SCENARIO ANALYSIS FOR THAILAND-VIETNAM TRANSPORTATION ROUTES: A TEXTILE CASE STUDY UNDER ASEAN ECONOMIC COMMUNITY (AEC)

WANWISA AUNKHAM

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……………………………………
Miss Wanwisa Aunkham
Candidate

……………………………….………
Assoc. Prof. Duangpun Kritchanchai,
Ph.D. (Manufacturing Engineering and
Operations Management)
Major advisor

…………………………….…………
Asst. Prof. Thanakorn Naenna,
Ph.D. (Engineering Science)
Co-advisor

…………..…………………………
Lect. Jirapan Liangrokapart,
Ph.D. (Industrial Engineering)
Co-advisor

……………………………	……………………………………
Prof. Banchong Mahaisavariya,	Asst.Prof. Thanakorn Naenna,
M.D., Dip Thai Board of Orthopedics	Ph.D. (Engineering Science)
Dean	Program Director
Faculty of Graduate Studies	Master of Engineering Program
Mahidol University	In Industrial Engineering
	Faculty of Engineering,
	Mahidol University

Thesis
entitled

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(Industrial Engineering)
on
March 14, 2013

……………………………………….
Miss Wanwisa Aunkham
Candidate

……………………………………….
Assoc.Prof. Tuanjai Somboonwiwat, Ph.D.
Chair

……………………………………….
Assoc.Prof.Duangpun Kritchanchai, Ph.D.
Member

…………………………………. ……………………………………….
Lect.Jirapan Liangrokapart, Ph.D. Asst. Prof. Thanakorn Naenna, Ph.D.
Member Member

…………………………………. ……………………………………….
Prof. Banchong Mahaisavariya, Lect. Worawit Isarangkul,
M.D., Dip Thai Board of Orthopedics Dean
Dean Faculty of Engineering
Faculty of Graduate Studies Mahidol University
Mahidol University

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WANWISA AUNKHAM 5136484 EGIE/M

M.Eng. (INDUSTRIAL ENGINEERING)

THESIS ADVISORY COMMITTEE: DUANGPUN KRITCHANCHAI, PH.D., THANAKORN NAENNA, PH.D., JIRAPAN LIANGROKAPART, PH.D.

ABSTRACT

Thailand is one of the largest export fabric manufacturers, which are upstream textile manufacturers. Vietnam imports most fabric from Thailand. Vietnam must import many raw materials or fabrics because Vietnam still cannot produce enough upstream textile products for the needs of the expansion of the downstream textile product industry. The ASEAN Economic Community (AEC), which will be in effect in 2015, was established to reduce the tariff to zero percent and remove the non-tariff barrier for all ASEAN members. Cross-border trade will have alternative routes in the future, besides ships. The purpose of this study is to examine the impacts of AEC on textile routes between Thailand and Vietnam until the year 2015. Using scenario analysis, this research proposes alternative routes from four areas of origin in Thailand fabric export to Hanoi and Ho Chi Minh City in Vietnam. Using driving forces and key factors, possible future scenarios are established to analyze the effects of AEC on textile transport routes. The results obtained help prepare for future uncertainties of Thailand-Vietnam textile export under AEC.

KEY WORDS: THAI TEXTILE EXPORT/ ASEAN ECONOMIC COMMUNITY
(AEC)/ SCENARIO ANALYSIS

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การเลือกเส้นทางขนส่งสิ่งทอไทย-เวียดนามในอนาคต

SCENARIO ANALYSIS FOR THAILAND-VIETNAM TRANSPORTATION ROUTES : A TEXTILE CASE STUDY UNDER ASEAN ECONOMIC COMMUNITY (AEC)

วรรณวิสา อุ่นคำ 5136484 EGIE/M

วศ.ม. (วิศวกรรมอุตสาหการ)

คณะกรรมการที่ปรึกษาวิทยานิพนธ์: ดวงพรรณ กริชชาญชัย PH.D., ธนกรณ์ แน่นหนา, PH.D., จิรพรรณ เลี่ยงโรคาพาธ, PH.D.

บทคัดย่อ

อุตสาหกรรมสิ่งทอเป็นอุตสาหกรรมที่สำคัญของประเทศไทย และสามารถสร้างรายได้จากการส่งออกได้เป็นจำนวนมาก สามารถส่งออกสิ่งทอประเภทผ้าผืนไปเวียดนามเป็นอันดับหนึ่ง ในขณะที่ เวียดนามยังไม่สามารถผลิตสิ่งทอต้นน้ำได้เพียงพอกับความต้องการของการขยายตัวของสิ่งทอปลายน้ำทำให้ขาดแคลนวัตถุดิบซึ่งก็คือผ้าผืน ประกอบกับข้อตกลงประชาคมเศรษฐกิจอาเซียนหรือ AEC (ASEAN Economic Community) เริ่มมีผลบังคับใช้ในอาเซียนภายในปี พ.ศ. 2555 ที่กำหนดให้ลดภาษีเหลือร้อยละ 0 ยกเลิกอุปสรรคมิใช่ภาษีและอำนวยความสะดวกในการผ่านแดน จากข้อตกลงนี้ เส้นทางขนส่งผ่านแดนระหว่างประเทศ จะเป็นทางเลือกใหม่ในการขนส่งอีกทางเลือกหนึ่ง จากเดิมใช้การขนส่งทางเรือ เพื่อลดต้นทุนโลจิสติกส์และลดระยะเวลาส่งมอบสินค้า ดังนั้น งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาผลกระทบของการเปิดการค้าเสรีที่เกิดขึ้นของประชาคมเศรษฐกิจอาเซียนภายในปีพ.ศ. 2558   ที่มีต่อเส้นทางการขนส่งสิ่งทอไทยสู่ประเทศเวียดนาม จากจุดเริ่มต้นอุตสาหกรรมต้นน้ำที่โรงงานทอผ้าภายในประเทศไทยไปยังเมืองปลายทางหลักของอุตสาหกรรมปลายน้ำที่โรงงานทอผ้าของประเทศเวียดนาม คือ กรุงนครฮานอยและนครโฮจิมินท์ โดยใช้การวิเคราะห์ทัศนภาพ (Scenario analysis) วิเคราะห์สถานการณ์ (Scenarios) ที่เป็นไปได้ในอนาคตและเลือกเส้นทางการขนส่งที่เหมาะสมแต่ละสถานการณ์ โดยสถานการณ์ต่างๆมาจากปัจจัยที่เรียกว่า Driving force และ Key factor เพื่อเป็นการเตรียมตัวพร้อมรับกับสถานการณ์ต่างๆที่เกี่ยวข้องกับการขนส่งสิ่งทอไทยไปเวียดนามในอนาคต

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CHAPTER I
INTRODUCTION

This chapter introduces the background and problem statement involved with textile transportation between Thailand and Vietnam in the future, together with the objectives, scope of work and expected results from this research.

1.1 Background and problem statement

Vietnam is one of the top ten garment exporters in the world. It is ranked as the 7th leading garment exporters in the world and has 2.1 percent share of the world market (Thailand Textile Institute, 2009). In addition, the garment industry is Vietnam's second largest export earner after crude oil as a result from it has rapidly grown and developed to succeed in the global scale. Characteristics of the Vietnam textile industry emphasizes on downstream industry as garment. Most of the production orders coming from abroad about 90% and local raw materials are consumed only 35% (Bureau of Foreign Trade in Ho Chi Minh City, 2009).

Although Vietnam garment industry can highly export, it must import greatly raw materials or the fabrics because Vietnam still cannot product enough upstream textile products or the fabrics to the needs of the expansion of the downstream textile products. This is a reason that it lacks the fabrics. Thus, it must import the fabrics from outside countries.

Thailand is one of the largest export fabric manufacturers which are upstream textile manufacturers. Fabric of Thailand is ranked the 15th leading fabric exporters in the world and has 1.41 percent share of the world market (Textile Information Center, Thailand Textile Institute, 2009). Moreover, Thailand is ready for production base due to a rich array of raw materials and the sufficient potentiality. The major fabric market of Thailand is ASEAN market. Vietnam is the highest fabric import from Thailand. Despite the global economic crisis in 2009, Thailand exports

fabric to Vietnam to increase with continuous growth. For example, It was increasing trend from 2007-2009. The export value of Thai fabric to Vietnam was $67.3 million to $96.8 million (www.thaitextile.org/.../Thai%20Textile%20Stat%20.Jan Aug_%2010.xls), as shown in Figure 1.1 and 1.2.
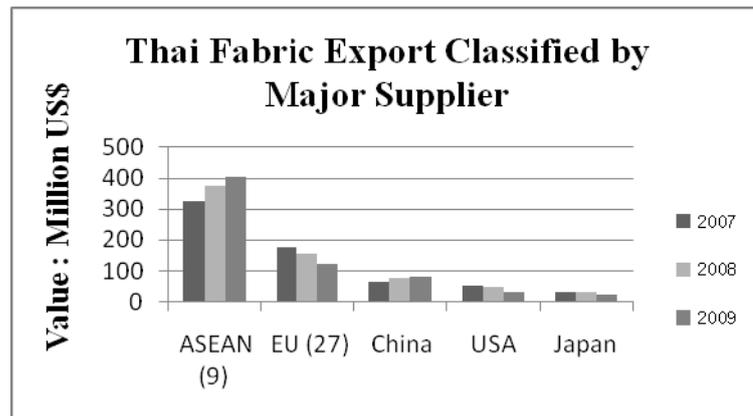
Figure 1.1 Thai fabric export classified by major supplier
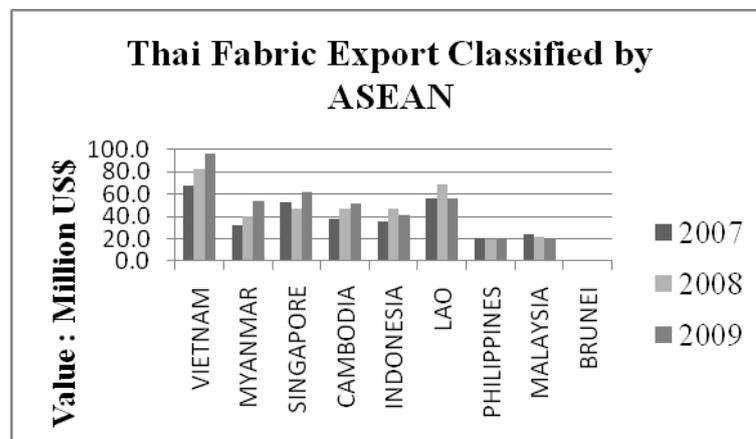
Figure 1.2 Thai fabric export classified by ASEAN

Although Vietnam is the major fabric market of Thailand, Thailand is not a major fabric exporter in Vietnam. The major fabric exporters of Vietnam are China, South Korea, Taiwan, Hong Kong and Japan. Therefore, Thai exporters should seek new channel to expand fabric export by Thailand and Vietnam trade link as a textile supply chain.

Currently, transportation route of textile Thailand and Vietnam is exported by vessel. However, Thailand and neighbor countries are developing the infrastructure within the country themselves and building international cooperation to link international transportation by Greater Mekong Sub-region Cooperation (GMS). This cooperation helps facilitate trade and international transportation. Furthermore, ASEAN Economic Community (AEC) which is effective on 1 January 2010 is established to reduce the tariff at 0 percent and remove the non-tariff barrier for all members within ASEAN for year 2015. Under this agreement, there are the benefits such as a single market, facilitation of the cross-border transportation and dependence on raw materials among members.

From all of these reasons above, the future of textile transportation from Thai crossing border though Cambodia crossing border or Laos crossing border to Vietnam is much more commercial. Liberalization on road transportation and multimodal transportation will be alternative routes in the future besides vessel. To logistics cost reduction and faster transit time, it will be essential to study possible alternative routes for Thai textile to Vietnam in the future if ASEAN Economic Community (AEC) is associated in order to prepare the upcoming change in the uncertain future.

This study presents the alternative routes from four origin areas of Thailand fabric export as follows: Bangkok, Pathumthani, Samutprakarn and Nakhonpathom to Ha Noi and Ho Chi Minh City of Vietnam. The uncertain future as ASEAN Economic Community occurrence is considered in this study. Driving forces and key factors for routes selection, possible future events and alternative routes are taken into account. This study considers both quantitative and qualitative factor for selecting alternative routes. The process of selection among different alternatives is complicate and the possible future events are uncertain. Therefore, scenario analysis is used in this study.

Scenario analysis was developed by Pierre Wack. It is widely used technique. Scenarios contain a set of possible future story instead of looking from the past. The good result is originated multiple perspectives, dimensions and uncertain factors. It is established to analyze textile transportation routes if ASEAN Economics

Community (AEC) occurs. The obtained results are approached to prepare for future uncertainties of Thailand-Vietnam textile export.

1.2 Objective of the study

The objectives of this research are following:

1.2.1 To evaluate possible alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

1.2.2 To study the factors influencing the decision to alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

1.2.3 To evaluate a model for a set of scenarios of alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

1.3 Scope and limitation of the study

Scopes of this research are following:

1.3.1 This research proposes the alternative routes from four origin areas of Thailand fabric export as follows: Bangkok, Pathumthani, Samutprakarn and Nakhonpathom to Ha Noi and Ho Chi Minh City of Vietnam.

1.3.2 This research only considers the type of vehicle including truck, trailer, train and vessel. The format of each type of vehicle such as type of lane road and type of railway are not considered.

1.4 Expected results

This study will lead to:

1.4.1 Obtain possible alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

1.4.2 Explore the factors influencing the decision to alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

1.4.3 Present a model for a set of scenarios of alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs.

CHAPTER II
LITERATURE REVIEW

This chapter will indicate literature review for this research. This chapter is divided into three sections. The first section shows Thailand textile supply chain. The second section provides development of scenario analysis process. The last section describes related literature.

2.1 Thailand textile supply chain

This section will present Thailand textile supply chain. It is divided into five subsections. There are ASEAN Economic Community (before & after), current routes of textile for Thailand and Vietnam, routes of Greater Mekong Sub-region Cooperation (GMS) and scenario analysis.

2.1.1 Thai textile export to Vietnam before and after ASEAN Economic Community (AEC)

In this subsection, we explain briefly about Thai textile industry and Vietnam textile industry before and after ASEAN Economic Community (AEC). They focus on export and gain the benefits from AEC.

2.1.1.1 Thai textile export to Vietnam before ASEAN Economic Community (AEC)

Textile industry of Thailand is a large industry which is composited many sectors from upstream industry to downstream industry, is an important Thai economy both export and employment. Textile of Thailand is ranked as the 13th leading textile exporters in the world (Thailand Textile Institute, 2009).

Information of Thailand Textile Institute can be summarized that from 2007 to 2008 , the overall export value of Thai textile industry was increasing trend. In 2007, export value was $3,599.6 million and in 2008, export value

was $3,694.4 million and growth rate was 2.6%. But export value and growth rate in 2009 were decreased as export value was $3,482.8 million and growth rate was -5.7%. USA, EU, ASEAN, Japan and China are major countries where import textile from Thailand. Due to currently depressed worldwide economic conditions, major textile export markets of Thailand have been affected by the economic crisis, especially USA and EU are the first two major textile export markets of Thailand. Thus value of textile export decreased. Fabric is the most exported type of Thai textile. Fabric is made from synthetic fibers which are the most exported type of all fabric types, followed by fabric made from cotton and yarn, respectively. Regarding textile export markets of Thailand, ASEAN, EU, China, USA and Japan are major countries where import fabric from Thailand. If we consider the countries in ASEAN, Thai textile can continuously export to Vietnam with the highest export value, as shown in Figure 2.1 and 2.2 (www.thaitextile.org/.../Thai%20 Textile%20Stat%20.Jan-Aug_%2010.xls).

Figure 2.1 Thai fabric export classified by major supplier
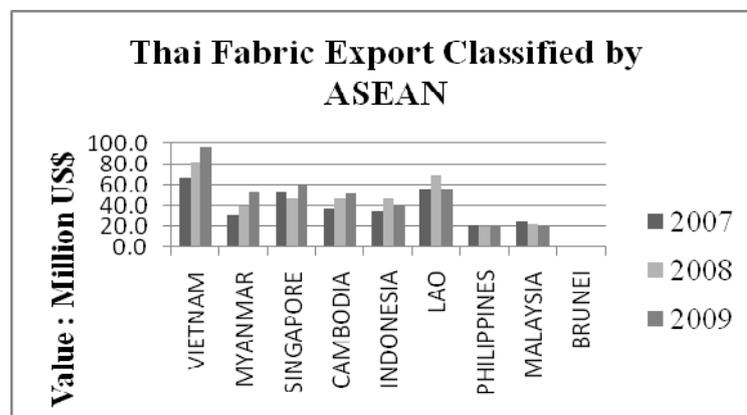
Figure 2.2 Thai fabric export classified by ASEAN

Currently, Vietnam is ranked as the 7th leading garment exporters in the world and has 2.1 percent share of the world market (Thailand Textile Institute, 2009). In addition, the garment industry is Vietnam's second largest export earner after crude oil as a result from it has rapidly grown and develops to succeed in the global scale. Characteristics of the Vietnam textile industry emphasizes on downstream industry as garment. Most of the production orders coming from abroad about 90% and local raw materials are consumed only 35% (Bureau of Foreign Trade in Ho Chi Minh City, 2009).

Vietnam industry sectors have dramatically expanded. However, major export products can drive revenue for the country, they lack raw materials. Then, they must import from the other countries, including textile industry (Kengpol et al., 2010). Vietnam has emerged as one of success in textile and garment industry because it has rapidly grown and developed to compete on a global scale. But it is high import raw materials as fabric. Vietnam garment is produced for export by half in the international market by USA is Vietnam's largest export market for Vietnam's garment (Nadvi and Thoburn, 2003).

It can conclude that Vietnam cannot sufficiently product upstream raw materials or fabric to meet the demand of expanded downstream textile while garment Vietnam which is downstream textile has greatly grown. This is a reason that it must import the fabrics from outside countries.

Vietnam is the important export market of Thai fabric. Nevertheless, the global economic crisis of 2009 has affected the industries, Thai fabric exports to Vietnam with export value and growth rate have raised. However, Thailand is not a major importer of fabric to Vietnam, Major importers of Vietnam as follow: China, South Korea, Taiwan, Hong Kong and Japan. Thus, Thai exporters should seek new channel to expand fabric export with Thailand and Vietnam trade link as a textile supply chain and using advantage of ASEAN Economic (AEC) together.

2.1.1.2 Thai textile export to Vietnam after ASEAN Economic Community (AEC)

As of January 1, 2010, AEC has resulted in an elimination of import duties of the tariff and the non-tariff barrier on goods including textile in ASEAN members. It is involved to remove all them by 2010 for Thailand, Indonesia,

Brunei, Singapore, Malaysia and Philippines and by 2015 for Cambodia, Laos, Myanmar and Vietnam (CLMV). Moreover, CLMV are reduced tariff on textile to 0-5% by 1 January 2010.

Export value of Thai textile in ASEAN market has continuously increased and higher growth rate after AEC. Especially, Fabric has the most export value of Thai. We consider from January to August 2010, export value was $322.9 million and growth rate was 33.5% when compared to the same month a year earlier. Vietnam remains as ranking the 1st fabric export of Thailand and imports Thai fabric to increase continuously export value and growth rate. From January to August 2010, export value was $78.3 million and growth rate was 36.9% when compared to the same month a year earlier as seen Table 2.1 and 2.2 (www.thaitextile.org/.../Thai%20 Textile%20Stat%20.Jan-Aug_%2010.xls).

Table 2.1 Thai fabric export classified by major supplier

Major Market	Value: Million US$					Growth: %			
	2007	2008	2009	2009 (Jan.-Aug.)	2010 (Jan.-Aug.)	2006	2007	2008	2009 (Jan.-Aug.)
1. ASEAN (9)	326.1	375.0	402.7	241.9	322.9	3.4	15.0	7.4	33.5
2. EU (27)	178.0	156.8	121.1	76.8	99.2	-2.5	-11.9	-22.8	29.2
3. China	66.1	75.1	80.9	43.8	53.9	23.5	13.7	7.7	23.1
4. USA	50.3	47.9	30.4	20.9	26.3	-7.8	-4.8	-36.5	25.8
5. Japan	33.2	30.5	24.5	16.7	22.7	37.3	-8.1	-19.7	35.9
6. Others	508.8	518.7	508.0	344.7	382.2	7.7	1.9	-2.3	10.9
Total	**1162.5**	**1204.0**	**1167.6**	**744.8**	**907.2**	**5.3**	**3.6**	**-3.1**	**-36.1**

Table 2.2 Thai fabric export classified by ASEAN

ASEAN	Value: Million US$					Growth: %			
	2007	2008	2009	2009 (Jan.-Aug.)	2010 (Jan.-Aug.)	2007	2008	2009	2010 (Jan.-Aug.)
1. VIETNAM	67.3	82.2	96.8	57.2	78.3	26.1	22.2	39.1	36.9
2. MYANMAR	31.6	39.9	54.4	25.2	32.6	11.1	26.3	48.2	29.1
3. SINGAPORE	53.1	47.1	61.5	32.6	45.7	54.5	-11.2	35.7	40.3
4. CAMBODIA	37.2	47.3	51.7	35.8	49.0	-33.3	27.2	46.8	37.0
5. INDONESIA	35.7	46.7	41.4	12.2	18.0	-7.0	30.7	29.0	47.5
6. LAOS	55.9	69.3	56.7	13.0	15.2	1.7	24.0	-28.0	17.1
7. PHILIPPINES	20.7	19.9	20.3	28.2	44.8	-6.7	-3.7	29.9	59.0
8. MALAYSIA	24.2	22.2	19.8	37.7	39.1	-11.5	-8.3	-1.9	3.8
9. BRUNEI	0.40	0.3	0.2	0.1	0.2	-16.7	-29.7	-35.9	46.2
Total	**326.1**	**375.0**	**402.7**	**241.9**	**322.9**	**45.0**	**15.0**	**7.4**	**33.4**

From Table 2.1 and Table 2.2, export value and growth rate of Fabric increased in order to global economic recovery had started. Consequently, Vietnam can export more garment to USA and it must also import more fabric. The benefits of AEC are another reason which is expected to help increased export value and growth rate. From all the reasons are described. They make ASEAN members rely on intra-ASEAN trade each other more.

Thai and Vietnam cannot have no adjunction areas. As of AEC, it eliminates the non-tariff barriers and facilitates cross-border besides reducing import the tariff. It is opportunity to Thailand export to Vietnam has increase. Hence, their commercial trades are through Laos and Cambodia with more possible commercial. It means that liberalization of international road transportation and multimodal will be an option for alternative routes besides the vessels use the current transportation. The vessels have the problems in capacity and transit time in monsoon season (Kengpol et al., 2010). These new alternative routes are advantages to reduce logistics cost and faster transit time.

2.1.2 Current textile transportation routes **for Thailand**-**Vietnam**

Office of transport and Traffic Policy and Planning (2006) proposed to develop multimodal transportation and logistics management. This research was found that mostly, Thai fabric is shipped to Vietnam at Laem Chabang port (LCB) and Bangkok port (BKK) about 80%. Moreover, a minor transportation uses border trade about 10% via Eastern and Northeastern of Thailand at Mukdaharn border, Nong Khai border, Nakhon Phanom border and Phibunmangsahan border to Vietnam by trucks and trailers. It can be summarized as Figure 2.3.
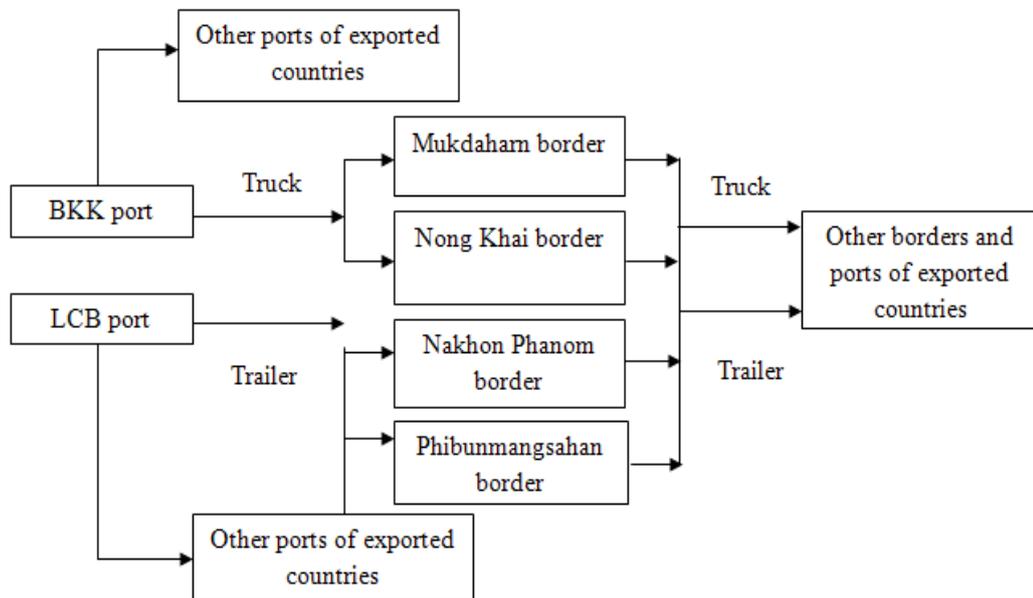
Figure 2.3 Current textile transportation routes for Thailand-Vietnam

2.1.3 Location of Thai and Vietnam weaving factory

2.1.3.1 Location of Thai weaving factory

The weaving factory manufactures fabric, similarly, Thai weaving factories produce fabric for export to Vietnam. There are seventy-nine factories in Thailand. Mostly, they are located at Bangkok, Pathumthani, Samutprakarn, Samutsakorn, Ratchaburi and Nakhonpathom as illustrated in Table 2.3 (http://www.thaitextile.org/th/textile_intel/01company_profiles.asp).

Table 2.3 Number of Thai weaving factories for export to Vietnam by province (2007-2009)

Provinces	Number of Thai weaving factories	%
Bangkok	27	34.18
Samutprakarn	19	24.05
Samutsakorn	11	13.92
Nakhonpathom	15	18.99
Ratchaburi	2	2.53
Pathumthani	5	6.33
Total	**79**	**100.00**

In this research, we divide configurations of distribution for Thai weaving factories by province group that refer from Office of the Public Sector Development Commission Thailand (www.nc.ac.th/osm/Pictures/om01.pdf). They are separated four group areas in this study as shown in Table 2.4.

Table 2.4 Four group areas of Thai weaving factories

No. group areas	Areas	Provinces	Provincial Operations Centre
1	Bangkok	Bangkok	Bangkok
2	Upper central part	Pathumthani	Pathumthani
3	Middle central part	Samutprakarn	Samutprakarn
4	Lower central part	Nakhonpathom, Ratchaburi, Samutsakorn	Nakhonpathom

2.1.3.2 Location of Vietnam weaving factory

Kotinthakom et al. (2008) and Hill (2000) said that major produced fabric and garment factories of Vietnam are located at Ho Chi Minh City (HMC) and Ha Noi City where are the South and the North of Vietnam, respectively.

Similarly, Office of Industrial Policy sector 2 (2009) said that 70% of all Vietnam weaving factories are located at the South of country especially HMC and 20% of all them are located at the North of country especially Ha Noi. The remaining of them are located the central of country.

It can conclude that the majority of Vietnam factories for weaving is situated HMC and Ha Noi. Hence, destinations for Thailand export fabric to Vietnam are HMC and Ha Noi.

2.1.4 Infrastructure and transportation network

Although, Thailand is not bordered Vietnam, they can link international transportation routes through Laos or Cambodia. Nowadays, Thailand has a collaborative framework contributes a strong support to ASEAN Economic Community. It is Greater Mekong Sub-region Cooperation (GMS) Economic Cooperation Program in 1992 which focuses on an enhancement of transportation to connect transportation routes of GMS countries (Cambodia, Laos, Vietnam, Thailand, Myanmar and China). It links along economic corridors among South Asia, East Asia and Southeast Asia. These economic corridors have North-South Economic Corridor (NSEC), East-West Economic Corridor (EWEC) and Southern Economic Corridor (SEC). This cooperation will help facilitate the transit of goods which have rules and regulations and procedures for members in the same direction and consistent. Moreover, it promotes multimodal transportation among GMS countries.

It is demonstrated that it relates to support the transportation among Thailand, Laos, Cambodia and Vietnam. Therefore, these economic corridors can be taken into account to new alternative routes for the textile export of Thailand to Vietnam in the future. These involved economic corridors are EWEC and SEC routes. It can summarize in Table 2.5.

Table 2.5 Economic corridors of Greater Mekong Sub-region Cooperation (GMS) for Thailand and Vietnam

Economic corridors	Crossing-border	Route No.
EWEC - Thailand – Laos - Vietnam	1.Mukdaharn (Thailand) - Savannakhet (Laos) - Den Savan (Laos) - Laos Bao (Vietnam)	R9
	2.Nakornpanom (Thailand) - Thakhek (Laos) - Nam pao (Laos) - Cao Treo (Vietnam)	R12
SEC - Thailand – Cambodia - Vietnam	1.Chong Meck (Thailand) - Wangtao (Laos) - Veunekham (Laos) - Dong Kralor (Cambodia) - Huanli (Vietnam)	R1
	2. Ban Had Lek (Thailand) - Kohkong (Cambodia) - Srihanu Ville (Cambodia - Vietnam)	R10
	3.Aranyaprathet (Thailand) - Poipet (Cambodia) - Bavet (Cambodia) - Moc Bai (Vietnam)	R13

Source: Bureau of ASEAN Department of Trade Negotiation, 2006

2.1.5 Alternative routes of Thailand to Vietnam in the future

Kengpol et al. (2010) studied multimodal transportation between Thailand and Vietnam to transport goods. It originates from Bangkok. The destinations are Ho Chi Minh City, Danang and Ha Noi. The transportation routes in the research are also EWEC and SEC routes. Each route shows cost, distance and time as Table 2.6, 2.7 and 2.8.

Table 2.6 Multimodal transportation routes of Bangkok (Thailand) - Ho Chi Minh City (Vietnam)

Routes of Bangkok (Bkk) - Ho Chi Minh City (HMC)	Distance (km)	Time (days)	Cost (USD)			
			20 feet	40 feet	per kg	per cubic meter
1.Bkk ✈ HMC	1,200	1.8	4,580	6,250	43.2	101
2.Bkk 🚚 Laobao 🚚 Dong Ha 🚆 HMC	2,130	6.4	2,198	2,532	41.336	131
3.Bkk 🚚 Laobao 🚚 Dong Ha 🚚 Da Nang ⛵ HMC	2,280	7.4	2,398	2,832	41.34	116
4.Bkk 🚚 Laobao 🚚 Dong Ha 🚚 Da Nang 🚆 HMC	2,215	7.4	2,354	2,776	41.32	131
5.Bkk 🚚 Laobao 🚚 Dong Ha 🚚 Da Nang ✈ HMC	2,280	4.4	5,980	7,800	43.22	111
6.Bkk ⛵ HMC	1,380	5.8	967.5	1,271.1	41.29	94
7.Bkk ✈ Da Nang ⛵ HMC	2,500	6.2	5,378	7,282	84.51	187
8.Bkk ✈ Da Nang 🚆 HMC	3,226	9.3	6,924	9,051	105	252.5
9.Bkk ✈ Da Nang 🚚 HMC	2,347	3.8	6,580	8,750	43.21	131

Remark: truck 🚚, train 🚆, air ✈ and sea ⛵

Source: Kengpol et al. (2010)

Table 2.7 Multimodal transportation routes of Bangkok (Thailand) - Ha Noi (Vietnam)

Routes of Bangkok (Bkk) – Ha Noi	Distance (km)	Time (days)	Cost (USD)			
			20 feet	40 feet	per kg	per cubic meter
1. Bkk 🚛 Laobao 🚛 Dong Ha 🚂 Ha Noi	1,752	6.4	2,154	2,476	41.32	131
2. Bkk 🚛 Laobao 🚛 Dong Ha 🚛 Da Nang ⛵ Hai Phong 🚛 Ha Noi	1,957	7.9	2,596	3,084	41.39	146
3. Bkk 🚛 Laobao 🚛 Dong Ha 🚛 Da Nang ⛵ Hai Phong 🚂 Ha Noi	1,954	9.5	2,620	3,125	61.87	166.5
4. Bkk ⛵ HMC 🚛 Ha Noi	3,106	9.8	3,967.5	4,771.7	41.31	124
5. Bkk ⛵ HMC 🚂 Ha Noi	3,206	12.1	1,807.5	2,346.7	62.14	174.5
6. Bkk ⛵ HMC ⛵ Hai Phong 🚛 Ha Noi	2,631	9.4	2,830	3,415	61.89	186.5
7. Bkk ⛵ HMC ⛵ Hai Phong 🚂 Ha Noi	3,017	15	1,741.5	2,456	91.4	150
8. Bkk 🚛 HMC ⛵ Da Nang 🚂 Ha Noi	2.971	11.5	4,718	5,077	61.93	166.5
9. Bkk 🚛 HMC ⛵ Da Nang 🚛 Ha Noi	2,280	10.4	5,798	6,232	41.34	146
10. Bkk 🚛 HMC 🚂 Ha Noi	2,906	9.4	4,430	4,330	41.37	131
11. Bkk 🚛 HMC ⛵ Hai Phong 🚛 Ha Noi	2,820	8.9	4,540	4,840	41.4	146

Table 2.7 Multimodal transportation routes of Bangkok (Thailand) - Ha Noi (Vietnam) (Cont.)

Routes of Bangkok (Bkk) – Ha Noi	Distance (km)	Time (days)	Cost (USD)			
			20 feet	40 feet	per kg	per cubic meter
12.Bkk HMC Hai Phong Ha Noi	2,817	10.5	4,564	4,881	61.88	166.5
13.Bkk Da Nang Ha Noi	2,591	10.8	2,960	3,910	41.3	206
14.Bkk Da Nang Ha Noi	2,691	12.1	2,080	3,005	62.08	256.5
15.Bkk Da Nang Hai Phong Ha Noi	2,477	12.4	2,166	3,119	61.96	241.5
16.Bkk Da Nang Hai Phong Ha Noi	2,474	14	2,190	3,160	82.44	262
17.Bkk Hai Phong Ha Noi	2,403	12.3	1,544	2,236	41.36	139
18.Bkk Hai Phong Ha Noi	2,503	12.7	1,924	2,736	82.56	210
19.Bkk Da Nang Ha Noi	2,291	6.2	5,290	7,170	84.49	202
20.Bkk Da Nang Ha Noi	2,191	4.8	6,080	7,950	43.21	131
21.Bkk Ha Noi	2,400	1.8	4,580	6,250	43.2	101

Remark: truck , train , air and sea

Source: Kengpol et al. (2010)

Table 2.8 Multimodal transportation routes of Bangkok (Thailand) – Da Nang (Vietnam)

Route Bangkok (Bkk) – Da Nang	Distance (km	Time (days)	Cost (USD)			
			20 feet	40 feet	per kg	per cubic meter
1.Bkk ⛵ HMC 🚚 Da Nang	2,327	7.8	2,967.5	3,771.67	41.303	124
2.Bkk ⛵ HMC 🚂 Da Nang	2,415	10.1	1,631.5	2,122.67	62.093	174.5
3.Bkk ✈ Da Nang	1,400	1.8	4,580	6,250	43.2	101
4.Bkk ⛵ Da Nang	1,800	7.8	1,460	2,210	41.29	176
5.Bkk 🚚 HMC ⛵ Da Nang	2,180	7.4	4,298	4,532	41.34	116
6.Bkk 🚚 HMC 🚂 Da Nang	2,115	7.4	4,254	4,476	41.32	131
7.Bkk 🚚 HMC ✈ Da Nang	2,180	4.4	7,880	9,500	43.22	111
8.Bkk ✈ HMC 🚂 Da Nang	2,235	6.2	5,334	7,226	84.5	202
9.Bkk ✈ HMC 🚚 Da Nang	2,147	3.8	6,580	8,750	43.21	131
10.Bkk ✈ HMC ⛵ Da Nang	2,300	6.2	5,378	7,282	84.51	187
11.Bkk ⛵ HMC ✈ Da Nang	2,480	7.1	5,257.5	7,146.7	63.99	154.5

Remark: truck 🚚, train 🚂, air ✈ and sea ⛵

Source: Kengpol et al. (2010)

According to Kengpol et al. (2010), this study discussed transportation routes between Thailand and Vietnam both vessel and crossing-border trade. The result concluded that vessel is still mainly used to transport goods because crossing-border found problem that custom clearance delayed and quality of routes are still bad. However, international transport routes are currently developing and ASEAN Economic Community (AEC) is starting. Transport routes of crossing-border are more efficient than vessel, these transport routes of crossing-border are the most efficient if ASEAN Economic Community (AEC) occurs in the future. Advantages of AEC help custom facilities. Moreover, AEC makes logistics cost and transit time reduction.

Thus, we should view transportation routes in the future if AEC happens and take transportation routes of Kengpol et al. (2010) to be a part of consideration for the textile export of Thailand to Vietnam in the future.

These information in this chapter will be determined transportation routes for the textile export of Thailand to Vietnam in the future in the chapter IV.

2.1.6 Scenario analysis

Scenario analysis first created following World War II. It was used to plan military (Mietzner and Reger, 2005). Military planners became proficient at generating scenarios depicting alternative moves of potential foes (Becker, 1983). After that scenario analysis was developed in the early 1970s as a corporate planning tool by Pierre Wack (Kirchgeorg et al., 2008, Mercer, 1995). He improved it in Royal Dutch/Shell. Instead of creating it from the past, he and the team described a series of stories in the future. Scenario analysis is an important methodology in the study of future and demonstrates alternative futures. It is widely used in the industries and the governments. Gained results come from multidimensional perspectives and uncertain factors. Moreover, it helps to look into the future world (Kirchgeorg et al., 2008). Scenarios consist of the stories of the multiple futures in terms of quality and quantity factors. These multiple futures are uncertain (Randall, 2009). Scenario should involve with complexity of the real world to led possible futures of events (Forge et al., 2006). Scenario analysis seems to be a perfect tool for management strategic decision in today's highly uncertain environment (Courtney, 2003). It explores uncertainties and expand people's thinking. Advantage of this technique is broader in scope of problem than other techniques Schoemaker (1993). Scenarios are based on future-open thinking and strategic thinking. To rectify the decision process, their objective should have uncertainties in complicated environments (Fink et al., 2004). Scenario analysis is not a forecast of future but it is a forward-looking statement that happen or not. To recognize the view for varieties of possible futures, we should consider environments of system that are identified with uncertainty (Ratcliffe, 2000). Forecast wants to know what the future will be or what should be like. Rather it limits thinking. Moreover, Forecast views the concept from the present to the future. However, the future is uncertain. We should open the doorway to possibilities (Ghanadan & Koomey, 2005).

Scenarios do not need to demonstrate the complex situation. Simple scenarios are enough to decide new possibilities. Thus we must prepare for plausible futures, not just the one we expect to happen. It is a key technique that involves with specialist opinion in the field for the future (Bishop et al., 2007). The main characteristics of scenarios are follows: 1. focus on the needs of some issue, decision, strategy or plan 2. should be logically structured and internally consistent 3. should be highly flexible and capable of adaptation to the needs of the given situation 4. should be high degree of ownership of the final product (Ratcliffe, 2000).

From reviewing literature, we can conclude that scenario analysis is a key technique of future study. Scenarios consist of various possible futures and show multiple perspectives and alternative options in the future instead of perspective from the present. Stories of the multiple futures are created from quality and quantity factors. The future situations have uncertainties that are considered in scenario process. Process should think breaking-out-of-the box. Scenario is not forecast or prediction. It is based on the assumptions that look the world in the future from today. However, the world always changes. We should search for possible futures to prepare uncertainties in the future.

2.2 Development of scenario analysis process

This section covers the step of scenario analysis from the revision and we develop scenario methodology in this study. The approach used in this study is based on the scenario development steps of related researches.

O'Brien (2004) studied the scenario concept and introduced scenario development methodology. The objective in this research is to add to the body of scenario planning literature by reflecting on the developed scenarios. There are three main issues, including the synthesis of information about what is important of uncertainties in the future, the development of a set of possible future or scenarios though using a structured procedure and the evaluation of the meaning of words for each different situation. The purpose of scenarios is to help people to think about the future and to believe that these possible futures, in the form of scenarios, may possibly

happen. There are eight steps in scenario development process as follows: 1. set the scene- to think to focus on big issues 2. generate uncertain and predetermined factors- to list key factors that may involve with issues in the future 3. reduce factors and specify factor ranges- with a much larger number of factors generated by the previous step, their ranking in terms of uncertainty and importance of factors should frame future scenarios 4. choose themes and develop scenario details- to use the factors from the previous step for creating scenarios 5. check consistency of scenarios- to check for influencing about issues and factors 6. present scenarios- to allow space for consideration of the issues involved in effectively presenting scenarios 7. assess impact of scenarios- to show future opportunities and threats presented by each of the scenarios 8. develop and test strategies- to check each option under each scenario to see if it is robust.

Ratcliffe (2000) described that scenarios should be focused on importance of issue, decision, strategy or plan. Good scenarios should be logically structured and consistent. Scenario process should be highly flexible and capable of adaptation to the situation. Scenarios are long-term trends and uncertainties about five to ten years. The process consists of seven steps as follows: 1.task identification and analysis- to identify the focal issue in question or the specific decision 2. key decision factors- to list the key factors influencing the success or failure of the decision indentified in previous step for being internal factor 3. driving forces- to explore the driving forces of change in the macro-environment for influencing these key factors 4. ranking- to rank degree of importance for the success and degree of uncertainty of key factors and driving forces, they appear the axes that a logical reason and structure for the scenarios. They are called scenario logics 5. alternative projections- to determine scenario logics and create the reasons under a scenario's plot or story 6. scenario development- to flesh out the scenarios by selection key factors and driving forces that be given some attention in each scenario and to create a table of comparative descriptions detailing what may happen to all key factors or driving forces in each scenario 7. interpretation- to imply strategy, fit the decision each scenario and to suggest the options under robust and consistent scenarios.

Schroeder et al. (2008) discussed that scenario analysis is an alternative method for evaluating regional impacts of statewide multimodal transportation

policies. They developed scenario process to six steps as follows: 1. identification the driving forces- to identify issue of change that impact the future 2. determination the patterns of interaction- to create multiple possible futures for interaction with driving forces 3. construction scenarios- to discuss and combine key factors and driving forces 4. analysis their implication- to determine the potential harmful effect of each scenario and develop ways to protect and/or respond to it 5. evaluation scenarios- to evaluate factors with scenarios by ranking from factors having major increase to major decrease in importance for scenarios 6. monitor indicators- to measure the impacts of each scenario.

Du et al. (2008) developed electricity distribution networks in the Netherlands by using scenario analysis. There are eight step in this study as follows: 1. identification of focal issues or decisions- to identify the focal issues or decisions 2. identification of key factors in the local environment- to list the key factors influencing the success or failure of identified focal issues or decisions in the local environment 3. identification of driving forces- to list the driving forces that influence the identified key factors in the macro-environmental 4. ranking by importance and uncertainty- to rank the key factors and driving forces based on the degree of importance for the success of the identified focal issues or decisions and the degree of uncertainty of the identified key factors and driving forces 5. selection of scenario logic- to identify the axes based on the ranking results along that different scenarios will be created 6. fleshing out the scenarios- to flesh out the framework of scenarios by paying attention to all the identified key factors in the developed scenarios 7. implications- to analyze the identified focal issues or decisions in the context of the developed scenarios 8. selection of leading indicators and signposts- to select leading indicators and signposts for ongoing monitoring.

Schwartz (1996); Mietzner and Reger (2005) studied different scenarios in the future. There are eight steps as follows: 1. identification of the focal issues or decisions 2. identification of key forces in the local environment 3. list of the driving forces 4. ranking of key factors and driving forces by importance and uncertainty 5. selection of scenario logics, the axes along different scenarios 6. fleshing out the scenario – the logics give the skeleton of the scenarios and returning to the key factors

and trends listed in step 1 and 3 7. exploration of the implications 8. selection of leading indicators and signposts.

Von Reibnitz (1988, 1992), Schwab et al. (2003); Mietzner and Reger (2005) studied scenarios create alternatives in case of uncertainties assemble them into highly consistent scenarios. There are eight steps as follows: 1. task analysis 2. influence analysis 3. projections 4. clustering alternatives 5. scenario interpretation 6. consequence analysis (opportunities, risks, actions) 7. analysis of disruptive events 8. scenario transfer (developing core strategy, monitoring system).

Marchais-Roubelat and Roubelat (2008) studied how action and actors' projects structure foresight foundations. Suggestion designs scenarios in views of the future. After that developed processes of scenario analysis are analyzed relationship between actors' projects and scenarios. Scenarios are created by identify issues, listing the factors and accession for strategies scenarios. Scenarios should avoid trap with framed crossing two dimensions that play scenario logics.

Based on reviewing related literatures in previous researches can build process of scenario in this study. Scenario development process is evaluated seven steps as follows:

- Step 1: Set the focal issues

The first step of scenario building process is to identify the focal issues or decisions that are important issues that impact in the future. In addition, time and scope of analysis are identified.

- Step 2: Identification of key factors and driving forces

The second step of scenario building process splits into two steps:

1) Identification of key factors: this step is to list key factors influencing the success or failure of identified focal issues or decision in the local environment.

2) Identification of driving forces: this step is to list driving forces influencing power behind the key factors. Driving forces will perform to change the future. They are based on the identified key factor in macro-environment.

- Step 3: Ranking by importance and uncertainty

Number of key factors and driving forces for appropriate scenario building process is no more than twenty (O'Brien 2004). If key factors and driving forces are too large number, these factors must be reduced. After that key factors and driving

forces are ranked in term of the level of importance and the level of uncertainty. The level of these factors is an important point for creating scenarios.

- Step 4: Selection of scenario logic

The result of the ranked factors in step three selects the most important and the most uncertain of key factors and driving forces to identify the axes along which scenarios are different (Ratcliffe 1999 and Forge et al., 2006).

- Step 5: Present scenarios

This step is the heart of scenario building process. The axes which are determined from the step four, demonstrate two scenario logics or axes and structure of scenarios. The other identified key factors and driving forces are given some attention in each scenario to flesh out scenarios (Du et al. 2008). Scenario building process should develop between two and four scenarios (O'Brien, 2004, Wilson, 1998; Mietzner and Reger, 2005).

- Step 6: Implication

The last step, set of scenarios in the previous step are checked future opportunities and threats each option under each scenario. This step fits the decision each scenario and suggests the options under robust and consistent scenarios. It determines the fundamental question of how the task, issue or decision identified at step one looks in the scenarios constructed. What are the strategic implications? How does the decision fit into each scenario? What options are suggest? (Ratcliffe, 2000).

However, scenario building process is based on the worldviews and experiences of researchers. They should not limit to framework of their belief and current situations (O'Brien 2004). Development of scenario process is summarized in Figure 2.4.

```
┌─────────────────────────────────────────────────────────┐
│    Set the focal issues or decisions, time and scope of analysis    │
└─────────────────────────────────────────────────────────┘
                              ⬇
┌─────────────────────────────────────────────────────────┐
│            Identify key factors and driving forces            │
└─────────────────────────────────────────────────────────┘
                              ⬇
┌─────────────────────────────────────────────────────────┐
│            Reduce & Rank importance and uncertainty            │
└─────────────────────────────────────────────────────────┘
                              ⬇
┌─────────────────────────────────────────────────────────┐
│                  Select two scenario logics                  │
└─────────────────────────────────────────────────────────┘
                              ⬇
┌─────────────────────────────────────────────────────────┐
│                  Present different scenarios                  │
└─────────────────────────────────────────────────────────┘
                              ⬇
┌─────────────────────────────────────────────────────────┐
│        Implicate & check each option under each scenario        │
└─────────────────────────────────────────────────────────┘
```
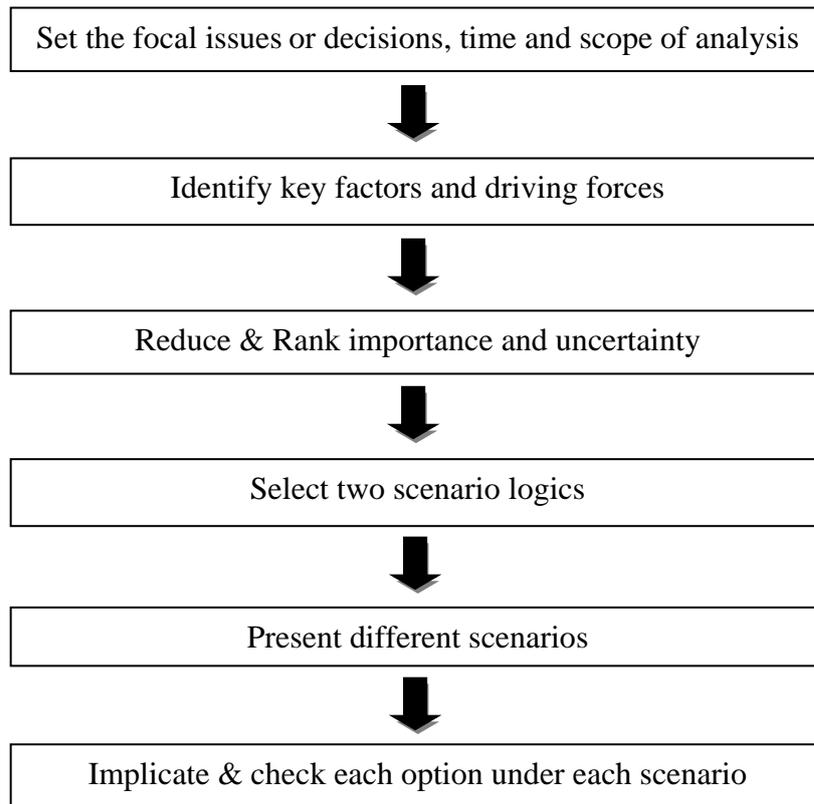
Figure 2.4 Development of scenario process

2.3 Related researches

The past research studies were applied a lot of fields, including science and technology, education, industry, transportation, marketing, medicine and environment. They can improve to the alternative selection by using the concepts of scenario analysis.

Allwood et al. (2007) applied scenario analysis to supply chain of textile and clothing in England. The objective is to know the direction of supply chain of textile and clothing to adequate demand in the future. Driving forces and key factors are considered. They are quantitative and qualitative factors which contribute a set of stories for supply chain of textile and clothing sector in the future.

Schroeder et al. (2008) are interested in the choice of transportation with long-term planning issues that will impact the future of the regional transportation

infrastructure. By using scenario planning, it considers a broad range of long-term multimodal transportation issues. They analyzed the impact of the transportation policies across criteria which are driving forces and the key factors, scenarios were created a set of stories in the future to plan investment and explore options for multimodal transport.

Inayatullah (2003) studied the alternative future of transportation. Scenario analysis was developed. They explored the alternative future of transportation. New technological transformation in long term projects risk and change. The way to solve them use scenario of alternative world and develop an understanding of the depth of the future.

Lin (2006) studied the radioactive waste repository site selection in Taiwan by scenario analysis and analytic hierarchy process (AHP) methodology. Scenarios are used for assessment blends information on site and characteristics of the radioactive waste. Results are discussed from expert group.

Crowley (1998) applied scenario analysis to study the change in transportation network and information and communication technologies (ICT) that play a major role our lives in the future. Transport supply is inadequate for the amount and pattern of demand. Infrastructure is fixed. Thus it is important to expand transport supply chain and capacity in long term.

Du et al. (2008) used scenario analysis to develop electricity distribution networks in the Netherlands. This research was analyzed for dealing with uncertainties in asset management. The approach used in this study is based on the scenario development steps. The results obtained four scenarios. One key factor and one driving force ranked highest in terms of influence on the outcomes. The implications of alternative decisions under each of the four scenarios were shown. Three possible trends of long-term network re-configurations of decentralization were assigned and developed each scenario.

Devesa et al. (2009) studied scenario analysis for the integrated management of sanitation infrastructures. Twenty nine scenarios representative of real situations were identified taking into account the experience of the organization. The results display possible events of industrial spills, rainfalls, inhibition of nitrification,

obstruction of a sewer system conduit and minimum river flow rate as well as possible control actions.

Jawjit et al. (2008) examined possible future trends in the environmental impact of the Kraft pulp industry in Thailand between 2000 and 2020. Based on scenario analysis, it analyzes the effect of different options to reduce the future environmental impact, and the costs associated with the implementation of these options. The results can summarize the most cost effective options may be the most interesting strategy for reducing the overall environmental impact of Kraft pulp industry in Thailand.

Kelly et al. (2006) studied to stimulate thinking and encourage informed discussions concerning the future trajectory and sustainable development of the competitive 'global city'. This research discussed a background of the challenges, driving forces, issues and trend form of the global city in the next twenty-five years by scenario analysis. The result shows four scenarios that use cities are the United States, the European Union, Asia and the Middle East/North Africa (MENA) region.

Saurin & Ratcliffe (2011) studied to demonstrate strategies and prospective in the future by scenario analysis. The result was found that scenario analysis can help explore, explain and enact change in a reactive and technically oriented environment. This methodology is reflexive and flexible. It can add value to this research to validity and quality.

Zhu et al. (2010) studied strategies of environmental assessment in China. Processes of the formulation and implementation have uncertainties that internal and external factors are complicated system. Thus, the method uses scenario analysis to solve problem. The results are found that there are four cases. Each case has three scenarios. Created scenarios led to assess scenarios and develop alternative strategies or options of strategies of environmental assessment in China.

Cilliers & Nagel (1994) studied to explore the latest trends in logistics in South Africa by scenario analysis. In order to enhance the development of logistics, not only in South Africa, but also internationally, it is important to identify the latest trends and do benchmarking against the best practices. The data on trends in logistics was generated through questionnaires distributed to these key people. The results have four scenarios that are different characteristics and logistics will play a critical role in

the recovery of the economy. International trade, which will have a major impact and will in fact be one of the drivers of economic growth, will depend to a large extent on the availability of infrastructure to facilitate exports.

The previous studies have not yet developed scenario analysis with the route selection of transportation. Hence, this research is applied scenario analysis for textile transportation route between Thailand and Vietnam.

CHAPTER III
RESEARCH METHODOLOGY

This chapter divides into six sections, including the research study area selection, data sources and collection, framework of research, the research methodology and materials for developing scenario analysis for selection transportation route between Thailand and Vietnam in textile industry. In the last section, the research time is considered that corresponds to the step of the research methodology.

3.1 Research study area selection

From reviewed in the previous section, the objective of this research is to study possible alternative routes of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs. Group areas are selected by amount of Thai weaving factories in this study. From literature reviews, this research can be divide configurations of distribution for Thai weaving factories by province group into four group areas. All groups are located in the middle part of Thailand. They consist of Bangkok, upper central part, middle central part and lower central part. The main group areas are chosen to the origins of this study.

In the middle part of Thailand, the group areas of Thai weaving factories are set the provincial operations center to study. They divided into Bangkok and Pathumthani is the center of upper central part. Middle central part where Samutprakarn is the center. Nakhonpathom is the center of lower central part.

Mainly, Vietnam weaving factories are located at Ha Noi and Ho Chi Minh City. The transportation can use ports or customs. Therefore, this study chooses Ha Noi and Ho Chi Minh City as the representative destination for Thai textile export to Vietnam.

The structure of group areas for Thai-Vietnam weaving factories in this study is shown as Figure 3.1.
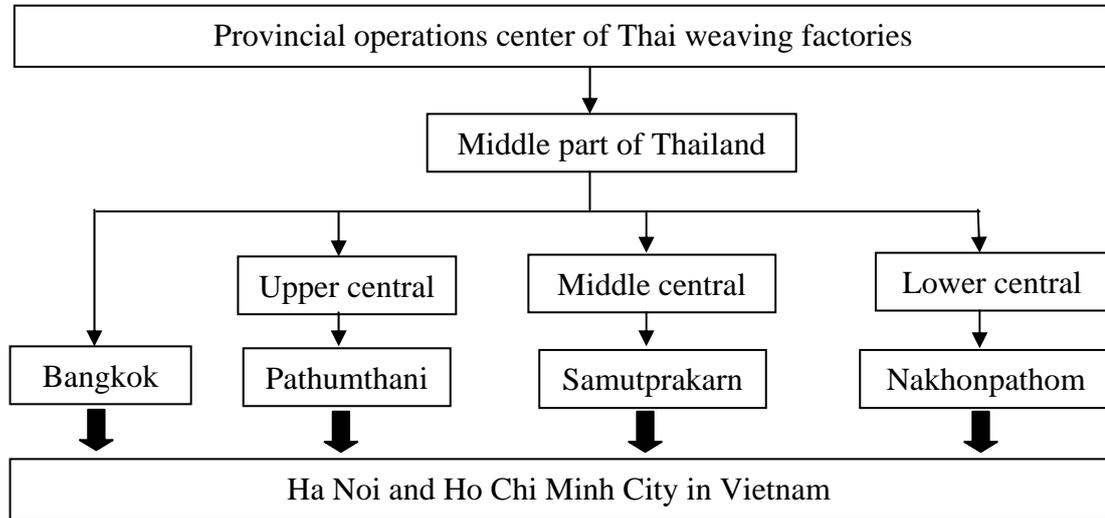
Figure 3.1 The structure of study group areas

3.2 Data sources and collection

The study accumulates literature reviews led to information about selection of the transportation. The study also gathers key factors and driving forces influencing textile transportation between Thailand and Vietnam. The study as collects Thailand-Vietnam textile supply chain facts. There are two types of data sources as primary and secondary data.

For primary data, it is collected from expert's opinion and based on the fieldwork and interviews. Moreover, secondary data is collected from reviewing relevant literatures, technical papers and internet sources.

3.3 Methodology

In this section, the research methodology is illustrated. Main steps of methodology are consists of the processes as follow:

3.3.1 Study the related theory and literature

This step studies theory and literature reviews of Textile Thai export to Vietnam in the future. There are three sections. The first section is Thai textile export to Vietnam before and after ASEAN Economic Community (AEC). The second section is both the origin of group areas in Thailand and the destination of two cities in Vietnam are studied. Current transportation routes for Thai textile export to Vietnam are collected to evaluate transportation routes for Thai textile export to Vietnam if AEC occurs. The last section is background and process of scenario analysis.

3.3.2 Identify the focal issues

This step starts technique by scenario analysis. This technique is analyzed for different situations under each scenario (What-if condition). It is based on literature reviews. This step focuses on identify the focal issues or decisions, time and scope of analysis for selection alternative routes of textile Thailand to Vietnam in the future will change, if ASEAN Economic Community (AEC) occurs. All information in this step are based on literature reviews.

3.3.3 Determine and reduce key factors and driving forces

Schwark (2009) studied influence factors for new environmental technologies by scenario analysis. The method of identify main factors is literature reviews. Thus, the main key factors and driving forces evaluated in this study are based on reviewing relevant literatures, technical papers and internet sources.

Before key factors and driving forces will be identified, the factors are listed from literature reviews to filter to get main factors in this study. After that obtained factors are divided to key factors and driving forces that used to develop suitable route of textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs. If the combinations of key factors and driving forces are much more twenty factors, we should reduce them.

3.3.4 Rank importance and uncertainty

After identify main factors in the previous procedure, key factors and driving forces are ranked in term of the level of importance and the level of

uncertainty from experts within associated fields (Allwood et al., 2008). Future views are based on judgements from a representative group of experts. Empirical evidence and theoretical arguments suggest that between five and twenty experts should be used (Makridakis and Wheelwright, 1989). This study ranks information by the opinions from logistics, transportation and AEC experts in the questionnaire about eight experts. Group of experts in this study are displayed in Table 3.1.

Table 3.1 Group of experts for ranking key factors and driving forces

Group of experts	Number of experts
Logistics and transportation academic	4
Health Systems Research Institute, Thailand	1
Scale Consulting Co.,Ltd., Thailand	1
Office of the National Science Technology and Innovation Policy, Thailand	1
Office of the National Economic and Social Development Board (NESDB), Thailand	1
Total	**8**

Table 3.1 presents group of experts. These experts rank key factors and driving forces with the level of importance and the level of uncertainty by using questionnaires. Expert team is logistics and transportation academic and other relevant organizations. Group of experts are as follows:

Logistics and transportation academic

- Mr. Nattapong Techasutheeudom, he is the President of Philosophy of Science Association at Ramkhamhaeng University.

- Dr. Auscharawan Maneeket, she is Community Devolpment Officer, Expert Level of Community Devolpment Department, Ministry of Interior.

- Miss Wirachchaya Chanpuypetch, she is a researcher of Centre of Logistics Management, Facultya of Engineering at Mahidol University.

- Miss Varunya Kulkittirangsi, she is a researcher at King Mongkut's University of Technology Thonburi (KMUTT).

Health Systems Research Institute

- Miss Natapak Sakunodom, she is Project Manager of Health Systems Research Institute.

Scale Consulting Co.,Ltd.

- Mr. Prajak Patitat, he is Management of Director of Scale Consulting Co.,Ltd.

Office of the National Science Technology and Innovation Policy

- Mr. Parinund Varnasavang: he is Policy Research Assistant of Office of the National Science Technology and Innovation Policy.

Office of the National Economic and Social Development Board (NESDB)

- Mr. Suriyon Tunkijjanukip: he is Plan and Policy Analyst (Senior Professional Level) of Office of the National Economic and Social Development Board.

Experts use the scale given in Table 3.2 and Table 3.3 to rank key factors and driving forces by the level of importance and the level of uncertainty in the questionnaires. The responses were gathered to transform for grading the levels of key factors and driving forces. There are three levels both importance and uncertainty. Three levels of importance are very important, important and not important. Three levels of uncertainty are highly uncertain, uncertain and not uncertain. Each level of importance and uncertainty has own numerical value in score (Du et al., 2008).

Table 3.2 Importance scores (Du et al., 2008)

Levels	Scores
Not important	1
Important	2
Very important	3

Table 3.3 Uncertainty scores (Du et al., 2008)

Levels	Scores
Not uncertain	1
Uncertain	2
Highly uncertain	3

The results of important from the questionnaire rank three levels with very important, important and not important. The results of uncertainty from the questionnaire rank three levels with highly uncertain, uncertain and not uncertain (O'Brien, 2004). Ranking are calculated by using the sum of score of importance and uncertainty of each factor. The highest ranked key factor and driving force are very important and highly uncertain.

3.3.5 Select scenario axe

From ranking key factors and driving forces, we select the most important and the most uncertain of key factors and driving forces to identify the two scenario axes or logics. These axes present a logic structure of scenarios.

3.3.6 Present scenarios

This stage produces a set of stories by filling two scenario logics and the other identified key factors and driving forces in each scenario. These other identified key factors and driving forces must relate each other. One driving force will effect to one key factor with direct and indirect influence. Thus, we should carefully examine corresponding key factors and driving forces.

This step collects Thailand-Vietnam textile transportation routes and AEC context facts to draw out the full scenarios. There are two types of data sources as primary and secondary data.

For primary data, it is collected from interviewees's opinion from the fieldwork by interview and survey from public and private sectors in Laos and Vietnam. Moreover, secondary data is collected from reviewing relevant literatures and internet sources. There are six interviewees. Group of interviewees in this study are displayed in Table 3.4.

Table 3.4 Group of interviewees for scenario development

Group of interviewees	Number of experts
Asia Road Express (Lao) Co., Ltd, Laos	1
Office of Commercial Affair, Royal Thai Embassy, Laos	1

Table 3.4 Group of interviewees for scenario development (cont.)

Group of interviewees	Number of experts
Haiphong Port Holding Limited Liability Co.,Ltd, Vietnam	1
Office of Commercial Affair, Royal Thai Embassy, Vietnam	1
ASEAN Secretariat, Vietnam	1
Vietrantimex 1 Co., Ltd, Vietnam	1
Total	**6**

Table 3.4 shows group of interviewees. The questions deal with transportation routes before and after AEC, flow of goods, preparation of AEC and the impact of AEC on ASEAN countries. Group of interviewees are as follows:

Asia Road Express (Lao) Co.,Ltd

- Mr. Kaisone Nuankamsing, he is the Director of Asia Road Express (Lao) Co.,Ltd in Laos.

Office of Commercial Affair, Royal Thai Embassy, Laos

- Mrs. Pimol Pongkongkaew, she is the Director of Thai Trade Center at Office of Commercial Affair, Royal Thai Embassy, Vientiane, Laos.

Haiphong Port Holding Limited Liability Co.,Ltd

- Mr. Cao Trung Ngoan, he is the Deputy General Director of the Hai Phong Port, Vietnam.

Office of Commercial Affair, Royal Thai Embassy, Vietnam

- Miss Busaba Butrat, she is the Director of Thai Trade Center at Office of Commercial Affair, Royal Thai Embassy, Hanoi, Vietnam.

ASEAN Secretariat

- Somsak Pipoppinyo, he is the Director of Finance, Industry and Infrastructure, ASEAN Secretariat, Vietnam.

Vietrantimex 1 Co.,Ltd

- Mr. Doung Viet Coung, he is Director of Vietrantimex 1, Vietnam.

Resulting from fieldwork (in-depth interview and survey) combine with resulting from the literature review to evaluate for category cases of scenarios.

3.3.7 Implicate of scenarios

The last step determines the fundamental question of how issue identified at step one looks in the scenarios created. The decision of alternative routes fits into each scenario for textile Thailand to Vietnam in the future if ASEAN Economic Community (AEC) occurs. In addition, the strategic implications are demonstrated in this step.

CHAPTER IV
RESULTS

This chapter will discuss transportation routes in this research and the results from scenario analysis.

4.1 Alternative routesfortextile Thailand-Vietnamif ASEAN Economics Community (AEC) occurs.

From reviewing literature in chapter II, Figure 2.3 and Table 2.4-2.8 are developed in this study. Alternative routes of each group area to the destination are difference that varied by origins and the target destinations. These are the following:

4.1.1 Textile logistics flow in Thailand - Ha Noi

Fabric plant areas and fabric manufacturers are mostly located in central of Thailand. In central part, the planted areas can be separated four group areas. These are the following:

4.1.1.1 Textile logistics flow in Bangkok - Ha Noi

Fabric manufacturers transport both ports and border trades. Manufacturers from Bangkok ship fabric to Ha Noi in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Bangkok to LCB port can use trailers but from Bangkok to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ha Noi via Da Nang port or Hai Phong port and can be accessed Ha Noi by truck. Fabric in this group area can use Mukdaharn border or Nakornpanom border to Ha Noi.

Exporters carry fabric from Bangkok to Ha Noi with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Lao PDR and cross the

2ndThai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

Moreover, exporters transport fabric from Bangkok to Ha Noi with Nakornpanom border in Thailand using truck is inland transportation. Then truck can access from Nakornpanom border to Thakhek border in Laos and cross the 3rdThai-Laos Friendship Bridge across the Mekong. Using the Nation Highway route number 12 (R12) is EWEC routes which support ASEAN Economic Community. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Afterward, exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

All routes for textile logistics flow in Bangkok are shown in Table 4.1.

Table 4.1 Routes for textile logistics flow in Bangkok to Ha Noi

Route No.	Origin	Thailand					International transportation		Vietnam			
		Inland mode	Port/Customs	Mode	Customs	Mode	Port	Mode	Port	Mode	Target	Mode
1	Bangkok	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
2	Bangkok	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
3	Bangkok	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
4	Bangkok	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Train
5	Bangkok	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
6	Bangkok	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
7	Bangkok	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
8	Bangkok	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Train
9	Bangkok	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
10	Bangkok	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train
11	Bangkok	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
12	Bangkok	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train

4.1.1.2 Textile logistics flow in upper central part- Ha Noi

In upper central part of Thailand, Pathumthani is the center area in the region. Fabric manufacturers export both ports and border trades. Manufacturers from Pathumthani ship fabric to Ha Noi in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Pathumthani to LCB port can use trailers. From Pathumthani to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ha Noi via Da Nang port or Hai Phong port and can be accessed Ha Noi by truck. Fabric in this group area can use Mukdaharn border or Nakornpanom border to Ha Noi.

Exporters transport fabric from Pathumthani to Ha Noi with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

Furthermore, exporters transport fabric from Pathumthani to Ha Noi with Nakornpanom border in Thailand using truck is inland transportation. Then truck can access from Nakornpanom border to Thakhek border in Laos and cross the 3[rd]Thai-Laos Friendship Bridge across the Mekong. Using the Nation Highway route number 12 (R12) is EWEC routes which support ASEAN Economic Community. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Afterward, exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

All routes for textile logistics flow in Pathumthani are shown in Table 4.2

Table 4.2 Routes for textile logistics flow in Pathumthani to Ha Noi

Route No.	Thailand				International transportation Vietnam						Target	Mode
	Origin	Inland mode	Port/Customs	Mode	Customs	Mode	Port	Mode	Port	Mode		
1	Pathumthani	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
2	Pathumthani	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
3	Pathumthani	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
4	Pathumthani	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Train
5	Pathumthani	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
6	Pathumthani	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
7	Pathumthani	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
8	Pathumthani	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Train
9	Pathumthani	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
10	Pathumthani	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train
11	Pathumthani	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
12	Pathumthani	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train

4.1.1.3Textile logistics flow in middle central part- Ha Noi

In middle central part of Thailand, Samutprakarn is the center area in the region. Fabric manufacturers export both ports and border trades. Manufacturers from Pathumthani ship fabric to Ha Noi in Vietnam via Laem Chabang port (LCB). Inland transportation from Samutprakarn to LCB port can use trailers. From LCB ports, fabric will finally be shipped to Ha Noi via Da Nang port or Hai Phong port and can be accessed Ha Noi by truck. Fabric in this group area can use Mukdaharn border or Nakornpanom border to Ha Noi.

Exporters transport fabric from Samutprakarn to Ha Noi with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

Moreover, exporters transport fabric from Samutprakarn to Ha Noi with Nakornpanom border in Thailand using truck is inland transportation. Then truck can access from Nakornpanom border to Thakhek border in Laos and cross the 3rdThai-Laos Friendship Bridge across the Mekong. Using the Nation Highway route number 12 (R12) is EWEC routes which support ASEAN Economic Community. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Afterward, exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

All routes for textile logistics flow in Samutprakarn are shown in Table 4.3.

Table 4.3 Routes for textile logistics flow in Samutprakarn to Ha Noi

Route No.	Thailand				International transportation		Vietnam					
	Origin	Inland mode	Port/Customs	Mode	Customs	Mode	Port	Mode	Port	Mode	Target	Mode
1	Samutprakarn	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
2	Samutprakarn	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
3	Samutprakarn	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
4	Samutprakarn	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Train
5	Samutprakarn	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
6	Samutprakarn	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train
7	Samutprakarn	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
8	Samutprakarn	Truck	Nakornpanom-Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train

4.1.1.4Textile logistics flow in lower central part- Ha Noi

In lower central part of Thailand, Nakhonpathom is the center area in the region. Fabric manufacturers export both ports and border trades. Manufacturers from Nakhonpathom ship fabric to Ha Noi in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Nakhonpathom to LCB port can use trailers. From Nakhonpathom to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ha Noi via Da Nang port or Hai Phong port and can be accessed Ha Noi by truck. Fabric in this group area can use Mukdaharn border or Nakornpanom border to Ha Noi.

Exporters transport fabric from Nakhonpathom to Ha Noi with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

Moreover, exporters transport fabric from Nakhonpathom to Ha Noi with Nakornpanom border in Thailand using truck is inland transportation. Then truck can access from Nakornpanom border to Thakhek border in Laos and cross the 3rdThai-Laos Friendship Bridge across the Mekong. Using the Nation Highway route number 12 (R12) is EWEC routes which support ASEAN Economic Community. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Afterward, exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck or train.

All routes for textile logistics flow in Nakhonpathom are shown in Table 4.4.

Table 4.4 Routes for textile logistics flow in Nakhonpathom to Ha Noi

Route No.	Origin	Thailand			International transportation				Vietnam			
		Inland mode	Port/Customs	Mode	Customs	Mode	Port	Mode	Port	Mode	Target	Mode
1	Nakhonpathom	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
2	Nakhonpathom	Truck	BKK	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
3	Nakhonpathom	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
4	Nakhonpathom	Truck	BKK	-	-	-	Danang	Vessel	-	-	Hanoi	Train
5	Nakhonpathom	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Truck
6	Nakhonpathom	Trailer	LCB	-	-	-	-	-	Hai Phong	Vessel	Hanoi	Train
7	Nakhonpathom	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Truck
8	Nakhonpathom	Trailer	LCB	-	-	-	Danang	Vessel	-	-	Hanoi	Train
9	Nakhonpathom	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
10	Nakhonpathom	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train
11	Nakhonpathom	Truck	Nakornpanom -Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Truck
12	Nakhonpathom	Truck	Nakornpanom -Thakhek (Thai-Laos)	Truck (R12)	Nam pao-Cao Treo (Laos-Vietnam)	Truck (R12)	Danang	Truck	Hai Phong	Vessel	Hanoi	Train

4.1.2 Textile logistics flow in Thailand - Ho Chi Minh City

Fabric plant areas and fabric manufacturers are mostly located in central of Thailand. In central part, the planted areas of Ho Chi Minh City and Ha Noi are alike. They can be separated four group areas. These are the following:

4.1.2.1 Textile logistics flow in Bangkok - Ho Chi Minh City

Fabric manufacturers transport both ports and border trades. Manufacturers from Bangkok ship fabric to Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Bangkok to LCB port can use trailers but from Bangkok to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ho Chi Minh City. Fabric in this group area can use Mukdaharn border in Mukdaharn Province, Chong Meck border in Ubonratchathani Province, Aranyaprathet border in Srakaew Province or Ban Had Lek border in Trat Province to Ho Chi Minh City.

Exporters carry fabric from Bangkok to Ho Chi Minh City with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). Finally, fabric is shipped to Ho Chi Minh City. Moreover, truck or train can export to Ho Chi Minh City.

Exporters transport fabric from Bangkok to Ho Chi Minh City with Chong Meck border using truck is inland transportation. Then exporters can access to Wangtao border in Laos by Truck. Using the Nation Highway route number 1 (R1) is SEC routes which support ASEAN Economic Community. After that truck is transported Veunekham border in Laos to Dong Kralor border in Cambodia. Next exporters can transport fabric from Dong Kralor border in Cambodia to Huanli border in Vietnam by truck. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Bangkok to Ho Chi Minh City with Aranyaprathet border. Inland transportation is truck. Then exporters can access to

Poipet border in Cambodia by truck or train. Using the Nation Highway route number 13 (R13) is SEC routes which support ASEAN Economic Community. After that truck is transported Bavet border in Cambodia to Moc Bai border in Vietnam. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Bangkok to Ho Chi Minh City with Ban Had Lek border in Thailand using truck is inland transportation. Then truck can access from Ban Had Lek border to Kohkong border in Cambodia. Using the Nation Highway route number 10 (R10) is SEC routes which support ASEAN Economic Community. Next fabric is shipped to Srihanu Ville border in Cambodia-Vietnam. Finally, fabric is shipped to Ho Chi Minh City only.

All routes for textile logistics flow in Bangkok are shown in Table 4.5.

Table 4.5 Routes for textile logistics flow in Bangkok to Ho Chi Minh City

Route No.	Thailand				International transportation		Vietnam			
	Origin	Inland mode	Port/Customs	Mode	Customs	Mode	Port/Customs	Mode	Target	Mode
1	Bangkok	Truck	BKK	-	-	-	-	-	HMC	Vessel
2	Bangkok	Trailer	LCB	-	-	-	-	-	HMC	Vessel
3	Bangkok	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Vessel
4	Bangkok	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Train
5	Bangkok	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Truck
6	Bangkok	Truck	Chong Meck-Wangtao border (Thai-Laos)	Truck (R12)	Veunekham-Dong Kralor border (Laos-Cambodia)	Truck (R12)	Dong Kralor-Huanli border (Cambodia-Vietnam)	Truck	HMC	Truck
7	Bangkok	Truck	Aranyaprathet -Poipet border (Thai-Laos)	Truck (R13)	Bavet-Moc Bai border (Cambodia-Vietnam)	Truck (R13)	-	-	HMC	Truck
8	Bangkok	Truck	Aranyaprathet -Poipet border (Thai-Laos)	Train (R13)	Bavet-Moc Bai border (Cambodia-Vietnam)	Truck (R13)	-	-	HMC	Truck
9	Bangkok	Truck	Ban Had Lek-Kohkong border (Thai-Cambodia)	Truck (R10)	Srihanu Ville (Cambodia-Vietnam)	Vessel	-	-	HMC	Vessel

4.1.2.2 Textile logistics flow in Pathumthani - Ho Chi Minh City

Fabric manufacturers transport both ports and border trades. Manufacturers from Pathumthani ship fabric to Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Pathumthani to LCB port can use trailers but from Pathumthani to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ho Chi Minh City. Fabric in this group area can use Mukdaharn border in Mukdaharn Province, Chong Meck border in Ubonratchathani Province, Aranyaprathet border in Srakaew Province or Ban Had Lek border in Trat Province to Ho Chi Minh City.

Exporters carry fabric from Pathumthani to Ho Chi Minh City with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). Finally, fabric is shipped to Ho Chi Minh City. Moreover, truck or train can export to Ho Chi Minh City.

Exporters transport fabric from Pathumthani to Ho Chi Minh City with Chong Meck border using truck is inland transportation. Then exporters can access to Wangtao border in Laos by Truck. Using the Nation Highway route number 1 (R1) is SEC routes which support ASEAN Economic Community. After that truck is transported Veunekham border in Laos to Dong Kralor border in Cambodia. Next exporters can transport fabric from Dong Kralor border in Cambodia to Huanli border in Vietnam by truck. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Pathumthani to Ho Chi Minh City with Aranyaprathet border. Inland transportation is truck. Then exporters can access to Poipet border in Cambodia by truck. Using the Nation Highway route number 13 (R13) is SEC routes which support ASEAN Economic Community. After

that truck is transported Bavet border in Cambodia to Moc Bai border in Vietnam. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Pathumthani to Ho Chi Minh City with Ban Had Lek border in Thailand using truck is inland transportation. Then truck can access from Ban Had Lek border to Kohkong border in Cambodia. Using the Nation Highway route number 10 (R10) is SEC routes which support ASEAN Economic Community. Next fabric is shipped to Srihanu Ville border in Cambodia-Vietnam. Finally, fabric is shipped to Ho Chi Minh City only.

All routes for textile logistics flow in Pathumthani are shown in Table 4.6.

Table 4.6 Routes for textile logistics flow in Pathumthani to Ho Chi Minh City

Route No.	Origin	Thailand			International transportation		Vietnam		Target	Mode
		Inland mode	Port/Customs	Mode	Customs	Mode	Port/Customs	Mode		
1	Pathumthani	Truck	BKK	-	-	-	-	-	HMC	Vessel
2	Pathumthani	Trailer	LCB	-	-	-	-	-	HMC	Vessel
3	Pathumthani	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Vessel
4	Pathumthani	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Train
5	Pathumthani	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Truck
6	Pathumthani	Truck	Chong Meck-Wangtao border (Thai-Laos)	Truck (R12)	Veunekham-Dong Kralor border (Laos-Cambodia)	Truck (R12)	Dong Kralor-Huanli border (Cambodia-Vietnam)	Truck	HMC	Truck
7	Pathumthani	Truck	Aranyaprathet -Poipet border (Thai-Laos)	Truck (R13)	Bavet-Moc Bai border (Cambodia-Vietnam)	Truck (R13)	-	-	HMC	Truck
8	Pathumthani	Truck	Ban Had Lek-Kohkong border (Thai-Cambodia)	Truck (R10)	Srihanu Ville (Cambodia-Vietnam)	Vessel	-	-	HMC	Vessel

4.1.2.3 Textile logistics flow in Samutprakarn - Ho Chi Minh City

Fabric manufacturers transport both ports and border trades. Manufacturers from Samutprakarn ship fabric to Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) port. Inland transportation from Samutprakarn to LCB port can use trailers only. From LCB ports, fabric will finally be shipped to Ho Chi Minh City. Fabric in this group area can use Mukdaharn border in Mukdaharn Province, Chong Meck border in Ubonratchathani Province, Aranyaprathet border in Srakaew Province or Ban Had Lek border in Trat Province to Ho Chi Minh City.

Exporters carry fabric from Samutprakarn to Ho Chi Minh City with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). Finally, fabric is shipped to Ho Chi Minh City. Moreover, truck or train can export to Ho Chi Minh City.

Exporters transport fabric from Samutprakarn to Ho Chi Minh City with Chong Meck border using truck is inland transportation. Then exporters can access to Wangtao border in Laos by Truck. Using the Nation Highway route number 1 (R1) is SEC routes which support ASEAN Economic Community. After that truck is transported Veunekham border in Laos to Dong Kralor border in Cambodia. Next exporters can transport fabric from Dong Kralor border in Cambodia to Huanli border in Vietnam by truck. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Samutprakarn to Ho Chi Minh City with Aranyaprathet border. Inland transportation is truck. Then exporters can access to Poipet border in Cambodia by truck. Using the Nation Highway route number 13 (R13) is SEC routes which support ASEAN Economic Community. After that truck is transported Bavet border in Cambodia to Moc Bai border in Vietnam. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Samutprakarn to Ho Chi Minh City with Ban Had Lek border in Thailand using truck is inland transportation. Then truck can access from Ban Had Lek border to Kohkong border in Cambodia. Using the Nation Highway route number 10 (R10) is SEC routes which support ASEAN Economic Community. Next fabric is shipped to Srihanu Ville border in Cambodia-Vietnam. Finally, fabric is shipped to Ho Chi Minh City only.

All routes for textile logistics flow in Samutprakarn are shown in Table 4.7.

Table 4.7 Routes for textile logistics flow in Samutprakarn to Ho Chi Minh City

Route No.	Origin	Inland mode	Thailand		International transportation Vietnam				Target	Mode
			Port/Customs	Mode	Customs	Mode	Port/Customs	Mode		
1	Samutprakarn	Trailer	LCB	-	-	-	-	-	HMC	Vessel
2	Samutprakarn	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Vessel
3	Samutprakarn	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Train
4	Samutprakarn	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Truck
5	Samutprakarn	Truck	Chong Meck-Wangtao border (Thai-Laos)	Truck (R12)	Veunekham-Dong Kralor border (Laos-Cambodia)	Truck (R12)	Dong Kralor-Huanli border (Cambodia-Vietnam)	Truck	HMC	Truck
6	Samutprakarn	Truck	Aranyaprathet -Poipet border (Thai-Laos)	Truck (R13)	Bavet-Moc Bai border (Cambodia-Vietnam)	Truck (R13)	-	-	HMC	Truck
7	Samutprakarn	Truck	Ban Had Lek-Kohkong border (Thai-Cambodia)	Truck (R10)	Srihanu Ville (Cambodia-Vietnam)	Vessel	-	-	HMC	Vessel

4.1.2.4 Textile logistics flow in Nakhonpathom - Ho Chi Minh City

Fabric manufacturers transport both ports and border trades. Manufacturers from Nakhonpathom ship fabric to Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) or Bangkok port (BKK). Inland transportation from Nakhonpathom to LCB port can use trailers but from Nakhonpathom to BKK port can use trucks. From LCB or BKK ports, fabric will finally be shipped to Ho Chi Minh City. Fabric in this group area can use Mukdaharn border in Mukdaharn Province, Chong Meck border in Ubonratchathani Province, Aranyaprathet border in Srakaew Province or Ban Had Lek border in Trat Province to Ho Chi Minh City.

Exporters carry fabric from Nakhonpathom to Ho Chi Minh City with Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam via Asian Highway 1 (1A). Finally, fabric is shipped to Ho Chi Minh City. Moreover, truck or train can export to Ho Chi Minh City.

Exporters transport fabric from Nakhonpathom to Ho Chi Minh City with Chong Meck border using truck is inland transportation. Then exporters can access to Wangtao border in Laos by Truck. Using the Nation Highway route number 1 (R1) is SEC routes which support ASEAN Economic Community. After that truck is transported Veunekham border in Laos to Dong Kralor border in Cambodia. Next exporters can transport fabric from Dong Kralor border in Cambodia to Huanli border in Vietnam by truck. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Nakhonpathom to Ho Chi Minh City with Aranyaprathet border. Inland transportation is truck. Then exporters can access to Poipet border in Cambodia by truck. Using the Nation Highway route number 13 (R13) is SEC routes which support ASEAN Economic Community. After

that truck is transported Bavet border in Cambodia to Moc Bai border in Vietnam. Finally, fabric can be accessed to Ho Chi Minh City by truck only.

Exporters transport fabric from Nakhonpathom to Ho Chi Minh City with Ban Had Lek border in Thailand using truck is inland transportation. Then truck can access from Ban Had Lek border to Kohkong border in Cambodia. Using the Nation Highway route number 10 (R10) is SEC routes which support ASEAN Economic Community. Next fabric is shipped to Srihanu Ville border in Cambodia-Vietnam. Finally, fabric is shipped to Ho Chi Minh City only.

All routes for textile logistics flow in Nakhonpathom are shown in Table 4.8.

Table 4.8 Routes for textile logistics flow in Nakhonpathom to Ho Chi Minh City

Route No.	Thailand				International transportation	Vietnam			Target	Mode
	Origin	Inland mode	Port/Customs	Mode	Customs	Mode	Port/Customs	Mode		
1	Nakhonpathom	Truck	BKK	-	-	-	-	-	HMC	Vessel
2	Nakhonpathom	Trailer	LCB	-	-	-	-	-	HMC	Vessel
3	Nakhonpathom	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Vessel
4	Nakhonpathom	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Train
5	Nakhonpathom	Truck	Mukdaharn-Savannakhet (Thai-Laos)	Truck (R9)	Den Savan-Lao Bao (Laos-Vietnam)	Truck (R9)	Danang	Truck	HMC	Truck
6	Nakhonpathom	Truck	Chong Meck-Wangtao border (Thai-Laos)	Truck (R1)	Veunekham-Dong Kralor border (Laos-Cambodia)	Truck (R1)	Dong Kralor-Huanli border (Cambodia-Vietnam)	Truck	HMC	Truck
7	Nakhonpathom	Truck	Aranyaprathet -Poipet border (Thai-Laos)	Truck (R13)	Bavet-Moc Bai border (Cambodia-Vietnam)	Truck (R13)	-	-	HMC	Truck
8	Nakhonpathom	Truck	Ban Had Lek-Kohkong border (Thai-Cambodia)	Truck (R10)	Srihanu Ville (Cambodia-Vietnam)	Vessel	-	-	HMC	Vessel

Identified transportation routes will be considered in the final step of scenario process.

4.2 Framework of scenario analysis

A framework is developed to relate causes, effects and strategies concern with textile Thai-Vietnam transportation routes under AEC in 2015. Basically, the framework recommends that transportation routes are affected by different scenarios. To be useful for decision making, strategies are suggested. The causes are the situation of AEC that affects by the scenarios and key factors and driving forces by literature. Key factors and driving forces are ranked in term of the level of importance and the level of uncertainty from experts within associated fields. The most important and uncertain factor are the scenario logic to determine the axes of diferrerent scenarios.After that other identified key factors and driving forces are given in each scenario. For the effects, the alternative gateways are presented by literature as follow: Laem Chabang port (LCB), Bangkok port (BKK), Mukdaharn border, Nakornpanom border, Chong Meck border, Aranyaprathet border and Ban Had Lek border. Alternative routes for each case are made upon origins and destinations. For this study, textile transportation routes between Thailand-Vietnamstarts from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ha Noi and Ho Chi Minh City (HMC) in Vietnam. For Bangkok to Ha Noi, it composes of twelve alternatives. For the upper central region to Ha Noi, Pathumthani is the center area composes of twelve alternatives also. Forthe middle central region to Ha Noi, Samutprakarn is the center area composes of eight alternatives. For the lower central region to Ha Noi, Nakhonpathom is the center areacomposes of twelve alternatives. On the other hand, for Bangkok to Chi Minh City, it composes of nine alternatives. For the upper central region to Chi Minh City, Pathumthani is the center area composes of eight alternatives. Forthe middle central region to Chi Minh City, Samutprakarn is the center area composes of seven alternatives. For the lower central region to Chi Minh City, Nakhonpathom is the center areacomposes of eight alternatives. In each alternative route, modes of transportation are identified. Moreover, alternative routes are analyzed to fit into each

scenario.The strategies are developed and drawn out in each scenario. Figure 4.1 shows the framework for scenario developement.
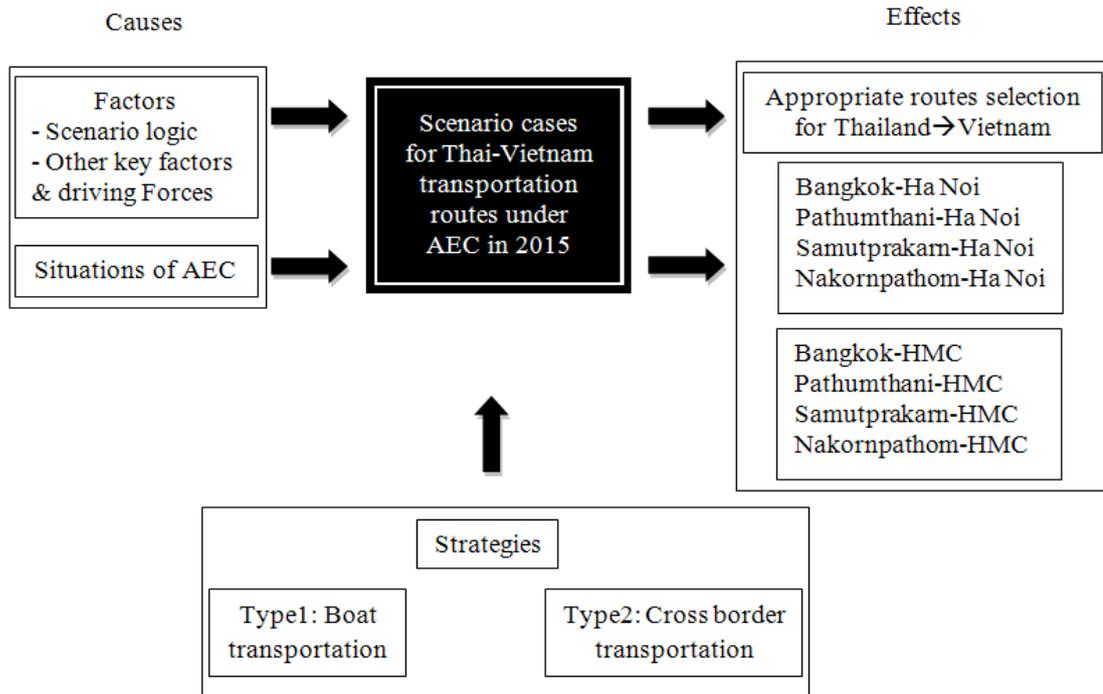
Figure 4.1 Framework for scenario development

4.3 Scenario process

Preliminary results are the 5th step of scenario process as follows:

4.3.1 Identify the focal issues

The first step is to identify the focal issues, time and scope of analysis by reviewing relevant literatures. Kengpol, et al. (2010) described that AEC influences to transportation routes of Thailand-Vietnam by cross border trade increase. Thus, the focal issue of this study is transportation routes will change if ASEAN Economic Community (AEC) happens in the year 2015. The scopes consider the type of vehicle including truck, trailer, train and vessel. The format of each type of vehicle such as type of lane road and type of railway are not considered. In addition, the origins of textile export in Thailand are four group areas, including Bangkok, Pathumthani,

Samutprakarn and Nakhonpathom. The destinations are Ha Noi and Ho Chi Minh City in Vietnam.

4.3.2 Determine key factors and driving forces

The second step in this study is to identify these factors which are key factors and driving forces. Based on reviewing relevant literatures, technical papers and internet sources, we focus on key factors and driving forces influencing to selection for transportation routes of textile Thailand and Vietnam if AEC occurs.

In this section, we divided two steps. The first step is to study review related literatures about the factors influencing of selection of textile transportation routes between Thailand and Vietnam. The last step is to identify key factors and driving forces for process of scenario analysis.

4.3.2.1 Evaluate the factors influencing to selection of textile transportation routes between Thailand and Vietnam if ASEAN Economic Community (AEC) occurs

This part will focus on the factors that influence to the choice of textile transportation routes between Thailand and Vietnam if ASEAN Economic Community (AEC) occurs. The method of factors influencing selection is four main steps. First, we scan common factors of choice of transportation mode. Then factors of choice of transportation mode for textile are listed and filtered factors for the remaining of textile transportation mode. The third step, we list factors of choice of transportation mode between Thailand and Vietnam. To choose factors with the same factor, these factors are identified. Finally, factors influencing of ASEAN Economic Community (AEC) are listed and combined with the previous step.

- Step 1 : Common factors of choice of transportation mode

From reviewing, there are some related researches as follows:

Meixell and Norbis (2008) said that logistics cost of total production costs is mainly transportation cost. Key word in logistics management is mode choice of transportation and carrier selection. To select an appropriate transport carrier is important to the firm's success. This research was demonstrated literature reviews about transportation choice and carrier selection. The purpose of this study is to categorize transportation choice and carrier selection leading to look theme in the

literature and direction for future research. The researchers found that the factors should consider freight rates, reliability, transit time, loss and damage, claims processing, traceability, capacity or availability of cargo space, flexibility, equipment availability, logistics cost, rate and quality, accurate documentation, responsiveness, convenience, timeliness, policy approach, suitability, quality of customer service and frequency of transport.

Pedersen and Gray (1998) have categorized the factors influencing to transportation routes. Time factors should consider transit time, frequency of transport,reliability in delivery time andquality of route. Price factors meancost, freight rate, special offer andpacking charges. Security/Control factors refer to loss and damage, flexibility, reliability, traceability and knowledge of port/harbor. Service factors are co-operation with the carrier, responsiveness and flexibility.

Kent and Parker (1999) found that the factors influencing to transportation routes are as follow: reliability, equipment availability, frequency of transport, rate changes, operating personnel, transit time, financial stability, loss and damage, expediting, tracing ability, service change, freight rate, scheduling flexibility, carrier salesmanship, linehaul service, facility and equipment, pickup and timeliness and claims.

Lu (2003) surveyed information of the marine carrier in Taiwan. It was found that service factors refer to equipment availability, loss and damage, accurate documentation, reliability of schedules, courtesy of inquiry, on-time pick-up, frequency of transport, door-to-door service, service coverage, knowledge ability of sales personnel, transit time, responsiveness, tariffs simplified, customs clearance service, inland transportation, freight rates and tracing.

Tuzkaya and Onut (2008) examined quality factors and quantity factors to influence transportation mode. These factors are location of warehouse, customer and factories, distance, facilities and equipment, transport cost, flexibility, reliability, transit time, safety of product, traceability, quality of route andrisk quotas related to state policies.

Vannieuwenhuyseet al. (2003) explored factors to influence transportation mode of industries of Belgium. There are eleven factors, including transportation cost, reliability, flexibility, transportation time, safety of goods,

capacity, density of network, regulation and legislation, impact on goods flow, company imageand strategic elements.

Kunadhamraks and Hanaoka (2008) believed that the factors for study of international transportation should consider logistics cost, transit time, qualification, flexibility, information systems, reliability and security of goods.

Kritchanchai and Chanpuypetch (2009)studied to design decision support systems in logistics for Thailand rubber export to China. The researchers have categorized four group factors that transportation factors should consider length, transportation time, route quality, security of product, reliability and punctuality. Economic factor refers to logistics cost. Port/customs considerations mean facilitation equipment, capacity, customs procedure and accessibility. Finally, Environment considerations should consider rules of international trade and insurance policy.

Mohammaditabar and Teimoury (2008) collected the researches about the factors selection of transportation route. These factors are cost, facilities and equipment, reliability of time and delivery, financial stability, quality of drives and employees, flexible rate, transit time for shipment, flexibility to future requirements, loss and damage, shipment tracking and tracing, custom clearance capabilities and quality of route.

Taet al. (2000) said that export to China had the problem of transportation and distribution. To consider in solving problem, selection of transportation mode should consider tracing, delivery reliability, custom procedures, custom clearing times, quality of route, loss and damage, inland transportation, equipment availability and frequency changes in transportation regulations.

Thiengburanathum et al. (2006) studied the factors influencing for transportation mode and transportation routes between southern China and Thailand. The factors are categorized four groups. There are cost, transit time, reliability of service and safety of service.

From the literatures, the common factors of choice of transportation mode and carrier selection are forty-one factors as shown in Table 4.9.

Table 4.9 Summary literature reviews on common factors for choice of transportation mode and carrier selection

Factors	Sources
1. freight rates	Meixell and Norbis (2008), Pedersen and Gray (1998), Kent and Parker (1999), Lu (2003)
2. reliability	Meixell and Norbis (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
3. transit time	Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Kritchanchai and Chanpuypetch (2009)
4. loss and damage of goods	Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersenand Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta, et al. (2000), Kritchanchai and Chanpuypetch (2009)
5. claims processing	Meixell and Norbis (2008), Kent and R.S. Parker (1999)
6. traceability	Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Kent and Parker (1999), Lu (2003), Ta et al. (2000)
7. capacity (availability of cargo space)	Meixell and Norbis (2008), Vannieuwenhuyse et al. (2003), Kritchanchai and Chanpuypetch (2009)
8. flexibility	Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen

Table 4.9 Summary literature reviews on common factors for choice of transportation mode and carrier selection (Cont.)

Factors	Sources
	and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999)
9. equipment availability	Meixell and Norbis (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000)
10. logistics cost	Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kritchanchai and Chanpuypetch (2009)
11. rate and quality	Meixell and Norbis (2008)
12. accurate documentation	Meixell and Norbis (2008), Lu (2003)
13. responsiveness	Meixell and Norbis (2008), Pedersen and Gray (1998), Lu (2003)
14. convenience	Meixell and Norbis (2008)
15. timeliness	Meixell and Norbis (2008), Kent and Parker (1999), Lu (2003) Kritchanchai and Chanpuypetch (2009)
16. policy approach	Meixell and Norbis (2008)
17. suitability	Meixell and Norbis (2008)
18. quality of customer service	Meixell and Norbis (2008), Lu (2003)
19. frequency of transport	Meixell and Norbis (2008), Pedersen and Gray (1998), Kent and Parker (1999), Lu (2003)
20. facilities and equipment	Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Kritchanchai and Chanpuypetch (2009), Kent and Parker (1999)

Table 4.9 Summary literature reviews on common factors for choice of transportation mode and carrier selection (Cont.)

Factors	Sources
21. financial stability	Mohammaditabar and Teimoury (2008), Kent and Parker (1999)
22. quality of drives	Mohammaditabar and Teimoury (2008)
23.custom procedures	Mohammaditabar and Teimoury (2008), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
24. quality of route	Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
25. location of warehouse, customer and factories	Tuzkaya and Onut (2008)
26. distance	Tuzkaya and Onut (2008), Kritchanchai and Chanpuypetch (2009)
27. risk quotas related to state policies	Tuzkaya and Onut (2008)
28. co-operation with the carrier	Pedersen and Gray (1998)
29. density of network	Vannieuwenhuyse et al. (2003)
30. regulation and legislation	Vannieuwenhuyse et al. (2003), Kritchanchai and Chanpuypetch (2009)
31. company image	Vannieuwenhuyse et al. (2003)
32. strategic elements	Vannieuwenhuyse et al. (2003)
33. impact on goods flow	Vannieuwenhuyse et al. (2003)
34. information systems	Kunadhamraks and Hanaoka (2008)
35. rate changes	Kent and Parker (1999)
36. carrier salesmanship	Kent and Parker (1999), Lu (2003)

Table 4.9 Summary literature reviews on common factors for choice of transportation mode and carrier selection (Cont.)

Factors	Sources
37. courtesy of inquiry	Lu (2003)
38. tariffs simplified	Lu (2003)
39. accessibility	Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
40. frequency changes in transportation regulations	Ta et al. (2000)
41. insurance policy	Kritchanchai and Chanpuypetch (2009)

- Step 2 : The factors of choice of transportation mode for textile

There are some researches that study about transportation mode of textile as follow:

Teng and Jaramillo (2005) studied the factors that influence to select textile transportation mode in USA. There are geographic location, government regulations for a certain type of products (it means trade restrictionsin common factors), transit time,a carrier's capacityto respond tounexpected customer demands (it is the same definition as flexibility in common factors), logistics cost, on-time delivery (it is the same definition as timeliness in common factors) anda supplier's effectiveness to respond to customer requests orcomplaints(it is the same definition as responsiveness in common factors). Moreover, there are reliability, country's political situation and warranty policies.

Aktas and Ulengin (2005) explored textile transportation route in Turkey. We found that the factors influence to choose transportation routes, including reliability, the ability of the carrier to deliver damage-free goods (it is the same definition as loss and damage of goodsin common factors), security of transportation (it is the same definition as quality of route in common factors), length of promised transit time(it is the same definition as transit time in common factors),

prompt action related to carrier's service(it is the same definition as responsiveness in common factors), on time deliveries (it is the same definition as timeliness in common factors), tracing, financial stability, service supporting of carrier's equipment(it is the same definition as facilities and equipment in common factors), the ability of the carrier to service to needs to deal with demand changes(it is the same definition as flexibility in common factors), assistance from carrier in handling loss and damage claims(it is the same definition as claims processing in common factors), quality of drivers and accurate documentation.

From the revision of this section, there are eighteen factors. We can summarize the factors of choice of transportation mode for textile as in Table 4.10.

Table 4.10 The factors for selection of textile transportation routes

Factors	Sources
1. geographic location	Teng and Jaramillo (2005)
2. trade restrictions	Teng and Jaramillo (2005)
3. transit time	Teng and Jaramillo (2005), Aktas and Ulengin (2005)
4. flexibility	Teng and Jaramillo (2005), Aktas and Ulengin (2005)
5.logistics cost	Teng and Jaramillo (2005)
6. timeliness	Teng and Jaramillo (2005), Aktas and Ulengin (2005)
7. reliability	Teng and Jaramillo (2005), Aktas and Ulengin (2005)
8. country's political situation	Teng and Jaramillo (2005)
9. warranty policies	Teng and Jaramillo (2005)
10. loss and damage of goods	Aktas and Ulengin (2005)
11. quality of route	Aktas and Ulengin (2005)
12. traceability	Aktas and Ulengin (2005)
13. financial stability	Aktas and Ulengin (2005)
14. facilities and equipment	Aktas and Ulengin (2005)

Table 4.10 The factors for selection of textile transportation routes (Cont.)

Factors	Sources
15. claims processing	Aktas and Ulengin (2005)
16. quality of drivers	Aktas and Ulengin (2005)
17. responsiveness	Teng and Jaramillo (2005), Aktas and Ulengin (2005)
18. accurate documentation	Aktas and Ulengin (2005)

From Table 4.9 and Table 4.10, we can reduce factors influencing to textile transportation routes as Table 4.11

Table 4.11 Summarize the factors for selection of textile transportation routes

Factors	Sources
1. geographic location	Teng and Jaramillo (2005), Tuzkaya and Onut (2008)
2. trade restrictions	Teng and Jaramillo (2005), Tuzkaya and Onut (2008),
3. transit time	Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Kritchanchai and Chanpuypetch (2009)
4. flexibility	Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999)
5.logistics cost	Teng and Jaramillo (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kritchanchai and Chanpuypetch (2009)
6. timeliness	Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Kent and Parker (1999),

Table 4.11 Summarize the factors for selection of textile transportation routes (Cont.)

Factors	Sources
7. reliability	Lu (2003) Kritchanchai and Chanpuypetch (2009) Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
8. country's political situation	Teng and Jaramillo (2005)
9. warranty policies	Teng and Jaramillo (2005), Kritchanchai and Chanpuypetch (2009
10. loss and damage of goods	Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
11. quality of route	Aktas and Ulengin (2005)
12. traceability	Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Kent and Parker (1999), Lu (2003), Ta et al. (2000)
13. financial stability	Aktas and Ulengin (2005), Mohammaditabar and Teimoury (2008), Kent and Parker (1999)
14. facilities and equipment	Aktas and Ulengin (2005), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2551), Kritchanchai and Chanpuypetch (2009), Kent and

Table 4.11 Summarize the factors for selection of textile transportation routes (Cont.)

Factors	Sources
	Parker (1999)
15. claims processing	Aktas and Ulengin (2005), Meixell and Norbis (2008), Kent and R.S. Parker (1999)
16. quality of drivers	Aktas and Ulengin (2005), Mohammaditabar and Teimoury (2008)
17. responsiveness	Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Pedersen and Gray (1998), Lu (2003)
18. accurate documentation	Aktas and Ulengin (2005), Meixell and Norbis (2008), Lu (2003)

• Step 3: The factors for selection for transportation routes between Thailand and Vietnam

There are some researches that study about transportation routes between Thailand and Vietnam as follow:

Kengpol et al. (2010) studied the factors influencing of multimodal transportation between Thailand and Vietnam. These are important factor as follow: logistics cost, other costs (it means other costs during transportation except logistics cost), risk and safety of route(it is the same definition as quality of route in Table 4.11), facilities and equipment, flexibility, timeliness, loss and damage of goods, traceability,political issues in international transportation (it is the same definition as country's political situation in Table 4.11), regulation and legislation and custom procedures.

Srisawas and Chaowarat (2006)studied the factors influencing of selection of cargo transportation routes between Thailand and Vietnam. The researchers found that the factors are important three top factors as follow: timeliness,freight rates and loss and damage of goods.

From the revision of this section, there are fourteen factors. We can summarize the factors of selection for transportation routes between Thailand and Vietnam as in Table 4.12.

Table 4.12 The factors for selection of transportation routes between Thailand and Vietnam

Factors	Sources
1. logistics cost	Kengpol et al. (2010)
2. other costs	Kengpol et al. (2010)
3. distance	Kengpol et al. (2010)
4. transit time	Kengpol et al. (2010)
5. quality of route	Kengpol et al. (2010)
6. facilities and equipment	Kengpol et al. (2010)
7. flexibility	Kengpol et al. (2010)
8. timeliness	Kengpol et al. (2010), Srisawas and Chaowarat (2006)
9. loss and damage of goods	Kengpol et al. (2010), Srisawas and Chaowarat (2006)
10. traceability	Kengpol et al. (2010)
11.country's political situation	Kengpol et al. (2010)
12. regulation and legislation	Kengpol et al. (2010)
13. custom procedures	Kengpol et al. (2010)
14. freight rates	Srisawas and Chaowarat (2006)

From Table 4.11 and Table 4.12, we list factors of choice of transportation mode for textile and choice of transportation mode between Thailand and Vietnam. And then we choose factors from these tables with the same factors. There are eight factors. The result is illustrated in Table 4.13.

Table 4.13 The factors for selection of textile transportation routes between Thailand and Vietnam

Factors	Sources
1. logistics cost	Kengpol et al. (2010), Teng and Jaramillo (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kritchanchai and Chanpuypetch (2009)
2. transit time	Kengpol et al. (2010), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Kritchanchai and Chanpuypetch (2009)
3. quality of route	Kengpol et al. (2010), Aktas and Ulengin (2005)
4. flexibility	Kengpol et al. (2010), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999)
5. timeliness	Kengpol et al. (2010), Srisawas and Chaowarat (2006), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Kent and Parker (1999), Lu (2003) Kritchanchai and Chanpuypetch (2009)
6. loss and damage of goods	Kengpol et al. (2010), Srisawas and Chaowarat (2006), Aktas and Ulengin (2005), Meixell and Norbis (2008),

Table 4.13 The factors for selection of textile transportation routes between Thailand and Vietnam (Cont.)

Factors	Sources
	Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009)
7. traceability	Kengpol et al. (2010), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Kent and Parker (1999), Lu (2003), Ta et al. (2000)
8.country's political situation	Kengpol et al. (2010), Teng and Jaramillo (2005)

Step 4: The factors for selection of textile transportation routes between Thailand and Vietnam if ASEAN Economic Community (AEC) occurs

There are some technical papers and internet sources that study about transportation routes between Thailand and Vietnam as follow:

Sutthikarnnarinai and Atthamet (2005) said that the 9th ASEAN summit discussed the factors influencing to transportation routes under ASEAN Economic Community (AEC) should consider logistics cost, transit time and flexibility.

Manager Online (2007) said that the seminar on "Integration ASEAN region" of discussed the factors influencing cross border transportation from Thailand to Laos and Vietnam under ASEAN Economic Community (AEC) should consider custom procedure that is speedy.

The International Trade Study Center, University of the Thai Chamber of Commerce (2008) studied that ASEAN Economic Community (AEC)

lead to cross-border trade in ASEAN members. The factors involve with selection of transportation routes. There are capacity and custom procedure.

Logistics Digest (2010) said that experts in transportation routes in ASEAN discussed logistics cost, distance, custom facilities, capacity, product demand and accessibility are the factors that influence to selection of transportation routes under ASEAN Economic Community (AEC).

Yoong (2007) who is a senior officer of infrastructure, Bereau for Economic Integration and Finance (BEIF) in ASEAN said that the factors should consider distance, quality of route, flexibility, custom facilities, responsiveness and product security(it is the same definition as loss and damage of goods in Table 4.13) in selection of transportation routes under ASEAN Economic Community (AEC).

From the revision of this section, there are eleven factors. We can summarize the factors of selection for transportation routes under ASEAN Economic Community (AEC) as in Table 4.14.

Table 4.14 The factors for selection of transportation routes under ASEAN Economic Community (AEC)

Factors	Sources
1. logistics cost	Sutthikarnnarinai and Atthamet (2005), Logistics Digest (2010)
2. transit time	Sutthikarnnarinai and Atthamet (2005)
3. flexibility	Sutthikarnnarinai and Atthamet (2005), Yoong (2007)
4. capacity	The International Trade Study Center, University of the Thai Chamber of Commerce (2008), Logistics Digest (2010)
5. custom facilities	The International Trade Study Center, University of the Thai Chamber of Commerce (2008), Logistics Digest (2010), Manager Online (2007), Yoong (2007)
6. distance	Logistics Digest (2010), Yoong (2007)
7. accessibility	Logistics Digest (2010)
8.quality of route	Yoong (2007)

Table 4.14 The factors for selection of transportation routes under ASEAN Economic Community (AEC) (Cont.)

Factors	Sources
9. responsiveness	Yoong (2007)
10. product security	Yoong (2007)
11.product demand	Logistics Digest (2010)

From Table 4.13 and Table 4.14, we list factors of choice of textile transportation routes between Thailand and Vietnam and factors of selection of transportation routes under ASEAN Economic Community (AEC). And then we choose factors from these tables with the same factors and add remaining factors that should also consider.

The result is found that the same factors of Table 4.13 and Table 4.14 are five factors. There are logistics cost, transit time, flexibility, quality of route and product security. Capacity, custom facilities, distance, accessibility, product demand and responsiveness should also consider because of these factors influencing to transportation routes under ASEAN Economic Community (AEC). In addition, the focal issue in this study focuses on alternative routes that will change in the future if ASEAN Economic Community (AEC) occurs. Exporter will consider advantages and disadvantages of current routes and future route. Kengpol et al. (2010) discussed those current routes which are mainly vessel. The disadvantage is delayed shipment when facing monsoon. If ASEAN Economic Community (AEC) occurs, cross-border trade will increase. Thus, timeliness should also consider. As a result of ASEAN Economic Community (AEC), it associates with many countries. Therefore, regulation and legislation and country's political situation should take into account. There are fourteen factors. The result is illustrated in Table 4.15.

Table 4.15 The factors for Thailand-Vietnam textile transportation routes under ASEAN Economic Community (AEC)

Factors	Sources
1. logistics cost	Kengpol et al. (2010), Teng and Jaramillo (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kritchanchai and Chanpuypetch (2009), Sutthikarnnarinai and Atthamet (2005), Logistics Digest (2010)
2. transit time	Kengpol et al. (2010), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Kritchanchai and Chanpuypetch (2009), Sutthikarnnarinai and Atthamet (2005)
3. flexibility	Kengpol et al. (2010), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Sutthikarnnarinai and Atthamet (2005), Yoong (2007)
4. capacity	The International Trade Study Center, University of the Thai Chamber of Commerce (2008), Logistics Digest (2010)

Table 4.15 The factors for Thailand-Vietnam textile transportation routes under ASEAN Economic Community (AEC)

Factors	Sources
5. custom facilities	The International Trade Study Center, University of the Thai Chamber of Commerce (2008), Logistics Digest (2010), Manager Online (2007), Yoong (2007)
6. distance	Logistics Digest (2010), Yoong (2007)
7. accessibility	Logistics Digest (2010)
8. quality of route	Kengpol et al. (2010), Aktas and Ulengin (2005), Yoong (2007)
9. responsiveness	Yoong (2007)
10. product security	Kengpol et al. (2010), Srisawas and Chaowarat (2006), Aktas and Ulengin (2005), Meixell and Norbis (2008), Mohammaditabar and Teimoury (2008), Thiengburanathum et al. (2006), Tuzkaya and Onut (2008), Pedersen and Gray (1998), Vannieuwenhuyse et al. (2003), Kunadhamraks and Hanaoka (2008), Kent and Parker (1999), Lu (2003), Ta et al. (2000), Kritchanchai and Chanpuypetch (2009), Srisawas and Chaowarat (2006), Aktas and Ulengin(2005), Yoong (2007)
11. timeliness	Kengpol et al. (2010), Srisawas and Chaowarat (2006), Teng and Jaramillo (2005), Aktas and Ulengin (2005), Meixell and Norbis (2008), Kent and Parker (1999), Lu (2003) Kritchanchai and Chanpuypetch (2009)
12. country's political situation	Kengpol et al. (2010) , Teng and Jaramillo (2005)
13. regulation and legislation	Kengpol et al. (2010)
14. product demand (fabric demand)	Logistics Digest (2010)

4.2.2.2Identify key factors and driving forces

From the previous section, we focus on the related literatures to choice of transportation mode and carrier selection. We adapt the literatures to identify the factors for Thailand-Vietnam textile transportation routes under ASEAN Economic Community (AEC). The result of this review is discussed in the previous section. In this section will categorize key factors and driving forces from fourteen factors in the previous section.

- Identify key factors

Huss and Honton (1987) defined key factors arethe factors directly influence the focal issues.These factors relate to market size, economic conditions and price trends, capital availability, human, material, energy and environmental resources.Kengpol et al. (2010) discussed that the current transportation routes of Greater Mekong Sub-region Cooperation (GMS) are continuously developed. These routes have more opportunities for using if ASEAN Economic Community (AEC) occurs completely. The factors influence to change transportation routes as follows: capacity of customs and ports, logistics cost, transportation time, custom facilities that mean customs increase for facilities and adequacy to exporters anddistance.

In this section, five key factors are considered in this study. There are capacity, logistics cost, transit time, customs increase and distance.

- Identify driving forces

Huss and Honton (1987) defined driving forces that are the influencing power behind the key factors, are the external factors as change or not in the system to be beyond the control. Driving forces are considered in the social, environmental, technological, economic and politicalfactors. In this section, we will identify driving forces in macro-environment which power behind key factors in the previous section.

In this section, nine driving forces are flexibility,fabric demand, accessibility, quality of route, responsiveness, timeliness, country's political situation and regulation and legislationand product security. Furthermore, we discover each driving forces that influence to key factors.

Definition of key factors and driving forces are illustrated in Table 4.16 and Table 4.17

Table 4.16 Definition of key factors in scenario analysis

Key factors	Definition
1. Capacity	The ability tosupport volume of goods at ports or customs (The International Trade Study Center, University of the Thai Chamber of Commerce, 2008)
2. Logistics cost	Logistics cost per unit including transportation cost, packaging cost and custom changes (Kritchanchai and Chanpuypetch, 2009)
3. Transit time	Time spent for transportation from the origin to the destination (Pedersen and Gray, 1998)
4. Customs increase	Transport rate of Truck volume increase at customs (The International Trade Study Center, University of the Thai Chamber of Commerce, 2008)
5. Distance	The closer of distancefrom the origin to the destination (Logistics Digest, 2010)

Table 4.17 Definition of driving forces in scenario analysis

Driving forces	Definition
1. Fabric demand	Rate of fabric demand increase (Logistics Digest, 2010)
2. Accessibility	The ability of ports or customs to access inland transportation (Kritchanchai and Chanpuypetch, 2009)
3. Flexibility	The ability to change customer needs (Teng and Jaramillo, 2005)

Table 4.17 Definitions of driving forces in scenario analysis (Cont.)

Driving forces	**Definition**
4. Responsiveness	The ability in response to customer needs (Aktas and Ulengin, 2005)
5. Quality of route	The quality of transportation route from the origin to the destination(Kengpol et al., 2010)
6. Timeliness	The ability of textile export on time (Kengpol et al., 2010)
7. Country's political situation	Risk in international transportation of textile (Kengpol et al., 2010
8. Regulation and legislation of international trade	Law and rules of international transportation that facilitate transportation routes (Kengpol et al., 2010)
9. Product security	Frequency of damage of goods during transportation (Aktas and Ulengin, 2005)

4.3.3 Rank importance and uncertainty

According to fourteen factors, all key factors and driving forces must not reduce numbers of factors. These factors are ranked the level of importance and the level of uncertainty based on expert's opinionsin questionnaire form. Levels of importance define the levels of importance for key factors and driving forces that influence to future outcomes. Levels of uncertainty define the levels of uncertainty for key factors and driving forces that will happen or not and what effects have on outcomes.

Key factors and driving forces are ranked by the level of importance and the level of uncertainty in the questionnaires. The responses were gathered to transform for grading the levels of key factors and driving forces. There are three levels both importance and uncertainty. Three levels of importance are very important, important and not important. Three levels of uncertainty are highly uncertain, uncertain and not uncertain. The scores were shown in Table 3.2 and Table 3.3 in the chapter III.

Ranking are calculated by using the sum of score of importance and uncertainty of each factor. The highest ranked key factor and driving force are very important and highly uncertain. The result of ranking by importance and uncertainty is demonstrated in Table 4.18.

Table 4.18 Ranking by importance and uncertainty of key factors and driving forces

	Levels of importance	Levels of uncertainty	Sum score of importance and uncertainty	Rank
Key factors				
Capacity	Very important	Not Uncertain	4	3
Logistics cost	Very important	Uncertain	5	2
Transit time	Very important	Uncertain	5	2
Customs increase	Important	Uncertain	4	3
Distance	Very important	Highly uncertain	6	1
Driving forces				
Fabric demand	Very important	Highly uncertain	6	1
Accessibility	Very important	Not uncertain	4	3
Flexibility	Very important	Not uncertain	4	3
Responsiveness	Very important	Not uncertain	4	3
Quality of route	Very important	uncertain	5	2
Timeliness	Very important	Uncertain	5	2
Country's political situation	Very important	Not uncertain	4	3
Regulation and legislation of international trade	Very important	Uncertain	5	2
Product security	Very important	Not uncertain	4	3

From Table 4.18, importance and uncertainty of key factors and driving forces are ranked for scenario axes building. The highest ranked key factor is distance. And the highest ranked driving forces are fabric demand. After that, the second highest key factors and driving forces will play role in present scenarios because of being trends that are the most important and the most uncertain (Schwartz, op cit; Ratcliffe, 2000).

4.3.4 Select of scenario logic

In the previous section, one key factor and one driving force are identified. They are distance and fabric demand as two scenario logics or axes. Not confuse, distance and fabric demand create the theme for thescenarios. There are four different scenarios for selection of textile transportation routes between Thailand and Vietnam if ASEAN Economic Community (AEC) occurs. Figure 4.2displays scenario logic (Duet al., 2008).

<table>
<tr><td></td><td colspan="2" align="center">Distance of transport mode</td></tr>
<tr><td></td><td align="center">Current Case</td><td align="center">Future Case</td></tr>
<tr><td>High</td><td align="center">Scenario 1</td><td align="center">Scenario 2</td></tr>
<tr><td>Fabric demand</td><td></td><td></td></tr>
<tr><td>Low</td><td align="center">Scenario 3</td><td align="center">Scenario 4</td></tr>
</table>

Figure 4.2 Scenario logic (Duet al., 2008)

In Figure 4.2, distance in current transportation mode is distance of vessel from Thailand to Vietnam and distance in future transportation mode is transportation routes that are a part of route of Economic corridors of Greater Mekong Sub-region Cooperation (GMS). These distances will be compared the closer distance. Fabric demand is explored in term of rate of fabric demand increase in high or low case. Four different scenarios are demonstrated under two scenario logics are following:

Scenario 1: Distance of current transportation mode under high fabric demand

Scenario 2: Distance of future transportation mode under high fabric demand

Scenario 3: Distance of current transportation mode under low fabric demand

Scenario 4: Distance of future transportation mode under low fabric demand

4.3.5 Present scenarios

In this section, the others key factors and driving forces are filled each scenario to present scenario details based on two logics, distance and fabric demand. Scenario developmentcan best be succeeded by returning to the lists of key factors and driving forces at step three. The second highestkey factors and driving forces are given some attention in each scenario to present scenarios. They are useful to identify the relationship of scenario logic. The relationship of the highest key factors and driving forces are complication and indirection. In Table 4.18, distanceis the highest key factor. The following key factors are logistics cost and transit time. Additionally, the highest driving force is fabric demand. the following driving force are quality of route, timeliness and regulationand legislation of international trade.

Hence, we can conclude seven factors to build scenario details, namely distance, logistics cost, transit time, fabric demand, quality of route, timeliness and regulationand legislation of international trade. These factors reflect different scenarios deal with the main characteristics of consistent key factors and driving forces.

Main characteristics fromscenario logic and the others key factors and driving forcesare plotted each scenarioas Table 4.19.

Table 4.19 Main characteristics each scenario

Scenarios	Main characteristics
Scenarios 1	Distance of current transportation modeand high fabric demand. Low logistics cost andtimeliness but long transit time.High quality of route with low risk in international transportation.

Table 4.19 Main characteristics each scenario (Cont.)

Scenarios	Main characteristics
Scenarios 2	Distance offuture transportation mode and high fabric demand. Low logistics cost, shorttransit time andtimeliness. High quality of route with low risk in international transportation.
Scenarios 3	Distance of current transportation modeand low fabric demand.High logistics cost, long transit time and no timeliness. Low quality of route withhigh risk in international transportation.
Scenarios 4	Distanceoffuture transportation modeandlow fabric demand. High logistics cost, long transit time and no timeliness. Low quality of route withhigh risk in international transportation.

We can summarize key factors and driving forces each preliminary scenarios in Figure 4.3.

Scenario1	a_{11}: distance of current transportation mode
	a_{12}: high fabric demand
	a_{13}: low logistics cost
	a_{14}: longtransit time
	a_{15}: timeliness
	a_{16}: high quality of route
	a_{17}: low risk in international transportation

Scenario2	a_{21}: distance of future transportation mode
	a_{22}: high fabric demand
	a_{23}: low logistics cost
	a_{24}: shorttransit time
	a_{25}: timeliness
	a_{26}: high quality of route
	a_{27}: low risk in international transportation

Scenario3	a_{31}: distance of current transportation mode
	a_{32}: low fabric demand
	a_{33}: high logistics cost
	a_{34}: longtransit time
	a_{35}: no timeliness
	a_{36}: low quality of route
	a_{37}: high risk in international transportation

Scenario4	a_{31}: distance of future transportation mode
	a_{32}: low fabric demand
	a_{33}: high logistics cost
	a_{34}: longtransit time
	a_{35}: no timeliness
	a_{36}: low quality of route
	a_{37}: high risk in international transportation

Figure 4.3 Key factors and driving forces each preliminary scenarios

To fulfill completely scenarios, this study review relevant literature and fieldwork (in-depth interview and survey). In the first case, relevant literature is reviewed as follow:

Kengpol et al. (2010) studied that decision support system of transportation route between Thailand-Vietnam. This research gave two opinions of AEC that is coming in 2015. The one opinion is AEC happens, it will not reach goal of customs clearance operations by 2015. Even though boat transportation is farther and longer than crossing border, current transportation routes for Thailand-Vietnam export goods by boat mainly (including textile) because of low logistics cost and timeliness. To pass many customs in many countries of crossing border, there are the risks in transportation, country's political situation and damage and loss of goods. However,

boat transportation delays during the monsoon season. Another one is if AEC occurs in 2015, transportation routes though crossing border will more export. In order to facilitate customs clearance operations, they make the speed of custom procedures. Furthermore, the linkage of international transportation is completed. There are low logistics cost, highquality of route, short distance, short transit time, timeliness, low damage and loss of goods and low risk of regulation and legislation of international trade. For transportation mode, the results of this study were found that type of transportation route is boat by starting Laem Chabang port (LCB) port to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam. Due to long time at across border and unsafe roads situation, road transportations are not popular. Although, ASEAN countries have Greater Mekong Sub-regional Cross Border Transport Agreement that support trade facilitation for AEC, this agreement spends gradually time in the operation.In addition, this study discussed that opinion of Entrepreneur Vietnam interpreted that Thailand and neighbour countries are not ready for AEC within 2015. The trade barriers are rules and legislations. Transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement cannot support trade facilitation. Therefore, Thailand-Vietnam transportation routes are still boat by Laem Chabang port (LCB) port in Thailand to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam.

Saguandeegul (2009) explained that if AEC incompletely occurs in 2015 and Thailand does not prepare for market competition, it will impact negatively on Thailand.

Siamturakij (2555) said that AEC can be the goal of regional economic integration by 2015.Crossing border will more export boat transportation. Advantages are low logistics cost quality of route, short distance, short transit time, timeliness, low damage and loss of goods.

Amornwiwat (2012) remarked that AEC cannot reach the goal of customs clearance operations within 2015. It spends more time. This integration is like EU-style trade region that cannot be free flow of goods within limited time. It spent 25 years to truly success.

Thannews (2012) discussed that AEC can be the goal of regional economic integration by 2015.Crossing border will more export. However, it may be

delay in the full implementation of the AEC and gradually move forward. The main reason is ASEAN members are not ready to take advantage of AEC.

Kasikornresearch (2012) said that AEC can reach the goal of the tariff reduction to 0% for trade goods and elimination non-tariff barriers by 2015. It means crossing border is used more because of customs clearance operations. The high speed of custom procedures, low logistics cost, short distance, short transit time, timeliness, low damage and loss of goods are advantage.

Chumchaiwet (2012) remarked that in principle of AEC each ASEAN member country will reduce tariff to 0% and remove non-tariff barriers by 2015. In fact, they will reduce tariff to 0% but increase non-tariff barriers to their own benefits. It is affected by trade barriers for high logistics cost.

Post Today (2012) discussed that Nipon Puapongsakorn, former president of the Thailand Development Research Institute (TDRI), told the Post Today that intra-regional trade between ASEAN countries will not occur within 2015. ASEAN members have trade barriers by creating regulation to protect their own products.

Cheewapanyaroch (2012) and Thansetthakij (2012) discussed that theASEAN leaders are not active to prepare for AEC seriously. In addition, they sometimes create trade barrier to discourage.

Thaisaeree News (2012) summarized that AEC is coming in 2015. Thailand and neighbour countries should prepare with the strategy plan together. Transportation routes should evaluate to the benefits together. The important transportation routes of Thailand-Vietnam in the future are R8, R9 and R12. If all routes are developed toward standard routes and have transport agreement together, they will more cross border. Especially, R12 route is more appropriate logistics route than R9. R8 route is the appropriate tourism route.

After that, information from fieldwork by in-depth interview and surveyis listed. We interviewed public and private sectors in Lao and Vietnam. The questions deal with transportation routes before and after AEC, flow of goods, preparation of AEC and the impact of AEC on ASEAN countries. These details are identified as follow:

- Thailand export consumer product to Laos as the first rank, followed by Vietnam and China, respectively. Main cross border of transportation route from

Thailand to Laos is Nongkhai border to Tha Na Laeng border. Minor cross border is Mukdahan border to Savannakhet border and Mukdahan border to Pakse border,respectively. China is ranked the first importgoods industries to Laos, followed by Korea, Thailand and Vietnam, respectively. Furthermore, Laos imports garment from America and Europe to third coutries by boat via Lamechabang port in Thailand mainly about 98%. Another route is though Bangkok port. Moreover, Laos exports goods via Hai Phong port. There is little transportation volume because of low capacity to meet demand, low volume of the vessel, high logistics cost and communication and language problem. Mainly, Laos exports coal and dangerous goods thoughHai Phong port. For AEC context, Laos will have strategy plan as land link to its bordering neighbours for AEC context. AEC is coming in 2015. Transportation routes of Thailand-Vietnam are still the same as it used to be. Transportation routes for textile Thailand-Vietnam are still by boat mainly. Thai goods are shipped from Laem Chabang port (LCB) port in Thailand to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam mainly.Cross border transaction cannot occur. The main reason is not still customs clearance operations within 2015. Despitedistance of boat transportation is longer than crossing border, advantages are low logistics cost and timeliness. However, crossing border will more use after 2015 because ASEAN countries are ready for AEC.However, infrastructures of each country are developing now. If they are already developed, the transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement will new trade lane in the future.Nongkhai border will be more transported thanSavannakhet border in the future. However, all countries are developing their infrastructures. When they are completely developed, the transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement will new trade lane in the future, namely R8, R9, R12 and R13 transportation route. The expected route for textile transportation is R12 (Nakormpanom-Thakhek Nam pao-Cao Treo-Ha Noi) because it is shorter distance and shorter transit time. Moreover, it is high quality of route and high product security with low risk in international transportation

        - Lao PDR is attentive for AEC and would like to play role as battery of Asia. Now the Laos government is constructing the dam. In 2015, the tariff will be reduced 0% exactly but the non-tariffs and other trade barriers will increase under

AEC. For problems of trade barriers in Laos, Thai exporters are border traders mostly by lack of professional maketeers. Price of Thai goods is higher than China and Vietnam. There are many the volumes of goods with illegal trade along the Thai-Laos border.

- Hai Phong port is the biggest port in the North of Vietnam. It was built in 1874. The main goods of Vietnam that imports from Thailand are rubber, electronics, cloth, textile, hair care, body care and cosmetics. Goods export from Thailand to Ho Chi Minh port and Hai Phong port in Vietnam. Cargo growth rate is about 20% per year. Vietnam will act international gateway under AEC context.Thus, new port is building to prepare for AEC. Moreover, AEC can reach the goal of regional economic integration by 2015. Vietnam prepares to transport linkage with Thailand. This cooperation leads to single market for export to China, EU USA, etc.

- Vietnam is not attentive for AEC but aims to solve domestic economy issue. Vietnam will be one man show in ASEAN and is a leader of CLMV countries (Cambodia, Lao PDR, Myanmar and Vietnam) for AEC. Vietnam would like to play role as international gateway also. Thai textile is the potential products for export to Vietnam by boat transportation. However, if AEC can reach the goal of elimination of the tariffs and non-tariff barriers, border trade will have greater role.

- ASEAN countries attend AEC but collaboration of regional economic is still not clear. They are reticent and taking into account own benefits. Although the tariffs of trade goods reduce to 0%, the non-tariffs remain.

- Type of transportation of textile Thailand-Vietnam is boat because trade facilitation of trade border cannot occur by 2015. The main problem is cooperation of ASEAN members is less or no action. Thus, transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement that support trade facilitation for AEC are not ready to trade routes for AEC. Thailand-Vietnam transportation routes are still boat by Laem Chabang port (LCB) port in Thailand to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam.

Resulting from the literature review and fieldwork (in-depth interview and survey) are analyzed. When we considered possible situations, there is the level of ASEAN cooperation for AEC. It is a power to succeed the goal of AEC that means the tariff reduction to 0% for trade goods and elimination non-tariff barriers can do within

2015. The levelof ASEAN cooperation for AEC leads to the degree of driving forces and key factors such as low logistics cost, high logistics cost, long distance and short distance. From the analysis, the first event isKengpol et al. (2010), Amornwiwat (2012),Thannews (2012) andthe fieldwork had the same opinion byAEC would likely meet most, but not all regional economic integration goals within 2015. AEC will succeed following years.The secondevent is Kengpol et al. (2010), Siamturakij (2555), Kasikornresearch (2012) and the fieldwork had the same opinion.This group is expected scenario. ASEAN countries can completely reach the goal of AEC by 2015. The last event is Chumchaiwet (2012), Post Today (2012), Cheewapanyaroch (2012),Thansetthakij (2012) and the fieldworkhad the same opinion. This group has little or no progress toward the goal of AEC by 2015 and each country take trade barrier and conditions to protect own benefits. The results of the analysis have three scenarios only. They are consistent with the preliminary of scenarios in Figure 4.2 and Table 4.19. Scenario3 in Table 4.19 has not occur. We can summarize in Table 4.20.

Table 4.20 Summarize information for building stories of scenarios

Scenario	Situations of AEC by 2015
Event1	-Even though AEC happens, it will not reach goal of customs clearance operations by 2015. It spends more time. This integration is like EU-style trade region that cannot be free flow of goods within limited time. It spent 25 years to truly success. The main reason is ASEAN members are not ready to take advantage of AEC. Transportation routes of Thailand-Vietnam are still the same as it used to be by boat mainly (including textile). Cross border transaction cannot occur. To pass many customs in many countries of crossing border, there are the risks in transportation, country's political situation and damage and loss of goods. The advantages of boat are low logistics cost, high quality of route, timeliness, low damage and loss of goods and low risk of regulation and legislation of international trade.However, the disadvantages are long

Table 4.20 Summarize information for building stories of three scenarios (Cont.)

Scenario	Situations of AEC by 2015
	distance, long transit time and to delay during the monsoon season.
Event2	AEC can reach the goal of the tariff reduction to 0% for trade goods and elimination non-tariff barriers by 2015, transportation routes though crossing border will more export. In order to facilitate customs clearance operations, they make the speed of custom procedures. Furthermore, the linkage of international transportation is completed. There are low logistics cost, high quality of route, short distance, short transit time, timeliness, low damage and loss of goods, low country's political situationand low risk of regulation and legislation of international trade.
Event3	In principle of AEC each ASEAN member country will reduce tariff to 0% and remove non-tariff barriers by 2015. In fact, they will reduce tariff to 0% but increase non-tariff barriers to their own benefits. The main problem is cooperation of ASEAN members is less or no action. Type of transportation of textile Thailand-Vietnam is boat because trade facilitation of trade border cannot occur by 2015. It impacts on trade barriers for high logistics cost. lowquality of route, long transit time andhigh damage and loss of goods.

From Table 4.21, information was concluded from reviewing and the fieldwork was founded that three events interaction with Table 4.19. We can illustrate key factors and driving forces as Figure 4.4.

e_{11}: distance of current transportation mode		e_{21}: distance of future transportation mode	
e_{12}: high fabric demand		e_{22}: high fabric demand	
e_{13}: low logistics cost		e_{23}: low logistics cost	
e_{14}: longtransit time		e_{24}: shorttransit time	
e_{15}: timeliness	Event1	e_{25}: timeliness	Event2
e_{16}: high quality of route		e_{26}: high quality of route	
e_{17}: low risk in international transportation		e_{27}: low risk in international transportation	
e_{18}: low product security		e_{28}: high product security	
e_{19}: no customs increase		e_{29}: customs increase	
e_{20}: high country's political situation		e_{30}: low country's political situation	

e_{31}: distance of current transportation mode	
e_{32}: low fabric demand	
e_{33}: high logistics cost	Event3
e_{34}: longtransit time	
e_{35}: low quality of route	
e_{36}: low product security	

Figure 4.4 Key factors and driving forces each event

Preliminary scenario in Figure 4.3 and the event in Figure 4.4 were founded that the interation of some key factors and driving forces as Figure 4.5.
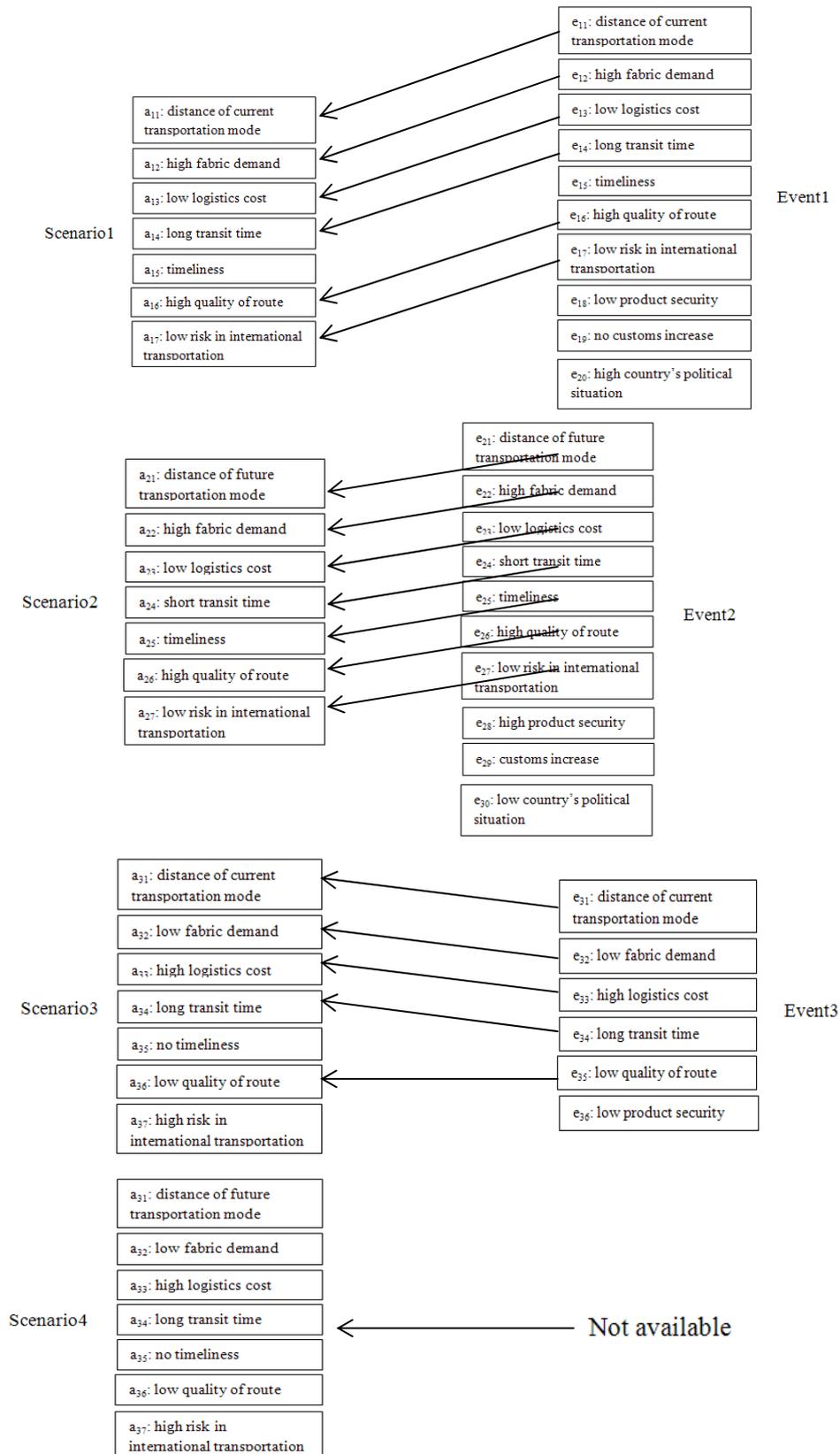
Figure 4.5 The relationship between scenarios and events

From the results of preliminary scenarios and events, final scenarios can classify three cases which are entitled to simple and easy to understand overview in Figure 4.6.
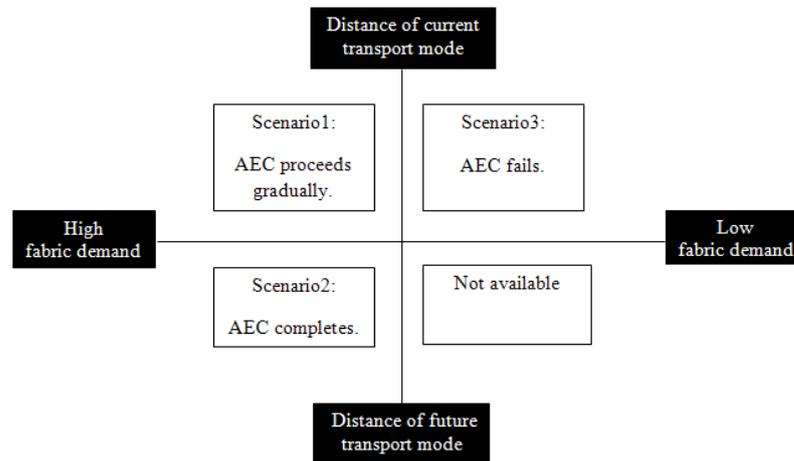
Figure 4.6 Titlescenarios

The stories of transportation routes for Thailand-Vietnam textile under AEC by 2015 in each scenario are described with two scenario logics (textile demand and distance), other key factors and driving forces, including situations of AEC by reviewing relevant literature and fieldwork (in-depth interview and survey).

Thai-Vietnam textile under AEC 2015 Scenarios

Scenario 1: The scenario is called "**AEC proceeds gradually.**" It means that AEC would likely meet most, but not all regional economic integration goals within 2015. It proceeds gradually to reach the goal of AEC. In this scenario, transportation routes of Thailand-Vietnam are still the same as it used to beeven if AEC in 2015 will happen. It means that transportation routesfor textile Thailand-Vietnamare still current transport modeby boat mainly with high fabric demand. The main reason is to facilitate though cross border transaction cannot occur in 2015. Despitetransit time of boat transportation is longer than crossing border, advantages are low logistics cost, timeliness, high quality of routeand low risk in international transportation.

Scenario 2: The scenario is called "**AEC completes.**" It is the most expected picture to see. It can reach the goal of AEC. For example, the tariffs can be reduced to 0% and the non-tariffs are eliminated within 2015. ASEAN countries are active to prepare for AEC seriously. They are ready to create trade facilitation for accelerated economic integration by 2015. It has facility and speed of custom procedures.Furthermore, the linkage of international transportation is completed. These isa reason to transportation routes though crossing border will more use with high fabric demand. Advantages of cross border transaction are lower logistics cost, shortertransit time than boat transportation. Moreover, there are timeliness, high quality of route with low risk in international transportation.

Scenario 3: The scenario is called "**AEC fails.**" It is a fizzled picture of the future. ASEAN countries have little or no progress toward the goal of AEC by 2015 and each country take trade barrier and conditions to protect own benefits. It will affect to trade barriers and rules to facilitate though cross border transaction. This reason makeslow transport rateat Thai-Vietnam custom with low fabric demand. Transportation routes still export by boat mainly becausethe disadvantages of crossing border are high logistics cost,long transit time, no timeliness and lowquality of route with high risk in international transportation.

The scenarios are now illustrated in full details. Next a step on implication for decision maker is drawn out.

4.3.6 Implicate of scenarios

The last step determines the fundamental question at step one of how issue identified looks in the scenarios created. This step is to create alternative views on the future for every scenario. The decision or options fit into each scenario. The final process helps turn scenarios into strategy. The strategies are implicated and drawn out.

Appropriate transportation routes each scenario are considered from the in-depth interview and Table 4.1-4.8 asthe origins are four group areasin Thailand and the target destinations (Hanoi and Ho Chi Minh City) in the detail.We can find three issues of transportation routes each scenario as follow:

1) ASEAN countries have Greater Mekong Sub-regional Cross Border Transport Agreement that support trade facilitation for AEC, this agreement spends gradually time in the operation.Transportation routes for textile Thailand-Vietnam are still by boat mainly. Thai goods are shipped from Laem Chabang port (LCB) port in Thailand to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam mainly.Due to long time at across border and unsafe roads situation, road transportations are not popular.

From this information, it corresponds with sceanrio1(AEC proceeds gradually) and the transportation routes of four origin groups to two destinations are Route No.5 in Table 4.1 (Routes for Bangkok to Ha Noi), Route No.5 in Table 4.2 (Routes for Pathumthani to Ha Noi), Route No.1 in Table 4.3 (Routes for Samutprakarn to Ha Noi), Route No.5 in Table 4.4 (Routes for Nakornpathom to Ha Noi). Route No.2 in Table 4.5 (Routes for Bangkok to Ho Chi Minh City),Route No.2 in Table 4.6 (Routes for Pathumthani to Ho Chi Minh City), Route No.1 in Table 4.7 (Routes for Samutprakarn to Ho Chi Minh City) and Route No.2 in Table 4.8 (Routes for Nakornpathom to Ho Chi Minh City).It was found that the appropriate transportation routes of Ha Noi is the same route from different origin groups. Likewise, the appropriate transportation route of Ho Chi Minh City is the same route. We can conclude the results in Figure 4.7-4.8.

Figure 4.7 Appropriate transportation route for Thailand-Hanoi of scenario1

From in Figure 4.7, scenario1 showstextile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ha Noi in Vietnam via Laem Chabang port (LCB).Inland transportation from four group areasin Thailand to LCB port use trailers. From LCB port, fabric will finally be shipped to Ha Noi via Hai Phong port and can be accessed Ha Noi by truck.
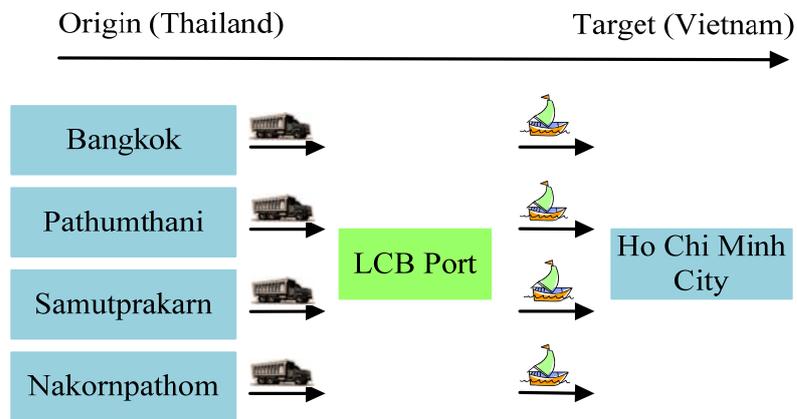
Figure 4.8 Appropriate transportation route for Thailand-Ho Chi Minh City of scenario1

From in Figure 4.8, scenario1 showstextile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) port. Inland transportation from four group areasin Thailand to LCB port use trailers. From LCB ports, fabric will finally be shipped to Ho Chi Minh City.

2) All countries of ASEAN are developing their infrastructures. When they are completely developed, the transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement will new trade lane in the future, namely R8, R9, R12 and R13 transportation route. The expected route for textile transportation is R12 (Nakormpanom-Thakhek Nam pao-Cao Treo-Ha Noi) because it is shorter distance and shorter transit time. Moreover, it is high quality of route and high product security with low risk in international transportation. On the other hand, if the expected route

for textile transportation to Ho Chi Minh City should be R9 (Mukdaharn-Savannakhet Den Savan-Lao Bao-Danang port-Ho Chi Minh City) because it is shorter distance and shorter transit time than R12.

From this information, it corresponds with sceanrio2 (AEC completes) and Route No.11 in Table 4.1 (Routes for Bangkok to Ha Noi), Route No.11 in Table 4.2 (Routes for Pathumthani to Ha Noi), Route No.7 in Table 4.3 (Routes for Samutprakarn to Ha Noi), Route No.11 in Table 4.4 (Routes for Nakornpathom to Ha Noi), Route No.3 in Table 4.5 (Routes for Bangkok to Ho Chi Minh City), Route No.3 in Table 4.6 (Routes for Pathumthani to Ho Chi Minh City), Route No.2 in Table 4.7 (Routes for Samutprakarn to Ho Chi Minh City) and Route No.3 in Table 4.8 (Routes for Nakornpathom to Ho Chi Minh City).It was found that the appropriate transportation routes of Ha Noi is the same route from different origin groups. Likewise, the appropriate transportation route of Ho Chi Minh City is the same route. We can conclude the results in Figure 4.9-4.10.

Figure 4.9 Appropriate transportation route for Thailand-Hanoi of scenario 2

From in Figure 4.9, scenario2 showstextile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ha Noi in Vietnam with Nakornpanom border in Thailand using truck is inland transportation. Then truck can access from Nakornpanom border to Thakhek border in Laos and cross the 3[rd]Thai-Laos Friendship Bridge across the Mekong. Using the Nation Highway route number 12

(R12) is EWEC routes which support ASEAN Economic Community. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Afterward, exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck.
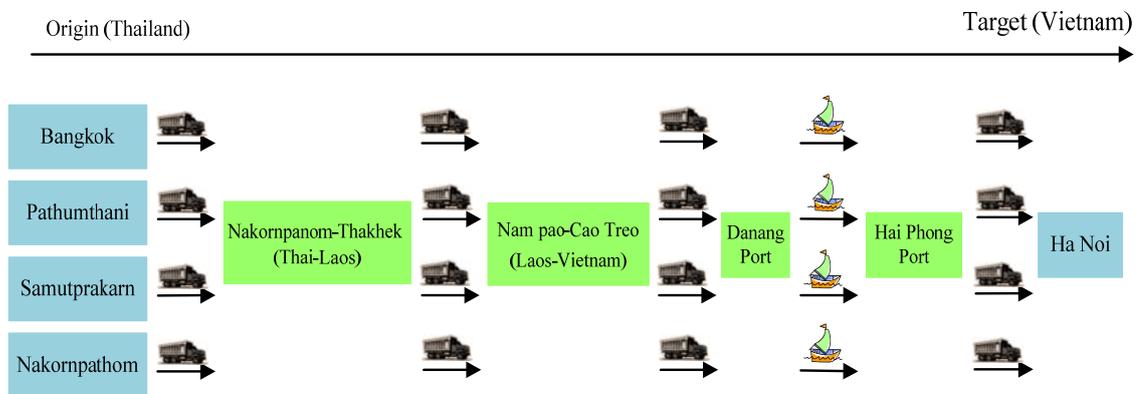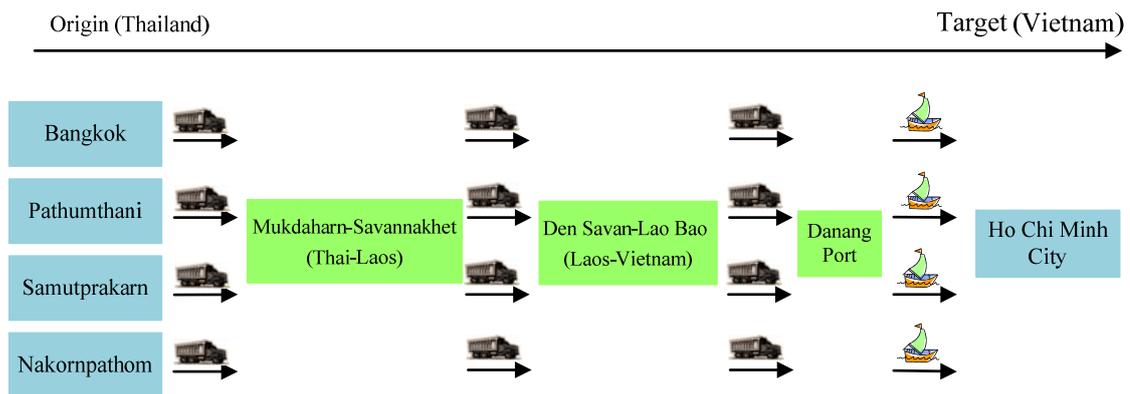

Figure 4.10 Appropriate transportation route for Thailand-Ho Chi Minh City of Scenario 2

From in Figure 4.10, scenario2 showstextile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ho Chi Minh City in Vietnamwith Mukdaharn border in Thailand using truck is inland transportation. Then truck can access from Mukdaharn border to Savannakhet border in Laos and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using the Nation Highway route number 9 (R9) is EWEC routes which support ASEAN Economic Community. Afterward, exporters can access to Da Nang port in Vietnam. Finally, fabric is shipped to Ho Chi Minh City.

3) Type of transportation of textile Thailand-Vietnam is boat because trade facilitation of trade border cannot occur by 2015. The main problem is cooperation of ASEAN members is less or no action. Thus, transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement that support trade facilitation for AEC are not ready to trade routes for AEC. Thailand-Vietnam transportation routes

are still boat by Laem Chabang port (LCB) port in Thailand to Ha Noi in Vietnam via Hai Phong port or Ho Chi Minh City in Vietnam.

From this information, it corresponds with sceanrio3(AEC fails) and Route No.5 in Table 4.1 (Routes for Bangkok to Ha Noi), Route No.5 in Table 4.2 (Routes for Pathumthani to Ha Noi), Route No.1 in Table 4.3 (Routes for Samutprakarn to Ha Noi), Route No.5 in Table 4.4 (Routes for Nakornpathom to Ha Noi),Route No.2 in Table 4.5 (Routes for Bangkok to Ho Chi Minh City),Route No.2 in Table 4.6 (Routes for Pathumthani to Ho Chi Minh City), Route No.1 in Table 4.7 (Routes for Samutprakarn to Ho Chi Minh City) and Route No.2 in Table 4.8 (Routes for Nakornpathom to Ho Chi Minh City). It was found that the appropriate transportation routes of Ha Noi is the same route from different origin groups. Likewise, the appropriate transportation route of Ho Chi Minh City is the same route. We can conclude the results in Figure 4.11-4.12.

Figure 4.11 Appropriate transportation route for Thailand-Hanoi of scenario3

From in Figure 4.11, scenario3shows textile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ha Noi in Vietnam via Laem Chabang port (LCB).Inland transportation from four group areasin Thailand to LCB port use trailers. From LCB port, fabric will finally be shipped to Ha Noi via Hai Phong port and can be accessed Ha Noi by truck.

Origin (Thailand)   Target (Vietnam)

Bangkok

Pathumthani
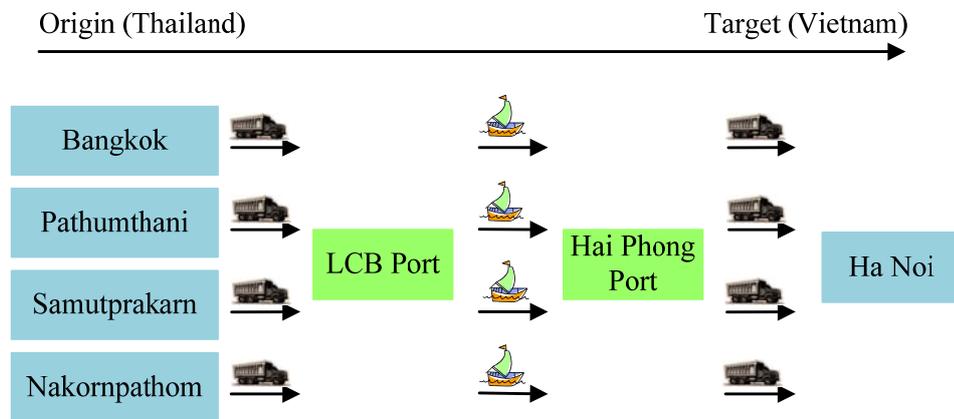
LCB Port

Samutprakarn

Ho Chi Minh City

Nakornpathom
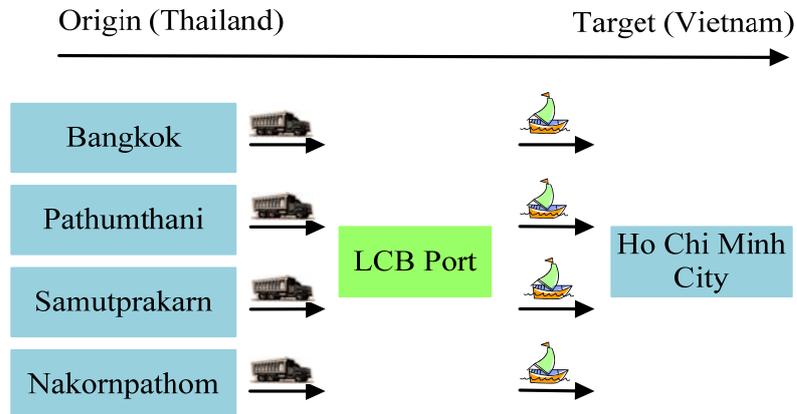
Figure 4.12 Appropriate transportation route for Thailand-Ho Chi Minh City of scenario3

From in Figure 4.12, scenario3 showstextile logistics flow from the origins are four group areasin Thailand (Bangkok, Pathumthani, Samutprakarn and Nakornpathom) to the target destinations as Ho Chi Minh City in Vietnam via Laem Chabang port (LCB) port. Inland transportation from four group areasin Thailand to LCB port use trailers. From LCB ports, fabric will finally be shipped to Ho Chi Minh City.

From the above results of taking into account of three scenarios, these key issues are analyzed betweenthe in-depth interview and Table 4.1-4.8 to find appropriate alternative routes for textile Thailand to Vietnam under AEC. We can summarize four routes to fit into all scenarios. These routes were found that scenario1 and scenario3 use boat transportation but scenario2 uses R12 route by crossing border. In addition, Ha Noi andHo Chi Minh City in Vietnam are different routes. Ha Noi uses R12 route (Nakormpanom-Thakhek Nam pao-Cao Treo-Ha Noi). Ho Chi Minh City in this study does not haveits route because this route is transportation route to the north of Vietnam. Thus, The R12 route is more appropriate Ha Noi than Ho Chi Minh City. As a result of consideration in R9 route, it is one of transportation routes of Greater Mekong Sub-regional Cross Border Transport Agreement that is higher quality of route than others. Moreover, we find that different origins do not affect to select transportation routes. The selection of transportation routes are the same results. We can concludein Table 4.21.

Table 4.21 Transportation routes fit into each scenario

Scenarios	Characteristics of sceanrios	Appropriate transportation routes (from the in-depth interview)	Detail of transportation routes (from Table 4.1-Table 4.8)
Scenario1: AEC proceeds gradually	It means that AEC would likely meet most, but not all regional economic integration goals within 2015. It proceeds gradually to reach the goal of AEC. In this scenario, transportation routes of Thailand-Vietnam are still the same as it used to be even if AEC in 2015 will happen. It means that transportation routes for textile Thailand-Vietnam are still current transport mode by boat mainly with high fabric demand. The main reason is to facilitate though cross border transaction cannot occur in 2015. Despite transit time of boat transportation is longer than crossing border, advantages are low logistics cost, timeliness, high quality of route and low risk in international transportation.	**- Thailand to Ha Noi** →LCB port-Hai Phong port-Ha Noi **- Thailand to Ho Chi Minh City** →LCB port-Hai Phong port-Ha Noi	**- Thailand to Ha Noi** → Inland transportation from Thailand to LCB port use trailers. From LCB port, fabric is shipped to Ha Noi via Hai Phong port and can be accessed Ha Noi by truck. **- Thailand to Ho Chi Minh City** →Inland transportation from Thailand to LCB port use trailers. From LCB ports, fabric is shipped to Ho Chi Minh City.
Scenario2: AEC completes	It is the most expected picture to see. It can reach the goal of AEC. For example, the tariffs can be reduced to 0% and the non-tariffs are eliminated within 2015. ASEAN countries are active to prepare	**- Thailand to Ha Noi** → Route number 12 (R12): Nakormpanom-Thakhek Nam pao-Cao Treo-Ha Noi	**- Thailand to Ha Noi** →Inland transportation from Nakornpanom borderto Thakhek border in Laos uses truckand cross the 3[rd]Thai-Laos Friendship Bridge across

Table 4.21 Transportation routes fit into each scenario (Cont.)

Scenarios	Characteristics of sceanrios	Appropriate transportation routes (from the in-depth interview)	Detail of transportation routes (from Table 4.1-Table 4.8)
	for AEC seriously. They are ready to create trade facilitation for accelerated economic integration by 2015. It has facility and speed of custom procedures. Furthermore, the linkage of international transportation is completed. These is a reason to transportation routes though crossing border will more use with high fabric demand. Advantages of cross border transaction are lower logistics cost, shortertransit time than boat transportation. Moreover, there are timeliness, high quality of route with low risk in international transportation.	**- Thailand to Ho Chi Minh City** → Route number 9 (R9): Mukdaharn-Savannakhet Den Savan-Lao Bao-Danang port-Ho Chi Minh City)	the Mekong. Using route number 12 (R12) is EWEC routes. Next exporters access to Nam pao border in Laos to Cao Treo border in Vietnam by truck. Exporters can access to Da Nang port in Vietnam by truck. And then fabric is shipped to Hai Phong port. Finally, fabric is transported to Ha Noi by truck. **- Thailand to Ho Chi Minh City** →Inland transportation from Mukdaharn border to Savannakhet border in Laos using truck and cross the 2nd Thai-Laos Friendship Bridge across the Mekong. Next exporters access to Den Savan border in Laos to Lao Bao border in Vietnam by truck. Using route number 9 (R9).Exporters can access to Da Nang port in Vietnam. Finally,

Table 4.21 Transportation routes fit into each scenario (Cont.)

Scenarios	Characteristics of sceanrios	Appropriate transportation routes (from the in-depth interview)	Detail of transportation routes (from Table 4.1- Table 4.8)
			fabric is shipped to Ho Chi Minh City.
Scenario3: AEC fails	It is a fizzled picture of the future. ASEAN countries have little or no progress toward the goal of AEC by 2015 and each country take trade barrier and conditions to protect own benefits. It will affect to trade barriers and rules to facilitate though cross border transaction. This reason makes low transport rate at Thai-Vietnam custom with low fabric demand. Transportation routes still export by boat mainly because the disadvantages of crossing border are high logistics cost, long transit time, no timeliness and low quality of route with high risk in international transportation.	**- Thailand to Ha Noi** → LCB port-Hai Phong port-Ha Noi **- Thailand to Ho Chi Minh City** → LCB port-Hai Phong port-Ha Noi	**- Thailand to Ha Noi** → Inland transportation from Thailand to LCB port use trailers. From LCB port, fabric is shipped to Ha Noi via Hai Phong port and can be accessed Ha Noi by truck. **- Thailand to Ho Chi Minh City** →Inland transportation from Thailand to LCB port use trailers. From LCB ports, fabric is shipped to Ho Chi Minh City.

From the results above, it demonstrates that the alternative routes are appropriate each scenario. Next the strategies will be analyzed and drawn out as Table 4.22.

Table 4.22 Summarization for the strategies of appropriate alternative routes each scenario

Scenario	Transportation Routes	Strategies
Scenario1: AEC proceeds gradually	1.1 Laem Chabang port (Thailand)-Hai Phong port (Vietnam)-Ha Noi (Vietnam)	Thai exporters export goods to Ha Noi should use boat in international transport to Hai Phong port. Inland transportation of Thai should use trailers, Vietnam inland can be accessed by truck. It leads to low logistics cost and timeliness in transportation.
	1.2 Laem Chabang port (Thailand)- Ho Chi Minh City(Vietnam)	Thai exporters export goods to Ho Chi Minh City should use boat in international transport to Ho Chi Minh City. Inland transportation of Thai should use trailers. It leads to low logistics cost and timeliness in transportation.
Scenario2: AEC completes	2.1 Nakornpanom border (Thailand)-Thakhek border (Laos)-Nam pao border (Laos)-Cao Treo border (Vietnam)-Da Nang port (Vietnam)-Hai Phong port (Vietnam)- Ha Noi (Vietnam)	Thai exporters export goods to Ha Noi should cross border from Thai, Laos to Vietnam by truck. It leads to low logistics cost, timeliness and shorttransit time.
	2.2 Mukdaharn border (Thailand)-Savannakhet border (Laos)-Den Savan border (Laos)-Lao Bao border (Vietnam)-Da Nang port	Thai exporters export goods to Ho Chi Minh City should cross border from Thai, Laos to Vietnam by truck. It leads to low logistics cost, timeliness and shorttransit time.

Table 4.22 Summarization for the strategies of appropriate alternative routes each scenario (Cont.)

Scenario	Routes	Strategies
	(Vietnam)-Ho Chi Minh City (Vietnam)	
Scenario3 : AEC fails	3.1 Laem Chabang port (Thailand)-Hai Phong port (Vietnam)-Ha Noi (Vietnam)	Thai exporters export goods to Ha Noi should use boat in international transport to Hai Phong port. Inland transportation of Thai should use trailers, Vietnam inland can be accessed by truck. It leads to low logistics cost and timeliness in transportation.
	3.2 Laem Chabang port (Thailand)- Ho Chi Minh City(Vietnam)	Thai exporters export goods to Ho Chi Minh City should use boat in international transport to Ho Chi Minh City. Inland transportation of Thai should use trailers. It leads to low logistics cost and timeliness in transportation.

From the results above, it illustrates that the strategies can recommend for textile exporters with appropriate transportation routes from Thailand to Vietnam in each sceanario.

CHAPTER V
DISCUSSION

The objectives of this study are to analyze factors (driving forces and key factors), alternative routes and strategies for Thailand textile export to Vietnam under AEC. Scenarios or plausible cases in the future are evaluated. This chapter discusses the situation of Thailand textile export to Vietnam by before and after AEC, and evaluation scenarios for Thailand textile export to Vietnam under AEC by using scenario analysis. Finally, the limitations of this study are explicated.

5.1 The situation of Thailand textile export to Vietnam before and after ASEAN Economic Community (AEC)

Thai textile industry is an important Thai economy both export and employment. The country that is the first rank to export textile of Thailand is Vietnam. Vietnam cannot sufficiently product upstream raw materials or fabric to meet the demand of expanded downstream textile while garment Vietnam which is downstream textile has greatly grown. This is a reason that it must import the fabrics from outside countries. AEC has resulted in an elimination the tariff and the non-tariff barriers on goods by starting January 1, 2010. Textile industry is affected this cooperation. When compared to same month a year before and after AEC, it was found export value and growth rate of Thai textile export to Vietnam after AEC are higher than before AEC. Textile type as fabric is the most export. The advantages of AEC by reducing the tariffs to 0% and eliminatation the non-tariff barriers provide facilitatation of cross-border. It is opportunity to Thailand export to Vietnam has increase. Hence, their commercial trades are through Laos and Cambodia with more possible commercial. It means that liberalization of international road transportation will be an option for alternative routes besides the vessels use the current transportation. These new

alternative routes are advantages to reduce logistics cost and faster transit time. It will be essential to study possible alternative routes for Thai textile to Vietnam in the future if ASEAN Economic Community (AEC) is associated in order to prepare the upcoming change in the uncertain future by using scenario analysis.

All routes for Thai textile export were considered in step of scenario analysis varied by the origins to the target destinations. The origins and the targets are the weaving factories in Thailand and Vietnam. In this research, we divide configurations of distribution for Thai weaving factories by province group that refer from Office of the Public Sector Development Commission Thailand. From literature review, this study has been divided into four regions of Thailand such as Bangkok, the upper central, the middle central, the lower central parts. Afterward, four group areas were selected to be the origins of case study namely Bangkok, Pathumthani, Samutprakarn and Nakhonpathom provinces. These areas are major factory area in each part. Mostly, textile from Thailand are shipped to Ha Noi and Ho Chi Minh City in Vietnam. Ha Noi and Ho Chi Minh City were considered that are the representative of the destination for route selection. The alternative routes are considered along with mode of transportation depending on the origins and the destinations. The alternative gateways are presented by literature as follow: Laem Chabang port (LCB), Bangkok port (BKK), Mukdaharn border, Nakornpanom border, Chong Meck border, Aranyaprathet border and Ban Had Lek border. All of alternative routes are considered to fit into each scenario in the step of scenario analysis.

5.2 Scenario Analysis for appropriate alternative routes of Thailand-Vietnam Textile under ASEAN Economic Community (AEC)

From the uncertain future of Thai textile under AEC, scenario analysis is a important technique of future study. Scenarios consist of possible futures and show alternative options in the future. The stories of scenarios are builded from quality and quantity factors. The future situations have uncertainties that are considered in scenario process. Scenario is not forecast or prediction. It is based on the assumptions that look the world in the future from today.

This study shows a case study of textile supply chain in Thailand. Selection of transportation routes is important for exporters. Key thing for the appropriate route selection is factor. In scenario analysis, factor is called key factor and driving force. These factors are developed by reviewing relevant literature, technical papers and internet sources. From reviewing relevant literature, technical papers and internet sources, there are six key factors. These are capacity of customs and ports, logistics cost, transportation time, custom facilities. There are eight driving forces. These are flexibility, fabric demand, accessibility, quality of route, responsiveness, timeliness, country's political situation and regulation and legislation. Afterward, these key factors and driving forces were ranked by the level of importance and the level of uncertainty by experts' opinion to select two scenario logics for creating the theme for the scenarios. They were found that distance and fabric demand are the highest score. Other key factors and driving forces are filled each scenario to present scenario details. They displayed mian characteristics each scenario. However, scenarios are still explicit composition to build stories of scenarios. Thus, scenarios are fulfill completely scenarios stories by reviewing relevant literature and fieldwork (in-depth interview and survey). Resulting from the literature review and fieldwork (in-depth interview and survey) are analyzed to classify cases of scenarios. When we considered possible situations, scenarios are based on the level of ASEAN cooperation for AEC in 2015. It is a power to succeed the goal of AEC that means the tariff reduction to 0% for trade goods and elimination non-tariff barriers can do within 2015. The level of ASEAN cooperation for AEC leads to the degree of driving forces and key factors such as low logistics cost, high logistics cost, long distance and short distance. The results of appropriate route selection in each scenario are analyzed the literature review and fieldwork (in-depth interview and survey). Moreover, we find that different origins do not affect to select transportation routes. The selection of transportation routes are the same results.

Disadvantage of scenario analysis is about the combination of stories of scenarios. It must ensure that there is built-in internal consistency. Moreover, scenarios were developed from perspective. It has sometimes biases to creat scenarios. Thus, system thinking is essential to bulid scenario by using framework. It helps clear process of scenario development.

5.3 Limitation of this research

1) The scopes of transportation routes consider the type of vehicle including truck, trailer, train and vessel. The format of each type of vehicle such as type of lane road and type of railway are not considered

2) The corresponding rank of key factors and driving forces are acquired from this scenario analysis may be changed. Due to key factors and driving forces were ranked the level of importance and the level of uncertainty by one group of experts only. Therefore, the rank may be changed when key factors and driving forces are ranked by other group of experts.

3) Stategies are presented in this study. They can only indicate to give reflections on "should do" issues but are not able to evaluate strategies on "will it happen and how will it prepare for the policies" issue.

CHAPTER VI
CONCLUSION

6.1 Conclusion

Thailand can export textile to Vietnam, especially fabric is rapidly increased after AEC takes effect in 2010. AEC comes into effect in 2015, will be illustrated to reduce the tariff at 0 percent and remove the non-tariff barriers for all ASEAN members within year 2015. Under this agreement, there are the benefits such as a single market, facilitation of the cross-border transportation and dependence on raw materials among members. The new lane as crossing border transportation is one choice of exporters. Reviewing relevant literatures, technical papers and internet sources identified alternative routes for current and future routes. This study displays alternative routes from four origin areas for Thailand textile transportation to Ha Noi and Ho Chi Minh City in Vietnam.It will be essential to study possible alternative routes for Thai textile to Vietnam in the future if ASEAN Economic Community (AEC) by using scenario analysis.

The process of selection among different alternatives is complicate and the possible future events are uncertain. Therefore, scenario analysis is used in this study. The focal issue is transportation routes will change if ASEAN Economic Community (AEC) happens in the year 2015. This study displays five key factors (capacity of customs and ports, logistics cost, transit time, customs increase and distance) and nine driving forces (flexibility, fabric demand, accessibility, quality of route, responsiveness, timeliness, country's political situation, regulation and legislation and product security) from reviewing relevant literature, technical papers and internet sources. With rank key factors and driving forces factors by exports' opinion, one key factor and one driving force ranked the highest score of the level of importance and the level of uncertainty. Distance of current and future transportation mode and fabric demand are selected to draw out theme of scenarios. Other key factors and driving forces are filled scenarios also. Afterward, scenarios are created by using key factors

and driving forces. The scenarios in full details are evaluated by the level of ASEAN cooperation for AEC in 2015 from the literature and fieldwork. Three scenarios are developed. The titles in each scenario are AEC proceeds gradually AEC completes AEC fails. Alternative routes for Thailand-Vietnam textile transportation under AEC are appropriately considered with scenario cases.

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6.2 Recommendation

This study This study is focused on Thailand textile products as fabric exports from four areas to Ha Noi and Ho Chi Minh City in Vietnam. The same methodology can be applied for other products and other areas.

Based on scenario analysis, the implications of scenarios are roughly identified the strategies each scenario for "should do or should not do". It should have the implication of "when will it happen and how will it prepare for the policies". Moreover, it should study and display the results of numerical factors. Thus, further research is analyzed.

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APPENDICES

APPENDIX A
RESEARCH QUESTIONARE

แบบสอบถามโครงงานวิทยานิพนธ์

เรื่อง ปัจจัยที่มีอิทธิพลต่อการเลือกเส้นทางการขนส่งสิ่งทอไทย-เวียดนาม

ภายใต้ข้อตกลงประชาคมเศรษฐกิจอาเซียน

คำชี้แจง: แบบสอบถามนี้เป็นส่วนหนึ่งของโครงงานวิทยานิพนธ์ของหลักสูตรวิศวกรรมศาสตร์มหาบัณฑิต สาขา วิศวกรรมอุตสาหการ คณะวิศวกรรมศาสตร มหาวิทยาลัยมหิดล

การเลือกเส้นทางการขนส่งสิ่งทอไทย-เวียดนามภายใต้ข้อตกลงประชาคมเศรษฐกิจอาเซียน (ASEAN Economic Community: AEC) มีวัตถุประสงค์เพื่อศึกษาผลกระทบของการเปิดการค้าเสรีที่เกิดขึ้นของข้อตกลง AEC ภายในปี 2015   ที่มีต่อเส้นทางการขนส่งสิ่งทอไทยสู่ประเทศเวียดนาม เพื่อเป็นทางเลือกในการขนส่ง นอกเหนือจากการขนส่งในปัจจุบันที่ส่วนใหญ่เป็นรูปแบบการขนส่งทางเรือที่จะช่วยลดต้นทุนขนส่งและลดเวลา การส่งมอบสินค้า

ในการเลือกเส้นทางการขนส่งสิ่งทอไทย-เวียดนามภายใต้ข้อตกลง AEC จำเป็นต้องมีการพิจารณาปัจจัย ที่มีผลต่อการเลือกเส้นทางการขนส่งสิ่งทอระหว่างไทยกับเวียดนามภายใต้ข้อตกลง AEC ผู้วิจัยจึงขอความร่วมมือ ท่านให้ข้อมูลเพื่อเป็นข้อมูลในการนำไปใช้ในการศึกษาต่อไป ผู้วิจัยขอรับรองว่า จะนำข้อมูลของท่านเพื่อ ประโยชน์ในงานวิจัยเท่านั้น ไม่นำไปใช้ในงานอื่นใด

ส่วนที่ 1: ข้อมูลส่วนตัว

ชื่อ-นามสกุลผู้ให้สัมภาษณ์...ตำแหน่ง.................................

ชื่อหน่วยงาน/บริษัท...ที่อยู่..

……

E-mail…………………………………….....................โทรศัพท์…………………………………………..

ส่วนที่ 2: ปัจจัยที่ท่านคิดว่ามีอิทธิพลต่อการเลือกเส้นทางการขนส่งสิ่งทอระหว่างไทยกับเวียดนามภายใต้ข้อตกลง AEC

คำชี้แจง: กรุณาใส่เครื่องหมาย "✔" ในช่องค่าความสำคัญและช่องค่าความไม่แน่นอนที่ท่านเห็นสมควรของ ปัจจัยแต่ละชนิด

เกณฑ์การตอบ: แบบสอบถามนี้เป็นแบบประเมินค่า 3 ระดับ โดยมีเกณฑ์การประเมิน ดังนี้

- ระดับการให้คะแนนของความสำคัญของปัจจัย คือ

1 หมายถึง ไม่มีความสำคัญ   2 หมายถึง ความสำคัญปานกลาง   3 หมายถึง ความสำคัญมาก

- ระดับการให้คะแนนของความไม่แน่นอนของปัจจัย คือ

1 หมายถึง ไม่มีความไม่แน่นอนที่ไม่ทราบว่าปัจจัยจะเกิดขึ้นหรือไม่ (มีโอกาสเกิดขึ้นสูง) และทราบว่ามีผลกระทบ (เชิงบวก หรือเชิงลบ) สูงต่อการเลือกเส้นทางภายใต้ข้อตกลง AEC

2 หมายถึง ความไม่แน่นอนปานกลางที่ไม่ทราบว่าปัจจัยจะเกิดขึ้นหรือไม่และมีผลกระทบ (เชิงบวก หรือเชิงลบ) ปานกลางต่อการเลือกเส้นทางภายใต้ข้อตกลง AEC

3 หมายถึง ความไม่แน่นอนสูงมากที่ไม่ทราบว่าปัจจัยจะเกิดขึ้นหรือไม่และมีผลกระทบ (เชิงบวก หรือเชิงลบ) ต่อการเลือกเส้นทางภายใต้ข้อตกลง AEC อย่างไร

ปัจจัย	ค่าความสำคัญ			ค่าความไม่แน่นอน		
	1	2	3	1	2	3
ความสามารถในการรองรับสินค้าของด่านการค้าชายแดนหรือท่าเรือ						
ต้นทุนค่าขนส่ง						
เวลาในการขนส่ง						
การเปิดด่านการค้าชายแดนระหว่างประเทศเพิ่มขึ้น						
ระยะทางที่ใช้ในการขนส่ง						
คุณภาพและความปลอดภัยของสินค้า						
ความต้องการผ่าผืนที่เพิ่มขึ้น						
ความสะดวกในการเข้าถึงบริเวณด่านการค้าชายแดนหรือท่าเรือ						
ความยืดหยุ่นในการเปลี่ยนแปลงต่อความต้องการของลูกค้า						
การตอบสนองต่อความต้องการของลูกค้า						
คุณภาพเส้นทางที่ใช้ในการขนส่ง อุบัติเหตุ						
การตรงต่อเวลาในการขนส่ง						
ประเทศที่ขนส่งผ่านมีปัญหาทางการเมืองกับเราหรือไม่						
ข้อกำหนดและกฎระเบียบการค้าระหว่างประเทศ						

หากมีปัจจัยอื่นๆ โปรดระบุ ....

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ข้อเสนอแนะ...

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APPENDIX B
TRIP SUMMARY

สรุปรายงานการเดินทาง

"โครงการระบบสนับสนุนการตัดสินใจของทิศทางการแปรรูปผลิตภัณฑ์ยางเพื่อ
สร้างมูลค่าเพิ่มยางพาราในเขตภาคตะวันออกเฉียงเหนือ"

ระหว่างวันที่ 14-18 พฤษภาคม 2555 ณ ประเทศลาว และประเทศเวียดนาม

1. ตารางการเดินทาง

วันที่	เส้นทาง	Mode	ระยะทาง (กม.)	เวลา (ชั่วโมง)	สภาพถนน		หมายเหตุ
					ไทย	ลาว/เวียดนาม	
1	อุดรธานี-ด่านหนองคาย (ไทย)-เวียงจันทน์[1] (ลาว)	รถตู้ (R13)	78 (58+20)	1.10 (40 นาที+30 นาที)	ดี	ลาว - สภาพถนนไม่ดีเป็นบางช่วง เป็นหลุมเป็นบ่อ - เป็น 2 เลน รถสวนทางกัน - พวงมาลัยรถอยู่ด้านซ้าย	ระยะเวลาการข้ามแดนขึ้นอยู่กับจำนวนคนข้ามแดน และขั้นตอนเอกสาร
2	เวียงจันทน์-ปากซัน-ด่านหลักซาว (ลาว)- ด่านเก่าเจา-วินห์ (เวียดนาม)	รถตู้จากเวียงจันทน์-ปากซัน (R13, R8)	470 (183+100+34+100)	9 (4+5)	-	ลาว - เหมือนข้อ 1 ถนนเป็นดินแดงบางช่วง เวียดนาม - สภาพถนนพอใช้ เป็นหลุมเป็นบ่อพอสมควร ทางโค้งเยอะ ลัดเลาะตามไหล่เขาและแม่น้ำ - เป็น 2 เลน รถสวนทางกัน สองข้างทางส่วนใหญ่เป็นทุ่งหญ้า	- เวียดนามมีการเก็บเงินค่าผ่านเมือง - การผ่านด่านเวียดนามล่าช้ากว่าลาว
3	วินห์-นิงห์ปิงห์-ฮาลองเบย์	รถตู้ (R1A → วินห์-นิงห์ปิงห์, R10)	400 (200+200)	8	-	- สภาพถนนดีพอใช้ เป็นหลุมเป็นบ่อบางช่วง ทางโค้งเยอะ ลัดเลาะตามไหล่เขาและแม่น้ำ - เป็น 2 เลน รถสวนทางกัน สองข้างทางส่วนใหญ่เป็นทุ่งหญ้า	
4	ฮาลองเบย์-ท่าเรือไฮฟง[2]-ฮานอย	รถตู้ (R1)	185	3	-	- สภาพถนนดี - รถไม่ติด	คนส่วนใหญ่ใช้มอเตอร์ไซค์
5	ฮานอย-สถานทูตไทยประจำเวียดนาม-Thai Summit-สนามบินฮานอย	รถตู้	45 (35+10 กิโลเมตร)	1.05 (10 นาที+45 นาที+10นาที)	-	- สภาพถนนดี - รถไม่ติด	คนส่วนใหญ่ใช้มอเตอร์ไซค์

หมายเหตุ [1] ในเวียงจันทน์ สัมภาษณ์บริษัท ARE (Asia Road Express) และพบท่านทูตพาณิชย์ไทย ณ สถานทูตไทยประจำเวียงจันทน์ สปป.ลาว

[2] สัมภาษณ์เก็บข้อมูลท่าเรือไฮฟง และสัมภาษณ์บริษัท VIETRANSTIMEX ในเมืองไฮฟง

รูปภาพที่ 1 แผนที่เส้นทางการสำรวจครั้งนี้ (อุดรธานี-เวียงจันทน์-หลักซาว-วินน์-ฮานอย)

2. เปรียบเทียบเส้นทางการเดินทางแบบรถของไทย-ลาว-เวียดนาม (ฮานอย)

| Route No.	Origin-Destination	ถนน หมายเลข	Distance (km)
1	มุกดาหาร (ไทย). 🚚 สะหวันเขต (ลาว) 🚚 ด่านแดนสะหวัน (ลาว) 🚚 ด่านลาวบ่าว (เวียดนาม) 🚚 ฮานอย	R9	775 (15+360+400)
2	นครพนม (ไทย). 🚚 เมืองท่าแขก (ลาว) 🚚 ปากซัน 🚚 หลักซาว. 🚚 ด่านน้ำพาว 🚚 ด่านเก่าเจา (เวียดนาม). 🚚 วินน์ 🚚 ฮานอย	R13, R8	661 (331+330)
3	นครพนม (ไทย). 🚚 เมืองท่าแขก (ลาว) 🚚 ด่านนาเพิ้ง. 🚚 ด่านจะหล่อ (เวียดนาม) 🚚 ฮาติ่ง 🚚 ดงฮา 🚚 ลาวบ่าว 🚚 ฮานอย	R12	1,094 (340+150+120+84+400)
4 (จากการสำรวจครั้งนี้)	อุดรธานี. 🚚 หนองคาย. 🚚 เวียงจันทน์(ลาว). 🚚 ปากซัน. 🚚 ด่านหลักซาว (ลาว) 🚚 ด่านเก่าเจา (เวียดนาม). 🚚 วินน์ 🚚 นิงห์บิงห์ 🚚 ฮาลองเบย์ท่าเรือไฮฟง. 🚚 ฮานอย	R13, R8, R10, R1	1,075

3. Fact findings

1) เส้นทางการขนส่งในปัจจุบัน

- ไทยสามารถส่งออก**สินค้าประเภท Consumer product ไปยังลาวได้เป็นอันดับ 1** รองลงมา คือ เวียดนาม จีน ตามลำดับ โดยสามารถเรียงลำดับการใช้เส้นทางขนส่งจากไทยผ่านด่านที่ลาวจากมาก ไปน้อย ได้ดังนี้ ด่านหนองคาย-ด่านท่านาแล้ง > ด่านมุกดาหาร-ด่านสะหวันเขต > ด่านมุกดาหาร-ปาก เซ

รูปภาพที่ 2 เส้นทางการส่งออกสินค้า Consumer Product จากไทยไปลาว และเวียดนาม

- ลาวนำเข้า Garment   จากอเมริกาและยุโรป แล้วส่งไปประเทศที่ 3 โดยใช้ท่าเรือแหลมฉบัง และท่าเรือกรุงเทพฯ ของไทย ประมาณ 98% (ท่าเรือแหลมฉบัง > ท่าเรือกรุงเทพฯ) นอกจากนั้น ลาวใช้ท่าเรือไฮฟง แต่ยังมีปริมาณการขนส่งยังน้อย
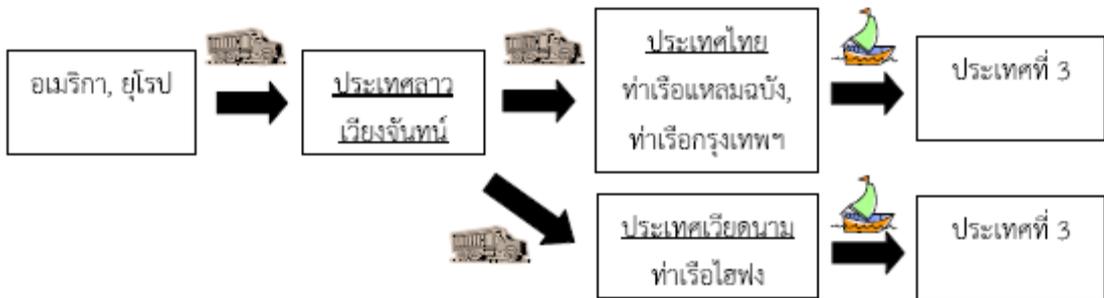
รูปภาพที่ 3 เส้นทางการส่งออก Garment ของลาวไปยังประเทศต่างๆ

- ลาวนำเข้าสินค้าอุตสาหกรรมจากจีน, เกาหลี เป็นอันดับ 1 รองลงมา คือ ไทย เวียดนาม ตามลำดับ แล้วส่งไปประเทศที่ 3 โดยใช้ท่าเรือแหลมฉบัง และท่าเรือกรุงเทพฯ ของไทย ประมาณ 98% (ท่าเรือแหลมฉบัง > ท่าเรือกรุงเทพฯ) นอกจากนั้น ลาวใช้ท่าเรือไฮฟง แต่ยังมีปริมาณการขนส่งยังน้อย ส่วนใหญ่ใช้กับการขนส่งถ่าน หรือ สินค้าอันตราย
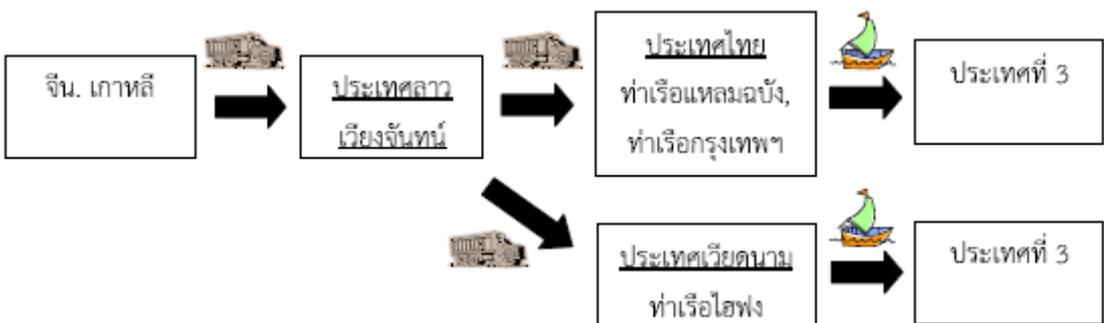
รูปภาพที่ 4 เส้นทางการส่งออกสินค้าอุตสาหกรรมของลาวไปยังประเทศต่างๆ

รูปภาพที่ 5 คณะเดินทางเข้าสัมภาษณ์ผู้ประกอบการ บริษัท ARE ในลาว

รูปภาพที่ 6 คณะเดินทางเข้าสัมภาษณ์ท่านทูตพาณิชย์ ในลาว

รูปภาพที่ 7 สรุปเส้นทางขนส่งสินค้าที่เกี่ยวข้องกับไทยไปเวียดนาม
ในการสัมภาษณ์ผู้ประกอบการในลาวและเวียดนาม

หมายเหตุ ▬ หมายถึง เส้นทางการส่งออกสินค้าประเภท Consumer product จากไทยไปเวียดนามเป็นอันดับ 1

➤ หมายถึง เส้นทางการส่งออกสินค้าประเภท Consumer product จากไทยไปเวียดนามเป็นอันดับ 2

➤ หมายถึง เส้นทางการส่งออกสินค้าประเภท Consumer product จากไทยไปเวียดนามเป็นอันดับ 3

●━　━● หมายถึง เส้นทางการนำเข้าสินค้าอุตสาหกรรม และ Garmnet จากประเทศที่ 3 มายังลาว ไปยัง
ประเทศที่สาม เป็นอันดับ 1

●‑ ‑ ‑● หมายถึง เส้นทางการนำเข้าสินค้าอุตสาหกรรม และ Garmnet จากประเทศที่ 3 มายังลาว ไปยัง
ประเทศที่สาม เป็นอันดับ 2

2) สภาพถนน ในลาวและเวียดนาม

- สภาพถนนในลาว

สภาพถนนดีพอใช้ เป็นหลุมเป็นบ่อในบางช่วง ถนนเป็น 2 เลน ไม่กว้างมาก รถสวนกัน บาง
ช่วงเส้นทางเป็นถนนดินแดง

- สภาพถนนในเวียดนาม

ถ้าเป็นถนนในตัวเมือง สภาพถนนดีกว่าแถบชนบท หรือชานเมือง จำกัดความเร็ว เป็นหลุมเป็น
บ่อพอสมควร เข้าแต่ละเมืองต้องเสียเงินผ่านเมือง สภาพด่านเก่า ต้องระวังมอเตอร์ไซค์แซง เพราะประชาชนส่วน
ใหญ่ของชาวเวียดนามขี่มอเตอร์ไซค์

รูปภาพที่ 8 สภาพด่านเข้าเมืองของเวียดนาม

3) มุมมองประชาคมเศรษฐกิจอาเซียน (ASEAN Economic Community: AEC)

- จากความเห็นของคุณไกรสอน นวลคำสิง ซึ่งเป็นผู้ประกอบการบริษัท ARE ในประเทศลาว และคุณ
พิมล ปงกองแก้ว ซึ่งเป็นท่านทูตพาณิชย์ของประเทศไทยประจำเวียงจันทน์ ประเทศลาว สามารถสรุปได้ว่า
บทบาทของลาว คือ เป็น Land link ของภูมิภาค

- จากความเห็นของ Le Mihn Hai ซึ่งเป็น Vice manager ของท่าเรือไฮฟง และคุณบุษบา บุตรรัตน์ ซึ่ง
เป็นท่านทูตพาณิชย์ของประเทศไทยประจำกรุงฮานอย ประเทศเวียดนาม สามารถสรุปได้ว่า บทบาทของเวียดนาม
เป็น Gateway ของภูมิภาค ดังรูปภาพที่ 9

รูปภาพที่ 9 บทบาทของประเทศไทย ลาว และเวียดนามใน AEC

รูปภาพที่ 10 คณะเดินทางเข้าสัมภาษณ์ Vice manager ของท่าเรือไฮฟง

รูปภาพที่ 11 คณะเดินทางเข้าสัมภาษณ์ท่านทูตพาณิชย์ ในเวียดนาม

- ลาวตั้งเป้าจะเป็น "Battery of Asia" เนื่องจากประเทศไม่มีทางออกทางทะเล ณ ปัจจุบัน กำลัง
เร่งสร้างเขื่อน

- เส้นทางขนส่งสินค้าประเภท Customer product จากไทยมาลาว ยังคงเป็นเส้นทางผ่านด่าน หนองคาย-ด่านท่านาแล้งเหมือนเดิม

- เส้นทางด่านหนองคาย จะมีบทบาทในการขนส่งมากขึ้น มากกว่าเส้นทางขนส่งด่านสะหวัน เขต

- ท่าเรือไฮฟงยังมีบทบาทขนส่งน้อยกว่าท่าเรือแหลมฉบัง เนื่องจากปัญหาเรื่องปริมาณเรือ ต้นทุนค่าขนส่ง และการสื่อสารเรื่องภาษา

- ถึงแม้ว่า ณ ปัจจุบัน การขนส่งจากไทยมาเวียดนามส่วนใหญ่ใช้ทางเรือ แต่ในอนาคต ใน ประเทศเวียดนาม เส้นทางขนส่งทางถนนจะมีบทบาทมากขึ้น และท่าเรือไฮฟง มีการขยายท่าเรือ เพื่อรองรับ เป้าหมายการเป็น International gateway

รูปภาพที่ 12 ท่าเรือไฮฟง ประเทศเวียดนาม

4)   ได้โจทย์วิจัยด้าน Healthcare   เกี่ยวกับ ควรมีการศึกษาเรื่องกำลังคน และผู้เชี่ยวชาญสำหรับ อุตสาหกรรมสาธารณสุข

5) อุตสาหกรรมที่น่าลงทุนในเวียดนาม ได้แก่ เคมีภัณฑ์ ปิโตรเคมี และสิ่งทอ

6) ลาวน่าลงทุน แต่เวียดนามไม่น่าลงทุน เนื่องจากการเข้าถึงข้อมูลประเทศเวียดนามยาก ไม่ได้รับการ อำนวยความสะดวกจากรัฐบาล

4. สิ่งที่จะดำเนินการต่อไป

1) มุมมองสปว.โลจิสติกส์

- เป็นข้อมูลเบื้องต้นให้กลุ่มโจทย์ AEC ในปี 2555 ในเรื่องการปรับรูปแบบโซ่อุปทานยานยนต์ และเครื่องนุ่งห่ม

- ได้โจทย์ด้าน healthcare ที่จะนำมาพิจารณาในปี 2556

2) มุมมองของนักวิจัย

- เป็นข้อมูลในการทราบเส้นทางการขนส่งสินค้าประเภทต่างๆรวมทั้งยางพาราจากไทยไปเวียดนาม และทราบบทบาทของลาวและเวียดนามในเวที AEC

- นำไปเป็นข้อมูลประกอบการทำแบบจำลองระบบการตัดสินใจเลือกที่ตั้งโรงงานยางพาราและทิศทางการแปรรูปยางพาราในภาคตะวันออกเฉียงเหนือ

สรุปประชุมโดย

นางสาววรรณวิสา อุ่นคำ

ผู้ช่วยผู้ประสานงานโครงการวิจัย

ด้านโลจิสติกส์และโซ่อุปทานร่วมระหว่าง วช. และสกว.

วันที่ 15 มิถุนายน 2555

ผู้ตรวจทาน / แก้ไขบันทึกการประชุม

รศ.ดร.ดวงพรรณ กริชชาญชัย ศฤงคารินทร์

ผู้ประสานงานโครงการวิจัยด้านโลจิสติกส์และโซ่อุปทาน ร่วมระหว่าง วช.และ สกว.

วันที่ 19 มิถุนายน 2555

BIOGRAPHY

NAME	Miss Wanwisa Aunkham
DATE OF BIRTH	18 June 1985
PLACE OF BIRTH	Nakornpathom, Thailand

INSTITUTIONS ATTENDED	Kasetsart University,
	  2003-2007: Bachelor of Science
	  (Chemistry)
	Mahidol University, 2008-2012:
	  Master of Engineering
	  (Industrial Engineering)

RESEARCH GRANTS	TRF Master Research Grant (RDC5450002)

HOME ADDRESS	24 Moo.4 T. Thammasala
	  Amphur Muang
	  Nakornpathom 73000
	  Email: wanwisa_aunkham@hotmail.
	  com

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