

Stakeholder Analysis of Socioeconomic Impacts on Chiang Rai- Chiang Khong Rail Project in Chiang Rai Province

Miss Tanthita Sukhopala

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Arts in International Development Studies
Common Course
Faculty of Political Science
Chulalongkorn University
Academic Year 2018

Copyright of Chulalongkorn University

บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)

เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ที่ส่งผ่านทางบัณฑิตวิทยาลัย

The abstract and full text of theses from the academic year 2011 in Chulalongkorn University Intellectual Repository(CUIR)

are the thesis authors' files submitted through the Graduate School.

การวิเคราะห์ผู้มีส่วนได้ส่วนเสียในประเด็นผลกระทบทางเศรษฐกิจและสังคมของโครงการรถไฟ
เชียงใหม่ - เชียงของ ในจังหวัดเชียงใหม่

น.ส.ต้นทิศา สุโขบล

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาศิลปศาสตรมหาบัณฑิต
สาขาวิชาการพัฒนาระหว่างประเทศ ไม่สังกัดภาควิชา/เทียบเท่า
คณะรัฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2561
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	Stakeholder Analysis of Socioeconomic Impacts on Chiang Rai-Chiang Khong Rail Project in Chiang Rai Province
By	Miss Tanthita Sukhopala
Field of Study	International Development Studies
Thesis Advisor	Assistant Professor PITCH PONGSAWAT, Ph.D.

Accepted by the Faculty of Political Science, Chulalongkorn
University in Partial Fulfillment of the Requirement for the Master of
Arts

..... Dean of the Faculty of
Political Science
(Associate Professor AKE
TANGSUPVATTANA, Ph.D.)

THESIS COMMITTEE

..... Chairman
(Associate Professor JITTICHAJ
RUDJANAKANOKNAD, Ph.D.)
..... Thesis Advisor
(Assistant Professor PITCH PONGSAWAT,
Ph.D.)
..... External Examiner
(Nuttakorn Vititanon, Ph.D.)

ศันทิศา สุโฆบล : การวิเคราะห์ผู้มีส่วนได้ส่วนเสียในประเด็นผลกระทบทางเศรษฐกิจและสังคมของโครงการรถไฟ เชียงราย - เชียงของ ในจังหวัดเชียงราย. (Stakeholder Analysis of Socioeconomic Impacts on Chiang Rai-Chiang Khong Rail Project in Chiang Rai Province) อ.ที่ปรึกษาหลัก : ผศ.พิชญ์ พงษ์สวัสดิ์

งานวิจัยนี้ถูกจัดทำขึ้นเพื่อ (๑) ศึกษาผลกระทบของโครงการรถไฟเชียงราย-เชียงของ ต่อจังหวัดเชียงราย โดยเฉพาะผลกระทบด้านสังคมและเศรษฐกิจ ทั้งผลกระทบเชิงบวกและเชิงลบ และ (๒) วิเคราะห์ข้อดีและข้อเสียของโครงการรถไฟเชียงราย-เชียงของต่อจังหวัดเชียงราย

ขอบเขตของการศึกษานี้มีทั้งสิ้น ๒ ขอบเขต นั่นคือ (๑) การศึกษาความแตกต่างของผลกระทบใน ๓ พื้นที่ที่แตกต่างกัน (๒) การศึกษาความแตกต่างของผลกระทบในพื้นที่ที่มีระยะห่างต่างกัน ระหว่างพื้นที่ที่อยู่ใกล้สถานที่ตั้งโครงการฯ หรือในระยะ ๕ กิโลเมตร และพื้นที่ที่อยู่ห่างไกลกว่า ๕ กิโลเมตร

การศึกษานี้ใช้วิธีการลงพื้นที่สำรวจและสัมภาษณ์เชิงลึกเพื่อเก็บข้อมูลกับประชาชนทั่วไปในจังหวัดเชียงราย โดยมีเป้าหมายอยู่ที่อำเภอต่าง ๆ ที่จะเป็นที่ตั้งของสถานีรถไฟ ประกอบไปด้วย อำเภอเวียงชัย อำเภอเชียงของ และอำเภอป่าแดด ซึ่งทั้ง ๓ อำเภอจะได้รับผลกระทบจากโครงการฯ ตั้งแต่เริ่มต้นก่อสร้าง ทั้งปัญหาการเวียนคืนที่ดิน ราคาที่ดินเพิ่มสูง ผลกระทบจากการก่อสร้าง ปัญหาการติด ปัญหาการขวางทางน้ำในพื้นที่เกษตรกรรม ทางรถไฟที่จะตัดผ่านหมู่บ้าน หรือปัญหาสิ่งแวดล้อม เป็นต้น การขายตัวของเมืองเชียงรายอาจไม่ได้เติบโตตามทางรถไฟหรือสถานีรถไฟเพราะเมืองเชียงรายได้ขยายตัวตามการพัฒนาเส้นทางคมนาคมทางบกแล้ว อย่างไรก็ตาม โครงการรถไฟ มีประโยชน์หลักอยู่ที่การส่งเสริมด้านการท่องเที่ยว อุตสาหกรรมการบริการ การค้าและการลงทุน โลจิสติกส์และโซ่อุปทาน ทั้งระดับภายในประเทศและระหว่างประเทศ ทั้งนี้ เชียงรายยังคงต้องการการพัฒนาที่แตกต่างจากจังหวัดอื่น ๆ ที่จะเหมาะสมต่อ โครงสร้างพื้นฐานของจังหวัดภายหลังจากเสร็จสิ้นโครงการรถไฟดังกล่าว

สาขาวิชา การพัฒนาระหว่างประเทศ

ลายมือชื่อนิติ

ปีการศึกษา 2561

ลายมือชื่อ อ.ที่ปรึกษาหลัก

6181211124 : MAJOR INTERNATIONAL DEVELOPMENT STUDIES

KEYWORD Rail project, Chiang Rai, Socioeconomic impact, urban expansion
D:

Tanthita Sukhopala : Stakeholder Analysis of Socioeconomic Impacts on Chiang Rai-Chiang Khong Rail Project in Chiang Rai Province. Advisor: Asst. Prof. PITCH PONGSAWAT, Ph.D.

The objectives of this research are (1) to study the impacts of Chiang Rai - Chiang Khong rail project on Chiang Rai provinces, especially the social and economic impacts which are caused by the rail project, positively and negatively and (2) to analyze advantages and disadvantages of Chiang Rai - Chiang Khong rail project on Chiang Rai province.

The scope of study covers 2 main areas including (1) the search for different impacts in 3 different train station areas and (2) the search for different impacts between local people who live within 5 kilometers of the area where train station will be constructed and local people who live farther than 5 kilometers from the area where train station will be constructed.

The research has done by employing survey, observation and in-depth interview with local people in Chiang Rai province in order to focus on the districts which are planned to be the location of train station, namely Wiang Chai district, Chiang Khong district and Pa Daet district. These districts can be influenced by the rail project from the beginning such as the impact from the construction, including land expropriation problem, land price increasing, the impact during the construction which may cause traffic jam or block the water flow in agriculture area, and the impact after construction by which the railway may separate villages or communities and cause several other environmental problems. Urban expansion in Chiang Rai may not expand according to the railway or train station because the town has correspondingly been expanded with the highway. However, the railway is mainly to benefit on tourism and hospitality industry, trade and investment, logistic and supply chain, domestically and internationally. Chiang Rai demands the different way of development which is suitable for basic infrastructure after having the railway in the province.

Field of Study:	International Development Studies	Student's Signature
Academic Year:	2018
		Advisor's Signature
	

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my Asst. Prof. Dr. Pitch Pongsawat for the continuous advice of my research and guiding me to the right way without forces. Besides my advisor, I would like to thank the rest of my thesis committee; Assoc. Prof. Dr. Jittichai Rudjanakanoknad and Dr. Nuttakorn Vititanon, not only for their useful comments and encouragement, but also for the hard question which allows me to widen my research in various perspectives.

In addition, there are many coordinators supporting this research for whom I really appreciated and would like to thank; MAIDs coordinators team, teachers from Mae Fah Luang University, Dr. Narat Hasachoo and Dr. Tipavinee Suwanwong, for advising and guiding me throughout the research, and all people in Chiang Rai whom I have collaborated for survey, observation and interview, which is very helpful in achieving the objectives of the research.

Lastly, I would like to thank my family; my parents, my sister, my brother, and all my friends in both Bangkok and Chiang Rai, for supporting me spiritually throughout this thesis and in general life.

Tanthita Sukhopala

TABLE OF CONTENTS

	Page
ABSTRACT (THAI)	iii
ABSTRACT (ENGLISH)	iv
ACKNOWLEDGEMENTS	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER 1	1
1.1 Background	1
1.2 Statement of Problems	2
1.3 Research Purpose	2
1.4 Research Questions	2
1.5 Scope of Study	3
1.5.1 Scope of area	3
1.5.2 Scope of information	3
1.5.3 Scope of Stakeholder of Chiang Rai Railway Project	4
CHAPTER 2	9
2.1 Rail Infrastructure and its Impacts	9
2.2 Urban Expansion	11
2.3 Rail Impacts and Urban Expansion	12
2.4 Chiang Rai Development	14
2.5 The Denchai - Chiang Rai - Chiang Khong Railway Project	15
2.6 Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project .	16
2.7 Summary	16
CHAPTER 3	18
3.1 Research Methodology	18

3.2 Data collecting	18
3.3 Population and Sampling	19
3.4 Scope of Questions	19
3.5 Data Analysis	20
3.6 Expected Outcome	21
3.7 Research Hypothesis	21
3.8 Limitation.....	22
CHAPTER 4	23
4.1 General Information About Chiang Rai.....	23
4.1.1 Chiang Rai Economy.....	23
4.1.2 Society in Chiang Rai	25
4.2 Transportation in Chiang Rai.....	27
4.3 Wiang Chai District	27
4.4 Chiang Khong District	29
4.4.1 General information of Chiang Khong district.....	29
4.4.2 Economic characteristics of Chiang Khong	30
4.4.3 Society in Chiang Khong	31
4.5 Pa Daet District.....	31
4.6 Land Utilization in Chiang Rai	33
4.7 History of Railway in Northern Thailand	33
4.8 History of Den Chai - Chiang Rai - Chiang Khong Rail Project.....	36
4.9 Location of train station in Chiang Rai: focus on research target.....	37
4.9.1 Chiang Rai station in Wiang Chai district.....	37
4.9.2 Chiang Khong station in Chiang Khong district	38
4.9.3 Pa Daet station in Pa Daet district	39
CHAPTER 5	41
5.1 Data Analysis	41
5.1.1 Comparative analysis between each district.....	42

5.1.2 Comparative analysis between local people who lives in different distances	51
5.2 Summary of local people’s expectation and concerns.....	53
5.2.1 The expectation of local people towards Chiang Rai - Chiang Khong Railway Project	53
5.2.2 The concerns of local people towards Chiang Rai - Chiang Khong Railway Project	54
5.3 SWOT analysis of the community toward Chiang Rai - Chiang Khong Railway Project.....	55
5.4 Social and Economic Impacts Analysis.....	57
5.4.1 Social impact	57
5.4.2 Economic impact.....	57
5.5 The analysis of the Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project report.....	58
CHAPTER 6	62
6.1 Urban Expansion and Land in Chiang Rai	62
6.2 Rail Impacts and Urban Expansion in Chiang Rai	63
6.3 Advantage and Disadvantage of rail project on Chiang Rai.....	63
6.4 The trend of transportation development in Chiang Rai.....	65
6.5 Overall recommendation.....	66
6.6 The suggestions for the feasibility study report.....	67
6.7 The community development concept from the study.....	68
REFERENCES	70
VITA.....	72

LIST OF TABLES

	Page
Table 1. Population and future train station in Chiang Rai Province	3
Table 2. SWOT of the community toward the railway project.....	20
Table 3. Hypothesis of social and economic impacts in Chiang Rai	21
Table 4. the household income and expense per month, the rank of Chiang Rai	23
Table 5. Gross Provincial Production at Current Market Prices by Economic Activities: 2014-2016	25
Table 6. Population Record, Percentage Change, Density and Area by District	26
Table 7. Land Utilization in Chiang Rai	33
Table 8. Sector that Chiang Rai needed to be improve compare between each district	42
Table 9. Factor that makes development on Chiang Rai from each district	44
Table 10. Land and land use in Chiang Rai	45
Table 11. The benefit of railway project by local people's view compare between districts	47
Table 12. The concern of local people in railway project comparison in each district	49
Table 13. The comparison in benefit of railway project among local people who lives in different distance's view	51
Table 14. The concern of local people on railway project compare between different distant.....	52
Table 15. SWOT analysis of the community toward Chiang Rai - Chiang Khong Railway Project	55
Table 16. Estimate the percentage of gross domestic product growth rate (year 2018-2037)	59
Table 17. Estimate the value of gross domestic product in 2017-2037 (million).....	59

LIST OF FIGURES

	Page
Figure 1. Map of Chiang Rai	5
Figure 2. Thailand Rail Map.....	6
Figure 3. Map of Den Chai – Chiang Rai – Chiang Khong Railway	7
Figure 4. Map of Train Station and Railway in Chiang Rai	8
Figure 5. Map of Wiang Chai District	28
Figure 6. Map of Chiang Khong District.....	30
Figure 7. Map of Pa Daet District.....	32
Figure 8. Map of Northern Railway of Thailand	35
Figure 9. Point of Chiang Rai Station in Wiang Chai district	37
Figure 10. Point of Chiang Khong Station in Chiang Khong district.....	38
Figure 11. Point of Pa Daet station in Pa Daet district	39

CHAPTER 1 INTRODUCTION

1.1 Background

On 26 March 1896, Thailand launched its first railway routing between Bangkok and Ayutthaya, there were 4 rounds a day with nine stations as transits. After the trains had firstly been operated and used as one of public transportations in Thailand, the railway was expanded from Ayutthaya to Nakhon Ratchasima in 1900 with the 265 kilometers length railway from Bangkok to Nakhon Ratchasima. Its main purposes were to expand the urban area and to create jobs for Thai population which could support the country's economic growth. There were different railway lengths which were operated later such as 932 kilometers in King Rama V, Chulalongkorn period, 2,581 kilometers in King Rama VI Vajiravudh period, 418 kilometers in King Rama VII, Prajadhipok period, and 259 kilometers in King Rama VIII, Ananda Mahidol period.

Recently, State Railway of Thailand owns three main railway lines; Northern railway from Bangkok to Chiang Mai with the approximated length of 752 kilometers, Southern - Eastern railway from Thonburi, Bangkok, to Su-ngai Kolok, Narathiwat, with the approximated length of 1,144 kilometers, and Northeastern railway from Bangkok to Ubon Ratchathani with the approximated length of 575 kilometers (State Railway of Thailand, 2017)

The Chiang Rai - Chiang Khong railway project had been paid an attention by the government since 1964, after the committee had agreed in the cabinet meeting on finding the possibility of railway construction, however, there was no positive sign shown, thus the project has continually been postponed until now.

On 31 July 2018, the cabinet committee has agreed to kick off the construction of Den Chi - Chiang Rai - Chiang Khong Railway project, with 26 stations in four main provinces, namely Phrae, Lampang, Phayao, and Chiang Rai, by providing 72,927-million-baht capital for construction, 1,764 million baht for assistance and 10,660 million baht for expropriation that would be 85,345 million bath in total. Logistic and transportation are the main purposes of the

railway project to be of benefit to tourism, trading and investment across border and to support Chiang Khong as one of special economic zone in Chiang Rai province.

In Chiang Rai - Chiang Khong railway project, the sector supposes to have 11 stations throughout the route, namely Pa Daet station - PaNgae station - Ban Pongkluea station - Ban San Phak Hi station - Chiang Rai station - Thung Ko Station - Wiang Chiang Rung station - Ban Pa Sang station - Ban Kieng station - Sri Don Chai station and the last station of the railway is Chiang Khong station which would connect the special economic zone (SEZ) in Chiang Khong to central area of Chiang Rai. The construction of this project is expected to be done in 2025.

1.2 Statement of Problems

According to Den Chai - Chiang Rai - Chiang Khong railway project construction plan, in Chiang Rai - Chiang Khong section, the government has to expropriate the land in order to construct its railway and 11 train stations in Chiang Rai for providing urban area accessibility, reaching better goods and services, providing local people more opportunity in aspects of education, healthcare and occupation in each area. However, it can cause both advantageous and disadvantageous impacts from transportation change by which people and community can directly be affected in part of social and economic change.

1.3 Research Purpose

1.3.1 To study the impact of having railway for urban development.

- To study the impact on social influence from railway project.

- To study the impact on economic influence from railway project.

1.3.2 To analyze advantages and disadvantages of railway project in Chiang Rai.

1.4 Research Questions

1.4.1 What is the stakeholder impact of railway project in Chiang Rai?

1.4.2 What is advantage or disadvantage of railway project in Chiang Rai?

1.5 Scope of Study

1.5.1 Scope of area

According to the number of population and the number of future train stations in Chiang Rai province as shown in table 1-1, this research will examine three stations in which each area is vary in population and conditions and can be divided into three types as follows;

- Chiang Rai Station as a station in city area
- Pa Daet Station as a station in outer area
- Chiang Khong Station as a station in border area

To compare the different impact in each type of area.

District	Population (2017)	Train station	Station type	Remarks
Wiang Chai	45,514	(1) Chiang Rai Station	Main Train Station	✓
Mueang	244,311	(2) Ban Pongkluea Station (3) Ban San Phak Hi Station	Railway stop Railway stop	
Thoeng	85,178	(4) Ban Kieng station	Railway stop	
Chiang Khong	64,210	(5) Chiang Khong station (6) Sri Don Chai station	Train Station Railway stop	✓
Wiang Chiang Rung	27,820	(7) Wiang Chiang Rung station (8) Ban Pa Sang station (9) Thung Ko Station	Train Station Train Station Railway stop	
Pa Daet	26,244	(10) Pa Daet Station (11) Pa Ngae Station	Train Station Railway stop	✓

Table 1. Population and future train station in Chiang Rai Province

(source: Chiang Rai Provincial Statistical Report: 2018)

1.5.2 Scope of information

- Social activity changes influenced by Chiang Rai - Chiang Khong railway project. People's avocation would be changed by a cause of upcoming rail infrastructure in the relation to urban expansion; from central area to peripheral area which would increase accessibility to basic needs and

social infrastructure such as education, healthcare services and career opportunity.

- Economic activity changes influenced by Chiang Rai - Chiang Khong railway project. This aspect of research mainly focuses on the changes in trading, investment and tourism which are caused by logistic and railway line.

1.5.3 Scope of Stakeholder of Chiang Rai Railway Project

The main stakeholders of Chiang Rai - Chiang Khong Railway Project belong to government division, private sector and civil society who have different perspectives, so it is mandatory to ensure that all stakeholders are on the same page. Reports and memorandums will be created as the evidence assuring that every single party can reach the common understanding and agreement on the same conditions. However, without the governmental announcement and public hearing, there is barely a chance for the local community, as well as local governors and householders, to acknowledge those surveys and reports.



Figure 1. Map of Chiang Rai

(source: Chiang Rai Travel Service, 2016)



Figure 2. Thailand Rail Map
(source: State Railway of Thailand, 2017)



Figure 3. Map of Den Chai – Chiang Rai – Chiang Khong Railway
(source: Ministry of Transport, 2018)

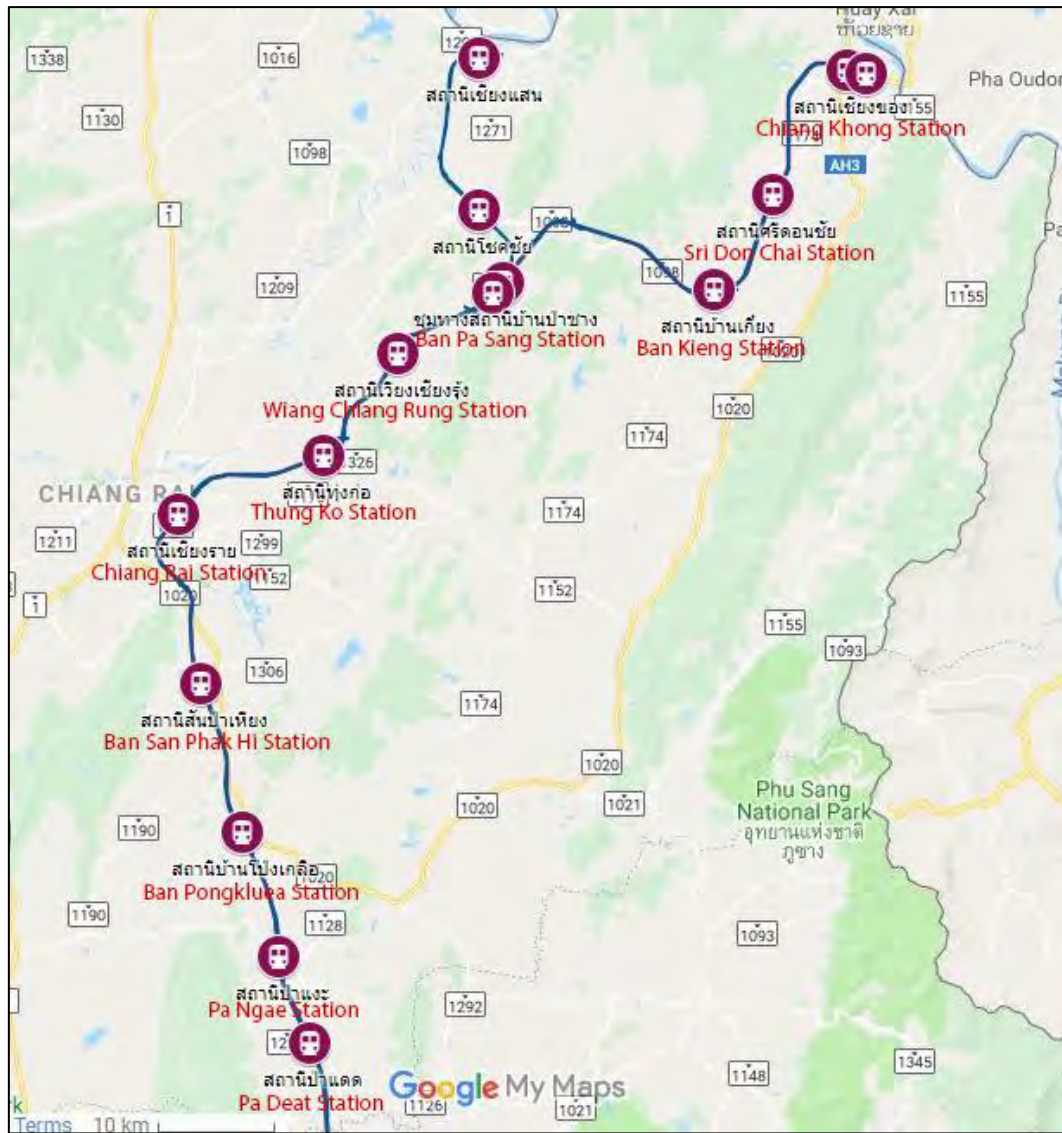


Figure 4. Map of Train Station and Railway in Chiang Rai

(source: Phayao TV, 2018)

CHAPTER 2

LITERATURE REVIEW

2.1 Rail Infrastructure and its Impacts

2.1.1 Dena Kasraian, Kees Maat and Bert van Wee (2016) have researched the railway network development and its impact on built-up area in Randstad, Netherland, which can be divided into two main effects;

- Effects of railway network to the development of built-up area: The increased number of build-up areas within 5 kilometers is higher than the number of overall built-up area growths. It is obvious that the development has started from the railway stations areas outwardly.
- Effects between built-up areas and the opening of railway station: according to the analysis, there is no impact between built-up areas and railway station by adopting comparative method for each period. There is insignificant number shown that the new station has been changed by the influence of built-up area. Even though the urban area might be expanded around, the new station is more likely to be opened in undeveloped area.

The growth of railway network would affect the expansion of built-up areas which is considered as a standard pattern of urban expansion while, the beginning and the development stages around rail station areas would affect other transportations.

2.1.2 Sathita Malaitham (2013) studied about urban rail transit development effects in Bangkok metropolitan region and found that a land development is a result from transportation development because when the urban rail transit (BTS Skytrain and MRT) has been operated, it creates an impact on the land usage in the nearest area and leads land value to be increased after a particular development. According to the research, there are three main topics to be focused as follows;

- Urban rail transit development causing land usage behavior to change: there are three types of land usages along the urban rail transit (BTS Skytrain, MRT Blue line, Airport Rail Link and MRT Purple Line), namely (1) for residential usage (2) high-rise residential usage and (3) non-

residential usage. One of the effects of urban rail transit on land usage is the land conversion surrounding in the rail lines, such as housing, condominium and shopping center because the distance between peripheral area and metropolitan area has been shorten.

- The influence of urban rail transit development on land price: the land price can be influenced by various factors such as distance to shopping center, accessibility to local transportation and industrial estate, moreover, the comparison of land price in parcels with a similar type shows that the location near rail transit station is more expensive than those in farther distance.
- The effect of urban rail transit improvement associated with residential location decision: Householders mostly prefer to live near the BTS Skytrain and MRT Blue line for they can easily access the urban rail transit. Obviously, the revenue of each household may reflect their living quality in the way they have afforded the residential location.

This research studies on the land usage that has been changed due to urban rail transit development in 5 kilometers scope and categorizes various factors into four categories; underdeveloped land, residential land, high-rise residential land, and non-residential land. The urban rail transit development has changed and influenced the land usage, land value and residential location choice resulting as effects on society and economy in the sense of transportation accessibility, such as increasing educational opportunity, medical services or better career path. Hence, the urban rail transit development expanded to neighbor province of Bangkok, Nonthaburi, causes the urban to expand from the city to perimeter area accordingly.

2.1.3 Pok Keokan (1991) researched the rail construction in southern part of Thailand which is expected to be the main center of politic and economy in southern Thailand. There are two impacts of rail construction, firstly, an impact on economy resulting as an expansion of mining area, reduction of boat and car usage, community expansion, job creation, behavioral changing, decreasing natural resource

consumption, and stronger economic dependency. Secondly, there is an impact on political relation with central part of Thailand as they can easily be connected to each other, it may reduce local government power and lower local community capacity in southern part causing more political supportive demands from the central part during the particular period.

2.2 Urban Expansion

Roberto Camagni, Maria Cristina Gibelli and Paolo Rigamonti (2000) studied the urban mobility and the urban template in Milan. They used five types of urban expansion to analyze the social and environmental costs in different patterns of urban expansion, then categorize the results into:

- Infilling is the new development or buildings which are rebuilt in previous used area or wasted area, such as old industrial sites or commercial areas, which is similar to the renovation or redevelopment of that area.
- Extension is the expansion depending on the development of land usage, especially on new infrastructures such as a new street which would create the connection between communities, districts, provinces, or countries.
- Liner development is mostly similar to extension but it rather depends on more potential factors or more advantageous such as an economic corridor; highway, railway, and etc.
- Sprawl is the standard characteristic of development or expansion of urban such as suburban that takes an advantage from urban area for its improvement which could mean that the suburban development is influenced by the urban.
- Large-scale projects are related to the way of using massive amount of land and resources such as an airport which demands a lot of changes from current condition.

The result of study provides the significant impacts on mobility, both direct and indirect effects, which affect population's behavior towards public transportation

and it seems likely that the public transportation has a strong influence on the efficiency and competitiveness that could impact to the expansion of urban area causing the relationship between number of new resident, new residential development and transportation to be changed in each area.

2.3 Rail Impacts and Urban Expansion

2.3.1 Magnus Andersson (2016) studied the urban expansion and public transportation, and implications of inclusive development by using Southern part of Sweden as an example and found that Skåne is different from other metropolitan areas such as Stockholm and Gothenburg which have more major cities and more potential in development. The County Administrative Board of Skåne identified five important factors to achieve sustainable transportation in the county as follows;

- The number of passengers in public transportation have been increasing.
- The structure between each building must be connected and to be able to facilitate passengers and visitors to reduce the number of cars used.
- There are various comfortable choices from a journey which make people to easily access the public transportation rather than drive their personal car.
- Investment in public transportation would increase quality of journey (traveling).
- It is important to control the balance of exploitation in transportation. Otherwise, it would have high degree of exploitation in the train station area in Skåne.

2.3.2 Kirk Kittikul (2002) researched the economic tendency in Chiang Rai which would be changed for trading and the services activities for tourists and local users at each train station located between Chiang Rai to Chiang Khong, also the activities of warehouse in the same area. Land users at the train station area would gain commercial benefits, such as warehouse of consuming products, agricultural products, cement and fuel. Moreover, the connection between each area would be more convenient for people who are seeking for career opportunity without moving to the urban area. Then the

sanitary facilities around the train station and warehouse area would be developed in order to facilitate and to prepare for migration.

The gap in this research is the difference between each area in Chiang Rain namely city area, rural or countryside area and border area which would have shown the different result in land usage and the different way of urban expansion.

2.3.3 Madalina Dociu and Anca Dunarintu (2012) explained the urbanization from global trending as a global phenomenon which has an impact on population from urban to rural area in the global scale of expansion. The statistics has shown that within 2030 60% of global population would be living in urban area, while it was 30% in 1930. Recently, there are 3.3 billion people live in urban areas and there are 180,000 people moving in urban area daily. According to the migration of population, there is the relation between the number of urban population and its processable impact in global level, which has been caused by two main effects; social and economic.

Firstly, the effect on society, is mainly caused by the increasing proportion of population and its movement that directly affects people and community, such as the number of people who can get into labor market, families, which are influenced by the change of urban society, domestic relations, fertility rate in rural and urban area, health problem and pollution, educational opportunity, and poverty problem.

Secondly, there is also an economic impact in both positive and negative aspect, such as diversification of commercial activities, minimizing the gap among business people, raising of technology and innovation, increasing infrastructure development, and possible accession to the facilities and resources of goods and services production.

The researchers' recommended a solution for minimizing risk and strengthen the benefit by the orientation of green cities, focusing on sustainable development which is mainly related to land usage and environment, and new opportunity provision in rural area in order to minimize number of migrations in urban area.

2.4 Chiang Rai Development

2.4.1 Preepong (1993) studied urban system for Chiang Rai development on purpose to find the potential spot of urban development in a province that should create a link between communities' duty and the development of urban system together. The research has explored three main parts, namely general information and the history of Chiang Rai province, the capacity of communities, and the development plan and policy in Chiang Rai. The result has pointed out four potential districts which are Chiang Rai district, Mae Chan district, Mae Sai district, and Phan district. According to their availability of basic infrastructure, these four particular districts could urbanize neighbor districts which would especially be benefited from logistic, supply chain and tourism.

Moreover, population capacity in local community can be influenced by urban development. The statistic shows that the most potential community must be located in the district that have enough urban development. Otherwise, the community may not increase its capacity because its population quality may not be good enough to reach opportunities in various aspects such as commercial, logistic and supply chain, etc.

2.4.2 Panisara Daoruang (2002) studied the border development guideline, the case study in Chiang Saen and she found that it is important to Chiang Rai province as a special economic zone (SEZ), The town was supported by government in trading, investment, and tourism which could increase the economic growth in town. As a SEZ, Chiang Saen plays an important part in balancing new infrastructure construction and reserving cultural heritage, which are the main parts of trading and tourism development.

The result of this study analyzed by SWOT analysis methodology has shown that Chiang Saen needs a stable development plan; supportive cooperation throughout region and neighbor countries along with government supports to strengthen special economic zone activity. There are short-term and long-term development plans that suggest Chiang Saen to be developed in various sectors such as infrastructure, city plan and land usage, social and economic, tourism, and border trade. In addition, Chiang Saen is one of potential towns in Chiang Rai province which can be grown in

multiple aspects. It contains enough potential to operate economic activity that would benefit the development of society, community and neighbor countries.

2.4.3 Titiporn Khamkaen (2007) researched the role of local administrative organization for promoting people's participation in livable city development. In the case study, Chiang Rai municipality, it has been found that the local government encouraged local people in communities to participate in identifying causes of problems and finding solutions together which led to a wide range of cooperation between local government and local people.

Even though 76% of population in the community participated in the activity, government section had difficulty with motivating people to keep developing their community and social interaction. However, the project which encouraged local people to join the development activity had finally achieved its objective since it had developed a good relationship and effective cooperation among local government, local people and communities, moreover, it motivated people in finding problem solution in their community or neighbor area. The situation would be benefit to Chiang Rai society.

2.5 The Denchai - Chiang Rai - Chiang Khong Railway Project

Warawut Ruankham and Chatrudee Jongsureyapart (2017) analyzed the positive externality from the dual gauge railway, Denchai - Chiang Rai - Chiang Khong line, in Chiang Rai province perspective and found that government and private sector had agreed on railway construction project as they expect Chiang Rai's to become beneficial economic activity, especially border trade, investment, tourism and local job creation. This research adopted qualitative analysis and descriptive analysis to analyze documentary data and in-depth interview the representatives from government and private sector, totally 7 interviewees, in October 2017.

From the study, the train will mainly create economic benefit for the province and its border and the interviewees totally agreed that the train will facilitate the regional economy, tourism and transportation. While 83 percent of them agreed that train will benefit the border trade, and more than 60 percent agreed that the train will support direct investment and local employment.

2.6 Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project

The feasibility study of Denchai – Chiang Rai – Chiang Khong Railway project have been studied pertaining to the feasibility of Chiang Rai in various sectors such as related policies and strategies, cooperation in each sector around the particular area, the regional development project, construction plan, the survey of logistic and transportation, the estimation of users and stakeholders, and operational plan. However, the report mentioned that there is a study in estimation of social and economic impacts and changes as follows;

- Social impact: the report recorded that the population in northern Thailand is increasing every year between 2006 – 2009, therefore, it would create a change in regional urban expansion. There is an estimation of populational growth in 2012 - 2037 as 0.14 - 0.29 per year which will also cause the increase of employment and revenue per person and household.
- Economic impact: according to economic growth between 2006 – 2009, the report estimated regional economic changes; if the number of industries, income per household, tourism and border trading had been increasing stably, the overall economy in the north of Thailand would have grown up with the estimated GDP at 3.5 - 5.8% per year.

However, the feasibility had been summarized that railway routing construction would be available in some parts of the area that was impacted by urban expansion. The project was also considered to be able to increase the possibility to connect the border between Chiang Khong and Laos and may be able to connect the south of China as well, according to the future plan.

2.7 Summary

This research mainly focuses on social and economic impacts on people who live near the future train station for the research studies about beneficial outcome from urban development in Chiang Rai train project. Collections of data from the government and private sector is available, but local resident's opinion was not recorded, even

though they may be the first group who absorb all the effects from the construction the railway.

In addition, it is important to take the different impacts in each area in consideration; city, rural and border, which may not provide the same result. Thus, this research will study not only about the community of people who live near the station, but also the differences in distance between household and future station since these differences may provide different results.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Research Methodology

The quantitative and qualitative methods are employed in this research in order to collect and analyze the answers from research questionnaires. The methodology process is identified as follows;

- I. To study the general information of Chiang Rai by focusing on social and economic activity
- II. To survey and observe the focused area and to collect information pertaining to land usage and community activity which can affect the economy
- III. To analyze the information in order to find social and economic impacts caused by the transportation development
- IV. To evaluate Chiang Rai development trend
- V. To summarize

3.2 Data collecting

The data will be collected by primary and secondary methodologies. Sources of data collecting are as follows;

3.2.1 Documentary: this research is studied from the credential sources, such as internet article, research, report or newspaper.

3.2.2 In-dept Interview: this research is operated in the research locations in Chiang Rai in order to interview two types of communities in each research's target station, namely Chiang Rai station, Pa Daet station and Chiang Khong station, as follows;

- the community located near the train station or within 5 kilometers
- the community located farther than 5 kilometers from the station

3.2.3 Survey and observation: survey and observation will be operated the exploration in Mueang Chiang Rai district, Wiang Chai district, Chiang Khong district and Pa Daet district as they are research locations.

3.3 Population and Sampling

Random sampling method to interview and questionnaire are adopted in the research in order to focus on three districts from the scope of research locations; Wiang Chai district, Pa Daet district and Chiang Khong district.

Questionnaire will be targeted on local people in each focused district, which can be divided into 2 types as follows;

- local people who live close to future train station or near the railway or within 5 kilometers.
- local people who live more than 5 kilometers away from the railway line.

This research focuses on these above targets due to the potential benefit that could be gained by comparing the different issues in each district and finding the potential benefit and the risk for stakeholder in each area.

3.4 Scope of Questions

The questionnaire will be divided into two main points in order to achieve the research objectives.

- **General information about the development in Chiang Rai**
 - What does Chiang Rai require in order to be developed?
(e.g. trade and investment, government policy, tourism, border to neighbor countries, etc.)
 - What are the factors that lead the development to Chiang Rai?
(e.g. tourism, support from government, basic infrastructure, etc.)
 - What are the land usages in Chiang Rai?
(e.g. public facilities, industrial area, overpopulation, land and road, etc.)
- **Stakeholder of rail infrastructure**
 - What are the benefits and risks of railway?
(e.g. trade and investment, logistic and supply chain, tourism, job creation, access to education and healthcare services, etc.)
 - What might be the future problems that should be concerned?
(e.g. migrant worker, drugs problem, waste, cost of living, etc.)

All questionnaire questions are open-ended which could encourage interviewees to arbitrarily participate and there is no deep question so that the participants can be able to answer.

3.5 Data Analysis

Comparative analysis will be used in this research in order to compare the different factors and opinions of local people who live in various distances from the train station or railway in three districts; Wiang Chai, Chiang Khong and Pa Daet.

In addition, SWOT analysis will be used to analyze and categorize the impacts toward social and economic . SWOT analysis can clearly identify advantages and disadvantages of various objects in various aspects such as internal and external factors and direct and indirect factors among groups.

S = Strength	the advantage for residents in Chiang Rai
W = Weakness	the area that needs improvement
O = Opportunity	the opportunity for local people
T = Threat	the area that may has been risked

The strength, weakness, opportunity and threat of the community toward the railway project in Chiang Rai following the structure shown in table 3.1

Strength	<ol style="list-style-type: none"> 1. connection of the transportation and border area 2. support domestic and international trade
Weakness	<ol style="list-style-type: none"> 1. land price problems and impact from land expropriation 2. the separation of village and agriculture area 3. impact from noise and rail vibration
Opportunity	<ol style="list-style-type: none"> 1. support tourism and promote local culture 2. development policy from the government
Threat	<ol style="list-style-type: none"> 1. crime and illegal trade 2. overpopulation in the community 2. health problems (from outbreak)

Table 2. SWOT of the community toward the railway project

3.6 Expected Outcome

To be able to identify social and economic impacts and positive and negative aspects of railway station in Mueang district, Chiang Rai.

3.7 Research Hypothesis

Recently, there are only two types of transportation in Chiang Rai province which are land and air. By the limitation of public transportation, local people have to own private car or personal motorbike causing traffic congestion and pollution, especially in central city area. An alternative transportation such a train could make a difference and a change in people's behavior from using personal car to public transportation which could also connect the city area - outer area - border area. The hypothesis of this research is to examine the positive and negative impacts of railway station in Chiang Rai, by employing SWOT analysis to categorize the information and its impact on social and economic as follows in table 3.2.

	Positive Impacts	Negative Impacts
Social	- accessibility to basic goods and services e.g. school, hospital, etc.	- pollution and waste along railway line - poor environment and noise
Economic	- supporting trade and investment - hotel owner have more opportunity - rise of tourism	- increasing of land price - land usage change - population proportion rate

Table 3. Hypothesis of social and economic impacts in Chiang Rai

The impacts on social and economic are influenced by railway project, which could be negative and positive impacts, and the local government should be aware of these impacts and provide the supportive development plan and policy for each impact, for example, migrant worker should have limited working possibility in order to reserve a career opportunity for local people, local people should be supported to reduce personal car usage, to develop waste management and to be familiar with the drainage system along the railway line. The trend of the development is influenced by railway

project in Chiang Rai, which may increase province capacity in various sections including opportunity for people to find jobs, to access to education and healthcare services, to connect and to cooperate between each area.

3.8 Limitation

The limitation of this research is that the land expropriation process from railway project at the moment has been causing unclear information from data collection as it requires people's opinion and the estimation of impacts from the railway infrastructure. In addition, if there is any unavailable information or names of the interviewees, theirs will be removed from the research and there would be only their general position remained in order to assure that the research has collected the data from the reliable sources. Pertaining to the documentary data sources, data will be collected from the public press or international organization to ensure that the collected statistic is neutral and allowed to be released or published.

CHAPTER 4

BACKGROUND OF CHIANG RAI

4.1 General Information About Chiang Rai

Chiang Rai is an old town located in northern part of Thailand, with approximated 805 kilometers from Bangkok metropolitan. The north of its border is connected to Myanmar and the east to Laos, and it has been known as “Golden triangle”. Chiang Rai territory is adjacent to Phayao, Lampang, and Chiang Mai province and there is Mekong river as a trans-boundary river. The total territory of Chiang Rai is approximately 11,524.904 square kilometers and approximated altitude 416 meters above sea level.

Chiang Rai was founded by King Meng Rai in B.E. 1262 and was the first capital of the Lanna Thai Kingdom and once was conquered by Myanmar (was Burma at that time). In B.E.1786, Chiang Rai became Thai territory and was proclaimed as a province in B.E.1910, during the reign of King Rama VI.

4.1.1 Chiang Rai Economy

Chiang Rai is ranked the 47th on country Gross Provincial Product ranking from 77 provinces and the 9th on regional ranking from 17 provinces in northern region, with the total of 9,827 million-baht GPP, and per capita 86,884 baht. According to the latest national ranking, Chiang Rai population earns revenue as 13,510 baht and has approximately 11,068 baht for the expense per household.

No.	Provinces	Income per household	No.	Provinces	Expenses per household
1	Bangkok	49,191	1	Bangkok	35,024
2	Surat Thani	36,865	2	Phathum Thani	29,514
3	Chachouengsao	34,548	3	Surat Thani	28,119
4	Phathum Thani	33,461	4	Nonthaburi	26,947
5	Trang	33,270	5	Samut Prakarn	26,193
:	:	:	:	:	:
76	Chiang Rai	13,510	76	Chiang Rai	11,068

Table 4. the household income and expense per month, the rank of Chiang Rai

(source: Chiang Rai Provincial Statistical Report: 2018)

Agriculture is the most important sector in Chiang Rai economy, as it is the main occupation that most of the people in communities have been doing for generations. Agricultural productions, especially timber or fishing, have made 31,573 million baht or 31% in Chiang Rai production value, followed by goods retailing which valued at 15,538 million baht while education sector has been marked at 11,198 million baht.

Agriculture plays an important role as the main activity that has been running in Chiang Rai, followed by other sectors such as wholesale and retail, education, public administration, financial insurance and manufacturing.

Economic Activities	2014	2015	2016
Agriculture, forestry and fishing	35,480	32,807	31,573
Wholesale and Retail trade	13,084	14,190	15,538
Education	9,724	10,234	11,198
Financial and Insurance activities	6,452	7,076	7,831
Manufacturing	4,493	4,631	5,311
Public Administration and Defense	3,724	4,504	4,680
Other activities	19,757	21,897	23,696
Gross Provincial Production (GPP)	92,757	95,339	99,827
GPP Per Capita (Baht)	80,103	82,639	86,884
Population (1,000 persons)	1,158	1,154	1,149

Table 5. Gross Provincial Production at Current Market Prices by Economic Activities: 2014-2016
(source: Chiang Rai Provincial Statistical Report: 2018)

In addition, other economic activities also have stable growth such as construction sector, transportation and storage sector, accommodation and food service sector, real estate sector and along with others.

4.1.2 Society in Chiang Rai

There are 18 districts (Amphoe) in the province which are sub-divided into 124 subdistricts (Tambon) and 1510 villages (Muban). The total population in Chiang Rai is 1,287,615 people. While 367,414 people or 28.5% of population lives in municipal area,

another 920,201 people or 71.5% lives outside municipal area. The number of populations in each district, percentage change, density per district are shown in the following table;

District	Population (2017)	Percentage Change (%)	Population density (Per sq.km.)	Area (Sq. km.)
Total	1,287,615	0.04	111.80	11,517.58
1. Mueang Chiang Rai	244,311	1.19	190.21	1,284.41
2. Wiang Chai	<u>45,514</u>	0.06	142.83	318.65
3. Chiang Khong	<u>64,210</u>	0.05	76.72	836.90
4. Thoeng	85,178	-0.16	107.07	795.50
5. Phan	122,644	-0.37	119.89	1,023.00
6. Pa Daet	<u>26,244</u>	-0.33	78.74	333.30
7. Mae Chan	107,882	-0.23	195.79	551.00
8. Chiang Saen	53,664	0.37	96.87	554.00
9. Mae Sai	120,280	1.54	422.04	285.00
10. Mae Suai	84,664	0.39	59.26	1,428.61
11. Wiang Pa Pao	68,930	0.21	56.64	1,217.00
12. Phaya Mengrai	42,434	0.05	68.44	620.00
13. Wiang Kaen	35,388	0.99	67.28	526.00
14. Khun Tan	31,708	-0.38	124.10	255.50
15. Mae Fa Luang	76,458	-0.01	119.20	641.40
16. Mae Lao	31,098	-0.11	94.24	330.00
17. Wiang Chiang Rung	27,820	0.34	134.85	206.31
18. Doi Luang	19,187	0.09	61.69	311.00

Table 6. Population Record, Percentage Change, Density and Area by District

(source: Chiang Rai Provincial Statistical Report: 2018)

4.2 Transportation in Chiang Rai

- **Land:** Land transportation is consisted of roads and highways in Chiang Rai including national highways that connect to neighbor provinces; Chiang Rai - Chiang Mai, Chiang Rai – Phayao and other provincial highways that connect between each district, sub-district or village.
- **Air:** Chiang Rai have two airports, the first is military airport which is located in central of Mueang Chiang Rai district, and the second is commercial airport located in Ban Du sub-district of Meang Chiang Rai district which is also an international airport operating both domestic and international flights to Myanmar, Laos and China.
- **Water:** Water transportation is reserved for commercial, logistic and supply chain purpose, therefore it may not be counted as public transportation. However, water transportation in Chiang Rai was supported by tourism activity in eco-friendly travelling form. Chiang Rai have one water transportation port located in Chiang Saen district which is considered as a special economic zone of the province, routing to Laos and Myanmar which are the borders of golden triangle.

4.3 Wiang Chai District

Wiang Chai district is adjacent to central of Chiang Rai. It shares the northern border with Muang Chiang Rai and Wiang Chiang Rung district, while the east is connected to Phaya Mengrai district, the south is linked to some parts of Phaya Mengrai, Thoeng and Muang Chiang Rai district, and the west is also connected to Mueang Chiang Rai. In 1941, Mueang Chiang Rai district had requested to divided Wiang Chai, Thung Koh and Pha Ngam into sub-districts, then the Ministry of Interior officially announced on 17th June 1950. Later, Wiang Chai sub-district was promoted into a district on 25 March 1971. The geography of Wiang Chai is a lowland that has three rivers, namely Kok, Lao, and Metak flowing through the district.

Tourism in Wiang Chai district is not as famous as Muang Chiang Rai district or others, but it has 4 unseen tourist destinations which are;

- Pha Ngam mountain is a standalone mountain in Pha Ngam subdistrict which is located in the middle of rice plantation.
- Nong Luang is a large canal in Wiang Chai with scattered islands and local myths. Recently, the canal was promoted for tourism by local community.
- Archaeological Site of Kue Na is an ancient Buddhist temple in Wiang Nuea subdistrict.
- Ban Pho Chai Ancient Buddha Statue is a buddha statue which is made of a huge sand rock that cannot be identified the age.



Figure 5. Map of Wiang Chai District
(source: Chiang Rai Focus, 2014)

4.4 Chiang Khong District

4.4.1 General information of Chiang Khong district

Chiang Kong district is located in the northern part of Chiang Rai province, with the total territory of 836.90 square kilometers. In the north, it shares the border with Laos and, in the south, it also is connected to neighbor districts such as Wiang Kean, Khun Tan, Phaya Mengrai and Wiang Chiang Rung. The western part of Chiang Khong is connected to Doi Luang and Chiang Sean and since Chiang Khong has been connected to Laos, there are gateways to enter neighbor country, for example, permanent border crossing bridge is at Huai Sri town and a temporary border crossing pathway is at Wiang subdistrict.

Geography of Chiang Khong is completely abundance because it is a lowland located between mountains which range along the north to the south. It contains a bunch of natural resources including wild forest and national park. Ing river, a tributary of the Mekong river, which is a main river of Chiang Khong district and various sub-rivers such as Duk and Som.



Figure 6. Map of Chiang Khong District

(source: Chiang Rai Focus, 2014)

4.4.2 Economic characteristics of Chiang Khong

The economic characteristic of Chiang Khong is mainly an agriculture, 50% of its population occupied agricultural activities such as rice plantation, farming, gardening, fishing, and some livestock, which could mean that most of the local people in Chiang Khong are relied on lands for agriculture, however, recently, Chiang Khong people have lost their opportunity to own a land due to private investment which causes the land which causes the land price to be unaffordable for local people.

4.4.3 Society in Chiang Khong

The population in Chiang Khong in 2017 is 64,210 people, which can be divided to male and female as 31,744 and 32,466, respectively. The most are living which causes the land price to be unaffordable for local people. There is a diversity in races since Chiang Khong has been accounted for native and tribes such as Thai Lue, Mong, Mang, Yao, Lahoo, Chamu and Haw.

4.5 Pa Daet District

Pa Daet district used to be a subdistrict of Phan before and it used to be a backcountry that located distantly from central Pan district therefore it was very difficult for local people to travel to central Pan without any public transportations. When people had to go to district office in the center, it took them a day to travel to the destination. On 1 June 1945, the governor of Chiang Rai province at that time had requested the Ministry of Interior to develop Pa Daet subdistrict and to support it to build its own subdistrict office.

On 8 August 1951 during the time under the jurisdiction, Pa Daet had increased its population until it was sufficient to get promoted to be a district under Chiang Rai province.

Pa Daet territory is connected to various districts in Chiang Rai and Pha Yao province. The north is connected to Phan, Mueang Chiang Rai and Toeng district, the east is connected to Toeng and Jun district, which belongs to Pha yao, the south is connected to Jun, Dok khamtai, Phu kamyao and Maejai district, which belongs to Pha yao while the west is connected to Phan.

There is some tourist destinations and archaeological sites in Pa Daet district as follows;

- Wat Phra That Chom Khiri, an ancient temple with buddha statue that made of sand stone age, estimated 1,800 years old
- Wat Phrathat Mon Phrachao Lai, another archaeological site in Pha Daet which local people usually organize religious ceremony in this temple

- Wat Tham Praphirom, a local temple located in the mountain which has beautiful caves inside
- Wat Tham Phajarui, another local temple located in the middle of the mountain, which has beautiful caves and buddha statue inside



Figure 7. Map of Pa Daet District
(source: Chiang Rai Focus, 2014)

4.6 Land Utilization in Chiang Rai

Chiang Rai province is full of natural resources from wild forests and rivers; thus, agriculture is important to Chiang Rai. The land is mainly utilized to make rice plantation or paddy land with the area usage of 1,381,701 rai from 7,298,981 rai in total.

Land Utilization	2014 (rai)	2015 (rai)	2016 (rai)
Total land	7,298,981	7,298,981	7,298,981
Total agricultural land use	3,015,417	3,015,221	3,018,980
- Paddy land	1,381,542,	1,382,469	1,381,701
- Upland field crop	615,110	614,749	616,679
- Orchard and perennial crop	736,416	735,687	738,272
- Vegetable and ornamental plant	60,268	60,162	60,224
- Miscellaneous land	222,080	222,153	111,103
Non-agricultural land use	1,282,839	1,319,894	1,356,975
Forest land	3,000,726	2,963,867	2,923,026

Table 7. Land Utilization in Chiang Rai

(source: Chiang Rai Provincial Statistical Report: 2018)

According to the land utilization in table 4-4, the scale of land usage in agriculture is increasing in every sub-part of overall agricultural land usage. It is also the cause of the decrease of wild forest areas.

4.7 History of Railway in Northern Thailand

Thailand's Northern Railways were established in order to prevent western invaders such as England and France those who had intended to take over the political control power in Thailand. Thailand had therefore expected the northern railway to be of benefit mainly to military transportation and to keep the center and the northern Thailand connected to each other.

Before the construction the northern railway, Hermann Gehrts, a German citizen, the second Director-General of the Royal Railway of Siam, had surveyed the geography of northern Thailand and had recommended the railway construction from Lopburi to Nakhon Sawan, which passed through Uttaradit, Lampang and Chiang Mai with approximated construction budget of 35.8 million baht in 1904. However, when

Hermann Gehrts resigned from Thai government, Luis Weiler, a German engineer, had become the next Director-General of the Royal Railway of Siam, and started the construction of northern line according to Germany's plan with an approximated width of the railway, 1.345 meters.

During the construction period, in 1914, there is a war between great nations which caused the first world war, Thailand decided to be an alliance, yet opposite side to Germany. Then King Rama VI had given an order to combine northern railway project with southern railway project and assigned His Royal Highness Prince Purachatra Jayakara, Prince of Kamphaengphet, as a Director General of the Royal Railway of Siam while Luis Weiler was promoted to be head of division in the same organization.

There was a problem in different width between eastern and northern line railway. The eastern line was 1.345 meters width, but the southern was only 1-meter width. Therefore, H.R.H. Prince Purachatra Jayakara had been determined to set the standard width of the railway as 1 meter.

For 25 years of construction, Thailand had finished its northern railway in 1926, started from Lopburi and ended in Chiang Mai with the length of 661 kilometers and the total budget was 46.8 million baht. If the Bangkok railway line were included, the total length of northern railway would be 751 kilometers.



Figure 8. Map of Northern Railway of Thailand

(source: State Railway of Thailand)

4.8 History of Den Chai - Chiang Rai - Chiang Khong Rail Project

The Den Chai - Chiang Rai - Chiang Khong Railway Project first started in 1936, and became a case study in various literature reviews on the railway project that had two potential routes surveyed, namely (1) the study and survey in 1945 on Den Chai - Phrae - Song - Chiang Muan - Dok Khamtai - Phayao - Pha Daet - Chiang Rai route, with a total of 273 kilometers, (2) the study and survey in 1970 – 1971 on Den Chai - Phrae - Song - Ngao - Phayao - Chiang Rai route. According to the surveys, it had been summarized that the second route had more potential than the other route.

in 1972 – 74, The State Railway of Thailand surveyed single track railway in details and also researched the environmental impact of the railway line which would be 246 kilometers in length. In 1980, the survey and study on construction of the Den Chai - Chiang Rai railway project was repeated and found the possibility to connect to southern China. This possibility of the connection was still be the subject in government attention.

On 17th November 1985, the cabinet had agreed on the railway infrastructure development plan, then on 27 April 1986 the cabinet agreed to invest in railway network improvement in which Den Chai - Chiang Rai - Chiang Khong railway project was included. The State Railway of Thailand received the budget in order to study and design the construction plan for double track railway in Den Chai - Chiang Rai - Chiang Khong route with a total length of 326 kilometers in 14 months. Moreover, the budget also covered the study on economic and engineering suitability and environmental impact according to the construction informative report in construction cost evaluation.

The main objective of Den Chai - Chiang Rai - Chiang Khong railway project is to connect the transportation network both domestically and internationally, especially with neighbor countries under Greater Mekong sub-regional and China which would be of benefit to the development and expansion of urbanization from the center to the North by focusing on Phrae, Lampang, Phayao, and Chiang Rai.

4.9 Location of train station in Chiang Rai: focus on research target

The government has planned to eventually build 26 stations in Den Chai - Chiang Rai - Chiang Khong railway project which can be divided into four main stations; Den Chai station, Phrae station, Phayao station and Chiang Rai station, and nine substations and thirteen railway stops. Therefore, it would totally be 11 stations in Chiang Rai province and Chiang Rai station is a main station along with other four substations and six train stops.

4.9.1 Chiang Rai station in Wiang Chai district

Since the land in Mueang Chiang Rai has been overcrowded and there has been no available land or suitable enough to build a train station, the neighbor district, which is located next to the Mueang Chiang Rai and contains suitable roads and highways connecting to center of Chiang Rai like Wiang Chai, was chosen to be a location for the main station instead.

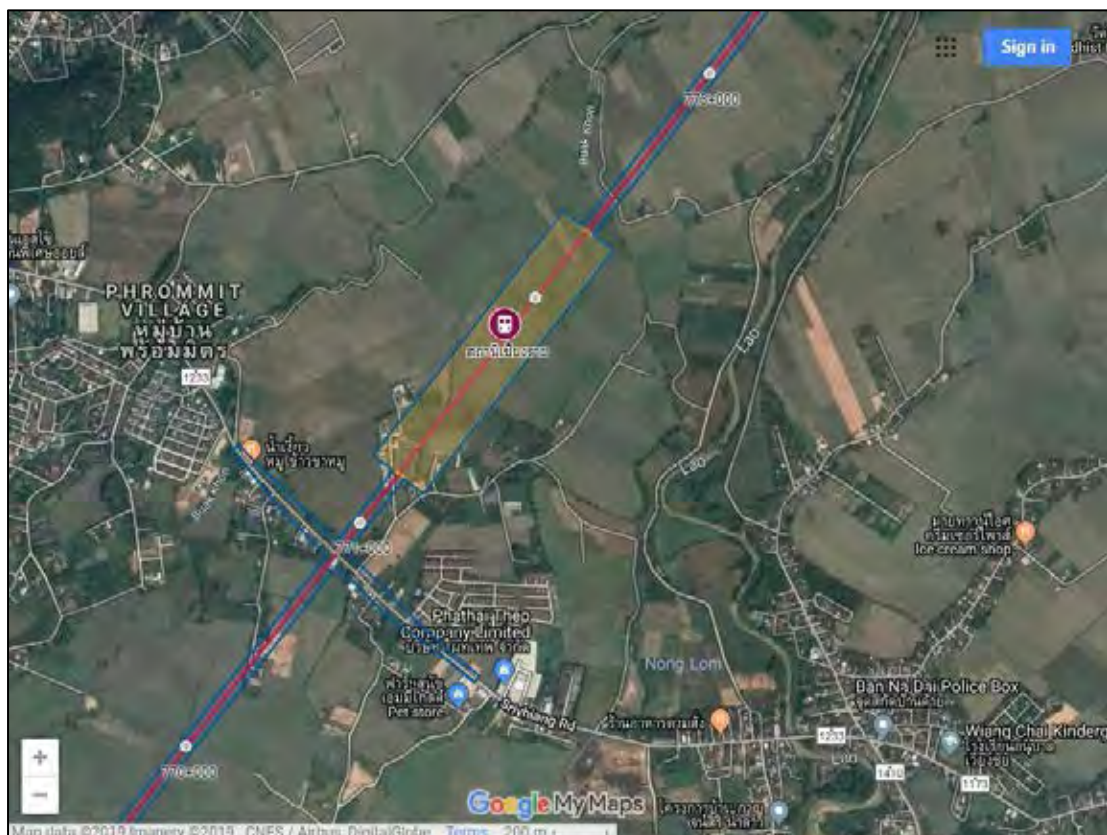


Figure 9. Point of Chiang Rai Station in Wiang Chai district

(source: Phayao TV, 2018)

According to Figure 4-5 point of Chiang Rai station, the station is located in Wiang Chai district which is approximately 5 kilometers away from the center of Chiang Rai. However, according to the survey and observation, there are many local shops, restaurants and market surrounding the community area, if the main station of the province were constructed here, it would possibly cause the traffic congestion as they have only one main road, Srivhiang, which is connected to Phahonyothin highway.

4.9.2 Chiang Khong station in Chiang Khong district

The Chiang Khong station has been pointed in Wiang subdistrict in Chiang Khong, not only is it close to the main road of Chiang Khong, but it is also located between the old town and the new town of the district. The State Railway of Thailand has purposed Chiang Khong to have its own depot in order to support logistic and supply chain which would be located next to the border area, it shares with Laos.

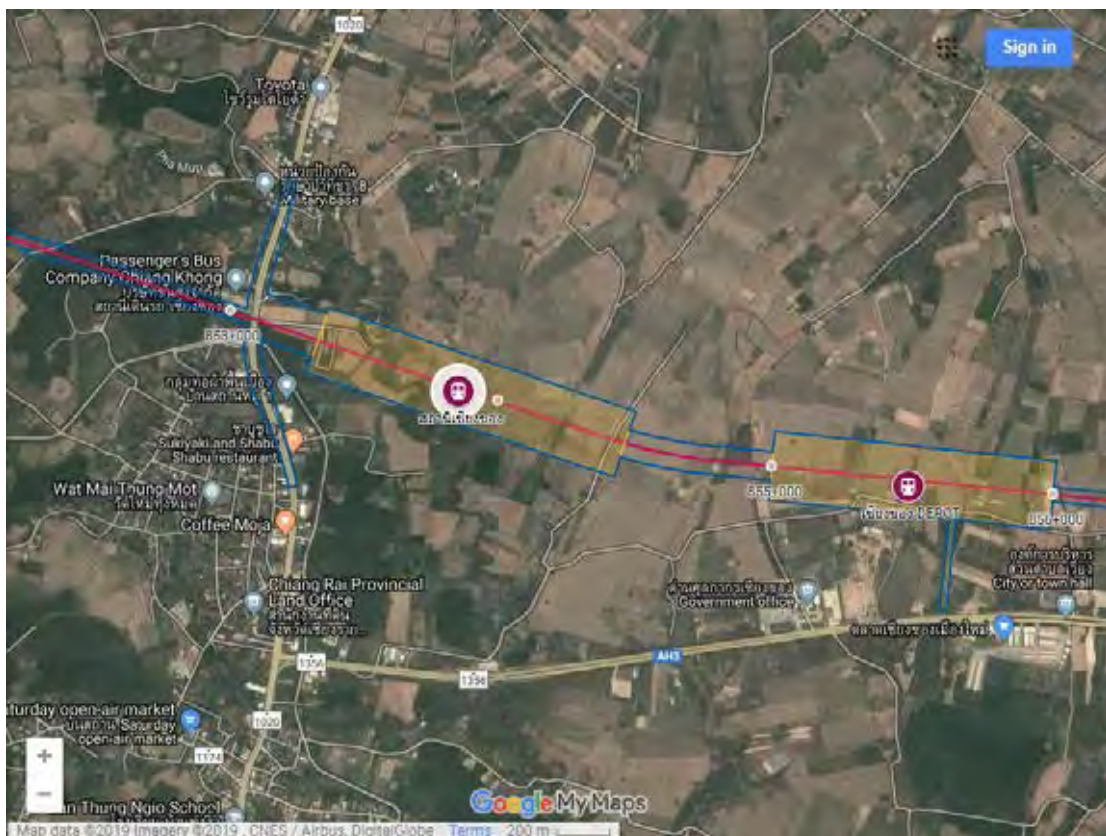


Figure 10. Point of Chiang Khong Station in Chiang Khong district

(source: Phayao TV, 2018)

According to the survey and observation in Chiang Khong district, the area that government determine to be the train station and railway line, would cross the main road of Chiang Khong district, national highway no. 1020, which leads to the old town of Chiang Khong. This becomes a big problem for local people and tourists since a bunch of activities has still been activated in old town. However, near the pin, there is also a national highway no. 1356 which goes straight to Chiang Khong-Huay Xai Friendship Bridge and Chiang Khong new town is located along the way.

4.9.3 Pa Daet station in Pa Daet district

The Pa Daet station have been pointed in Rong Chang subdistrict in Pa Daet district. It is close to the town. However, Pa Daet station and Railway would be located in agricultural area in order to avoid local forests or to connect to the main road which is linked Rong Chang to Pa Daet and national highway no.1202.

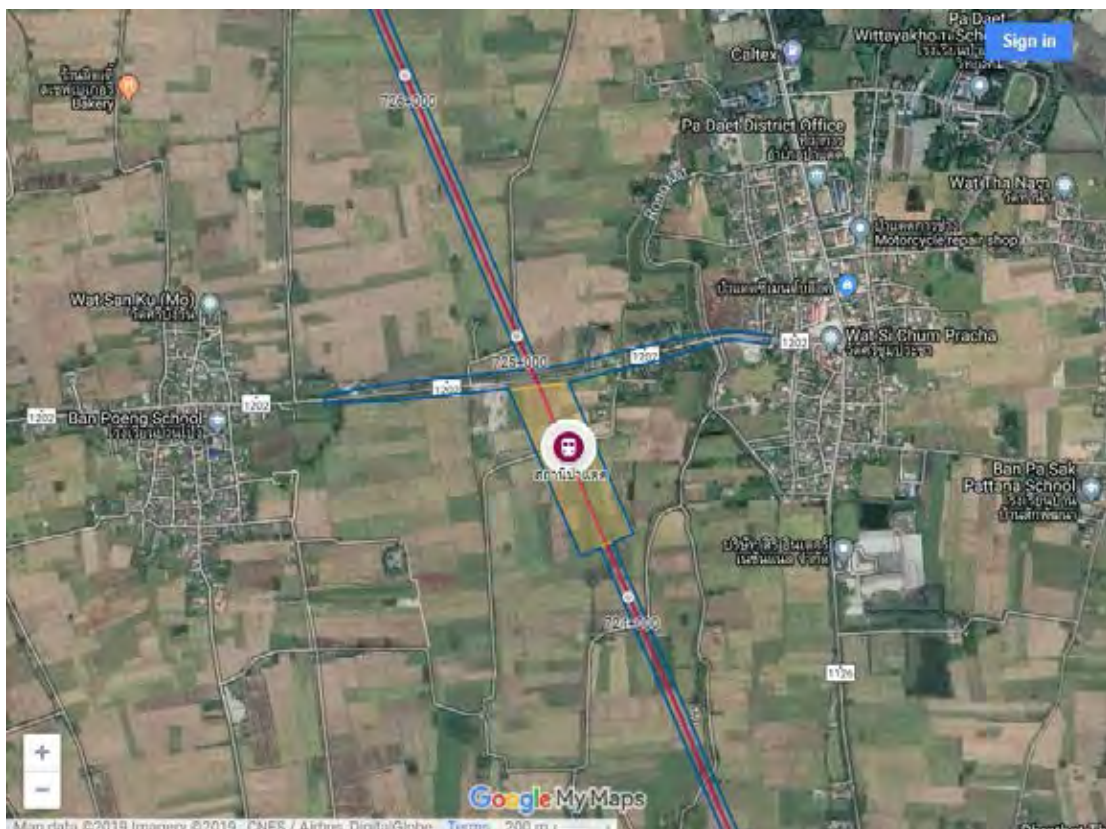


Figure 11. Point of Pa Daet station in Pa Daet district

(source: Phayao TV, 2018)

According to the survey and observation, most of the land usages in Rong Chang and Pa Daet district are agricultural and farming area, therefore, the point, where the train station and railway line would be constructed, can cause problems to the community since there has been villages and rice farming around the highway.

CHAPTER 5

DATA ANALYSIS

5.1 Data Analysis

According to the analysis of the study on social and economic impact that may be influenced by Chiang Rai - Chiang Khong Railway Project, data was collected by survey, observation, and interview. This research adopts the table of comparative data in order to find factors those which have to be analyzed, as well as using SWOT Analysis to categorize the positive and negative impacts.

The interviewees are the local people in Wiang Chai, Chiang Khong and Pa Daet district, with 19 people in total, the detail is shown in the list below;

- The interviewees in Wiang Chai and Mueang district is including;
 - (1) The headman of moo 14 community, male.
 - (2) The member of moo 14 community, female.
 - (3) The headman of moo 16 community, female.
 - (4) The deputy headman of moo 16 community, female.
 - (5) The headman of Baan Mueang Ruang community in Mueang district, male.
 - (6) The member of Baan Mueang Ruang community in Mueang district, female.
- The interviewees in Chiang Khong district is including;
 - (1) The leader of Rak Chiang Khong Group, male.
 - (2) The coordinator of Rak Chiang Khong Group, male.
 - (3) A member of Rak Chiang Khong Group, lives in Khrueng subdistrict, male.
 - (4) The vice president Chairman Committee Development on Logistics and GMS The Chiang Rai Chamber of Commerce, male.
 - (5) The restaurant owner in Chiang Khong old town, female.
 - (6) The shopkeeper in Chiang Khong old town, male.
 - (7) The receptionist at the Chiang Khong Green River hotel, female.
 - (8) The shopkeeper at Chiang Khong new town market, female.

- The interviewees in Pa Daet district are local people
 - (1) The coordinator of Homestay Pongsri Nakorn community, female.
 - (2) The member of Homestay Pongsri Nakorn community, female.
 - (3) The coffee shop owner in San Makha subdistrict, female.
 - (4) A coffee shop's staff in San Makha subdistrict, female.
 - (5) A farmer in San Makha subdistrict, male.

The analysis will be divided into two main comparative parts (1) Comparison in each district and (2) Comparison of people who live in different distance from the future train stations.

5.1.1 Comparative analysis between each district.

The analysis of general development overview is done in Chiang Rai by in-depth interview comparison in different districts, namely Wiang Chai, Chiang Khong and Pa Daet.

- **Demand of Improvement**

In the overview of local people in Chiang Rai, most of them have agreed that Chiang Rai province is in need of improvement, especially in economy, while 40% and 50% of people who share the same opinion are in Chiang Khong and Pa Daet.

Table 8. Sector that Chiang Rai needed to be improve compare between each district

Sector that needed to be improved	Wiang Chai	Chiang Khong	Pa Daet
Economic	0.00%	0.00%	<u>33.33%</u>
Tourism	0.00%	<u>40.00%</u>	<u>50.00%</u>
Electricity	<u>50.0%</u>	<u>13.33%</u>	0.00%
Social	<u>50.0%</u>	0.00%	0.00%
education	0.00%	<u>6.67%</u>	0.00%
Agriculture	0.00%	<u>20.00%</u>	0.00%
Logistic and transportation	0.00%	<u>13.33%</u>	0.00%
Trade and investment	0.00%	<u>6.67%</u>	<u>16.67%</u>
Total	100%	100%	100%

(source: In-depth interview)

People in Wiang Chai seem to be less concerned with economic and tourism development than those who live in other districts, because they have already lived near the city, Mueang Chiang district. However, the survey and observation state that some areas in Wiang Chai district have not had enough electricity supply. Moreover, some villages in Wiang Chai have tried to promote their hometowns as a tourist destination since their villages contain big lakes and islands, yet they are still concerned with the potential problem caused from tourism since most of the people who regularly stay at home are elders and children. The more visitor visit, the more security problems occur in one way or another.

Chiang Khong people have an opinion that economy is one of the important parts of Chiang Rai development as they live in the border area, along Mekong river which allows them to cross to Laos territory, and they are also close to the border of Myanmar in Mae Sai district. Hence, it is important that the province should have the advantage from its location.

“A problem that is happened in many villages in Chiang Khong, even in some other districts, is that young people went to study and returned without any related idea to develop their hometown because they have been studying in an area with different condition from Chiang Khong, which does not require the same needs so I think we should develop the education program that will benefit each area in particular.” Said by a local people in Chiang Khong.

Agriculture in Chiang Khong really benefits Chiang Rai province because people can do farming and fishing the entire year. For the local household, they can also grow some crops for their daily consumption which is more than enough. If the province would support this sector in every district of Chiang Rai, it will be of benefit to all Chiang Rai people and it will also support economy in province.

Economy in Pa Daet has not been activated enough therefore it has become the main factor for the support in tourism, trading and investment development at the same level because those parts are important activities of Chiang Rai economy, besides agricultural production.

- **Development Factor of Chiang Rai**

There are several factors that create the development in Chiang Rai but in local people opinion, these following factors are what they realized;

Table 9. Factor that makes development on Chiang Rai from each district

Factors that makes development	Wiang Chai	Chiang Khong	Pa Daet
Support from government policy	5.88%	19.05%	0.00%
Tourist destination and archeological sides	<u>23.53%</u>	<u>33.33%</u>	<u>38.46%</u>
Trade and investment	<u>23.53%</u>	28.57%	0.00%
Cultural prosperity	<u>23.53%</u>	4.76%	30.77%
Agriculture production	<u>23.53%</u>	4.76%	23.08%
Benefit from border area	0.00%	9.52%	0.00%
Variety of food	0.00%	0.00%	7.69%
Total	100%	100%	100%

(source: In-depth interview)

In Wiang Chai district, the district located near Chiang Rai central area, local people are mostly focusing on cultural prosperity because they realized that culture can be a tourist attractive point, not only Lanna culture but also Chinese culture from the highland tribe and Northeast culture in some part of Chiang Rai. The other factors which may also improve Chiang Rai at the same level are trading, investment and agricultural products.

In Chiang Khong, a border district, people are focusing on tourism, trading and investment to be developed at the same level because only border area is always activated, not in the town.

“It would be easy to promote that Chiang Khong because it has different new year celebrations from nine tribes which have different cultures. They are attractive and fascinating for people to visit, which may develop the tourist industry in Chiang Khong somehow” Said, local people in Chiang Khong.

People in Pa Daet district focus on trading and investment as a main factor which make a development in Chiang Rai because trading will encourage agricultural products to flow from producers to buyers or consumers. The culture in northern Thailand has a powerful attractiveness, especially Lanna culture but, in Pa Daet district, there is a northeastern culture because their primogenitors had moved from the northeastern Thailand which is also reserved as the ancient one.

- **Land and land Use**

In Chiang Rai, besides the abundance of wild forests and natural resources, it also contains rivers and sub-rivers in almost every village so the main activities of local people are agriculture activities, farming and fishing and they are the main economic activities of the province.

Table 10. Land and land use in Chiang Rai

Land use in Chiang Rai	Wiang Chai	Chiang Khong	Pa Daet
Suitability of each venue in your hometown	✓		✓
Overpopulation problems		✓	
Land price higher	✓	✓	✓
All-year agriculture and farming	✓	✓	✓
Public facilities problems	✓		✓

(source: In-depth interview)

Remark: the symbol “✓” means agreed

Even though Chiang Rai has good balance between urban and local cultures but there are some kinds of problem occurred with the local people as follows;

“The location of each place in Chiang Khong is not suitable enough for the development, when the government attempted to build and create new area, called new town, near Chiang Khong - Huay Xai Friendship Bridge, it has caused old town to be less in the number of tourists and visitors stopping by. At the same time, people in old town are not willing to move, change their livelihood or chase the opportunity because of expensive land price around the highway, especially near the bridge. These

areas are very expensive so it is quite difficult to travel or visit some places in sometime” said by some of local people in Chiang Khong district

However, even the local people in Wiang Chai and Pa Daet district are not facing any problems about the location of each venue in their hometown. The survey and observation had found that some villages are more than 10 kilometers away from hospital or public healthcare service center and, however, the reason people claimed it does not seem that far is because there is no traffic congestion in their district, even they have only one main road or highway.

The overpopulation was never accounted as a problem in Chiang Rai, which can be seen in size and scale of a house for one household. Moreover, almost every household has enough space for farming or planting some crops for their consumption.

“Overpopulation is in concern of Chiang Kong people because when Chiang Kong becomes the tourist destination, there would be many people visiting, some of them stay temporarily. not only have people from other province moved in, but they also see advantages from Chiang Khong geography for proceeding agriculture activities such as farming or fishing for the whole year without seasonal restrictions” said by the staff from local school in Chiang Khong.

Land price in Chiang Rai is gradually increasing every year, not only the lands near the road or highway area, but also those that are close to markets or shopping centers.

“After Tesco Lotus, a shopping center, have been brought to the land with the approximated cost of 6 million baht per rai (one rai: 1,600 square meters) in Chiang Khong old town, the land prices around that area have never be lower than that again” Said by local people in old town in Chiang Khong.

“Land price around Boon Rawd Farm or Singha Park is getting higher every year whether the roads or highways are expanded or not. When Singha Park can attract tourists to Chiang Rai for an entire year, it becomes a good opportunity for local people to have more chance to promote their communities and sale their products such

as agricultural products, handicrafts, food, coffee and tea, so it makes sense why the land price in this area is increasing all the time” said by the headman of the community nearby Boon Rawd Farm.

There is no reason to argue why agriculture and farming in Chiang Rai are completely successful because most of the local people especially in three survey areas where are fertile with natural resources, therefore, every household have some corps and trees which are fruitful for the entire year. With this amount spare, it is more than enough for household consumption and selling to other provinces in fair price.

The climate and season in Chiang Rai are supportive for its agriculture and farming for the entire year. Even though there may be some natural disasters or wildfire problems, the province still has all-year production from agriculture such as rice, longan, jackfruit, mango, lychee, rambutan and various fresh, dried or preserved fruit and vegetable.

Public facility is one of main the problems in Wiang Cahi and Pa Daet transportation surface conditions as they have mostly been developed on highway and some main roads but the rural road conditions in communities or villages are still poor.

- **Stakeholder of Railway Project**

It is not surprising that most of Chiang Rai people from Mueang Chiang Rai, Wiang Chai, Chiang Khong and Pa Daet district have acknowledged about the railway project before, the first time that they have heard about this was a long time ago.

Table 11. The benefit of railway project by local people’s view compare between districts

Railway project will be benefit or not	Wiang Chai	Chiang Khong	Pa Daet
Yes	<u>50%</u>	<u>75%</u>	<u>60%</u>
No	<u>50%</u>	25%	40%

(source: In-depth interview)

According to the result of the interview, most of the local people in three districts have agreed on the railway project which will be benefit to Chiang Rai and their districts especially pertaining to public transportation, tourism, trading and investment in fruit and vegetable transportation. However, people in Wiang Chai district, the closest

district to center of Chiang Rai have expressed their opinions that they do not need the railway or train anymore because they can easily travel by their own private cars and motorcycles. There still are some positive and negative comments as follows;

“Railway can be benefit to our tourism industry for our district as we have created eco-friendly homestay in our hometown. It can support local community economy” said by local people in Wiang Chai.

“It would be easier if I can carry my agricultural products to the center of Chiang Rai by train so I can have some sleep along the way to the destination” said by local people in Chiang Khong.

“Railway is good for public transportation especially if it has enough timetable for the whole day not just once or twice a day” said by local people in Chiang Khong.

“If the railway can create movement of people, it will be a benefit, for example, if we could travel back and forth from Pa Daet to center of Chiang Rai easily every day, we would not have to move into the town anymore” said by local people in Pa Daet.

“We have heard about the railway for a long time and we have been waiting until we do not longer need it because we have another choice of public transportation already” said by local people in Wiang Chai.

“We might not have any benefit from the railway because it is not necessary to my household at all” said by local people in Chiang Khong.

“The train is not important to us. We already have our own car” said by local people in Pa Daet.

- **The concern of stakeholder on railway project**

Basically, the concerns about railway can be divided into three main parts (1) the problem before construction process such as land expropriation (2) problem during the construction period such as land separation and road deterioration from truck transportation (3) the problem after construction or during the train operation period such as the blocking of water flow and so forth.

Table 12. The concern of local people in railway project comparison in each district

The concern about railway project	Wiang Chai	Chiang Khong	Pa Daet
Separating or blocking traffic between communities	<u>18.18%</u>	<u>22.22%</u>	<u>16.67%</u>
Obstructing the flow of water	13.64%	14.81%	<u>16.67%</u>
Interrupting the traffic on road/ cause of traffic jam	9.09%	11.11%	<u>16.67%</u>
Noise problem	13.64%	14.81%	<u>16.67%</u>
Land expropriation	13.64%	18.52%	0.00%
Railway Vibration	9.09%	0.00%	8.33%
Land price	13.64%	11.11%	0.00%
Overpopulation	9.09%	3.70%	<u>16.67%</u>
Security	0.00%	3.70%	8.33%
Total	100%	100%	100%

(source: In-depth interview)

The main concerns in railway project that local people focus are the impacts of those which may have been occurred after railway construction as follows;

“I am concerned with the train station and railway as it may block or separate our community or village then it may be difficult to us for reaching each other” said by local people in Chiang Khong.

“We do worry about community security, if the both domestically and internationally transportations become easy, it would mean that our community would have more visitors and passengers and it could possibly cause illegal activities such as illegal migration, illegal timber trade or drug problem in our community” said by local people in Chiang Khong.

Some of Chiang Khong people do not have that much worry about the land price because they think that the land price in Chiang Khong could not seem to be more expensive than current price, said by local people in Chiang Khong.

“if the railway or train station can be the cause of traffic problem such as congestion or blocking the road that is less in our district, we should already have solution.” said by local people in Wiang Chai.

“Wiang Chai is located next to Mueang Chiang Rai therefore the culture, people’s behavior or activity, livelihood and social are not significantly different. However, when the government had chosen a part of Wiang Chai as the location for Chiang Rai train station, it would have caused the same problem to Muang Chiang Rai especially when the location has been marked near the local community” said by people in Wiang Chai.

“If the railway does not separate any village or agriculture area it would be great. Agriculture and farming are really important to our community” said by local people in Pa Daet.

“The land price in Pa Daet is quite stable, around 3-6 million baht, if the government wants to pay land expropriation cost it would not be problem like other areas in Mueang Chiang Rai, Mae Sai, Chiang Saen, and Chiang Khong where the land price are more expensive than Pa Daet so it is easy to make a deal with for Pa Daet people” said by local people in Pa Daet.

In addition, people in these three districts share the same concerns with the obstructer of the water flow which would affect the agriculture sector which is the main occupation especially rice plantation. In addition, the noise and railway vibration are the problems that people do worry about since it could have directly affected their life quality, for example, they would not have a good sleep, or it might interrupt the school class. Moreover, the overpopulation is also in people’s concern. Even though they have not had overpopulation or resource insufficiency in their community, especially in Wiang Chai and Pa Daet, unlike Chiang Khong, it has the greater number of populations, visitors and passengers than other districts and the local people have enough current population density and hopefully wish to have less people in the surrounded area.

5.1.2 Comparative analysis between local people who lives in different distances

Basically, the concerns in railway can be divided into three main parts which are (1) pre- construction problem such as land expropriation (2) during construction problem such as land separation or road deterioration from truck (3) post construction or during the train operation problem such as the blocking flow of water way and so forth.

- **Stakeholder of Railway Project**

There is an exact different opinion from people who live closer and farther to the future train station but there are some interesting opinions, for example, the community that is located farther could find more advantageous in the railway project than those who live closer.

Table 13. The comparison in benefit of railway project among local people who lives in different distance's view

Railway project will be benefit or not	Less than 5 kms.	More than 5 kms.
Yes	<u>70%</u>	<u>56%</u>
No	30%	44%

(source: In-depth interview)

From table 5-6, most of the people agreed on the railway project which will be of benefit to them regardless of the distance. Therefore, where they live the railway project can benefit them more or less. The local people's opinion from the interview are as follows;

“Train timetable is very important to attract people to use the train as their usual transportation” said by local people in Chiang Khong who live within three kilometers from the future train station area.

“It will be easier for our community if we could transport our agricultural products as much as we want by the train and could sit back and relax in the cabin for a while before we arrive at the marketplace in central area or other areas. We do not even need to drive by ourselves since the train is safer and we do not have to bother with any middlemen who usually come and purchase at our farm” said by local people in Chiang Khong who live within three kilometers from the future train station area.

“The railway project will benefit us while we are promoting tourism industry in our district. It does not matter if the train station is located too far, we could create more jobs for people in our community such as shuttle vehicle services between community and train station in order to support tourism and economy in our community” said by local people in Wiang Chai who live farther than 8 kilometers from the area where the train station will be built.

“We already own personal car which makes us to be able to travel to Chiang Rai city so we do not need the train for our daily life” said by people in Wiang Chai who live in the village that located within two kilometers from the area near train station plan.

“Our community is doing well on agriculture and farming without train transportation for a long time and we do not have any tourist destination in our community, so the train might not benefit us directly” said by local people in Pa Daet who live by the roadside 10 kilometers away from the future train station.

- **The concern of stakeholder on railway project**

The comparison of concerns of people in the different distances towards railway project have shown that people in farther area have less concerns than people in closer area.

Table 14. The concern of local people on railway project compare between different distant

The concern about railway project	Less than 5 kms.	More than 5 kms.
Separating or blocking traffic between communities	<u>21.43%</u>	15.79%
Obstructing the flow of water	14.29%	15.79%
Interrupting the traffic on road/ cause of traffic jam	14.29%	5.26%
Noise problem	14.29%	15.79%
Land expropriation	11.90%	15.79%
Railway Vibration	7.14%	0.00%
Land price	11.90%	5.26%
Overpopulation	2.38%	<u>21.05%</u>
Security	2.38%	5.26%
Total	100%	100%

(source: In-depth interview)

According to the table 5-7, people in different distances have been concerned about the separation and traffic blocking between communities or villages at the same level; 20.59% of people in closer area and 20% of people in farther area from the future train station.

“Agriculture is our main activity so if railway may separate or block the water flow, it will be a big problem to farmers” said by local people in Chiang Khong who live in area which is close to future train station.

“We do worry about overpopulation problem, if the number of population in the area which is close to the future train station increases, it is possibly to cause an invasion in our village someday” said by local people in Pa Daet who live far from the area that may have future train station.

5.2 Summary of local people's expectation and concerns

According to the entire analysis of data collection, there are two main parts that have been shown up (1) the exact expectation of people in each area, community and district and (2) the concern of local people towards railway project, the details are as follows;

5.2.1 The expectation of local people towards Chiang Rai - Chiang Khong Railway Project

After the survey, observation and interview, local people are counting on the railway project mainly due to their livelihood and agriculture activities. Currently, the local people in Chiang Rai have realized that there is no necessity to move themselves to other provinces for career opportunity and they can willingly stay and find an opportunity for a better life in their hometown. So the local people are expecting railway project to mainly be of benefit to agricultural products transportation, not only in province but also all the way along Den Chai - Chiang Rai - Chiang Khong railway project. However, the level on expectation depends on timetable and the speed of the

train which will pursue people to use train and to become their usual public transportation.

“If the timetable and speed of the train is good enough, people will choose the train” said by people in Chiang Khong.

“We expected the railway to Chiang Khong will benefit the border trade and hopefully, in someday, China may construct its train passing through Laos and connect to our railway” said by people in Chiang Khong.

“Sometimes tourism industry will influence the transportation development, however, if the railway and train station is constructed in Pa Daet, it will be advantageous to us to keep everything that we are trying to promote running such as rice, agricultural products, handicrafts and eco-friendly homestay, which can be a community center of eco-friendly and sustainable development” said by people in Pa Daet.

“Hopefully the coming railway and the train station will benefit tourism in our community which could create more job opportunity for this district in the future” said by people in Wiang Chai.

5.2.2 The concerns of local people towards Chiang Rai - Chiang Khong Railway Project

There are many concerns about the situation which would come before and after the construction, but the main problem that happens before is the land expropriation process which can cost over budget. People are also curious to know what the railway will be like. Some of the local people have heard that the railway is unique, not like other railways in other provinces because it will have rail fence which will be troublesome for the community if it separate the area or villages.

“The land price in Chiang Khong is too expensive for land expropriation, it is impossible that the government could pay in reasonable price which local people will accept” said by local people in Chiang Khong.

“If the train starts the operation, it may affect the local public transportation especially mini bus, green bus and red bus, so it should have the solution to deal with them” said by local people in Chiang Khong.

“Hopefully the railway and train station will not interrupt our daily life especially the noise and railway vibration” said by local people in Pa Daet

“It is impossible to expropriate the land where the government plans to construct Chiang Rai station because it is located next to the community area” said by local people in Wiang Chai.

5.3 SWOT analysis of the community toward Chiang Rai - Chiang Khong Railway

Project

SWOT analysis can categorize the positive and negative impacts of railway project to the stakeholders in Chiang Rai province which is able to indicate the points of advantages and disadvantages from internal and external factors of the railway project, not only in the per-construction but also throughout the whole project. The SWOT analysis is shown in the table below;

Table 15. SWOT analysis of the community toward Chiang Rai - Chiang Khong Railway Project

<p>Strength</p> <ul style="list-style-type: none"> ● Connect to border area in Chiang Khong and another districts and provinces ● Domestic transportation for local people ● Promote logistic and supply chain in agricultural products and crafts 	<p>Weakness</p> <ul style="list-style-type: none"> ● Impact from land expropriation ● The agriculture or farming area separation. ● Health impacts (from noise and rail vibration) ● May block the water way in agricultural area
<p>Opportunity</p> <ul style="list-style-type: none"> ● Movement of people can support activities in each community ● Support tourism and hospitality industry 	<p>Threat</p> <ul style="list-style-type: none"> ● People who lives far from public transportation will be overlooked ● Traffic congestion near by the station

<ul style="list-style-type: none"> ● Trade and investment both domestic and international market ● Job creation around train station area 	<ul style="list-style-type: none"> ● Crime and illegal trade problems ● Overpopulation ● Health problem
---	--

5.3.1 Strength: the strength of rail project for people and communities in Chiang Rai province is that it can connect to another area and border area of Chiang Khong which will benefit the trading and investment, not only in Chiang Rai province but also in other provinces such as Phayao and Phrae. The main advantage of railway project is the public transportation and cargo transportation especially in agriculture section. Anyway, the demand in train usage is dependent on its speed and timetable.

5.3.2 Weakness: the main weakness that could be troublesome during land expropriation is that the land prices in some areas are over budget. It will be a big problem if railway is constructed in the agricultural area or plantation. In addition, after the train starts its operation, it may cause noise and rail vibration problem which will affect people in direct and indirect way such as the interruption of learning process in school nearby or the interruption for fisherman in fishing area. Moreover, the other important problem for people is related to health problem which may come from disposal of waste and people's movement along the railway line.

5.3.3 Opportunity: the first and seriously important opportunity to every district is an opportunity in tourism and hospitality development which will benefit the economic activities in the district especially in unknown districts as they may have a chance to promote their attractiveness to visitors or passengers and invite them to stop by. Moreover, trading and investment are the main economic activities in the province especially agricultural products so the present of railway can provide people more opportunities to access to other marketplaces and to have a chance to expand their target markets.

5.3.4 Threat: The threat of the railway is the possibility to cause social problems such as traffic congestion which makes people spend more time in their cars, overpopulation in their community or having too many visitors and passengers which would also cause illegal migrant workers, crime and illegal trading problems, especially illegal trading of forest resources. Health problem is one of threats because the train

station and railway may generate too many wastes along the railway line and if there is no solution or proper waste management, it may lead to health problem for local people living close to the unclean environment.

5.4 Social and Economic Impacts Analysis

5.4.1 Social impact

The impact that possibly happen to society is the land expropriation which can cause various problems to communities around the point of train station and railway line in pre-construction period. The construction period also impacts the community as it generates noise and the truck would pass through the area and cause environmental impact in the community around the construction area. All problems that people concern also have social effects, which are the change of their culture, livelihood or behavior, for example, every village which has always been in contact with each other, is suddenly separated or blocked by the train station or railway. It would make people lack connection or communication and may be the cause of losing local culture or lower cooperation rate with neighbor villages.

5.4.2 Economic impact

The economic impact is from the overview of Chiang Rai province since people's activity in the community can cause good and bad economic system. During the construction period, it could slow down economy growth. Since the main product of Chiang Rai is from agriculture which requires high speed transportation or highway, it could be limited the speed by railway construction site. In addition, the problem which local people are concerned with also affects the environment such as the blocking of the water flow. Noise and vibration of the railway also affects the land price, located around the train station and railway. However, the most important part of economy in Chiang Rai depends on agriculture, therefore, providing that there is nothing interrupted the agriculture activities, Chiang Rai can protect its main economic player.

The social and economic impacts in Chiang Rai from the rail project can affect every sector. Any social activities can be influenced by the change in economy of districts and provinces. Nevertheless, the government still focuses on the benefit which would come after the railway construction because not only can it support domestic trading or transportation, but it also can expand the trading and transportation internationally, especially with Chinese people who are travelling via Laos to Chiang Khong border in order to enter Thailand. The outcome of the rail project is that it has brought more opportunity to Chiang Rai pertaining to social movement which can also support the domestic trading and other activities. Economy has been supported by railway project in logistic and the supply chain which connects Chiang Rai border to other provinces, namely Phrae, Lampang and Phayao. Chiang Rai people could have more chance to transfer their products and supplies to central area of Thailand.

5.5 The analysis of the Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project report

According to the Feasibility Study report of Denchai – Chiang Rai – Chiang Khong Railway Project, the latest version of the feasibility study and survey research has been studied in 2011 which is 9 years ago. The information about the road and highway still is the same and the feasibility in constructing the railway and other infrastructures such as train station, railway stop and depot is applicable, but the environment along the way that was surveyed has been changed. There is a growth in urban area and people movement in four main provinces of Denchai – Chiang Rai – Chiang Khong railway project; Phrae, Lampang, Phayao, and Chiang Rai. Chiang Rai's population has grown up every year, at least 3,000 people per year, most of them have moved to Mueang Chiang Rai district, so, if the population density increases continually, it will be difficult to construct the railway project, especially in community area which the railway target is. If the railway could not be located close to the community area, it would be difficult for local people to access the train services.

The report also mentions that agriculture industry is the main industry of Chiang Rai but the route of the railway requires an expropriation of the land in the agriculture areas such as in Rong Chang subdistrict, Pa Daet district, and the railway, which is routing from the central area of Chiang Rai to Chiang Khong, also requires an expropriation in local forests and agriculture areas which is against to the environmental policy of Chiang Rai that aims to reserve the local forests in the province.

The railway construction project should include crossways for pedestrians and overpass for motorcycles to cross the railway since people are concerned that the railway may pass or cut their usual road. In addition, the report has not mentioned any solution for the impacts on society and people well-being. Therefore, at the moment there is nothing which can guarantee that the railway will support local people on their livelihood, well-being, and will provide more job and trading opportunity, if there still is a lack of details for people to prepare themselves before the land expropriation or construction period.

The feasibility study of Chiang Rai economic growth forecasts that the population growth after the development of transport infrastructure will affect economic activities such as job creation and opportunity the estimated statistic is shown in table 5-9 and 5-10 below.

Table 16. Estimate the percentage of gross domestic product growth rate (year 2018-2037)

GDP	2018-2022	2023-2027	2028-2032	2033-2037	Growth Rate (%)
Whole Kingdom	3.54	3.58	3.59	3.61	3.6
Northern Region	3.61	3.63	3.64	3.66	3.6
Chiang Rai	3.48	3.54	3.65	3.64	3.5

(source: The Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project Report, 2012)

Table 17. Estimate the value of gross domestic product in 2017-2037 (million)

	2017	2022	2027	2032	2037
Whole Kingdom	5,482,402	6,400,704	7,472,822	8,724,520	9,976,218

Northern Region	439,170	522,612	621,908	740,070	858,232
Chiang Rai	32,146	38,179	45,345	53,865	62,367

(source: The Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project Report, 2012)

In fact, it is impossible that the number of populations will be increased after the railway construction because, according to the survey, there are impacts from railway and train station towards environment in negative ways and the land price is also quite higher than people in middle-low income could afford to move in. Then the land price would be uncontrollable and the environment is not suitable for living, hence the hopeful prediction that the number of populations will be increased in order to support economic activities may not happened.

CHAPTER 6

CONCLUSION

6.1 Urban Expansion and Land in Chiang Rai

The theory on urban expansion is that the expansion of the infrastructure such as accommodation and community area, healthcare service center or hospital, institution or education center, business center, commercial area or industrial area, expand in town and influence the livelihood residents on the aspects of culture, behavior and activity in both positive and negative way.

The urban expansion in rural area in Thailand mostly expands from the area which is consisted of local government office, marketplace, education center or healthcare service center. This is also happened in Chiang Rai, where the highest number of population density is Mae Sai district, followed by Mae Chan and Mueang Chiang Rai district. There is a big hospital and supermarket close to the highway, which connects Mae Sai and Mae Chan district, thus it is not necessary for people in this area to travel into the center of Chiang Rai for any basic facility as they already have.

The land price in Chiang Rai also increases in every area and every year, especially in the area close to basic infrastructure. However, the village that is far from the community area or in the outer area also has high land price because the transportation to all basic needs is comfortable enough, even though, there is 10 kilometers between their houses and the nearest healthcare service center, it will only take 20 minutes without any traffic congestion, and the environmental situation is better than in the center or town area.

Moreover, land utilization in Chiang Rai is mainly an agricultural area, even the government tried to promote the special economic zone in Chiang Rai including Mae Sai, Chiang Saen and Chiang Khong, to become industrial area which will benefit the province on the condition that Chiang Rai must have the manufacturing plant that can support the exportation of Thai products. The problem is that Chiang Rai is full of good nature and environment for agriculture, investors are not willing to invest or interested in those areas and the lands in Chiang Rai are reserved for agricultural purpose as well.

6.2 Rail Impacts and Urban Expansion in Chiang Rai

There always are impacts on the community caused by the transportation change, especially by any mega projects such as Chiang Khong-Huay Xai Friendship Bridge in Chiang Khong district that was expected to support the transportation between Thailand and Laos, and hopefully it would attract people and tourist to visit Chiang Khong. In fact, even though the construction of Chiang Khong Friendship bridge had been completed and the transportation has been more convenient, it could only make Chiang Khong to become a bypass spot for truck, no one stop and visit the town since the passengers or truck drivers can go through the bridge in order to avoid a necessity of staying overnight.

Basically, the urban expansion of Chiang Rai is being expanded along the highway and infrastructures such as supermarket, institution or tourist destination, but this expansion of urban area and the people would be not happened by the coming train because it is not necessary to live near railway, moreover, the train station has many concerns about the noise, railway vibration, wastes and so forth.

In addition, the local people in Chiang Rai province have been waiting for the railway for more than 20 years since they had required, but they have found another solution for their transportation. In government and private sectors' perspective, it seems like the railway project can only generate the positive outcome to Chiang Rai province for it may support in logistic and supply chain, and the future plan, which they attempt to connect the railway project to the south of China in Laos by Chinese investment, but in the local people's point of view, the project contains both positive and negative results for it is considered to have an impact on economic sector as same as trading and investment sector, which is agriculture activities.

6.3 Advantage and Disadvantage of rail project on Chiang Rai

According to the summary from local people's expectation and concerns about Chiang Rai - Chiang Khong rail project in Chiang Rai Province and SWOT analysis, the stakeholder of Chiang Rai - Chiang Khong Rail Project are supposed to be reserved for local people as a main user of the transportation who are truly have the benefit from and would

provide the benefits to society and economy. This situation is similar to butterfly effect because when the local people behavior have changed, it can have an effect on economic activities to be more or less and the people's movement can benefit the community to have more opportunity such as selling their agricultural product or promoting their local culture as a tourist destination.

There is a main point of stakeholder's impact on Chiang Rai - Chiang Khong rail project, which can be categorized into advantage and disadvantage as follows;

- Advantage in Chiang Rai - Chiang Khong railway project for the stakeholder in Chiang Rai is advantageous because the train operation would mainly support the trading that will benefit local people, especially those who live in the same distance with people in Pa Daet and Chiang Khong so they can have better opportunity to access new marketplace. Moreover, the train will allow people to be benefit of tourism promotion plan and will support their community's culture and products regardless of the distance.
- Disadvantage of the Chiang Rai - Chiang Khong rail project firstly started by land expropriation that could make the local people dissatisfy on this impact because the land that is required to be expropriated by the government is agricultural plantation, it will cut off the water flow or separate their villages. The other important thing which would come after the land expropriation problem is to be occurred during and post-construction process. If the rail infrastructure is constructed in the area where people conduct agriculture activities, it will be impossible to have railway fence which could be less accessible for the adjacent areas.

However, it is entirely relied on the evaluation of the impact which can be both positive and negative for local people who still hope to have the railway as soon as possible, especially people in distant areas such as Pa Daet and Chiang Khong district. However, it is dependent on the timetable and train speed, if it is convenient and facilitate as people have expected it to be. The movement and the flow of people is one of the good things in order to create the new behavior and to influence economic

activities therefore the railway network still is a good idea for Chiang Rai as the gateway to other provinces and the opportunity provider.

6.4 The trend of transportation development in Chiang Rai

The development trend in Chiang Rai has an opportunity to be a center of cultural tourism, trading and investment, and logistic center between Thailand, Laos and Myanmar, especially in the border area in Mae Sai and Chiang Khong, therefore, it is important to develop the basic infrastructures, highways and roads in order to connect all areas together.

6.4.1 Short-term development plan

- The roads and highways should be adjusted and repaired since almost every main road in Chiang Rai has been the bypass for trucks, if there's any bad road condition such as the road surface, it will be obstructer for transportation.
- The central area of Chiang Rai is facing traffic congestion problem. The management of public transportation in town should support and facilitate people in order to prevent them from using their own cars.
- The emergency telephone should be set up along the roadside of the highway between each district for emergency situation and security purpose.

6.4.2 Long-term development plan

- Chiang Rai has already had a renovation plan in Mae Fah Luang International Airport in order to expand its capacity to support the increasing number of passengers.
- Construction plan of the bypass highway to reduce traffic congestion in central area of Chiang Rai and also to separate the road for general users and heavy transporters which is safe for everyone.
- The environmental issues have been on the government agenda such as wastewater treatment and waste management.

6.5 Overall recommendation

The construction of rail project in Chiang Rai have not started yet due to the land expropriation process in four provinces; Phrae, Lampang, Phayao, and Chiang Rai. Chiang Rai could be a gateway to international trading and cooperation between Thailand, Laos, China and Myanmar in the border area in Mae Sai. Chiang Rai has the limitation in land usage since the local people have their own culture, well-being and behavior which has not been changed from the past including the archeological sites or some ancient temples which should not be located too close to the industrial areas, so whether the government is launching any policies in order to support the economy, all the changes would depend on the local people expectation and the flexibility of the situation and environment. A plan for the land usage in Chiang Rai should be carefully aware of archeological sites and agriculture areas because they are important to the community and the province in the relation to tourism attraction and commercial center, especially agricultural products. The rail project will benefit Chiang Rai but there should have been a solution to some problems as follows;

- If railway blocks or separates agriculture area or community, it will be problematic for both society and economy of Chiang Rai. Therefore, the railway construction plan should have a solution such as a construction of crossway or overpass for pedestrians to walk and for motorcycles to cross in many communities.
- The environmental problem is problematic in various areas of Chiang Rai such as in Wiang Chai due to the number of populations. Therefore, the waste management should be more effective in order to support the circumstance when it has railway passing by. The waste management should be on the local governmental agenda.
- The city and town plan, which indicates the expansion in the future, should be related to the location of the railway and train station, especially in Chiang Khong district in which most of the areas are agricultural areas. The new town of Chiang Khong will be located next to

the Chiang Khong Depot and the train station may cause overpopulation to Chiang Khong because there will be more job opportunities and the development of infrastructures.

- The old road or highway should be reconstructed and prepared for the growth of logistic and supply chain.
- The solution for health problem should be planned in order to prevent the effects from noise and pollution from construction period and vibration of railway after construction.
- Security should have been more potential, effective and clearer for its people and should be facilitated and available for local people to access.

However, it should have more supportive plan in the future. If the government demands the connection between the railway in Chiang Khong and the railway project from China, which would pass through Laos and would increase people, trading, logistic and supply chain, Chiang Rai will have to prepare their provinces to be ready for the expansion of the transportation because those connection and changes will come with high risks.

6.6 The suggestions for the feasibility study report

In conclusion, the Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project reported in 2012, is still applicable for the railway project recently, but it still lack solution or guidance for local people in various small details, for example, in some areas a tunnel or the railway bridge for crossing the road and highway will be constructed or some areas will be separated by the railway. this may cause environmental and people livelihood problems, especially an impact on health aspect from noise, railway vibration and waste management, which should have been set as the prior issues. Therefore, if it is possible to study about feasibility on railway project in the future the report should have more detail on the following issues as shown below;

- The information of local people such as their livelihood, culture and behavior in order to make sure that the railway plan will not interrupt or affect negatively to their lives. However, if it is unavoidable, the report

should add a solution for the government and people to suggest to their leader.

- The policy that will be activated after the railway construction and set the local people as a priority group to be of benefit to the railway in their hometowns.
- The draft plan of train operation in each station should be in the report in case of information support. Providing that people would like to study and prepare themselves for the coming of train and railway, it will be an opportunity for them to find the information about a job at train station or a chance to start business or services. Moreover, the policy should be set to reserve some jobs for only Thai nationality and some for migrant workers.
- The solution for environmental problems should be highlighted in the report because there are risks from the movement of people which can lead to the expansion of disease and bacteria from deposal waste along the railway line. Moreover, the local forests and rivers should preserve strictly.

6.7 The community development concept from the study

The basic concept of community development is to support people's livelihood and to bring the opportunity to people such as the accessibility to the public services, basic need and facilitate their activities. Chiang Rai is different from other provinces because the benefit from border areas and the slow growth of urban expansion, even the government policy has attempted to support the economic activities in the province, it is not activate enough because some facilities are not supported such as the limitation of public transportation, the distance between each tourist destination, and the distance between the basic infrastructures and public services. However, Chiang Rai has their own characteristic to run the economy by local and cultural community activities which are specifically suitable for their province such as Wat Rong Khun known as the white temple and Baandam Museum. They are the popular destinations for tourists because it has been created by the

national artists which causes an economic growth to Chiang Rai and the province does not need to invest in mall project, therefore, it can focus on art and culture to attract tourists and support economic activities.

The idea of community development from this study is that the development may not have to mainly focus on supporting economy but art, culture and environment in order to create the different things which can make the province become more interesting, for example, Chiang Rai has the variety of people, communities, cultures and characters. It is important to focus on the demand of local people in the province which might not expect only on the growth of economy, but people may want to promote and preserve their cultures which can make the development more sustainable rather than running the economy according to the trend of the country. In this way, the development in basic infrastructures will be supported the characteristic of Chiang Rai, to be more outstanding, yet not to create Chiang Rai to be similar to other provinces.

According to the study, the development of transportation infrastructure in Chiang Rai is a part of development policy to improve well-being of people in the province, which is important for Chiang Rai, because the connection of transportation will provide an opportunity and improve Chiang Rai to be the competitive and potential province. Chiang Rai is the statistic location for connecting Thailand with Mekong sub-region countries such as Laos and Myanmar. However, every improvement and changing from the development plan can cause both direct and indirect impacts therefore the development plans require a detailed study to ensure that the project would be able to achieve its purposes, especially the network-transportation development. It is not only for connecting the communities, but it is also a part of urban development which would provide an opportunity for people to access the basic need and increase the opportunistic progress for people's life quality in the present and future.

REFERENCE

- Andersson, M. (2016). Urban Expansion and Public Transport Implications for Inclusive Development. Retrieved from <https://www.ide.go.jp/English/Library.html>
- Annual Report 2018 SRT: Focused Sustainability Growth.* (2018). Retrieved from Approved the Den Chai - Phayao - Chiang Rai Railway Project. (2018). Retrieved from <https://phayaotv.com/อนุเมตริคไฟสายเด่นชัย-พ/>
- Binthaisonk, S. (2014). *Politics of The Sustainable Development: A Case Study of Chiang Khong District, Chiang Rai Province.* (Degree of Master of Arts Program in Government), Chulalongkorn University,
- Chase, M. (2018). Definition of Socioeconomic Factors. Retrieved from <https://classroom.synonym.com/definition-of-socioeconomic-factors-12079366.html>
- Chiang Rai Provincial Statistical Report.* (2018). Retrieved from
- Daoruang, P. (2002). *Development Guidelines for Border Towns: A Case Study of Chiang Saen, Chiang Rai Province.* (The Degree of Mastter of Urban and Regional Planning in Urban Planning), Chulalongkorn University,
- Dena Kasraian, K. M. a. B. c. W. (2016). Development of Rail Infrastructure and its impact on urbanization in the Randstad, the Netherland. *Journal of Transport and Land Use*, 9, 151-170.
- Double Track Railway Denchai - Chiang Rai - Chiang Khong. (2018). *Ministry of Transport Journal*, 8-11.
- Dunarintu, M. D. a. A. (2012). The Socio-Economic Impact of Urbanization. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 47-52.
- Feasibility Study of Denchai – Chiang Rai – Chiang Khong Railway Project.* (2012). Retrieved from
- Jongsureyapart, W. R. a. C. (2017). An Analysis of Positive Externality from the Denchai - Chiang Rai - Chiang Khong Dual Gauge Railway: Chiang Rai Province's Perspectives. *Journal of Economics of Ramkhamhaeng University*, 2, 76-95.
- Keokan, P. (1991). *Southern Rail Construction and Its impact on Economic and Politic.* Srinakharinwirot University,
- Khamkaen, T. (2007). *The Role of Local Administrative Organization in Promoting People's Participation in Liveable City Development : A Case Study of Chiang Rai Municipality.* (The Degree of Master of Arts Program in Human and Social Development), Culalongkorn University,

- Kittikul, K. (2011). *The Urban Development Relating the Train Transportation of Chiang Rai Town*. (The Degree of Master of Urban and Regional Planning in Urban Planning), Chulalongkorn University,
- Lertpornlaksana, P. (1993). *A Study of Chiang Rai Urban Systems for Development*. (The Degree of Master of Urban and Regional Planning), Chulalongkorn University,
- Malaitham, S. (2013). *A Study of Urban Rail Transit Development Effects in Bangkok Metropolitan Region*. (The Degree of Doctor of Engineering), Kyoto University,
- McLeod, S. (2018). List of Socio-Economic Factors. Retrieved from <https://classroom.synonym.com/list-of-socio-economic-factors-12083166.html>
- Photchanawatee, W. (2006). *The Impact of Bangsue Subway Station on the Surrounding Communities and Areas*. (the Degree of Master of Urban and Regional Planning Program in Urban Planning), Chulalongkorn University,
- Roberto Camagni, M. C. G. a. P. R. (2000). *Urban Mobility and Urban Form: the Social and Environmental costs of Different Patterns of Urban Expansion*. the 40th Congress of the European Regional Science Association, Barcelona.

VITA

NAME Tanthita Sukhopala
DATE OF BIRTH 17 November 1991
PLACE OF BIRTH Bangkok
HOME ADDRESS 90 Chokchai 4 soi 54 to 4, Latphrao road,
Bangkok, 10230

