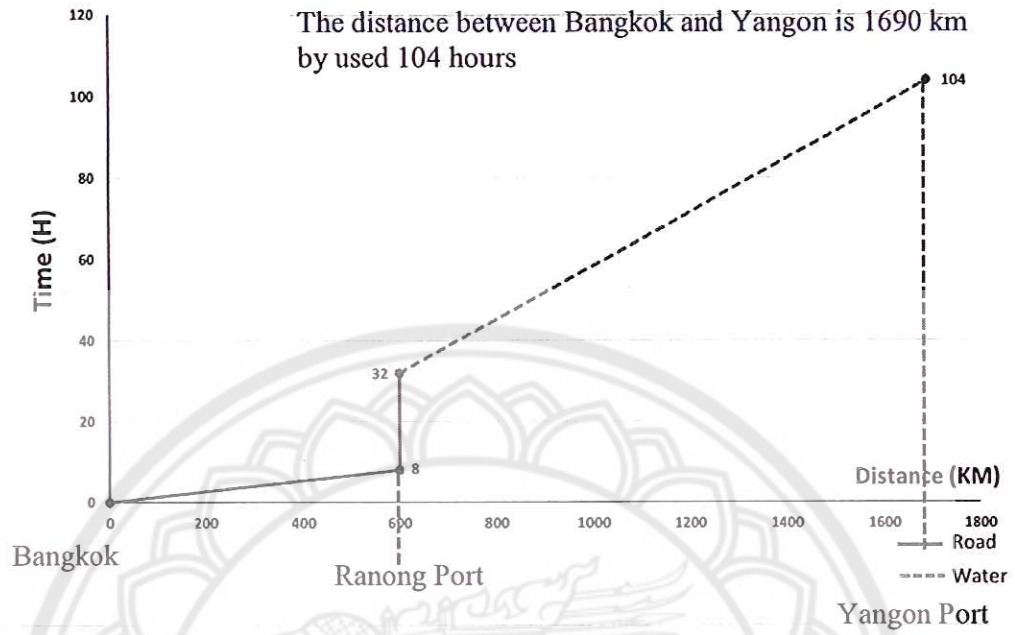


Figure 13 Transportation time of R3 via Ranong

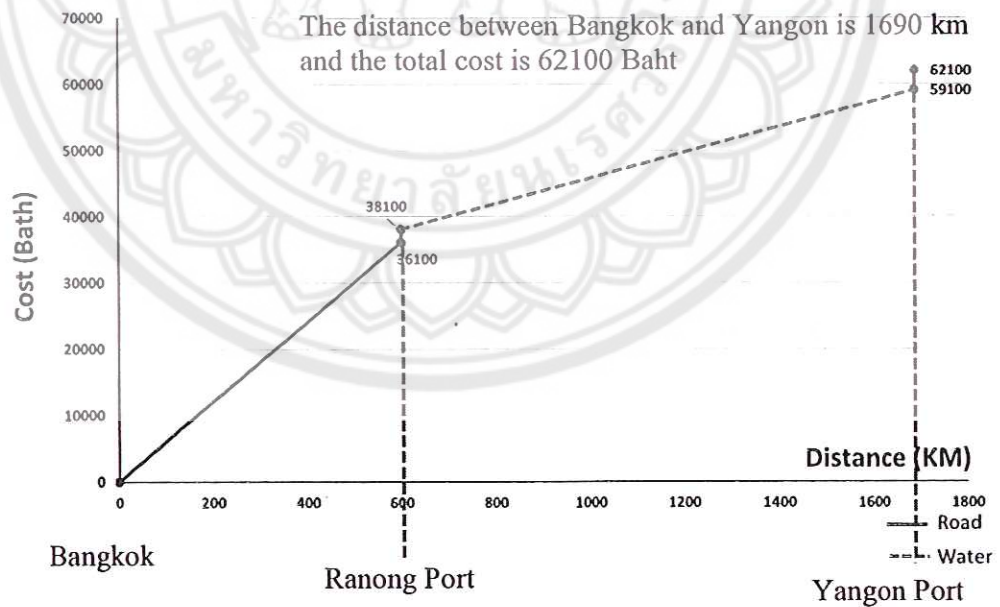


Figure 14 Transportation cost of R3 via Ranong

Figures 13 and 14 show the time-distance, cost-distance of freight transport between Bangkok and Yangon by multiple transport. The mode of transport used for Bangkok-Ranong Port is road and Ranong Port -Yangon Port is maritime. The route takes a total of 104 Hours to deliver cargo covering a distance of 1690 km and spend total cost is about 62100 Baht wherein 2000 Baht is the cost for customs at Ranong Port and 3000 Baht at Yangon Port. Base on the speed of ocean shipping is the same so the transportation cost and time are same. Furthermore, the cost of customs also as same. So the road transportation cost and time are calculated based R1 and ocean shipping cost and time are calculated based R2. The process of loading and unloading, documentation, customs clearance and transshipment at Ranong port takes about one day, a very time-consuming process on this route.

1.4 Comparative analysis of transport routes

To find a potential route of transportation from Bangkok, Thailand to Yangon, Myanmar by making a comparative analysis of the three routes.

1.4.1 Comparative analysis of transportation time (Figure 15)

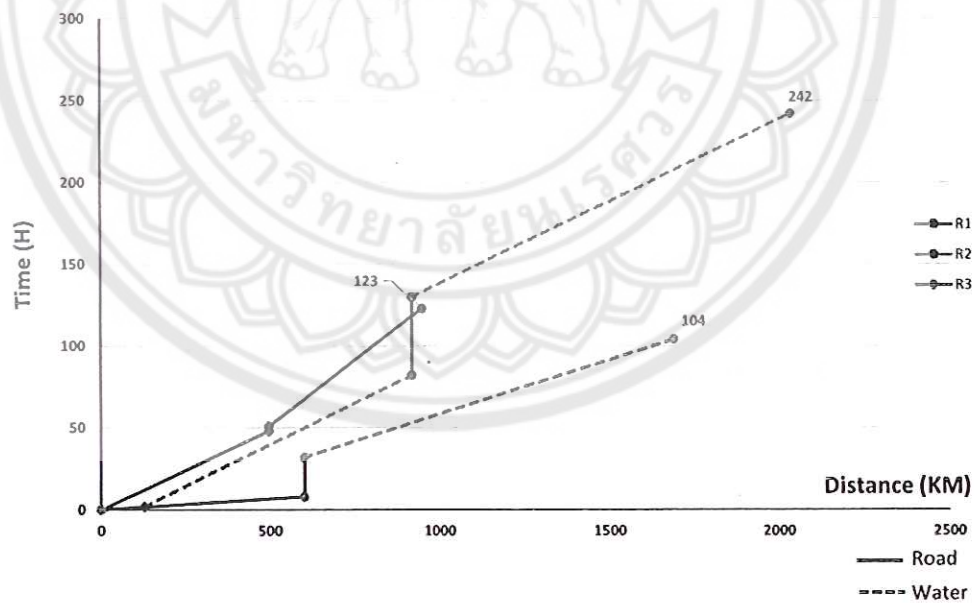


Figure 15 Comparative analysis of transportation time (3 routes)

1.4.2 Comparative analysis of transportation cost (Figure 16)

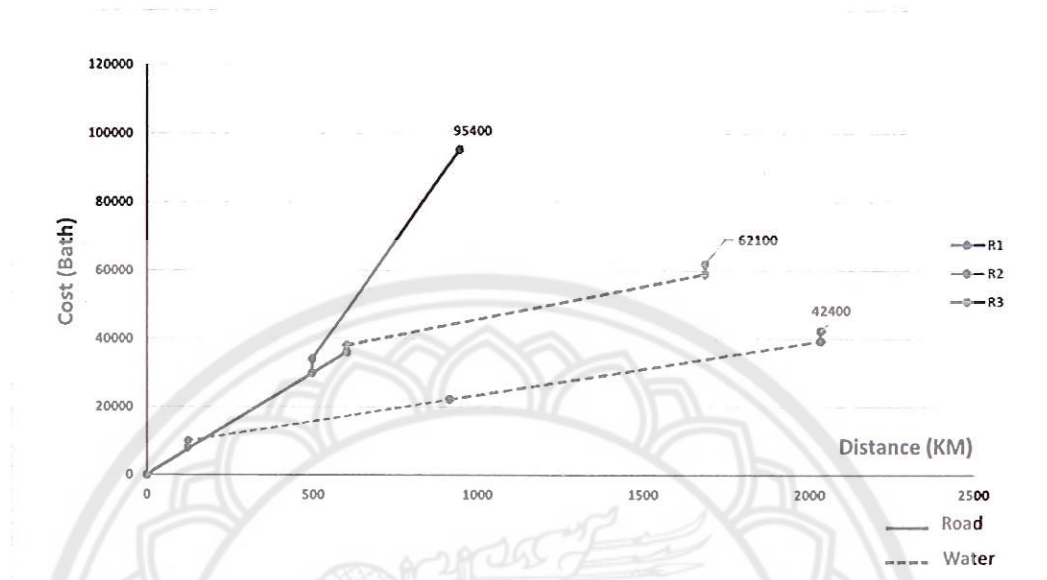


Figure 16 Comparative analysis of transportation cost (3 routes)

Figures 15 and 16 show a comparison of time and cost for three routes from Thailand to Myanmar. It can be concluded that the distance of Route 1 is shortest of the least time with highest cost and, the distance of Route 2 is longest of the most time with the least cost. While the distance of Route 3 is between that of the Route 1 and the Route 2, so it takes least time, but at a total cost of 62,100 Baht.

From the results, it is concluded that the multi-modal transport has the superiority in both time and cost in general, which has the potential to attract bilateral trade and decrease the logistics cost at the same time. It is also necessary to predict a further possible new route linking Thailand and Myanmar, which is the Dawei project.

The Dawei project, projected to be completed by 2016–2017, is perhaps the most promising of all projects in terms of trade potential. The project, approved by the Thai government, has the potential to become a major logistical hub that can boost connectivity of India's Chennai, Kolkata, and Vishakhapattanam ports with Southeast Asian ports by several folds, thereby increasing the commercial output by leaps and bounds. Still, in June 2013 the governments of Myanmar and Thailand set

up a special purpose vehicle (SPV), each holding 50% of shares in the new entity entrusted to be the concessionaire to develop, manage, and promote the Dawei project.

Based on the hypothesis that the impact factors are same as the three routes mentioned above, the Figures 17 and 18 show the total transport distance of the new route, which is close to the first route, but the transport time and cost are expected to be reduced by about 50% (from 123 hours to 71.5 hours) and 52%, lowering from 95,400 Baht to 46,000 Baht. So the new route via Dawei will be the economic optimal selection route from Thailand to Myanmar in the future.

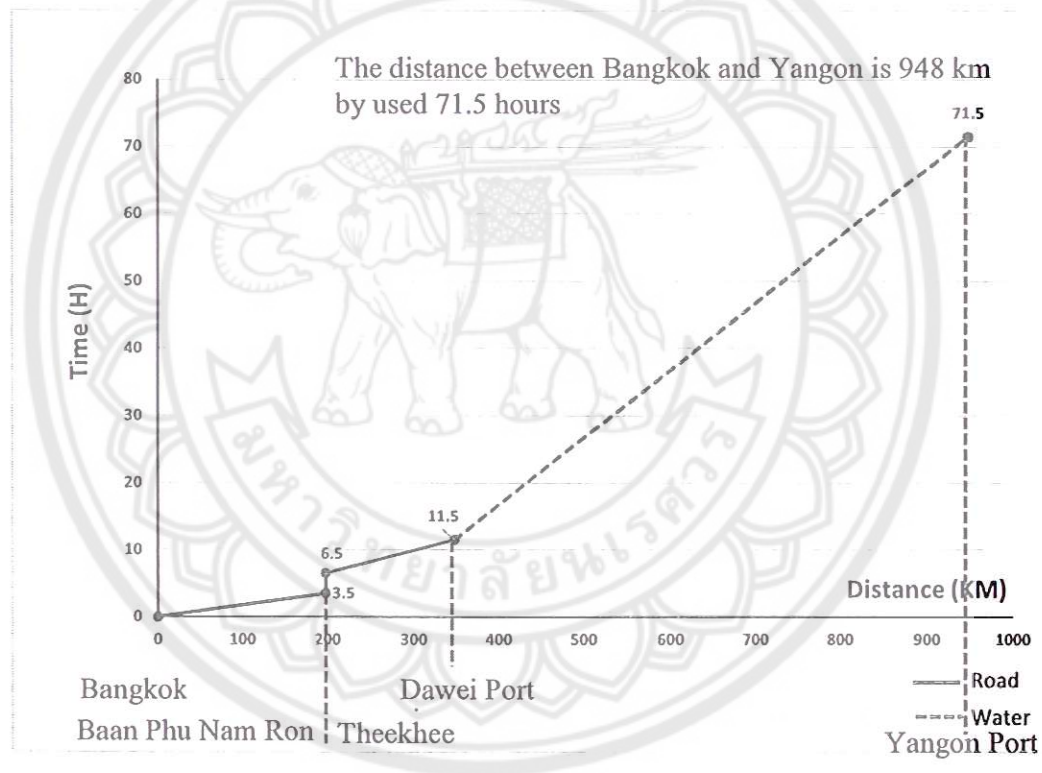


Figure 17 Transportation time of R4 via Dawei

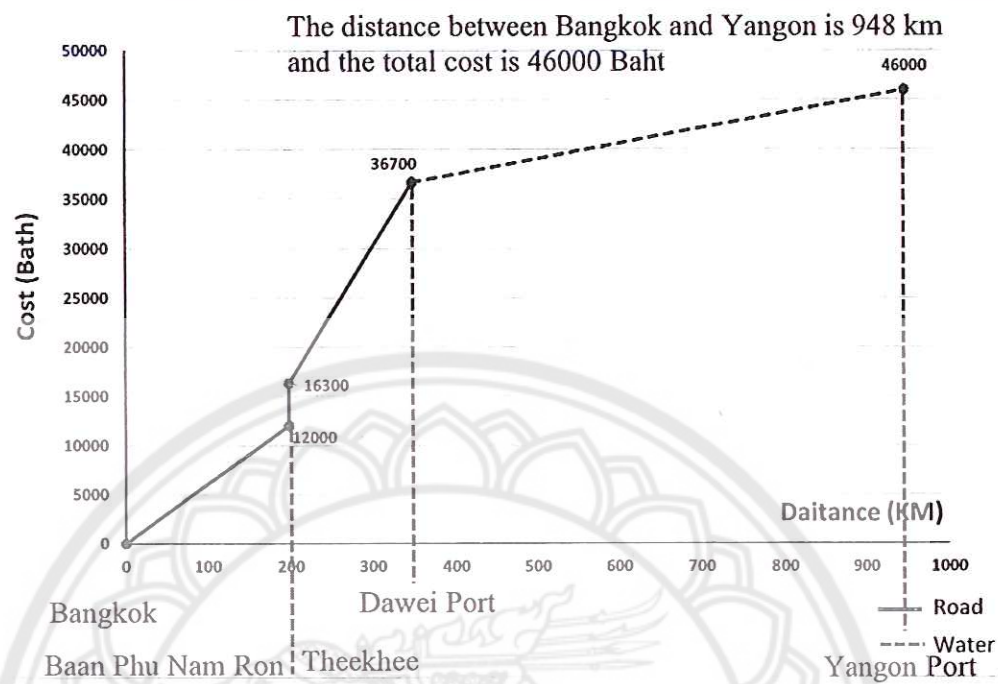


Figure 18 Transportation cost of R4 via Dawei

Table 6 Summary of results

Route	Distance (km)	Time (H)	Cost (Baht)
R1	947	123	95,400
R2	2034	242	42,400
R3	1690	104	62,100
R4 (New)	948	71.5	46,000

Table 6 shows the shortest route is via Mae Sot border and uses less time than the Ranong Port route but the lowest cost is via Singapore Port. Therefore, the Ranong Port route is currently a good choice. If the Dawei Port is finished, it will be the optimal route because the distance, time and cost of this route is are better than for the other routes.

1.5 Benefits in cross-border infrastructure projects

A cross-border infrastructure project is either an infrastructure project with activities involving two or more countries, or a national infrastructure project that has significant cross-border impact (Fujimura 2010). Governments must carefully examine the implications of the costs and benefits, including how they are allocated, to get political buy-in and build credibility with the public, especially local communities in the host country. Project stakeholders are the people, groups or institutions that are likely to be affected. They may be in a position to enhance or threaten project implementation.

Myanmar recently suspended work on several large infrastructure projects that faced public opposition. These include the Myitsone Dam on the Ayeyarwady River, a coal-fired power plant in Dawei, and two hydroelectric projects that were being planned with India's assistance at Tamanthi and Shwezayay on the Chindwin River. The government cited social and environmental impacts in its decisions to suspend these projects and subject them to further review.

Notwithstanding the issues faced by these projects, Myanmar has efficiently hosted major cross-border projects in energy. It is currently a net exporter of natural gas to its neighbors. After economic sanctions starting in 2000 were imposed, the government began to rely heavily on the export of energy resources as the main source of foreign exchange. Strong demand from neighboring countries, particularly Thailand and the PRC, made this possible. Two major offshore gas fields, Yadana and Yetagun, have been supplying natural gas to Thailand since 2000. In 2004, the discovery of the Shwe gas field off the coast of Sittwe was announced. Production from the Shwe field for export to the PRC through an overland pipeline commenced in 2013.

For Myanmar, the project helps in diversifying exports of energy resources and sources of foreign exchange earnings beyond Thailand. The latter currently accounts for 75% of Myanmar's gas output. Considering that the PRC will purchase natural gas from Myanmar for the next 30 years, the project will be a major source of foreign exchange earnings and help reduce Myanmar's trade deficit. The project will also bring to Myanmar direct benefits in the areas of taxation, investment bonuses, transit fees, training, and capital for social aid, as well as job opportunities.

A transport network in Myanmar providing viable multimodal routes to India should help promote trade, attract FDI, and support tourism in Myanmar in the long run. Currently, there is little demand for land transit freight traffic through the India–Myanmar border. India’s northeast region is geographically isolated from the rest of the country and poorly integrated with the national economy. The prospects for economic complementarity between India’s northeast region and Myanmar are unclear. The region has little capacity to produce goods for export to Myanmar and the rest of Southeast Asia.

On the other hand, a high degree of economic complementarity exists between Myanmar and Thailand. Further considerations include the challenging labor and business environment in Thailand, shorter land-based travel compared to sea travel between the two countries, the existence of trade and production facilities at the border, the relatively low cost of hard infrastructure, and the prospects for employment generation as companies move to Myanmar. Also when the ASEAN economic partnership is realized in 2015, logistics costs will be reduced further. This should provide a boost to Myanmar’s export opportunities.

The government has contributed minimal resources toward improving road and rail connectivity between South Asia and Southeast Asia. Despite assistance from India, several major road projects have either stalled or continued to remain at the conceptual stage due to lack of commitment from Myanmar on its share of the responsibilities. The India–Myanmar–Thailand Trilateral Highway is expected to link Moreh, India, to Mae Sot, Thailand, through Mandalay, Myanmar. In Myanmar, about 1,500 km is still unpaved or impassable links despite the project being in the pipeline for the last 15 years. Only the Tamu–Kalewa–Kalemyo link (160 km) has been upgraded with the costs of construction and maintenance being shouldered by India. Myanmar has only agreed in concept to supporting the trilateral highway and has yet to upgrade the roads beyond this link.

Pursuing regional connectivity involves risks and uncertainties for Myanmar. It can aggravate social problems such as illegal migration, human trafficking, and spread of disease. Since 1992, Myanmar nationals have been migrating illegally to Thailand on Myanmar’s eastern border to join the Thai labor market where wages are higher. As a consequence, the pool of skilled and unskilled workers in Myanmar has

been reduced considerably. Other constraints to connectivity are illegal migration causing unrest, illegal border trade, and lack of border security. Myanmar must manage these issues as part of a reform agenda to promote connectivity with South Asia and Southeast Asia.

Myanmar's investment in bridges and other key infrastructure have created opportunities and reduced financing risks for future connectivity projects. Road and rail projects are mainly funded through government expenditure and some Build-Operate-Transfer (BOT) arrangements with domestic investors. The Myanmar portion of the GMS North-South Corridor, which has shortened travel time (to half a day) between Thailand, Myanmar, and the PRC, was built on a BOT basis with contractors from the PRC and Thailand. Prior to 1986, Myanmar received development funding for major highway projects (for example, from ADB for the Rangoon–Prome road, and the Australian Agency for International Development for the Bassein–Monywa highway) but it has received almost no development funding since 1988.

The cost of the simplest road-based connection between South and Southeast Asia, the trilateral highway, is estimated as \$841 million, with most of the costs being in India and Myanmar. The cost of the three-country Trans-Asian Rail Link is approximately \$1.48 billion, with the cost for India, Myanmar, and Thailand, respectively, estimated as \$649 million, \$344 million, and \$491 million. South to Southeast Asian road and rail physical connectivity can therefore be achieved for \$2.2 billion. The amount would be shared by three countries and spread over several years, thereby making investment more manageable—for example, with investments of \$200 million per year by each of the three countries for 4 consecutive years.

Results from the Qualitative Methods

1. Questionnaire and In-depth Interview

1.1 Selecting the key related criteria by qualitative analysis

In collecting data from shippers in Thailand, it was determined that information would be needed on the physical attributes of goods shipped, why the existing mode was chosen, what options currently exist for movement of goods, and what plans if any exist for goods movement in the future. Utilizing perspectives from a number of reports and studies from the literature review, a table was developed to group

the various mode choice factors, then the point in time at which the factors come in to play were identified. Table 7 displays the various choice of mode factors that affect the choice of a freight mode. Displayed also are the stages in the freight decision making process when each factor comes into play.

In order to select the key factors the author has not only reviewed previous studies, but also has used purposive sampling and snow-ball sampling to interview some representatives of the transport companies. Each factor has been rated by the interviewees (Table 7).

According to the results of in-depth interviews with transport entrepreneurs who transport Thai products to Myanmar, we can make a summary of which selection criteria for transport routes should be considered by the transport companies. The results are shown in Table 7 below.

Table 7 Criteria and rating used by Transportation Company for the selection of transport routes

Criteria	Company A	B	C	D	The case study company	Total	Average value
Cost	5	5	5	5	5	25	5
Time	5	5	4	4	5	23	4.6
Reliability	5	4	5	5	4	23	4.6
Safety	4	4	4	5	5	22	4.4
Risk	3	3	4	5	5	20	4
Capacity	2	3	3	5	4	17	3.4
Accessibility	5	4	5	3	5	22	4.4
Product characteristics	4	3	4	3	5	19	3.8
convenience	3	3	3	4	4	17	3.4
Traceability	3	2	2	5	4	16	3.2
Flexibility	5	4	4	4	4	21	4.2
Distance	2	2	3	4	4	15	3
Cargo value	2	4	3	3	4	16	3.2
Cargo volume	2	4	3	4	4	17	3.4
Transportation frequency	3	3	2	4	4	16	3.2
speed	4	4	2	5	5	20	4
Suitability	2	2	2	3	4	13	2.6

Remark: 1=Very Unimportant; 2=Unimportant; 3=Neutral; 4= Important; 5=Very important

Note that each of the four rows will form a separate variable that contains the appropriate numeric code from 1 to 5.

Table 7 shows many companies think the important factors which are related to the selection of the transport routes are cost, time, reliability, safety, accessibility, flexibility, and product characteristics. From the review of the previous studies and the results of in-depth interviews we can obtain the major criteria that the transport entrepreneurs would consider to be the 6 key factors that are transportation cost, time, reliability, safety, accessibility and flexibility. According to the literature review and in-depth interviews, transportation cost and time have the most important role in logistics management. Thus, we will now discuss the details of transportation cost and transit time during transportation.

1.2 Analysis of the data and the general condition of the routes

This research adopts a descriptive research approach to analyze the data and the general condition of four routes from Bangkok, Thailand to Yangon, Myanmar via Mae Sot border, Singapore port, Ranong port and the Dawei port in the future. In order to find the potential advantages of route the author applies purposive sampling and snow-ball sampling to interview the companies who provide transportation services between Thailand and Myanmar. The results from the interview are as follows:

1.2.1 Reliability and Safety

R1 via Mae Sot border the paved road in Thailand from Bangkok to Tak is 4 lanes asphalt road and from Tak to Mae Sot border is 2 lanes asphalt road in the past but now it is expanding into 4 lanes. Thus, it will be more convenient for transport products from Thailand to Myanmar and it will reduce the lead time. There are many winding mountain roads on this route which is why many accidents occur. From the opposite side of the Myawaddy border to Yangon Port there is a one-way system at some points which cause more lead time, but the government of Myanmar is establishing a new route so the one-way system will no longer be necessary.

R2 via Singapore Port the paved road in Thailand from Bangkok to LaemChabang Port is 4 lanes asphalt road, from LaemChabang Port to Yangon Port is transported by ship which there is little loss or damage. Ocean shipping can transport large cargo volumes, but is relatively slow and takes a long time.

R3 via Ranong the paved road in Thailand from Bangkok to Phu Nam Ran border Town in Kanchanaburi is 4 lanes asphalt road and from Phu Nam Ran border to Ranong Port is 2 lanes asphalt road in the past but now it is expanding into 4 lanes. This will be more convenient for transport products from Thailand to Myanmar and it will reduce the lead time. There are many winding mountain roads on this route which is why many accidents occur. From Ranong Port to Yangon Port is ocean shipping.

R4 via Dawei this project is in progress it will be 2 lanes asphalt road when it is finish. If this can be used that will be shortest distance and the less time to transport cargo from Thailand to Myanmar. So it will reduce costs.

1.2.2 Accessibility

Nowadays, most shippers use the R1 via Mae Sot because it is road transport for the entire route and it is the shortest distance from Thailand to Myanmar. It is more convenient than R2 and R3.

1.2.3 Flexibility

As we know, road transport is more flexibility than other modes, which can transport door to door but there are also high costs. R1 is the optimal route to transport cargo from Thailand to Myanmar at present. The customs services at Mae Sot are well developed and help carry out transit procedures faster.

Next, the thesis discusses the procedure and barriers to the export sale and distribution of beer in Myanmar and the related laws, policies and cultural traditions for transportation the products from Thailand to Myanmar.

1.3 Procedure and barriers to the importation of beer to Myanmar

From the results of the questionnaire and the in-depth interviews we can summarize the procedure and barriers to the export sale and distribution of beer in Myanmar and the related laws, policies and cultural traditions as below:

The procedure and barriers of import sale distribution beers in Myanmar.

1. Myanmar may protect a local beer from foreign competition.
2. Myanmar may restrict the amount of imported of imported beer into the country.

3. Myanmar may increase tariff in order to add revenues for their country.

4. Increasing transportation cost is also a big barrier for exporting beer.

5. Packaging of beer that can be destroyed easily.

1.4 Related laws and policies

Thailand encounters border trade barriers with neighboring countries due to different laws, policies and cultural traditions of each country. The barriers of transport crossing border into The Union of Myanmar are listed below:

1. Political issues.
2. The legal regulations of the two countries are not conducive to border trade.
3. Transport routes in Myanmar which link with the Thailand border are in a state of dilapidation.
4. Billing issues in addition to the official procedures at the border have increased greatly.
5. The lack of purchasing power.
6. Fighting between minorities and the Myanmar government.
7. Lack of communication.
8. The lack of trust between the government of Myanmar and Thailand.
9. The boycott by the United States and the European Union.
10. The delay of the MIC unit in the Ministry of Transport of Myanmar.
11. Thailand will be raised temporarily permitted area of trade border to allow the crossing point to be more permanent.
12. Ignorance of the Myanmar language.
13. Myanmar officials changed frequently.

2. Results from the Case Study by a SWOT analysis

Next, the author uses a SWOT analysis to analyze the case study company's logistics strategy. As the interview of the case study company know that can only transport cargo to Thailand and Myanmar border then transferred to Myanmar agents but cannot transport cargo across border into Myanmar by itself directly. The transportation model of the case study company is shown below (Figure 19):

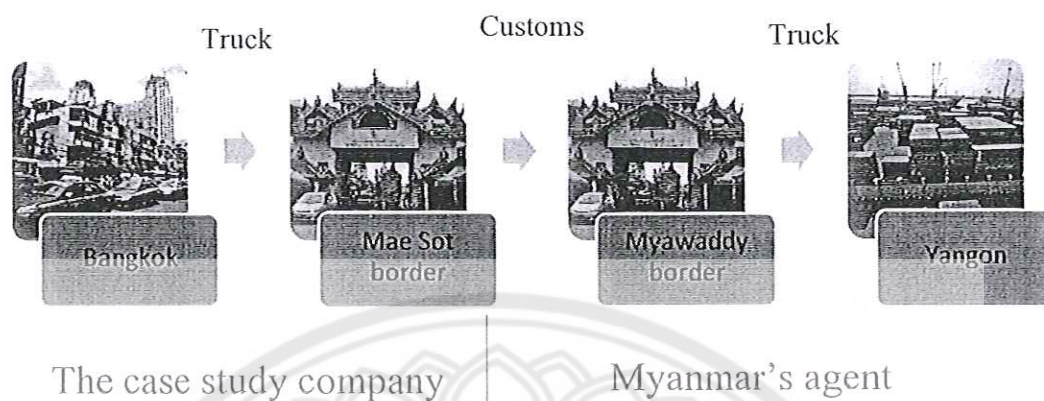


Figure 19 Case Study's transportation system

Many shippers in Thailand use the same model at present, they just transport to the border of Thailand and Myanmar, there is very little company transport the products into Myanmar by itself in Thailand. Transporters in Thailand use trailer semi-trailer to transport products to cross border and then change mode to 6 wheels for transport in Myanmar. As we already know, Company A transported products into Myanmar by itself, moreover, it has an office in Myanmar. Meanwhile, Company B also transport products into Myanmar by itself, Company B use both cross-border transport and ocean transport.

Due to strong competition and a continuous market change, most companies engage in strategic planning today to become or stay competitive in the long run. Strategy is all-embracing. Strategy has to capture internal and external aspects that are the means to competencies and market opportunities. Strategy has to keep in view the company, the customers and the competitors.

The challenge is to create customer values and competitive advantages to assure benefits and growth. As a result, the starting point of every strategic decision demonstrates the recognition and the analysis of the company's current situation containing a high variety of parameters. These parameters are generally defined by the company's influence into internal and external parameters. However, the understanding

of the company's situation is only defined in absolute by analyzing parameters and its bilateral dependencies. Therefore, the combination of the company's internal factors and the external environmental circumstances presents the basis for the strategy development and the resulting organizational marketing goals and application of the marketing instruments (Meffert 2000).

The SWOT analysis is a strategic planning tool used to evaluate the Strengths, Weaknesses, Opportunities and Threats of a company. It provides information that is helpful in matching the company's resources and capabilities to the competitive environment in which it operates. The resulting SWOT matrix contrasts the results of the internal analysis (strengths and weakness) and the external analysis (opportunities and threats) to define strategic fields of action. The application of a SWOT analysis is therefore instrumental in strategy formulation and selection.

In order to get the data to adopt SWOT analysis the author had an in-depth interview with the case study company, from which the author used three steps to process the data which were taking notes, coding and memoing after the interviews were finished. Then, a SWOT analysis was adopted to examine the logistics strategy of the case study company as follows. (Figures 20 and 21).

By combining all the external and internal factors discussed above, the SWOT matrix of for the case study (see Figure 20) shows what strengths, opportunities, weaknesses, and threats the case study company has to answer objective 4, which is to develop a logistics strategy for transporting beer products across the border to Myanmar.

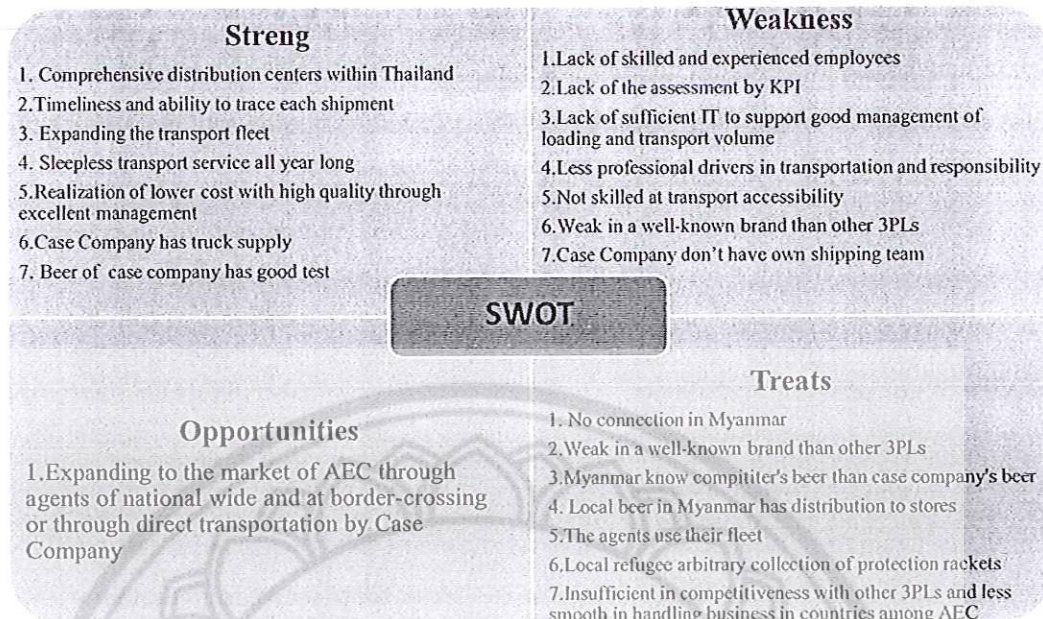


Figure 20 SWOT matrix of the case study company

Strength: According to Berry and Parasuraman (1999) companies should concentrate on customers to build long term trust with its close customers. The case study company has a distribution network that covers the whole country. Further, the case study company provides truck supply and has a vision to expand the transport fleet. Moreover, the case study company also provides short time delivery, safety insurance service with hi-tech equipment. It brings customer satisfaction and high efficiency. Therefore, balancing sustainability efforts with customer expectation can be achieved by the case study company.

Weaknesses: the case study company lacks skilled and experienced employees according to the assessment by KPI. For example, employees are not proficient Myanmar language. On the other hand, in transport, the case study company does have its own shipping team and less professional drivers in transportation and responsibility, who are not skilled at transport accessibility. In addition, the case study company lacks sufficient IT to support good management of loading and transport volume. To compare with the case study company's competitors, it lacks liability insurance. This could lead to customer losses. The most serious problem is price. Indeed, the case study company is more expensive than its competitors. Also, in some areas, the quality of service is

difficult to guarantee, especially since some staffs have a bad attitude which could have significant influence on the company image.

Opportunities: Different companies have different exclusive strategies. Even when core competency cannot be copied, there is still a lot of things the case study company can learn from other companies. For instance, the case study company can establish its own liability insurance by following the example of its competitors. The case study company is expanding to the market of AEC through agents of nationwide and at border-crossings or through direct transportation.

Threats: the company has no connections in Myanmar, and in Myanmar there are local minority groups who run protection rackets which is against the law in. Therefore, Myanmar's road transport is still not perfect and lacks transport infrastructure. Moreover, the company is insufficiently competitive with other 3PLs and less smooth in handling business in countries among AEC. In addition, people in Myanmar are more familiar with their own beers than with Thai beer

To know the case study company's strengths, weakness, opportunity and threats, the author has proposed a related strategy as shown in Figure 21:

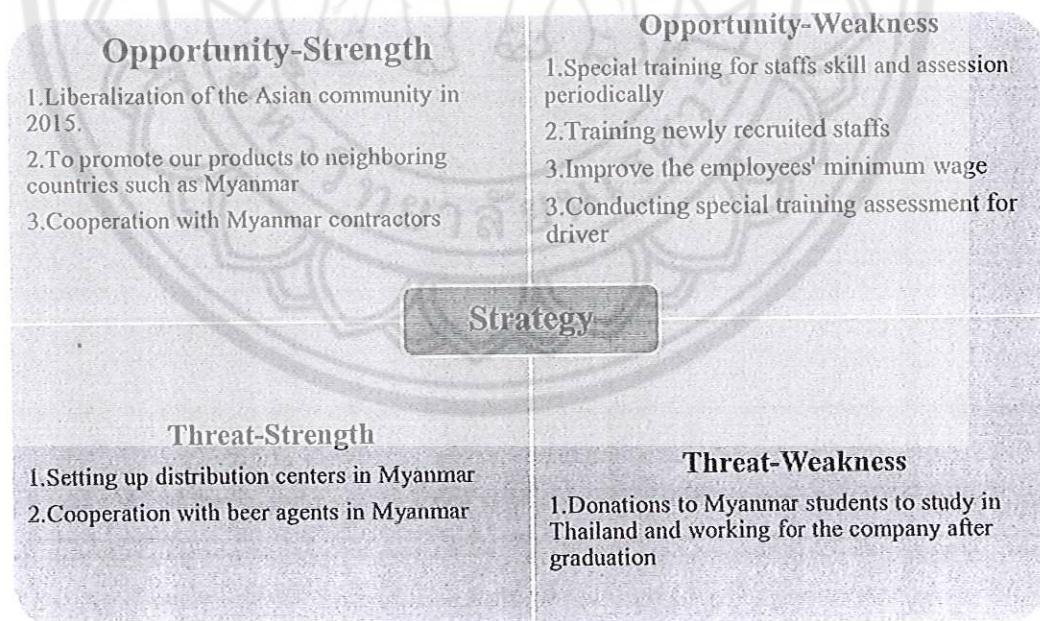


Figure 21 Strategy of the case study company

The strengths and opportunities should be regarded as the company's competitive advantages. For instance, the competitive advantages of the case study company are customer satisfaction, hi-tech transportation service and good salaries. If the case study company can study from other companies or improve teamwork it will be more successful. Also, if the case study company cooperates with transport contractors and beer agents in Myanmar it will bring a lot of benefit and convenience into opening up the Myanmar market.

Moreover, the opportunities and weaknesses are the company's external and internal factors. The case study company can avoid its own shortcomings to seize the opportunity of the liberalization of the Asian community in 2015. The case study company should take this opportunity to advertise its product brands and services.

In addition, the threats and strengths are the company's internal advantages and external threats. Figure 21 showed that the company can cooperate with beer agents in Myanmar because they can understand the relevant laws, regulations and culture of Myanmar very well.

On the other hand, the weaknesses and threats should be seen as competitive disadvantages. The case study company lacks complete liability insurance which might lead to customer loss, and weaken safety issues. Also, the total number of the company's employees is not enough to deal with global business. More employees means an opportunity to provide more service to clients. Meanwhile the workload of each employee can be reduced. So that excessive toil can be prevented. Therefore, recruiting is a good option to solve such problems. Moreover, the costs of the company will be higher. This will deter potential customers from using the company. Furthermore, it is difficult to control the qualifications of each employee, some of them might lack patience or experience in handling problems. However, the company can provide training for personnel, for example, they could provide scholarships for a number of Myanmar students who will work for the company after graduation. Because they will be able to speak the Myanmar and the Thai language they will be able to communicate with their employees as well as customers in Myanmar, thus, such a policy could great benefits.

Discussion

1. Discussion of the optimal route

From a summary of the literature review and in-depth interviews we obtained 6 key criteria for the selection of transport routes which are cost, time, reliability, safety, accessibility and flexibility. Also, from the results of the time/cost distance model (Table 6), in-depth interviews and the SWOT Analysis we can see that transporting brewery products via the Mae Sot border offers the fastest transit time or through Ranong port which is the most competitive in term of costs from Bangkok to Yangon these days. In addition, we found that R3 which is via Ranong takes the shortest time and R2 via Singapore is the least expensive at present. Therefore, R1 via Mae Sot is the most expensive with a short distance which is a door-to-door route without much transit time, so it is more flexible, although there are many minority groups who set up turnpikes for taking bribes between Mae Sot and Yangon, so this route is less safe, less reliable and not very accessible. R2 via Singapore is the least expensive, but it takes the longest time and is the longest distance, although it is more safe, reliable and accessible than R1 but it is not flexible. R3 via Ranong, which is an intermodal from Bangkok to Yangon, in Thailand is a land route and in Myanmar it is a water route, so it can avoid the protection fees demanded by minority groups, so it is safer, more reliable and more accessible than R1 and it has more flexibility than R2 which is via Singapore. Nevertheless, there are some key factors which emerge from this thesis study for the respective routes, and it can be seen from Table 7 that the 6 most important key factors for the case study companies are cost, time, safety, reliability and accessibility, which are more important than flexibility, so the route via Ranong is the optimal route for transportation. For the above reasons, the optimal transport route from Bangkok (Thailand) to Yangon (Myanmar) is via Ranong port which is an intermodal route which combines land and water transport. But if the Dawei project is finished the companies can change to this new route because it is expected that this new route will cost less and take less time. However, there are many issues in the implementation of this project which pose uncertainties to the project's smooth completion.

At present, a dirt road from Ban Pu Nam Ron, a border village in Kanchanaburi, is linked to a provincial road leading to Dawei, which serves as a temporary access road for equipment and materials mobilization. In the near future, a

new 160 km 8-lane highway will be built to link Kanchanaburi with Dawei. There are also plans to build railway, oil, and gas pipelines, and a power transmission line along the new highway. So if the Dawei project is completed, it will become the optimal transport route from Thailand to Myanmar.

2. The optimal route suitable for the case study company

The product that the case study company transports from Thailand to Myanmar is a beer product. At present, the company uses land transport and water transport to transport beer product to other countries. Furthermore, from the in-depth interview the case study company is looking for the importation criteria of selection transportation route are transportation cost, time, safety and accessibility 4 key criteria more importance than other criteria (see Table 7). And from the results of Time/Cost Distance Model can know that R3 via Ranong port spends shortest transportation time and spends less transportation cost than R1 via Mae Sot. In addition from this, safety and accessibility are also better than R1. Moreover, from the results research the optimal transport route from Bangkok (Thailand) to Yangon (Myanmar) is via Ranong port which is an intermodal route combine land transport and water transport. However, the case company is looking for reliability and flexibility less than other criteria. But the transport route via Ranong from Thailand to Myanmar is suitable for case study in current. R3 via Ranong can save transport cost and time because if water transport is used in the Myanmar area it can avoid the "one day one way" route in Myanmar and also unofficial turnpikes which demand bribes. The transport cost and time of R3 via Ranong is half of R1 via Mae Sot. At present, the company cannot transport its beer products from its Bangkok factory to Yangon in Myanmar directly, so it just transports products to the Thai-Myanmar border and then it is transitted to a Myanmar agent, who transports products from the Thai-Myanmar border to Yangon and deals with the customs procedures. Thus, the R3 via Ranong is the most suitable route for the case study company. But in the near future, if the Dawei project is finished, the optimal transport route from Thailand to Myanmar may be changed to the new route via Dawei port. The distance of the new route via Dawei is half that of R1 via Mea Sot, so the transport cost and time of the new route via Dawei will be half of R1 via Mea Sot.

In addition to this, from the beginning, the company was able to cooperate with the local transportation contractors who are very familiar with the transportation

routes in Myanmar. Furthermore, it is also able to cooperate with the beer agents in Myanmar because they understand the local culture and Myanmar people's eating habits very well, so they understand the best means of importing beer to the market in Myanmar.

In addition, from the results of the questionnaire and in-depth interviews, we found that there are procedures and barriers to the export sale and distribution of beers in Myanmar, for example, related laws, policies and cultural traditions as below. Myanmar may also want to protect its local beer from foreign competition and increase tariffs in order to add revenues for their country, which results in increasing transportation cost which is a barrier for beer exports.

Further, Thailand encounters border trade barriers with neighboring countries due to different laws, policies and cultural traditions of each country. There are some barriers such as the legal regulations of the two countries that are not conducive to border trade; transport routes in Myanmar which are linked with the Thai border are dilapidated; fighting between minority groups and the Myanmar government; lack of communication; the lack of trust between the government of Myanmar and Thailand and the fact that Myanmar officials change frequently. In the face of these problems, if the case study company wants to enter into the Myanmar market, it must have a logistics strategy to solve the problems. In this thesis, the author used a SWOT analysis to investigate these problems and find an appropriate logistics strategy for the case study company.

CHAPTER VI

CONCLUSION

In order to answer the research objectives the author took 5 steps which were, firstly, to carry out a review of the previous literature, secondly, to design a questionnaires, thirdly, to contact the relevant companies to give in-depth interviews, fourthly, to use a time/cost-distance model and a SWOT analysis to obtain the data necessary to produce the results, and finally, to make a summary.

Firstly, there are many barriers in transporting cargo from Thailand to Myanmar as mentioned in chapter 5. To avoid those barriers shippers will face great challenges.

Secondly, the author uses a time/cost model to find out the shortest route, which is via Mae Sot border and uses less time than the Ranong Port route but costs less than transporting via Singapore Port. Currently, using the route via Ranong Port is a good choice. But if the Dawei Port is finished it will be the optimal route due to the distance, time and cost of this route being less than for the other routes.

Thirdly, through the use of a qualitative analysis to design a questionnaire for in-depth interviews and then to conduct interviews. After collecting the information the author analyzed the data by using qualitative analysis. Thus, we have been able to select the key criteria to choose the optimal transport route. There are 6 key criteria which have been selected as defined in chapter 5. The criteria for each of the routes is explained below.

Finally, a beverage company in Thailand was taken as an example and its logistics strategy was investigated by using a SWOT analysis, which analyzed the strengths, weaknesses, opportunities, and threats to the company.

The research findings clearly demonstrate that the “road-sea” combination via Ranong Port in Thailand is the most competitive in terms of costs while the “all-road” option offers the fastest transit time across the Mae Sot border. Furthermore, by combining a summary of the previous research and in-depth interviews to select the 6 key criteria for the selection of a transportation route/mode were cost, time, reliability, safety, accessibility and flexibility. Based on these results and those of the SWOT Analysis this thesis recommends that the case study company transport their own

product through Ranong port which is the most competitive in terms of costs from Bangkok to Yangon at the present time. However, if the Dawei project is finished, the case study company should change to this new route because it is expected that this route will cost less and take less time. At first the case study company was able to cooperate with the local transportation contractors who are very familiar with the transportation routes in Myanmar. Furthermore, they can also cooperate with the beer agents in Myanmar because they understand the local culture and Myanmar people's eating habits very well, thus they will know how to import beer to the local market in Myanmar.

This research is original in terms of new potential routes linking Thailand and Myanmar and for using a quantitative analysis of first-hand data. However, there are some limitations to the present research study which should be pointed out.

Firstly, the data objectivity due to the limited sources of data. The data adopted in this paper originates from private logistics companies in Thailand by means of interviews and questionnaires. Although these private logistics enterprises are the top 10 in Thailand, they do not reflect the whole situation or present a complete picture of industry as a whole.

Secondly, the data only represents the figures in less than one year (April to October 2015), so they do not show the history of recent years or the trends of the recent past. It is obvious that the time and cost of each route must alter slightly or significantly for each year, so the data in this paper should ideally be extended to at least the previous ten years for the sake of the dynamics of cost and time in real cases.

Thirdly, owing to the sensitivity of the operational costs and time data for the private sector operators in their business competitiveness, it is understandable that the data might not be absolutely correct, which means further research would be necessary to ensure complete accuracy.

Finally, the new route is based on the assumption that all conditions on the route via Dawei is as the same as for the other routes, which in reality means the situation might have changed in many aspects, such as the economic and political aspects between Thailand and Myanmar. In addition, the Dawei project is under discussion for some complicated concerns such as investment, which have delayed the construction and implementation.

From the results of time/cost distance model, in-depth interviews and the SWOT Analysis we can see that transporting brewery products via the Mae Sot border option offers the fastest transit time or through Ranong port which is the most competitive in term of costs from Bangkok to Yangon at present. So if the Dawei project is finished, the company can change to this new route because it is expected that this route will cost less and will take less time. However, implementation issues now pose many uncertainties to the project's smooth completion. Further, Thailand encounters border trade barriers with neighboring countries due to different laws, policies and cultural traditions of each country. There are some barriers as the legal regulations of the two countries are not conducive to border trade; the transport route in Myanmar which links with Thailand is dilapidated; there is fighting between minority groups and the Myanmar government; lack of communication; lack of trust between the government of Myanmar and Thailand and Myanmar officials change frequently. In the face of these problems if the case study company want to enter into the Myanmar market it must has a logistics strategy which will solve these problems.

Therefore, R1 via Mae Sot is the most expensive with the shortest distance with a door-to-door route and transit does not take much time, so it is more flexible, although there are minority groups who have set up turnpikes for taking bribes between Mae Sot and Yangon so this route is less safe, less reliable and less accessible. R2 via Singapore is the least expensive route but it takes the longest time with the longest distance which makes it safer, more reliable and more accessible than R1 but lacks flexibility. R3 via Ranong which is an intermodal from Bangkok to Yangon, in Thailand is a land route and in Myanmar it is a water route so it can avoid the minority groups demanding protection fees, which make it safer, more reliable and more accessible than R1 and more flexible than R2 which is via Singapore. From Table 7 we can see that the 6 key factors for the case study company are cost, time, safety, reliability and accessibility which are more important than flexibility, so the route via Ranong is the optimal route. But if the Dawei project is the company can change to this new route because it is expected that this route will cost less and take less time. However, implementation issues pose many uncertainties to the project's smooth completion.

Moreover, the benefit of this thesis is that transport companies in Thailand will understand the barriers to the transport of Thai products from Thailand to Myanmar.

From the results of the time/cost-distance model we know that the route via Ranong port is the shortest distance and has the lowest transport costs at present. The transport companies can choose the optimal route to suit their needs. Furthermore, a logistics strategy can help some companies solve their logistics problems. Thus from the research we can conclude that the Dawei project is of great significance for both Myanmar and Thailand. The general conclusion is that the Dawei Port can (i) reduce logistics and labor costs for GMS members by providing an alternative sea route to India, the PRC, the Middle East, Europe, and Africa; (ii) reduce dependence on the congested Strait of Malacca; (iii) provide opportunities for the private sector to review supply chains and optimize production activities in ASEAN and India; (iv) provide an industrial location so that private firms and factories in Thailand and other neighboring countries may consider relocating; and (v) support Myanmar's strategic importance as a regional logistic and trading hub. So the traders, logistics companies and related associations should jointly unite to promote the implementation of this port and find solutions for their respective governments.

In the future, it will be useful to take into account other modes of transport, such as the multimodal route from Thailand to Myanmar which will include rail transport. Also, a road and rail mode combined with a water mode, or rail and road combined will reduce a large amount of the cost, because these modes of transport have relatively low costs.



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APPENDIX A

Table 8 Myanmar-Thailand Bilateral Trade, 2000-2012 (\$)

Year	Exports	Imports	Surplus/Deficit
2000	232,957,615	554,652,691	(321,695,077)
2001	735,406,335	390,543,970	344,862,365
2002	831,193,107	355,879,530	475,313,577
2003	826,958,210	483,335,595	343,622,616
2004	1,230,337,613	665,370,326	564,967,287
2005	1,622,982,701	777,297,172	845,685,529
2006	2,135,715,639	837,901,693	1,297,813,946
2007	2,104,878,563	1,053,955,413	1,050,923,150
2008	3,059,594,994	1,449,122,151	1,610,472,843
2009	2,549,024,855	1,693,589,022	855,435,833
2010	2,590,266,326	2,280,160,859	310,105,467
2011	3,172,603,332	3,095,574,671	77,028,661
2012	3,362,598,865	3,419,234,922	(56,636,057)

Note: () = deficit

Source: IMF. Direction of Trade Statistics.

www.elibrarydata.imf.org (accessed 16 January 2014).

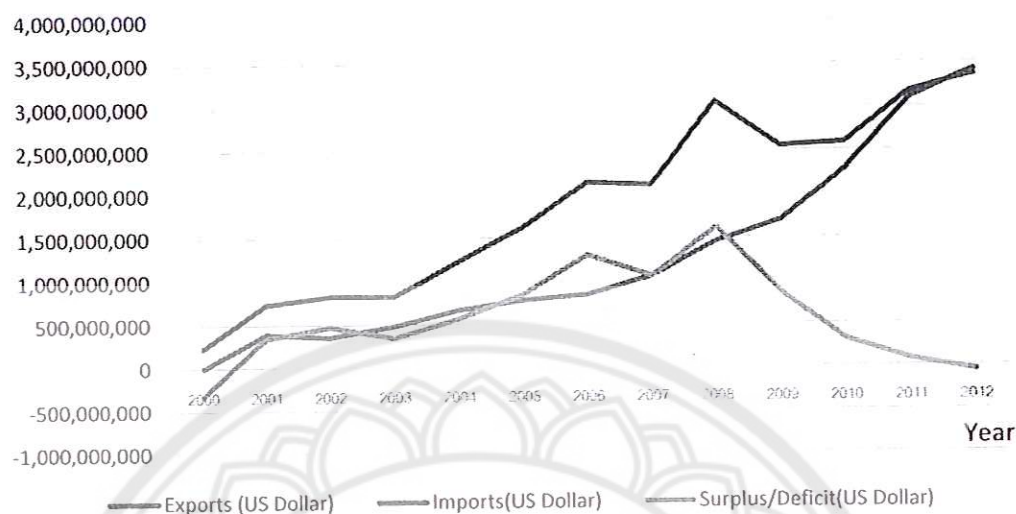


Figure 22 Myanmar-Thailand Bilateral Trade, 2000-2012

Table 9 Thailand's Top Ten Products Exported to Myanmar, 2012

Item	Product	Value (B million)
1	Diesel fuel	7,191.90
2	Gasoline	5,074.85
3	Alcoholic beverages	4,877.81
4	Non-alcoholic beverages	3,993.44
5	Fabric and yarn	3,122.91
6	Palm oil	2,057.65
7	Instant noodles and instant food	1,899.06
8	Iron and steel	1,817.18
9	Cosmetics, perfumes, and soaps	1,801.22
10	Vehicle tires	1,700.38
Total 10 Products		33,536.40
Total all Products		69,975.66

Source: Ministry of Finance, 2014.

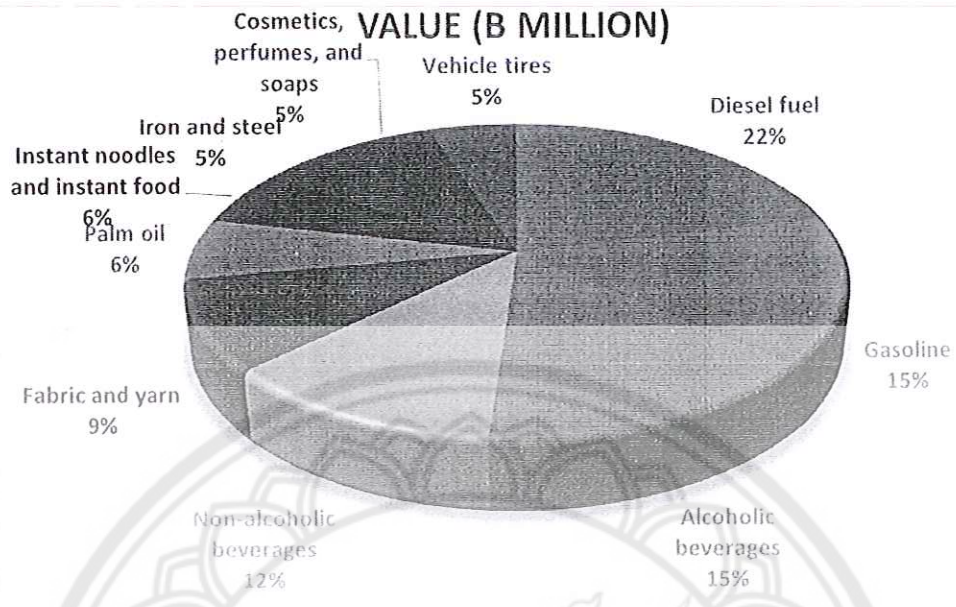


Figure 23 Thailand's Top Ten Products Exported to Myanmar, 2012



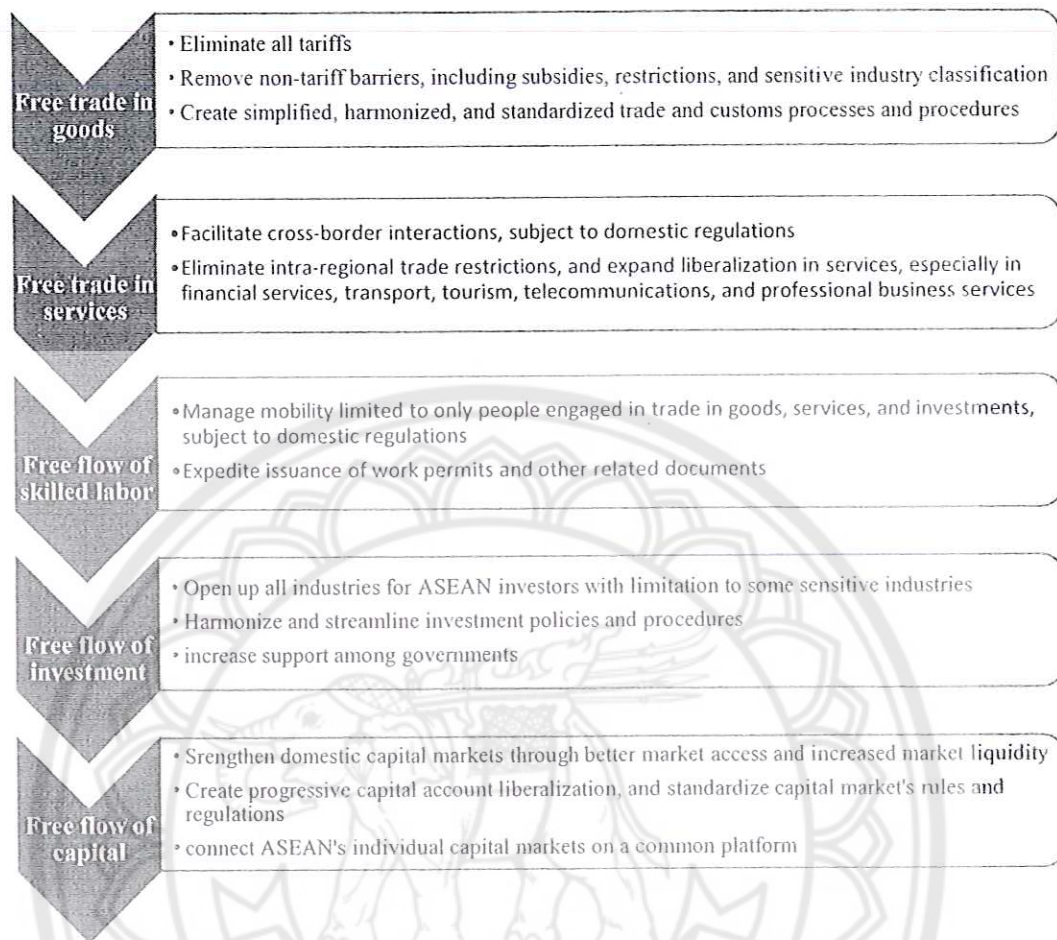


Figure 24 Benefits of the Asean Economic Community (AEC)

Note: ASEAN is the Association of Southeast Asian Nations.

Source: ASEAN Economic Community 2015: Opportunities or Threats. By the Bank of Thailand; A.T.Kearney analysis

APPENDIX B

Advantages and disadvantages of Different modes of transport

Transportation plays a major role in the economy. It increases the production efficiency and it links to the logistics system. Vehicle should have some characteristics which are used for easy transport of goods and services.

Transportation is generally of two types. They are public transport and transport for non generic-use. Public transport is nothing but which is used for meeting the needs of all sectors of the people for transportation of goods and services. Transport non-generic will be for the plant operations here the transportation means may be by the non-transport enterprises.

There are numerous advantages of road transport in comparison to other modes of transport, shows in Table 4 below:

Table 10 Advantages and Disadvantages of each mode

Transport mode	Advantages	Disadvantages
Road	Flexible Service	Finite loading capacity
	Door to Door Service	Seasonal Nature
	Suitable for Short Distance	High cost for long distances
	Lesser Risk of Damage in Transit	Externalities of road mode. Noise, air pollution, high energy consumption
	Rapid Speed	Lack of organization
	Service in Rural Areas	Congestion

Table 10 (cont.)

Transport mode	Advantages	Disadvantages
Maritime	It is economical mode for transporting heavy loads and even cargo	Difficult to monitor exact location of goods in transit Customs and Excise restrictions
	Cost of construction and maintenance is very low	Very slow, longer lead/delivery times
	Cheap for large volumes	Inflexible routes and timetables
	It even provides international transport	Requires inland transportation for door-to-door delivery
	Suitable for products with long lead times	It is highly affected by the weather conditions
Rail	Fast delivery	Potential of damages from shunting
	Capacity	Subject to unforeseen delays
	Cost effective	
	Safe mode to transport	
	Frequency of delivering the goods over long distance	
	Climatic conditions have no effect	
	Dose not add to congestion	

Table 10 (cont.)

Transport mode	Advantages	Disadvantages
Air	Fastest for long distance deliveries	Risky
	Customer perception is high, easy for order fulfilment	Potential for flight delays and/or cancellations
	Very safe mode of transport	Customs and Excise restrictions
	Reduces lead time	Expensive vs. other modes
	Improved service levels	Unsuitable for some goods
Pipelines		Limited routes, and inflexible timetables
		Environmental pollution
		Airport taxes
	Capacity	Highly specialized
	Low cost	
	Less affected by environmental factors	Ideal for transporting liquid or gaseous products, cannot be used to transport solid product
	Safe and reliable	Transport applicability subject to certain restrictions
	No pollution	

Road transportation. Road infrastructures are large consumers of space with the lowest level of physical constraints among transportation modes. However, physiographical constraints are significant in road construction with substantial additional costs to overcome features such as rivers or rugged terrain. While historically road transportation was developed to support non-motorized forms of transportation (walking, domestication of animals and cycling at the end of the 19th century), it is

motorization that has shaped the most its development since the beginning of the 20th century. Road transportation has an average operational flexibility as vehicles can serve several purposes but are rarely able to move outside roads. Road transport systems have high maintenance costs, both for the vehicles and infrastructures. They are mainly linked to light industries where rapid movements of freight in small batches are the norm. Yet, with containerization, road transportation has become a crucial link in freight distribution.

Maritime transportation. Because of the physical properties of water conferring buoyancy and limited friction, maritime transportation is the most effective mode to move large quantities of cargo over long distances. Main maritime routes are composed of oceans, coasts, seas, lakes, rivers and channels. However, due to the location of economic activities maritime circulation takes place on specific parts of the maritime space, particularly over the North Atlantic and the North Pacific. The construction of channels, locks and dredging are attempts to facilitate maritime circulation by reducing discontinuity. Comprehensive inland waterway systems include Western Europe, the Volga / Don system, St. Lawrence / Great Lakes system, the Mississippi and its tributaries, the Amazon, the Panama / Paraguay and the interior of China. Maritime transportation has high terminal costs, since port infrastructures are among the most expensive to build, maintain and improve. High inventory costs also characterize maritime transportation. More than any other mode, maritime transportation is linked to heavy industries, such as steel and petrochemical facilities adjacent to port sites.

Rail transportation. Railways are composed of a traced path on which wheeled vehicles are bound. In light of more recent technological developments, rail transportation also include monorails and maglev. They have an average level of physical constrains linked to the types of locomotives and a low gradient is required, particularly for freight. Heavy industries are traditionally linked with rail transport systems, although containerization has improved the flexibility of rail transportation by linking it with road and maritime modes. Rail is by far the land transportation mode offering the highest capacity with a 23,000 tons fully loaded coal unit train being the heaviest load ever carried. However, vary around the world, often challenging the integration of rail systems.

Air transportation. Air routes are practically unlimited, but they are denser over the North Atlantic, inside North America and Europe and over the North Pacific. Air transport constraints are multidimensional and include the site (a commercial plane needs about 3,300 meters of runway for landing and takeoff), the climate, fog and aerial currents. Air activities are linked to the tertiary and quaternary sectors, notably finance and tourism, which lean on the long distance mobility of people. More recently, air transportation has been accommodating growing quantities of high value freight and is playing a growing role in global logistics.

Pipelines transportation. Pipeline routes are practically unlimited as they can be laid on land or under water. The longest gas pipeline links Alberta to Sarnia (Canada), which is 2,911 km in length. The longest oil pipeline is the Transiberian, extending over 9,344 km from the Russian arctic oilfields in eastern Siberia to Western Europe. Physical constraints are low and include the landscape and pergelisol in arctic or subarctic environments. Pipeline construction costs vary according to the diameter and increase proportionally with the distance and with the viscosity of fluids (from gas, low viscosity, to oil, high viscosity). The Trans Alaskan pipeline, which is 1,300 km long, was built under difficult conditions and has to be above ground for most of its path. Pipeline terminals are very important since they correspond to refineries and harbors.

Define the related criteria

To selection the related criteria to selection optimal transportation route from Thailand to Myanmar, apart from identifies cost, time, distance three factors the author also identifies others related criteria. Along with determining each commodity's shift potential, the key factors that affect the mode choice decision for a particular commodity are also identified, as follow:

Reliability: The level of realized transportations, which provide the conditions associated with time requirements.

It means what the ratio of the cargoes is which arrives in time and in good condition. The cargo will swag in the long-distance transportation. Some cargoes such as grains and vegetable will be rotten if they are reserved for too long time. When the cargoes are loaded and unloaded, some cargoes will be lost. They are the cargo loss in the transportation. The transportation reliability is weighed by it. If the shippers and the

carriers need high cargo perfection, they will choose the transportation mode with good reliability in order to guarantee the cargo quality. It includes indices like reliability of transportation (fulfilment of delivery time, reliability of transport means, fulfilment of other transportation contract terms and others) and safety of transportation (safety of cargo, protection from unauthorized access to cargo and others).

RE1: Accountability level for not delivering on time.

RE2: The ratio of freights that are delivered on time and in undisturbed condition in comparison to all deliveries affected.

RE3: Convenience ratio to the predetermined departure times.

Safety: This cluster includes the safety problems related to the transportation,

S1: The possibility of burglary of the freight, which changes according to the transportation and warehousing conditions and the product characteristics.

S2: The ratio of transportations concluding in an accident to all transportations in a determined time period.

S3: The number of reasons for accidents, which show differences according to the transportation modes and product characteristics.

S4: The probability of damaging a product during any stage of transportation.

Risk: Risk probabilities that can be observed at any stage of the transportation process.

RI1: Risks of mishaps that can occur in the short storage stage for transshipment activities.

RI2: Risk of encountering embargo and quotas related to state policies.

RI3: Risk of opposition from the social environment associated with transportation conditions.

RI4: Risk of polluting the environment depending on the transportation conditions.

Flexibility: There are three subcriteria in this cluster that handle unexpected changes, capacity flexibility, and route flexibility.

F1: Meeting unexpected changes in demand.

F2: Level of meeting the demand changes over time in terms of the volume and weight capacities of the transportation vehicles.

F3: The ability to change the transportation route at any time during transportation.

Accessibility: The accessibility describes whether it is easy to obtain the cargoes transported. The quality of transportation service is thought highly in the modern logistics and the accessibility is an important aspect of that. Some shippers will consider accessibility in order to make the consignee more convenient, so they will choose the transportation mode which transports the cargo to the place near to consignee.

Traceability: Traceability of the transported freight, container, vehicle, and other factors associated with the transportation process.

T1: Traceability of the geographical position and physical conditions of the freight or vehicle

T2: Traceability of the geographical position of the container, especially for the reverse logistics.

T3: Traceability of the bureaucratic requirements and documents.

Cargo value: The cargoes are divided into three types, high value, medium value and low value. As for the cargoes with high value, the shippers and carriers will choose the transportation mode with high safety and light hurting to cargo. The safety of the transportation mode will not be regarded important for the cargoes with low value.

Cargo volume: When the shippers and carriers transport certain kind of cargo, the capacity of the transportation mode should be thought of. When they transport a large mount of bulk cargo, the vehicle whether can transport this kind of cargo and the cost should be considered.

Transportation frequency: Transportation frequency means how long time the next vehicle should wait for starting after the first vehicle start to transport the cargoes. The transportation frequency is influenced by vehicle, yard and natural condition. Some cargoes which need constant arrival and have high random is fit for transportation mode with high frequency. Generally speaking, if the transportation mode has higher frequency, the probability of choosing this kind of transportation mode is more.

APPENDIX C TABLE OF DISTANCE AND CONDITION OF EACH ROUTE

Table 11 Distance and the condition route via Mae Sot

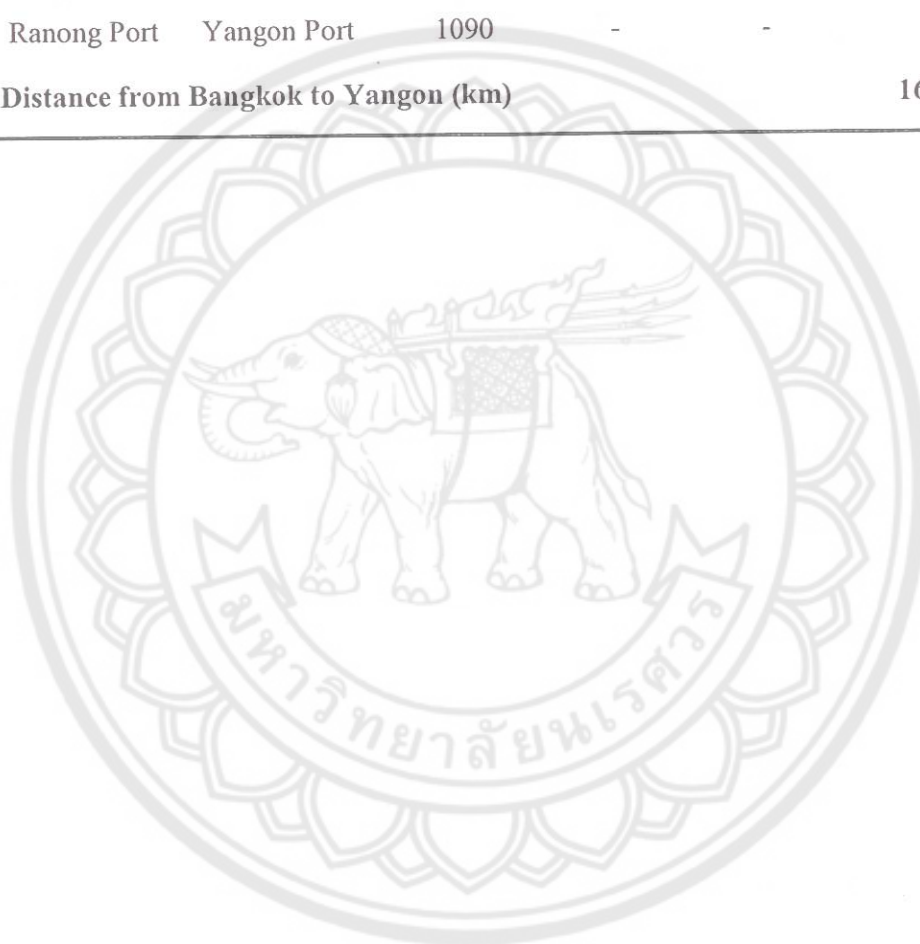
Route 1 via Mae sot					
Origin	Destination	Distance (km)	Lane	Road size (meter)	Road type
Bangkok	Mae Sot border	497	4	20	paved road
Mae sot border	Myawaddy border	0.5	bridge	bridge	bridge
Myawaddy border	Yangon	450	1.5	7	pothole
Distance from Bangkok to Yangon (km)					947

Table 12 Distance and the condition route via Singapore

Route 2 via Singapore					
Origin	Destination	Distance (km)	Lane	Road size (meter)	Road type
Bangkok	Leam Chabang Port	126	4	20	paved road
Leam Chabang Port	Singapore Port	791	-	-	-
Singapore Port	Yangon	1117	-	-	-
Distance from Bangkok to Yangon (km)					2034

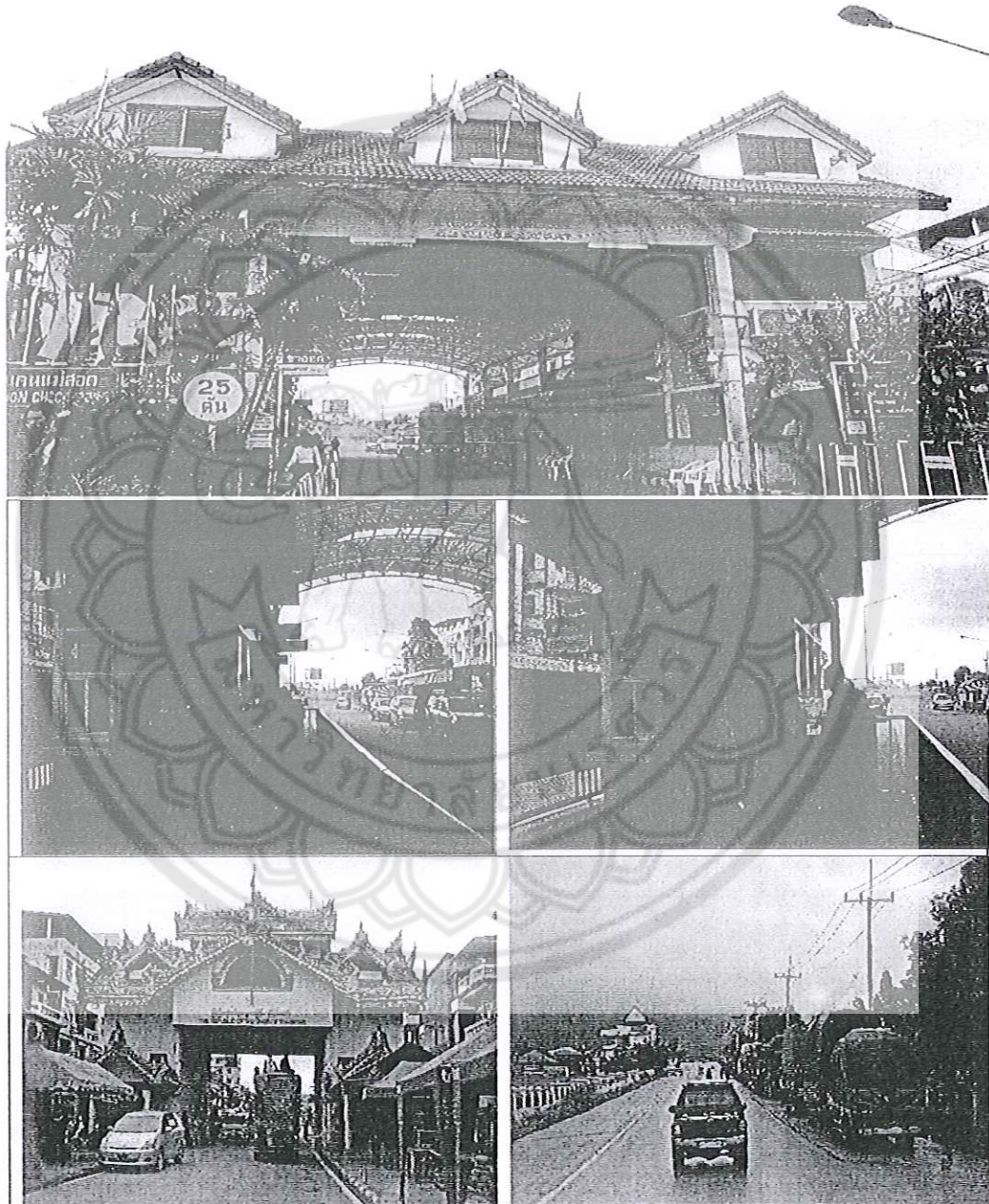
Table 13 Distance and the condition route via Ranong

Route 3 via Ranong					
Origin	Destination	Distance (km)	Lane	Road size (meter)	Road type
Bangkok	Ranong Port	600	4 2	8	Paved road
Ranong Port	Yangon Port	1090	-	-	-
Distance from Bangkok to Yangon (km)					1690



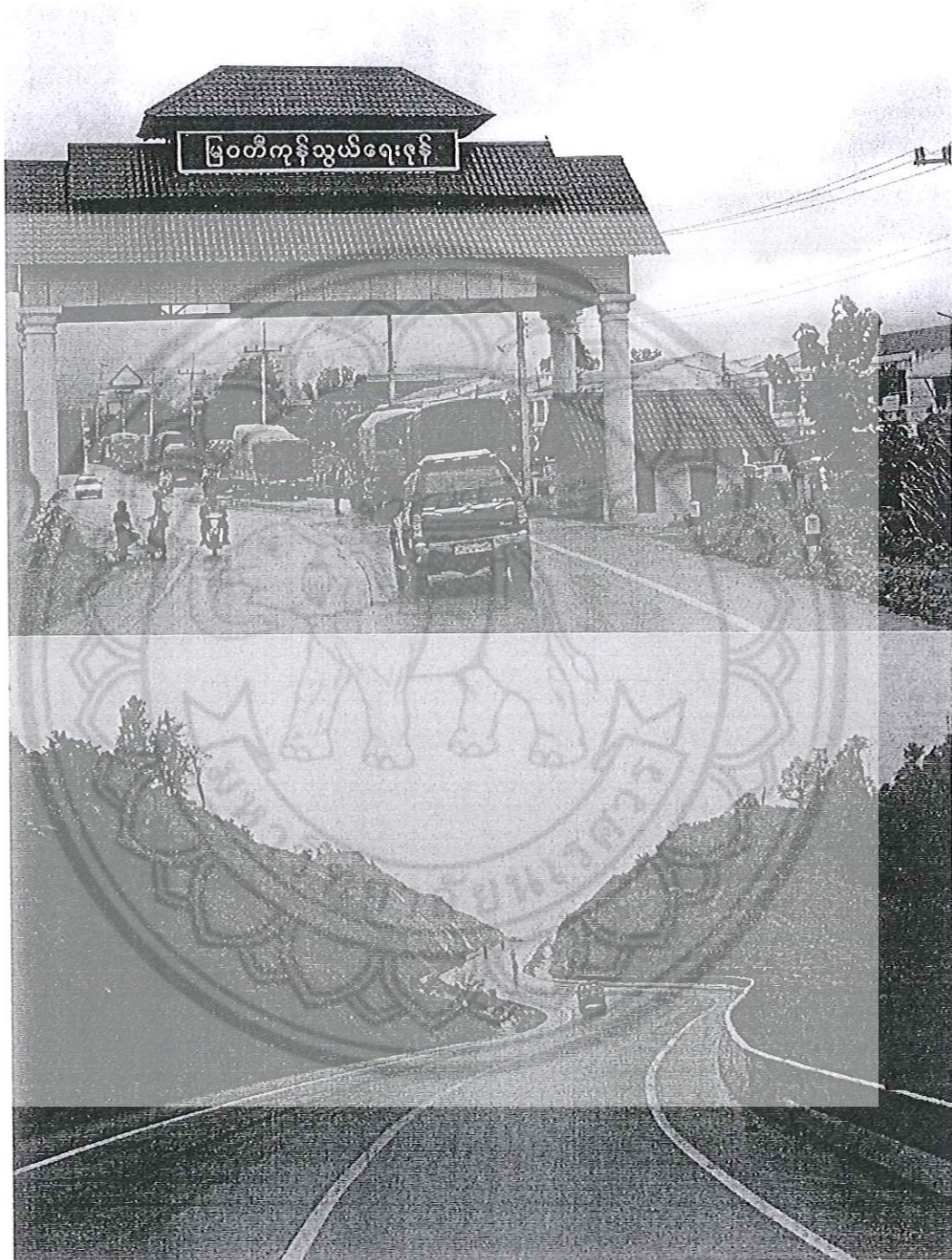
APPENDIX D PHOTOS OF BORDERS AND PRTS

Photo of Mae sot and Myawaddy border

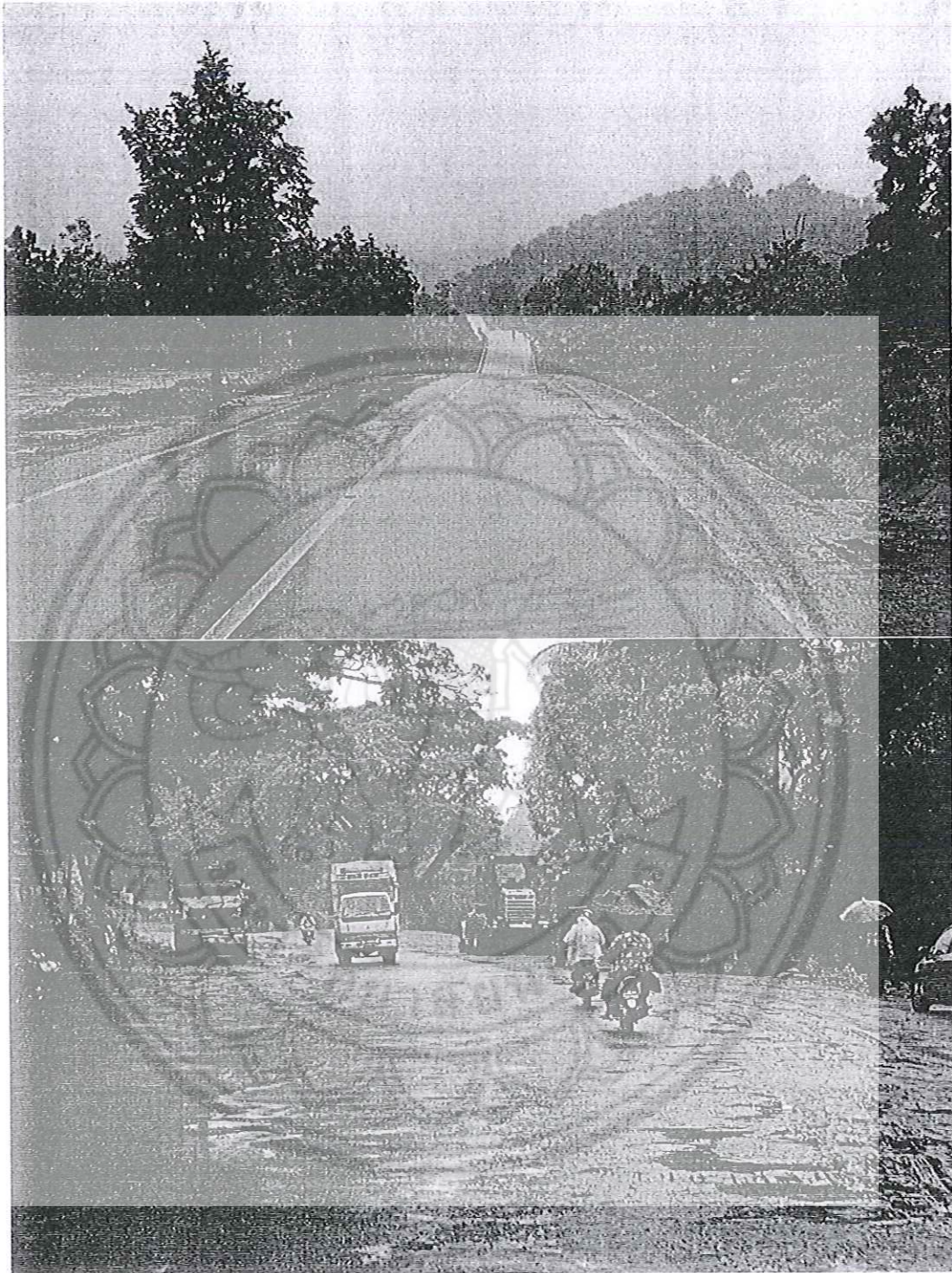


Source: research group of School of Logistics and Supply Chain (2015.06)

Road in Myanmar



Source: research group of School of Logistics and Supply Chain (2015.06)

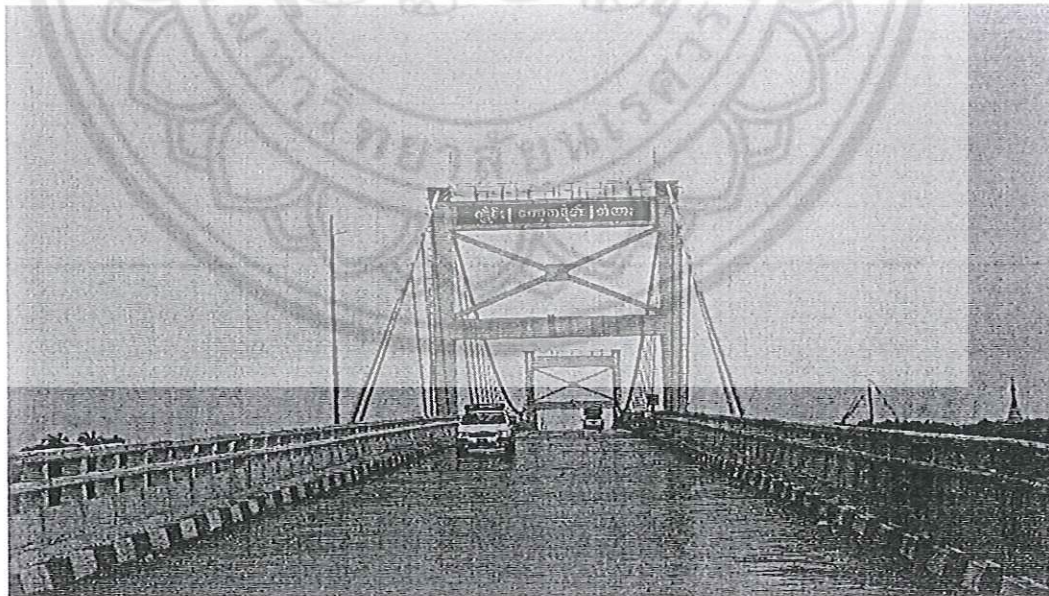


Source: research group of School of Logistics and Supply Chain (2015.06)

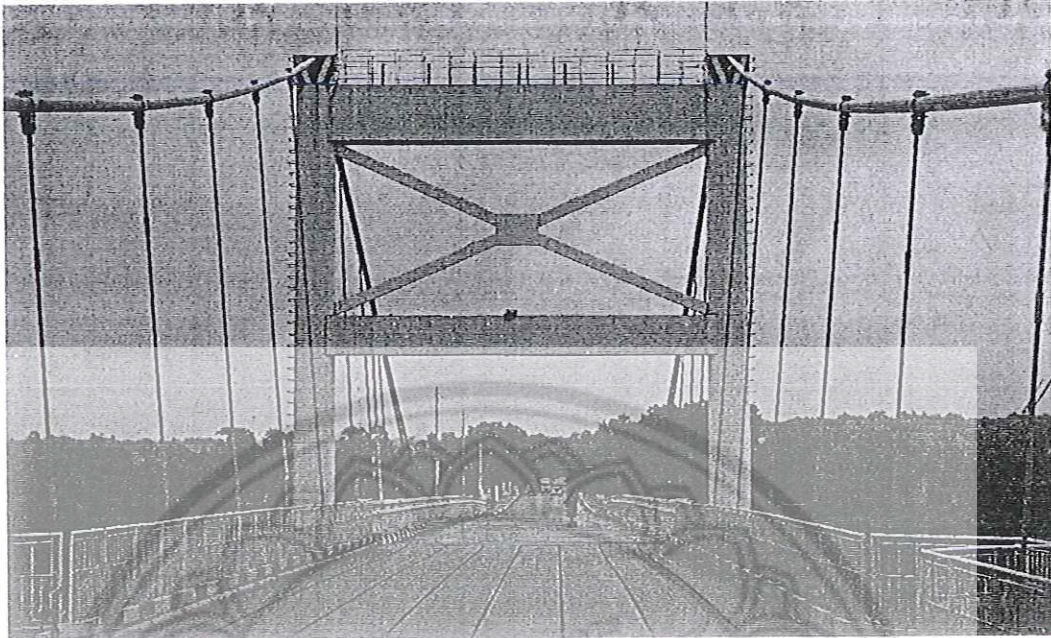


Source: research group of School of Logistics and Supply Chain (2015.06)

New bridge in Mae sot border

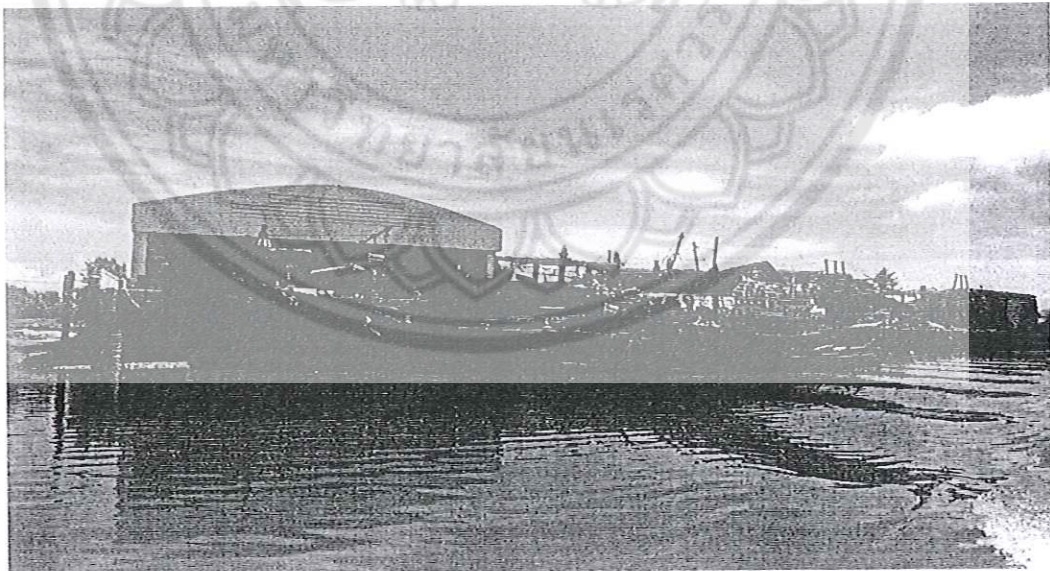


Source: research group of School of Logistics and Supply Chain (2013.06)

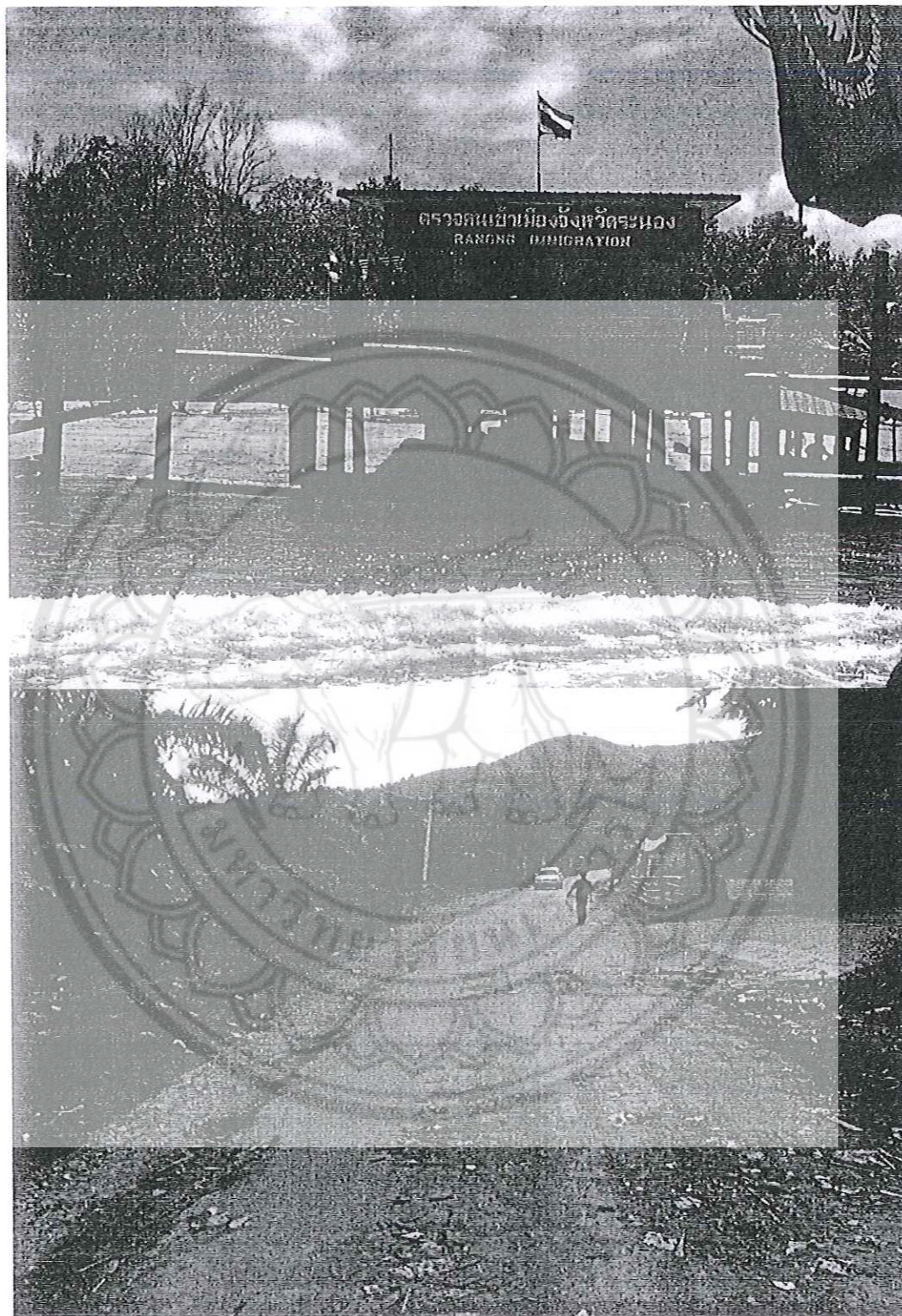


Source: research group of School of Logistics and Supply Chain (2015.06)

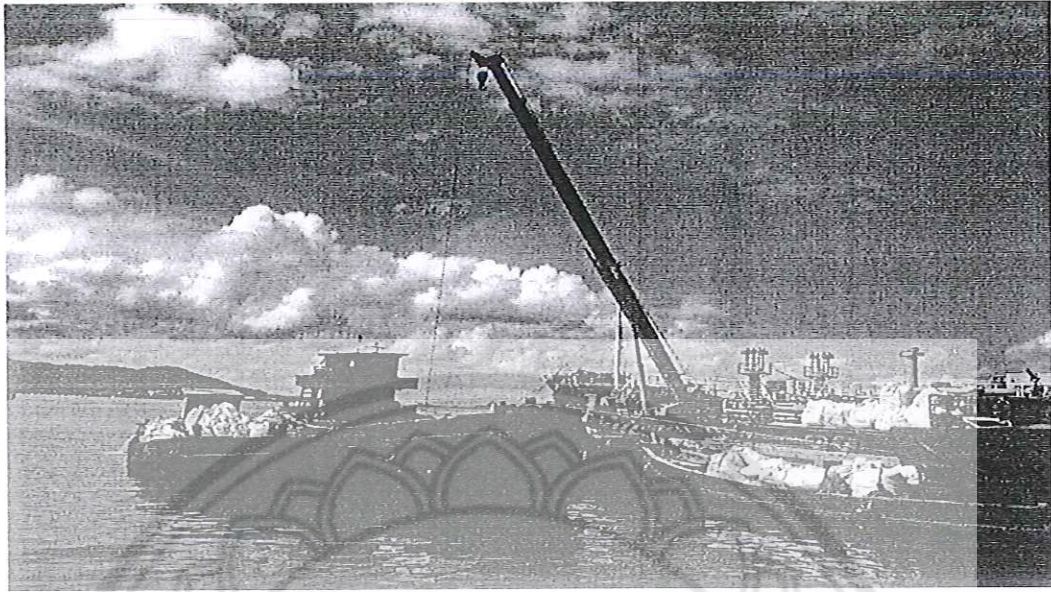
Ranong Port



Source: research group of School of Logistics and Supply Chain (2015.06)

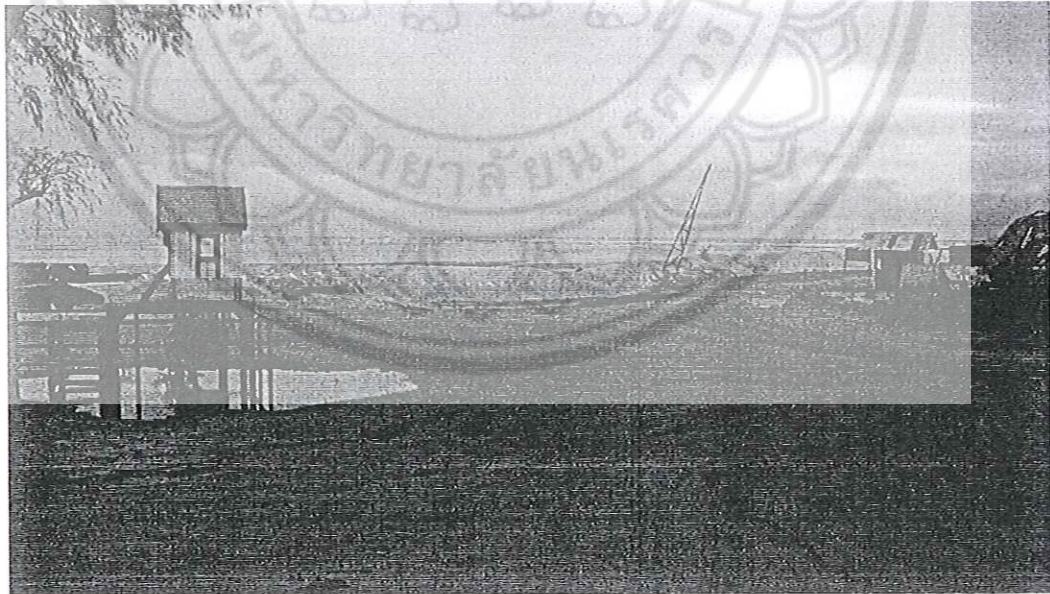


Source: research group of School of Logistics and Supply Chain (2015.06)

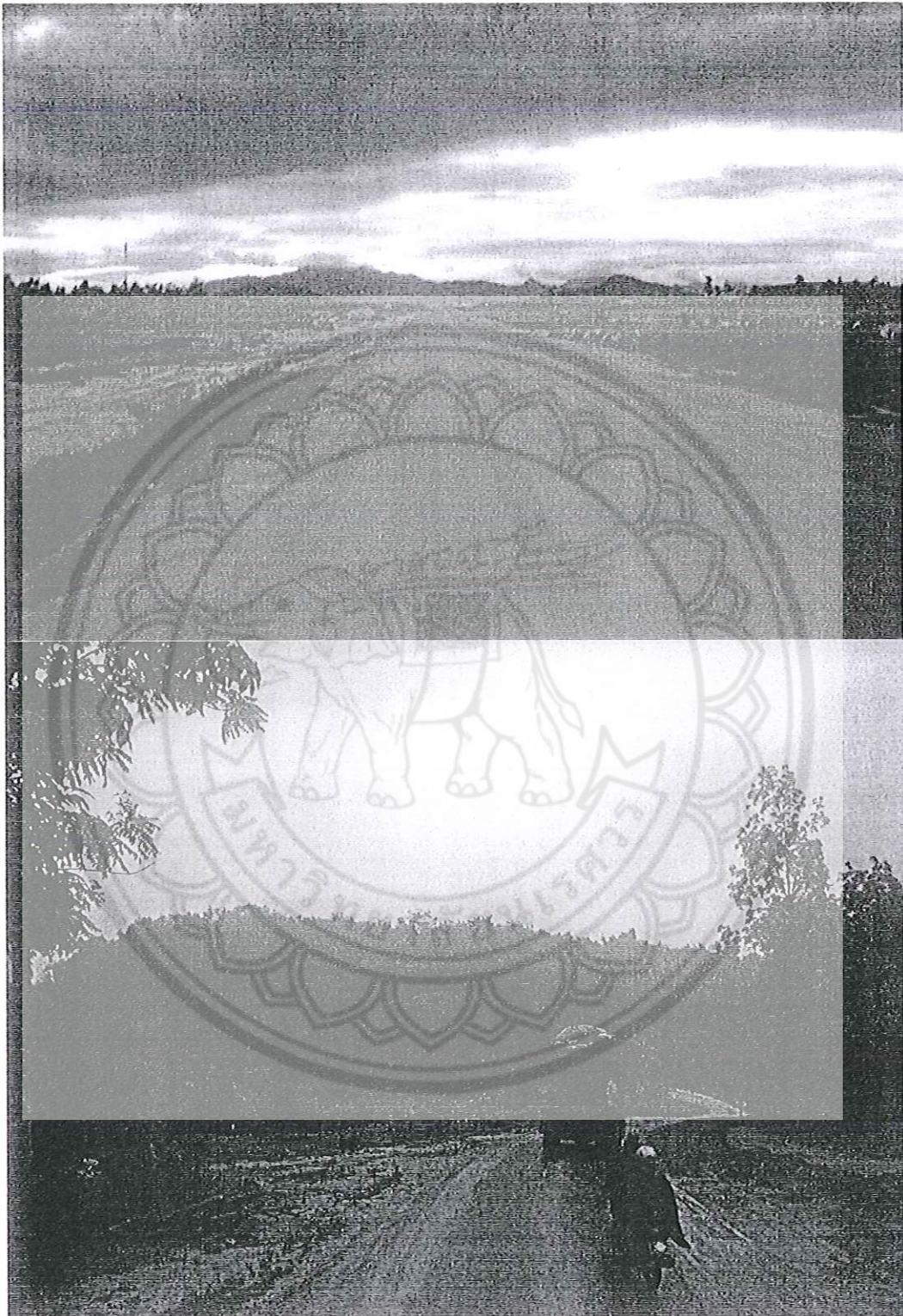


Source: research group of School of Logistics and Supply Chain (2014.05)

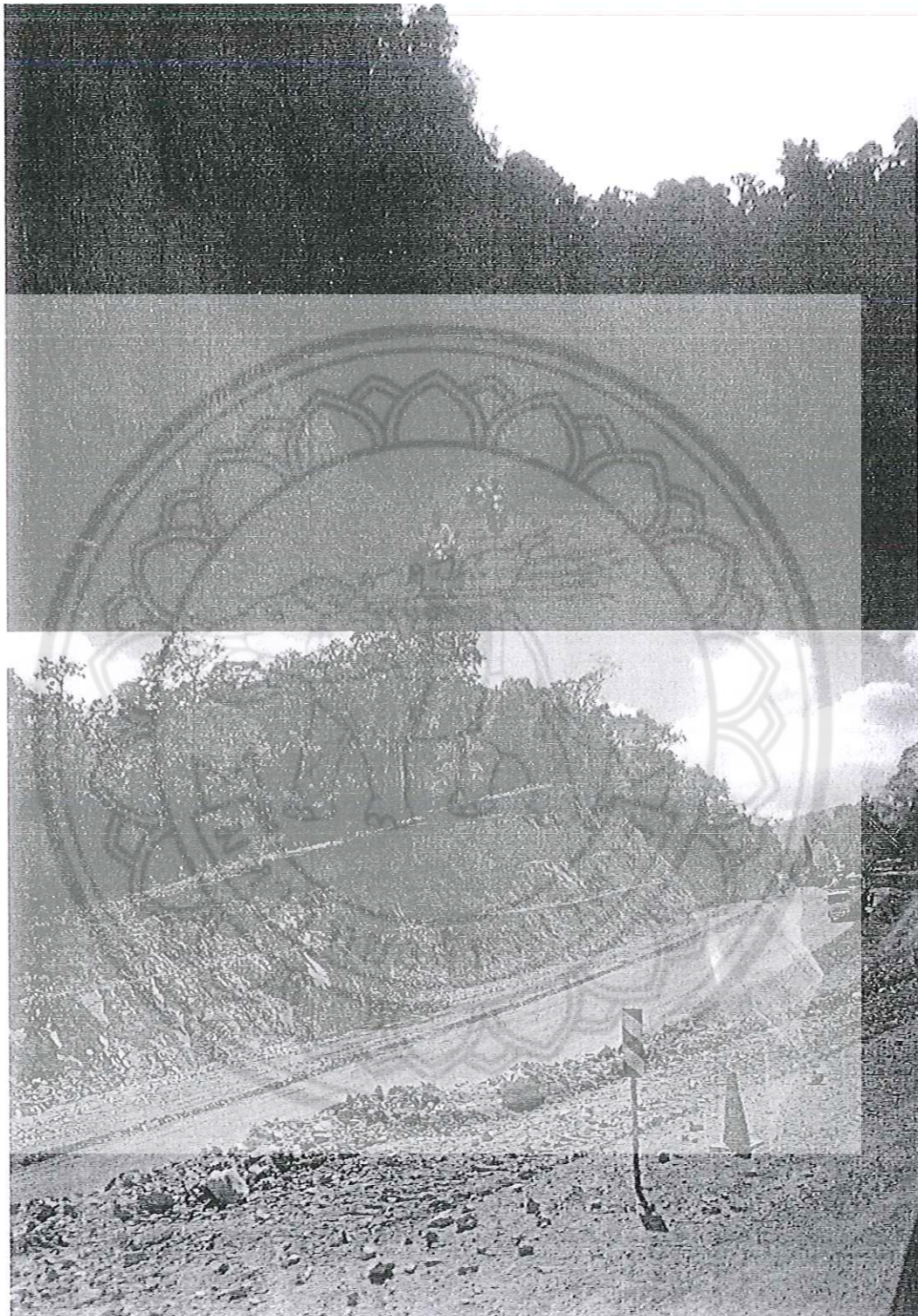
Dawei Port and Phu Nam Ron border



Source: research group of School of Logistics and Supply Chain (2015.12)



Source: research group of School of Logistics and Supply Chain (2015.12)



Source: research group of School of Logistics and Supply Chain (2015.12)



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