PROJECT FOR PROMOTING SUSTAINABILITY IN FUTURE CITIES OF THAILAND

FINAL REPORT OF PHASE 1 (STAGE 1-3)

September 2019

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

ALMEC CORPORATION ORIENTAL CONSULTANTS GLOBAL CO., LTD INTERNATIONAL DEVELOPMENT CENTER OF JAPAN INC.



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Note: National Economic and Social Development Council (NESDC) was reorganized from National Economic and Social Development Board (NESDB) based on the National Economic and Social Development Council Act in 2018. In this report, the term of NESDB is used from Chapter 1 to Chapter 12, and the term of NESDC is used in Chapter 13.

Part I

Sustainable Future City Initiative

1.	Ove	rall Framework of Thai Future City Project	1-1
	1.1	Background	1-1
	1.2	Objectives	1-2
	1.3	Stages of Project Implementation	1-2
	1.4	Implementation Organization of the TFCP	1-3
	1.5	Records of the Project Activities	1-4
2.	Ana	lysis on Current Status of Local Cities of Thailand	2-1
	2.1	Changes in Socio-economic Development and their Implications to Urba	an
		Development and Administration	2-1
		2.1.1 Salient Social and Economic Changes	2-1
		2.1.2 Implications to Urban Development and Administration	2-14
	2.2	National Spatial Structure of Thailand	2-16
		2.2.1 Overall Demographic Structure	2-16
		2.2.2 Regional Corridor and Transport Network	2-18
		2.2.3 Urban System	2-23
	2.3	Urban Development Policy Directions by Hierarchy of Cities	2-32
		2.3.1 Globally Competitive BMA, BMR, and ESB	2-34
		2.3.2 Regional Growth Cities	2-35
		2.3.3 Local Urban Centers	2-36
	2.4	Environmental Policy toward Sustainable Development	2-38
		2.4.1 Historical Changes in Environmental Policy and Strategy	2-38
		2.4.2 Environmental Conditions in Thailand	2-40
		2.4.3 Environmental Planning Instruments	2-51
		2.4.4 Environmental Projects Implemented in Tessabans	2-57
	2.5	Decentralization and Local Autonomy in Thailand	2-70
		2.5.1 Provincial and Local Administration	2-70
		2.5.2 Decentralization Process and Local Autonomy	2-75
		2.5.3 Local Autonomy in Urban Planning and Urban Development	2-76
	2.6	Institutional Framework of Urban Development Planning in Thailand	2-78
		2.6.1 Urban Planning Systems in Thailand	2-78
		2.6.2 Local Strategic Development Plan (LSDP)	2-79
		2.6.3 Urban Planning and Comprehensive Plan	2-81
		2.6.4 Urban and Landscape Design	2-94
	2.7	Current Conditions and Problems of Cities in Thailand	2-103
		2.7.1 Current Status of Tessabans	2-103
		2.7.2 Civil Society in Thailand	2-108
		2.7.3 Urban Problems and Issues of Tessabans	2-113
		2.7.4 Visions of Tessabans	2-116
		2.7.5 Characteristics of Projects by Region	2-119
	2.8	Financing and Project Implementation of Tessabans	2-121
		2.8.1 Financial Capability of Tessabans	2-121
		2.8.2 Project Implementation by Tessabans	2-125
3.	Dev	elopment of SFCI	3-1

3.1 Rationale of and Need for Sustainable Development in Local Cities of Thailand

		3-1
	3.1.1 Self-sustaining Economic Competitiveness / Promotion of Centra	lity of
	City	3-I
	3.1.2 Sustainable Environmental Strategy/ Limited Capabilities of Tessa	ibans
		3-2
	3.1.3 Attractiveness and Identity of Cities/ Pride of the Local Communi-	ty3-3
	3.1.4 Depopulation, Aging, and Low-fertility Society/ Livable City for Al	l3-3
	3.1.5 Strengthened Initiatives of Tessabans in Development	3-3
	3.1.6 Strengthened Peoples' Participation in Development/ Core of Ser	nse of
	Ownership	3-4
	3.1.7 Linkage between National Government Program and Local Reality	y3-4
3.2	Establishment of Sustainable Future City Initiative (SFCI)	3-6
	3.2.1 Objectives and Overall Concept of SFCI	3-6
	3.2.2 Target Cities of SFCI	3-8
	3.2.3 Organizational Structure	3-8
	3.2.4 Implementation Framework of SFCI	3-10
3.3	Implementation Program of SFCI Model City Activities (the First Phase	of SFCI)
	······································	3-18
	3.3.1 Purpose of SFCI Model City Projects	
	3.3.2 Target Model Cities	
	3.3.3 Implementation Process of SFCI Model City Projects	3-18
3.4	SFCI's Relevance to the NESDP and National Reform Implementation .	
	3.4.1 SFCI's Relevance to National Reform	

Part II Model City Projects

4.	Model City Activities					
	4.1 Identification of Target Tessabans and Selection of Model Cities	4-1				
	4.1.1 Overall Steps of Selection of Model Cities	4-1				
	4.1.2. Selection of Overall Target Tessabans of SFCI	4-1				
	4.1.3 Longlist of Candidate Model Cities	4-4				
	4.1.4 Evaluation and Shortlisting of Candidate Cities	4-7				
	4.1.5 Invitation and Proposal Submissions	4-10				
	4.1.6 Evaluation of Proposals and Selection of Model Cities	4-14				
	4.2 Schedule of Model City Activities	4-18				
	4.3 Formulation of Planning Team (PT) and Project Coordination Comm	ittee (PCC)				
		4-20				
	4.4 Output of Model City Project	4-23				
5.	Tessaban Nakhorn Chiang Rai	5-1				
	5.1 SFC Plan, Program, and Projects	5-1				
	5.2 Project Implementation Support	5-16				
	5.3 Pilot Project under JICA's Financial Support	5-22				
	5.4 Lessons Learned	5-31				
6	Tessahan Nakhorn Khon Kaen	6-1				
0.	6.1 SEC Plan Program and Projects	6-1				
	6.2 Project Implementation Support	6-14				
	6.3 Pilot Project under IICA's Financial Support	6-34				
	6.4 Lessons Learned	6-57				
7	Tossaban Muoang Krahi	71				
7.	7.1 SEC Plan Program and Projects	7-1 7_1				
	7.1 Sic Flah, Flogram, and Flogects	7-1 7_18				
	7.2 Pilot Project under IICA's Financial Support	7-36				
	7.5 Thor Toject under Ster 3 Thaneid Support	7-48				
~						
8.	Lessaban Mueang Nan	8-1				
	8.1 SFC Plan, Program, and Projects	8-1 0.15				
	8.2 Project Implementation Support					
	8.3 Pliot Project under JICA's Financial Support	8-3 I م د د				
	8.4 Lessons Learned					
9.	Tessaban Mueang Phanat Nikhom	9-1				
	9.1 SFC Plan, Program, and Projects	9-1				
	9.2 Project Implementation Support	9-13				
	9.3 Pilot Project under JICA's Financial Support	9-24				
	9.4 Lessons Learned	9-32				
10.	Tessaban Nakhorn Phitsanulok	10-1				
	10.1 SFC Plan, Program, and Projects	10-1				
	10.2 Project Implementation Support	10-13				
	10.3 Pilot Project under JICA's Financial Support	10-29				
	10.4 Lessons Learned	10-38				

11.	Summary and Lessons Learned from the First SFCI Model City Project	11-1
	11.1 Evaluation of the Overall Framework of SFCI	11-1
	11.1.1 Overall Evaluation of SFCI	11-1
	11.1.2 Evaluation of the Planning Process for the SFCI	11-6
	11.1.3 Impact on Project Implementation	11-10
	11.1.4 Impact on Human Resource Development in the Tessaban	11-11
	11.2 Lessons on Urban Development Issues	11-13
	11.2.1 Sector Coverage of Strategies for the Model Cities	11-13
	11.2.2 Key Urban Development Issues identified in the SFCI	11-15
	11.3 Issues to Promote Urban Development in Local Cities of Thailand	11-18
	11.3.1 Shortage of Information and Data	11-18
	11.3.2 Preparation of Sectoral Plans on Various Issues	11-18
	11.3.3 Necessity of Multi-disciplinary or Inter-ministerial Approaches.	11-19
	11.3.4 Coordination with Regional Universities	11-19
12.	Conditions and Issues to be Clarified to Continue SFCI in Thailand	12-1
	12.1 Endorsement as a Policy Tool	12-1
	12.1.1 Expected Output of the SFCI	12-1
	12.1.2 Scope of the SFCI	12-1
	12.1.3 Target City	12-2
	12.2 Administrative Mechanism for the SFCI	12-2
	12.3 Budgeting for SFCI	12-3
13.	Proposed Framework for the Next SFCI	13-1
	13.1 Introduction	13-1
	13.2 Administrative Mechanism for SFCI and Stakeholders	13-1
	13.2.1 National Level	13-1
	13.2.2 Local level	13-3
	13.2.3 Provincial Level	13-5
	13.2.4 Consultant	13-5
	13.3 SFCI Platform	13-6
	13.4 Overall Framework and Major Components of SFCI	13-7
	13.5 Implementation Schedule	13-10
	13.6 Monitoring by Tessaban	13-12
	13.6.1 Set-up Monitoring Framework	13-12
	13.6.2 Monitor and Check the Progress of SFC Projects	13-12
	13.6.3 Update and Revise the SFC Plan and Projects	13-13
	13.7 Preliminary Framework for the Second Phase of SFCI toward the Thai	SFCI
	in the Future	13-14

Appendix 1 Record of Project Implementation

1.	Member List of TFCP	A1-1-1
2.	Summary of Meetings	A1-2-1
3.	Record of Japan Study Tour	A1-3-1
4.	Good Practices of Sustainable Urban Development in Japan	A1-4-1

Appendix 2 Sustainable Future City Initiative Guideline for SFCI Cities

Intr	oduction	A2-1
1.	Rationale on Sustainable Development of Local Cities	A2-2
2.	Sustainable Future City Initiative	A2-5
3.	SFCI Methodology	A2-8
4.	SFC Project Implementation Supports	A2-34
5.	Monitoring by Tessaban	A2-37
6.	SFCI Platform	A2-39
Ref	erences: List of Format	A2-41

ABBREVIATIONS

ACCCRN	Asian Cities Climate Change Resilience Network
AEC	ASEAN Economic Community
ASEAN	Association of Southeast Asian Nations
BAU	business as usual
BEMS	Building Energy Management System
BMA	Bangkok Metropolitan Administration
BMA	Bangkok Metropolitan Area
BMR	Bangkok Metropolitan Region
BOB	Bureau of Budget
BOD	biochemical oxygen demand
BOI	Board of Investment
BOQ	bill of quantities
BRT	Bus Rapid Transit
CBD	Central Business District
CBD	Commercial Business Districts
СВО	community-based organization
CBT	Community-based Tourism
CBTA	Cross-border Transport Agreement
CCRC	Continuing Care Retirement Community
CLM	Cambodia, Lao PDR, and Myanmar
CSR	Corporate Social Responsibility
CY	Container Yard
DASTA	Designated Areas for Sustainable Tourism Administration
DEDE	Department of Alternative Energy Development of Efficiency
DEPA	Digital Economy Promotion Agency
DEQP	Department of Environmental Quality Promotion
DIW	Department of Industrial Works
DLA	Department of Local Administration
DLT	Department of Land Transport
DOP	Department of Older Persons
DOT	Department of Tourism
DPT	Department of Public Works and Town and Country Planning
DWR	Department of Water Resources
E&M	evaluation and monitoring
EDGAR	Emission Database for Global Atmospheric Research
EE	Empowerment Evaluation
EEC	Eastern Economic Corridor
EGAT	Electricity Generating Authority of Thailand
EIA	Environment Impact Assessment
EQMP	Environmental Quality Management Plan
ERIC	Environmental Research Institute
ESB	Eastern Sea Board

ESC	Environmentally Sustainable City
FAD	Fine Arts Department
FCB	fecal coliform bacteria
FDI	Foreign direct investment
FGD	Focus Group Discussion
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	Gesellschaft für Internationale Zusammenarbeit (German International
	Cooperation)
GMS	Greater Mekong Subregion
GOJ	Government of Japan
GRDP	Gross Regional Domestic Product
HSW	Health, Safety and Welfare
ICT	Information and communication technology
IGES	Institute for Global Environmental Strategies
JAIF	Japan - ASEAN Integration Fund
JCC	Joint Coordinating Committee
JCMU	The Japan Center for Michigan Universities
JICA	Japan International Cooperation Agency
KKTS	Khon Kaen Transit System Company Limited
ККТТ	Khon Kaen Think Tank
KKU	Khon Kaen University
KPI	King Prajadhipok's Institute
KPI	Key Performance Indicator
LAO	Local Administrative Organization
LRT	Light Rail Transit
LSDP	Local Strategic Development Plan
MIC	Ministry of Internal Affairs and Communication
MNRE	Ministry of Natural Resource and Environment
MOI	Ministry of Interior
MOPH	Ministry of Public Health
MOT	Ministry of Transport
MOTS	Ministry of Tourism and Sports
MOU	memorandum of understanding
MSW	Municipal Solid Waste
NAMA	Nationally Appropriate Mitigation Action plan
NEQA	National Environmental Quality Act
NESDB	National Economic and Social Development Board
NESDC	National Economic and Social Development Council
NESDP	National Economic and Social Development Plan
NGO	non-governmental organization
NMT	National Municipal League of Thailand
NR	National Road
NR	National Reform
NSO	National Statistical Organization

ODLOC	Office of Decentralization to Local Government Organization Committee
ONEP	Office Natural Resources and Environmental Policy and Planning
OPM	Office of Prime Minister
OPS	Office of Permanent Secretary
OTP	Office of Transport and Traffic Policy and Planning
PAO	Provincial Administrative Organization
PCC	Project Coordination Committee
PCD	Pollution Control Department
PCU	Passenger car unit
PMO	Prime Minister Office
PONRE	Provincial Office of Natural Resources and Environment
PPP	Polluters Pay Principle
PPTA	Private Public Transportation Agency
PSDP	Provincial Strategic Development Plan
PSO	Provincial Statistic Organization
РТ	Planning Team
R/D	Record of Discussion
REO	Regional Environmental Office
SDGs	The global Sustainable Development Goals
SEZ	Special Economic Zone
SFC	Sustainable Future City
SFCI	Sustainable Future City Initiative
SPSO	Spatial Development Planning and Strategy Office
SRT	State Railway of Thailand
STP	Sewerage Treatment Plant
T.N.	Tessaban Nakhorn
TAO	Tambon Administrative Organization
TAT	Tourism Authority of Thailand
TAZ	Traffic Analysis Zone
ТСВ	total coliform bacteria
TDM	Transport Demand Management
TEI	Thailand Environment Institute
TFCP	Project for Promoting Sustainability in Future Cities of Thailand
TGO	Thailand Greenhouse Management Organization
TICA	Thailand International Development Cooperation Agency
TMO	Town Management Organization
TOD	Transport Oriented Development
TPES	Total primary energy supply
TRACE	Tool for Rapid Assessment of City Energy
TRF	Thailand Research Fund
TSP	Transformative Scenario Planning
U3A	University of Third Ages
UD	universal design
UNFCCC	the United Nations Framework Convention on Climate Change
UNIAP	United Nations Inter-Agency Project on Human Trafficking

USP	unique selling point
WG	Working Group
WHO	World Health Organization
WS	Workshop
WtE	Waste to Energy

Executive Summary

Part I Sustainable Future City Initiative

1. Profile of Thai Future City Project

Project for Promoting Sustainable in Future Cities of Thailand (Thailand Future City Project, TFCP) commenced in August 2015, in order to promote sustainable urban development in local cities of Thailand. More specifically, TFCP aims to establish a development concept for the Sustainable Future City (SFC) in Thailand and to develop a practical implementation mechanism to realize such a sustainable city concept in Thailand. TFCP comprises three stages, "Policy Research on Future City Development Concept in Thailand" in stage 1, "Preparation of Development Plans and Conduct of Pilot Projects in Model Cities" in stage 2, and "Finalization and Dissemination of Planning and Implementation Guidelines" in stage 3.

The implementation organization of the TFCP is composed of the Joint Coordinating Committee (JCC) and Counterpart Team of National Economic and Social Development Board (NESDB) at national level, tessaban and Planning Team (PT) and Local Consultant Team at tessaban level on Thai Side and JICA, JICA Project Team, and the JICA Advisory Committee on Japan's side.

2. Key Urban Development Challenges and Rationale of and Needs for Sustainable Development in Local Cities of Thailand

There are some prevailing trends of socio-economic changes in the context of changes of Thai society as a whole such as depopulation and aging of the communities that causes diminishing economic dynamics in the existing urban centers. Urban areas are economically, socially, and physically influenced by such socio-economic changes because such changes have important implications on urban policies.

Moreover, it is important to note that local cities are redefined to become local growth centers in the current 12th National Economic and Social Development Plan (NESDP) that constitutes the first 5-year of 20-year National Strategy. Local cities are expected to be "Livable Cities" for all and to take more proactive roles and functions as development bases for a province or a cluster of provinces.

Given these two aspects, there are seven key implications for sustainable urban development in local cities, which should be well considered both in national urban development initiatives and local government development policies.

- Self-sustaining economic competitiveness / promotion of centrality of city
- Sustainable environmental strategy
- Attractiveness and identity of cities/ pride of the local community
- Depopulation, aging, and low-fertility society/ livable city for all

- Strengthened initiatives of tessabans in development
- Strengthened peoples' participation in development/ core of sense of ownership
- Linkage between national government policy and program and local actual needs.

3. Development of Sustainable Future City Initiative

3.1 Objectives and Overall Concept of SFCI

Sustainable Future City Initiative (SFCI) was proposed as an implementation mechanism to realize sustainable urban development. Overall concept and outstanding features of SFCI are summarized as below.

- National-government-guided and local-government driven development: to strengthen local initiatives to set its own visions and propose the plan and, at the same time, to ensure financial and institutional support of national or provincial government to link with locallyproposed projects.
- People-centered development: to apply participatory approach in the all of the planning process in order to understand actual needs of stakeholders and ensure collaboration of such stakeholders in implementation and operation stage.
- New and Different Approach: including holistic approach to cover economic, social and environmental aspect comprehensively, regional approach to extend municipal administrative boundaries for effective urban management, long-term approach to examine future sustainability of the urban area and collaborative approach to expand scope and scale of planning and ensure its implementation.
- Common Visions of Sustainable Future City: While visions for sustainable future city (SFC) are not homogenous but vary according to the city's locality, five (5) characteristics that cities should aspire for in preparing their own visions, including (i) self-sustaining competitive, (ii) attractive and distinctive identify, (iii) eco-friendly and resilient, (iv) safe, secured, and inclusive, and (v) civic pride for future generations.

3.2 Target Cities and Organizational Structure

Target cities to participate SFCI are regional growth cities and local urban centers. Since SFCI aims to serve as a policy tool to direct more equitable and sustainable development all over the county, those cities can be centers of their respective regions. Specifically, it includes all of tessaban nakhons and tessaban mueangs. Surrounding tessabans and TAOs should be integrated to consider sustainable development of the integrated urban areas.

3.3 Organizational Structure

Organizational Structure of SFCI is described in the Figure 3.5, including JCC as overall steering committee of SFCI, NESDB as a main secretariat, the selected tessabans to participate SFCI model city projects, and PT meeting to discuss analysis, plan and projects in the SFCI.



Note: National Economic Social Development Board (NESDB), Department of Public Works and Town and Country Planning (DPT), Department of Local Administration (DLA), Department of Industrial Works (DIW), Office of Transport and Traffic Policy and Planning (OTP), Department of Land Transport (DLT), Office of Natural Resources and Environmental Policy and Planning (ONEP), Department of Environmental Quality Promotion (DEQP), Pollution Control Department (PCD), Department of Alternative Energy Development of Efficiency (DEDE), Thailand International Cooperation Agency (TICA), National Municipal League of Thailand (NMT)

Figure 1 Organization Structure of SFCI

3.4 Overall Framework of SFCI

The SFCI commences with a clear commitment of the national government to achieve a national policy fully aligned with the 12th NESDP. As a policy document, the SFCI Development Guideline has been prepared by NESDB with technical assistance by JICA and approved by the JCC. The SFC Development Guideline provides a strategic framework for their sustainable development, describe key urban development challenges, establish SFCI guiding principles, common visions, SFC implementation framework.

Based on the SFCI Development Guideline, participating tessabans conduct SFCI projects, including research planning and project formulation, and implementation. Project implementation support will be provided by national and provincial organizations and the dispatched Consultant accordingly. Overall framework of SFCI is illustrated in the Figure 1.



Figure 2 Overall Framework of SFCI

3.5 SFC Research and Planning

SFC Planning: SFC Plan is a core output of the SFCI. Based on the result of sustainability analysis, the SFC Plan is formulated to identify issues and projects to achieve the SFC vision, of which main concept is to keep sustainability of economy, society and environment of tessaban. The SFC Plan includes vision, strategies, and projects.

SFC Plan should be a holistic plan to keep sustainable urban growth in long run. It can cover any sector which is authorized by central and provincial administration as well as those under tessaban or the Local Strategic Development Plan (LSDP). The SFC Plan can also cover the surrounding tessabans and Tambon Administrative Organizations (TAOs) depending on the issues identified in each city, while the Comprehensive Plan covers urban areas in the surrounding tessabans and TAOs (see Figure 2). The SFC Plan can include projects which will be implemented by central and provincial ministries, changwat, PAOs, or surrounding tessabans/TAOs. It is important for the SFC Plan to harmonize with the relevant plans of these agencies and, at the same time, for SFC projects to be included in those relevant plans.



Figure 3 Coverage of SFC Plan

SFC Project Formulation SFC projects are formulated as potential actions to be taken to materialize strategies. Each strategy has several programs and projects. In the SFCI, a list of projects is formulated as action plans for further elaboration, where detail consideration such as engineering design, procurement list etc. is not be included. The action plan identifies, at least but not limited, initial implementation schedule and potential project financial sources of each project from the possible budgeting sources. (see Figure 3).

No.	Project	Year 1	2	3	4	5	Organization (potential budget source)
1	AA Planning						Changwat
2.	BB construction project		-		-		DLA
3	CC capacity development						KPI
4	DD training	_					Tessaban (own budget)
x	XX Construction		_		-		Changwat Cluster
Y	YY Development	-					DPT
Ζ	ZZ Festival						TAT

Figure 4 Image of Action Plans of SFC Projects

Participatory Planning Process through Planning Team (PT) Meeting: Participatory planning process, one of the most important features of SFCI, is composed of (i) issues identification "where we are?" at the first step, (ii) vision formulation "where we want to go?", (iii) plan formulation "how can we achieve vision?", and then (iv) project identification. Tessaban and Local Consultant closely work together to prepare each PT meeting. Output of the PT meeting is summarized by tessaban and local consultant in order to proceed to the next step.



Note: PR: public relation of the output of each meeting by tessaban

Figure 5 Participatory Planning Process in the First Phase of SFCI

Ownership of SFC Plan: Since SFCI is implemented along with SFCI Development Guideline authorized by NESDB, core output of SFCI are eventually owned by NESDB as a main secretariat of NESDB. SFC Plans and Projects can be a part of Regional Development Plan of NESDB.

3.6 SFCI Project Implementation Support

Based on the approved SFC plan and projects, tessabans receive implementation support to

promote implementation of those projects, including the following;

- Collaboration with National and Provincial-level Authorities: Tessaban or Changwat office are the main actors and are expected to collaborate with relevant government agencies such as provincial office of ministries Provincial Administrative Organizations (PAOs), neighboring tessabans and TAOs. Private sector, universities and communities are also actively coordinated. Tessaban makes MOU with relevant organizations, which are directly related to the formulated projects.
- **Technical and Institutional Support by National Departments:** Technical and institutional supports are provided by national departments through discussion.
- **Project Financial Supports:** Potential budget to implement SFC projects under the existing Thai administrative system are summarized as below:

(i) **Municipal General budget:** Some of SFC projects, particularly for the small ones and short-term ones can be included in the LSDP and implemented directly under municipal general budget.

(ii) **Specific subsidy of DLA:** Specific subsidy of Department of Local Administration (DLA) is allocated to the specific projects depending on the policy issues. DLA is only one national department to provide direct subsidy to local administrative organizations including tessaban. Once SFCI is identified as a key policy issue, DLA can provide specific subsidy to the selected tessabans.

(iii) Changwat and Changwat Cluster General Budget: Tessabans can apply general budget allocated to changwat and Changwat cluster, which shall be screened and approved through discussion in the regional committee. NESDB is also a member of that committee.

(iv) Function budget: Function budget is budget of each department of line ministries. Each tessaban can coordinate with relevant departments depending on the sector of SFC plans to get budget. However, since budget allocation depends on policy of each ministry, it is difficult to put priority under SFCI.

(v) Fund: There are several funds available for tessabans in Thailand. It includes Regional Urban Development Fund, which was established by WB and operated by Government Saving Bank, National Village and Urban Community Fund. However, Mayor is not willing to take loans.

In addition to the above existing budgeting, there is special budget system to respond to the urgent policy issues as below;

(vi) **Special budget:** Special budget for local economic development started several years ago. A total amount of THB 100,000 mil was allocated by provincial cluster in 2017 and by region in 2018. Tessaban can submit project application to changwat and Changwat shall approve the projects. NESDB is one of screening committee member.

It is also proposed to set up budgeting system, which is earmarked under SFCI.

(vii) SFCI Matching Fund: This is a proposed funding mechanism for SFCI to ensure stable budgeting for SFC projects. One of the options is that national government provide grant for

60-70% of total cost and tessaban pay 30-40% by themselves, which needs further consideration.

Part II SFCI Model City Projects

4. Model City Projects: the First Phase of SFCI

4.1 Purpose of SFCI Model City Projects

In order to examine the implementability of the SFCI on the practical ground as well as the relevance and appropriateness of the SFCI Development Guideline, first phase of SFCI conducted as model city projects including Pilot Projects with financial support of JICA. The main purposes of the model city activities are as follows;

- to examine implementability of the SFCI
- to check the relevance and appropriateness of the SFC Development Guidelines,
- to make leading cities for sustainable urban development of local cities of Thailand, and
- to identify issues on existing administrative systems on urban development that need improvement, such as institutional and budgeting mechanism, if possible.

4.2 Identification of Target Tessabans and Selection of Model Cities

Model Cities for SFCI cover 6 tessabans, in order to cover different types of cities in terms of the following;

- Size of municipality (Tessaban Nakhorn and Tessaban Mueang)
- Four regions (northern, north-eastern, central, and southern region)
- Urban typology in the national development context (regional center, strategic city, urban cluster center, provincial center, others)
- Urban development issues
- Development mechanism

Model Cities for SFCI were selected in several steps. Criteria and selected tessabans at each step are summarized in Table 4.1, of which detail is described in the following chapters.

Step of Selection			Selection Criteria (number)	The no. of selected tessabans
1.	Overall Target	-	Tessaban Nakhorn (30)	208 tessabans
	Tessabans	-	Tessaban Mueang (178)	
2.	Target	-	Regional growth cities (28)	163 tessabans
	tessabans by	-	Local urban centers (135)	
	type of			
	tessaban			

 Table 4.1
 Summary of Criteria and Selection Step of Model Cities

3.	Longlist of candidate model cities	 Qualitative evaluation mainly on the following points, Strong leadership and capability for city development Possibility of replication in other cities Recommendation from relevant agencies (KPI¹), DLA, DEQP²), PCD³, NMT⁴) 	34 tessabans
4.	 Shortlist of candidate Socio-economic vitality, including population growth rate, Financial Capacity, revenue per capita, share of own revenue Tessabans' capacity, including awarding record Possibilities to discuss key issues of local cities 		13 tessabans
5.	Invitation and	 Invitation was sent to the shortlisted 13 cities Proposal was submitted by 9 tessabans 	9 tessabans
6.	Final Selection Criteria	 (1) Evaluation of Proposal Understanding on SFCI readiness to join SFCI (2) Variety of model cities Regional balance City typology (3) SFCI dissemination Possible issues and themes in the common visions implementation mechanism 	6 tessabans

Note: The number of tessabans are as of 2015.

1) KPI: King Prajadhipok's Institute, 2) DEQP: Department of Environmental Quality Promotion, 3) PCD: Pollution Control Department, 4) NMT: National Municipal League of Thailand

4.3 Implementation Process of SFCI Model City Projects

SFCI Model City Projects are separated into the following nine (9) steps.

- (1) NESDB and JICA Project Team prepare SFCI Guidelines and send invitations to the shortlisted tessabans.
- (2) Tessabans submit applications to join SFCI.
- (3) NESDB and JICA Project Team select 6 model cities and JCC approves them.
- (4) NESDB and JICA Project Team dispatch local consultant teams to support tessabans for SFC Planning
- (5) Tessabans formulate PT and develop SFC Plan and identify SFC Projects
- (6) Tessabans submit SFC plan and projects to NESDB and JCC for approval.
- (7) Tessabans identify pilot project, to be financed by JICA
- (8) Tessabans formulate detail plan of priority SFC projects for budget application
- (9) Relevant departments are expected to provide budget to implement SFC projects.

4.4 Schedule of Model City Activities

Overall Schedule of SFCI Model City project activities are shown in Figure 4.1. After six model cities (Chiang Rai, Phitsanulok, Nan, Khon Kaen, Phanat Nikhom, Krabi) were selected in May 2016 through proposal evaluation, JICA Project Team and Local Consultant team started to visit model cities and commenced model city activities officially at Kick-off Seminar on 5th July 2016.



Figure 6 Implementation Schedule of SFCI Model City Project

4.5 Formulation of Planning Team (PT) and Project Coordination Committee (PCC)

Since one of the important concepts of SFCI is "local-driven approach", Tessabans need to have strong initiatives to lead SFCI activities. At the same time, multi-sectoral local stakeholders shall be involved from the planning stage to achieve another important concept of SFCI "collaborations".

As a basis to practice such participatory and collaborative approach, each tessaban and JICA Project Team together with local consultant firstly worked together to identify stakeholders of public, private, academic, and community organizations to cover comprehensive aspects of urban development, including social, economic, environment and urban management. Each tessaban finalized a list of PT, which shall be chaired by each Mayor. Each city has own characteristic of the members depending on its development issues.

5. Sustainable Future City Plan of Each Model City

As a result of SFCI, all six model cities formulated their respective SFC Plans and identified SFC Programs as well as a list of SFC Projects. JICA Pilot Project was also selected as a priority project which included preparatory activities and start-up projects. The outputs of the model cities activities are summarized below.

5.1 Tessaban Nakhorn Chiang Rai

SFC Vision and	Vision: Chiang Rai, City of Happiness for All		
Strategies	Strategy 1: Infrastructure System Development for Safety in Life and Property		
	Strategy 2: Generation of New Value by the Interaction of All Ages		
	Strategy 3: Development of Health Service for All Ages		
SFC Program	Generation of New Value by the Interaction of All Ages		
	To provide the opportunities to encounter various people Gitter City Development		
	 Sister City Development Create the places to interact all generations at Doi Saken 		
	 Expand IT accessibility 		
	To provide educational opportunities for capacity development		
	- The Third University		
	- Digital education for life-long learning		
	- Promotion of Sufficiency Economy Philosophy		
JICA Pilot Project The Project for Promoting Interactions among the All Ages through			
	Learning		
	Component 1: Active Learning Courses for Elderly People		
	Component 2: Camp Program for Students		
	Component 3: Organic Vegetation Training for Community People		
	Component 4: Tourism Spot/ Program at Doi Saken		
Expected output	 Active learning can make people develop their skills. 		
of SFC Program	 Platform for interactions with all ages, which can make strong communities. 		
	• Learnings and interactions can make people have more confidence of local		
	culture, products and identity.		
Long-term	• Expect to upgrade local culture, products, and identity new Chiang Rai values		
impact of SFC	through interactions with all ages		
Plan	• Io enhance sustainability of Chiang Rai, in terms of sustained population,		
	tourism promotion.		

5.2 Tessaban Nakhorn Khon Kaen

SFC Vision and	Vision: Make the City Global, Create a Happy Society" and "Smart City"
Strategies	Strategy 1: Enhance "Centricity "in Isan
	Strategy 2: Smart and yet Traditional Urban Renewal
	Strategy 3: Green and Quality Amenity City
	Strategy 4 : Beyond car-oriented development
	Strategy 5: Sustainable Urban Growth with Nature
	Strategy 6: Design for All
	Strategy 7: Safe, Secured and Quality Living Environment

SFC Program	Beyond Car-oriented Development			
	Transit-oriented Development			
	• Development of high-order transit system along NR 2 as the main transit ax			
	• Extended feeder transit network in a hierarchical manner (smart bus stop wit			
	bicycle parking system, para-transit, taxi)			
JICA Pilot Project Public Transport Promotion				
Expected output	Higher number of public transport passengers and bicycle users			
of SFC Program	 Reduce barriers of shifting from private to public transport 			
	 Improve security of bicycle parking facilities 			
Long-term	• The project can promote public transportation multimodal connectivity,			
impact of SFC	accessibility and information facilities and services. It can encourage more			
Plan	people to use public transport and non-motorized transport and reduce traffic			
	issues by shifting behavior from private transport to public transport.			

5.3 Tessaban Mueang Krabi

SFC Vision and	Vision: To make Krabi City as Art and Culture City with Tourism			
Strategies	Strategy 1: Conservation & promotion of environmental and tourism resources			
	program			
	Strategy 2: Conservation & promotion of cultural and tourism resources			
	Strategy 3: Promotion of Community-based Tourism (CBT)			
SFC Program	Enhancement on Dissemination of Andaman Culture			
	Improvement of Andaman Cultural Center			
	Development of Andaman OTOP Shop			
	Marketing and public relation promotion			
	 Promotion of art activities and cultural learning and teaching 			
	Establishment of local support/volunteers group and their activities			
	Krabi Art Olympic 2018			
	National artists exhibition			
	Development of international art hall			
	Construction of historical tracing ship			
JICA Pilot Project	The project for improvement on Entrance Area of Andaman Cultural			
	Center, Design and Construction of Local Beverage and Sweets Shop and			
	Marketing and Public Relation Promotion			
	Sub-project 1: Improvement of entrance area of Andaman Cultural Center			
	Sub-project 2: Design and construction of local beverage shop			
	Sub-project 3: Marketing & public relations promotion			
Expected output	• Increase of visitors of Andaman Culture Center through collaboration with			
of SFC Program	the other tourism destinations.			
	Increase of tourists visiting historical and cultural sites in Krabi Municipal			
through Community-based Tourism.				
	Revitalization of agricultural industry and relevant local industry			
	Increase of employment opportunities.			

Long-term impact of SFC Plan	• Establishment of distinguished cultural tourism hub for people in the tessaban Krabi and neighboring communities as well as domestic and international tourists, which will promote sustainability of Krabi and surrounding area.
	• Provision of lessons learned for other tourism cities, in terms of coordination
	between tessaban and regional tourism, community-based tourism, strategic tourism marketing, etc.

5.4 Tessaban Mueang Nan

SFC Vision and	Vision: Nan, The Happiness and Living Old Town		
Strategies	Strategy 1: Revitalization of Value of Nan's Existing Cultures and Traditions		
	Strategy 2: Improve the quality of life in Nan's style		
	Strategy 3: Improve & Conserve the Quality of Environment		
	➔ Cross-cutting project of All 3 Strategies		
SFC Program	Experience Nan Live Museum along the Bicycle Route		
	1) Establishing Bicycle routes or routes for demonstrating Nan's museum Increase attractiveness of routes for HEALTHY NAN		
	2) Solid Waste Management for Nan for CLEANER NAN (to contribute for		
	beautification of bicycle route)		
	3) Increase green area for GREENER NAN(to contribute for beautification of		
	bicycle route)		
JICA Pilot Project	• "Experience Nan-the Living Old Town along the bicycle route" cross-cutting		
	project		
	Component 1 : Long Nan Information Center		
	Component 2: Lighting for Temples and Archeological Sites Projects		
	Component 3: Solid Waste Management		
Expected output	Promote residents and tourists for acknowledging their unique traditions such		
of SFC Program	as architecture, herbs /food, crafts, etc., and way of life.		
	Improved solid waste management to be suitable for Nan's lifestyle and		
	contributing the bicycle lane beautification.		
	• Increased green area in their houses, and riverbanks and along the bicycle		
	lane for beautification.		
Long-term impact of SFC Plan	 Value of old towns and Nan's way is promoted to both tourists and locals. Improve health & happiness for both tourists and locals by consuming clean & safe food and through exercise by riding bicycle. Increasing green area and apply proper solid waste management will reduce pollutions and improve environmental quality. 		

5.5 Tessaban Mueang Phanat Nikhom

SFC Vision and	Vision: Livable City
Strategies	Strategy 1: Strengthen Phanat Nikhom as urban service center
	Strategy 2: Improve livability in Multi-generation
	Strategy 3: Utilize local resources for uniqueness as Phanat Nikhom

SFC Program	Provision of Urban Services for Various Generation and Their Lives in					
	Comfort					
JICA Pilot Project	Project for Introducing Universal Design in Phanat Nikhom					
	 To develop universal design guiles for Phanat Nikhom 					
	• To develop of a "long-term strategy" for introducing universal design in					
	Phanat Nikhom and to identify "required projects"					
	Priority project improvement					
Expected output	• Guideline for universal design including the components of infrastructure,					
of SFC Program	building, facilities/equipment and public awareness					
	• Diagnosis map through workshop/ interview survey and location of the					
	problem					
	Long-term strategy and project list					
	Implementation of priority project					
Long-term	Livable city for all ages can enhance centrality of Phanat Nikhom, which can					
impact of SFC	sustain people in Phanat Nikhom and thus sustainability of Phanat Nikhom.					
Plan	• To provide lessons learned for other cities with aging society, in terms of					
	comprehensive strategies for universal design.					

5.6 Tessaban Nakhorn Phitsanulok

SFC Vision and	Vision: Central City with nice landscape, Happy People				
Strategies	Strategy 1: Encouragement of next leading business				
	Strategy 2: Improvement of Naa Yuu (sustainability) and Local Pride for All				
	generations				
	Strategy 3: Provision of Infrastructure Utilities for Safety and Sufficient Living				
	Environment				
SFC Program Preparation for Aged Society					
	Hardware improvement				
	Software improvement				
	 People ware development Database and IT system to serve social welfare and medical service for elderly. 				
	people				
JICA Pilot Proiect	t The Pilot Zone for Creating Sustainable Ageing Society				
Apply universal design concept to design infrastructure and p					
(hardware)					
	Care system integration (software)				
	Capacity development (people ware)				
	10-year strategic plan				
Expected output	Improving infrastructure supporting all standards for aged and disabled				
of SFC Program	• The integrated care system can make people get efficient social welfare				
	services				
Long-term	• Contribute to create "livable city for all people" including aged and disabled.				
impact of SFC	It may generate sustainability of society of Phitsanulok in the long-term.				
Plan	• Transfer of the lessons to other similar-scale Tessaban Nakhon and its				
	surrounding Tambons.				

Source: JICA Project Team

5.7 Short-term Actions identified in the SFC Plan

Project	Project description	Budget (THB)	Status	Implementing Body	
Chiang Rai	Developing Doi Saken Community Area to be a source of learning and as a new tourism spot:				
	Keeree Chai Yama. Most short-term actions will be conducted under the Tessaban's budget				
	following mid-to-long term actions	are being coordina	ated with relevant o	lepartments.	
Construction of Sky	- Footpath development within	15 million	Being prepared	DLA Subsidy	
Walk	Doi Saken area		under FY 2019		
			budget		
Water system	-	250,000	Being prepared	Tessaban budget	
renovation					
Electric and light	-	105,000	Being prepared	lessaban budget	
renovation		200.000	Delte en en en el	Transland boot	
Installation of CCIV	-	200,000	Being prepared	lessaban budget	
System Sign of Joarning		450.000	Linder	Tassahan budgat	
sign of learning	-	450,000	Drocuromont	lessaban budget	
source			process		
Improve Jandscape		500.000	Under	Tessahan hudget	
on Doi Saken		500,000	Procurement	lessabali buuget	
on bor saken			nrocess		
Construction of	-	22 million	Being prepared	Northern Regional	
buildings supporting			under FY 2019	Dev Budeet	
the use of children.			budget	Dev. Budget	
vouth, people and			Sauger		
elderly.					
Camping	-	500,000/year	Being prepared	Tessaban budget and	
1 5			51 1	Schools in Chiang Rai	
				City Municipality	
Hikina	-	100.000/vear	Being prepared	Tessaban budget and	
5			51 1	Schools in Chiang Rai	
				City Municipality	
CBT for touching	- To realize sufficiency economy	1.0 million	Being prepared	For short-term by	
lifestyle follow	philosophy through	(200.000/vear)	51 1	, tessaban/Ministry of	
sufficient economy		(200,000/year)			
philosophy.	community-based tourism			Iourism or Sport	
Arrangement of	-	50.000/vear	Being prepared	Tessaban budget	
meeting rooms,				g	
seminar, recreational					
activities					
Sport field	-	300,000	Being prepared	DLA Subsidy	
improvement			under FY 2019		
			budget		
Khon Kaen	Roadmap for public transport pron	notion has been de	veloped under the	SFCI. Short Term Action	
	Plan is shown below, of which the	detailed financial s	ources will be disc	ussed under Smart City	
	Committee after completion of JIC	A Pilot Project.	I	I	
Linkage information	- To create route map of transit	10 million	2018-2019	Khon Kaen Smart City	
	system.			Operation Center	
Place information	- To create map of surrounding	10.0 million		Tessahan	
	area of each bus stop.				
Public transport	- To improve bench, shelter,				
support	lighting, phone charger and	10.0 million		Tessaban	
	solar panel at bus stop				
Data management	- IO create mass transit	10.0 million		Knon Kaen University	
1	management system within	1		(NKU)	

Project	Project description	Budget (THB)	Status	Implementing Body
	the city			
Public transport app	 To develop application software on smart phone to support songthaew passengers 	5.0 million		KKU
Cashless payment	- To introduce RFID smart card system in songthaew	1.0 million		Public Private Partnership (PPP)
Skills development of service providers	 To improve management of the service providers 	2.0 million		ККО
Accessible public transport transit	 To develop public terminal as an integrated travel hub for users to switch modes. 	2.0 million		Tessaban
Multimodal	 To promote multi-modal public transport to provide alternative choices 	20.0 million		РРР
Marketing campaign	 Marketing campaign to encourage citizen to use the public transportation 	2.0 million		РРР
Public space	 To make agreement or regulation about multi- stakeholder to create public space 	30.0 million		Tessaban
Krabi	Action list under SFC Strategy "Con	servation and Prom	otion of Cultural ar	nd Tourism Resources in
	Krabi urban area and Surrounding are as below;	Beaches " was pre	pared, of which sho	ort-term action projects
Construction of Local Community Products and Andaman OTOP Shop	 Construction of OTOP shop building Café next to this building is being developed under JICA Pilot Project 	21 million	Under Procurement process	Community Development Department
Promotion of art activities and cultural learning and teaching	-	100,000		Tessaban
Establishment of local supporter/ volunteer groups and their activities	-	50,000		Tessaban
Thailand Biennale Krabi 2018	- International Art event in Andaman Culture Center	50 million	2018.11~2019.2	Krabi Cultural Office, Ministry of Culture
International Art Hall	- Development of Art Hall	90 million	Being prepared under Regional Development Plan (FY2019)	Krabi Changwat
Nan	Under Nan Old Town Museum Development Plan, action lists have been prepared under 3 strategies, of which short-term action projects are as below.			
Design Installation of Lighting at historical sites	 Installation of lighting based on the detail design prepared under JICA pilot project 	30mil (first year) 62 mil (overall)	2019 2020	Department of Fine Arts
Underground electric lines project	 Put electric lines in the city center under ground 	700 million	2018-2022	Provincial Electricity Authority
Phanat Nikhom	Action list under SFC Strategy "Imp	orove Livability in M	ulti-generation" an	d barrier-free guideline

Project	Project description	Budget (THB)	Status	Implementing Body
was prepared, of which short term projects are as below;				
Phanat Nikhom Stadium Improvement Project	- Renovation of the stadium to	2 million	FY 2019-2020	Phanat Nikhom
	be suitable for all ages (based			Municipality /Thai
	on the guideline prepared			Health Promotion
	under JICA pilot project)			Foundation
Tessaban Mueang Phanat Nikhom Park Improvement Project	- Renovation of the public park	3 million	FY 2019-2020	Phanat Nikhom
	to be suitable for all ages			Municipality /Thai
	(based on the guideline			Health Promotion
	prepared under JICA pilot			Foundation
	project)			
Bike Lane Suggestion Program Project	- development of the 2.6 km	1.04 million	FY 2019	Phanat Nikhom
	bike lane			Municipality
	- To promote activities for all			
	ages in communities			
	- To reduce cars in tessaban			
	- To improve livability of			
	tessaban			
Public Parking Lot Improvement Project	- To add more facilities for public	190,000	FY 2020-2021	Phanat Nikhom
	transportation in tessaban			Municipality /Thai
				Health Promotion
				Foundation
Phitsanulok	10-year Strategy for Sustainable A	Ageing Society was	prepared through	SFCI, comprising four
	strategies and 49 projects. Most of	the short-term actio	ons will be conduct	ed under the Tessaban's
	budget. The following mid-to-long	term actions are bei	ng coordinated wit	n relevant departments.
training and income generation	- Career training for elderly	300,000/ year	FY2019	lessaban/ Provincial
	(vegetable planting, food			Ministry of Society
	processing, invention etc.)			
Construction and renovation of footpath and road for all	- Universal design strategy	150,000/ year	FY 2019	Tessaban/ Changwat
	- Construction and renovation of			
	the footpath			

Source: JICA Project Team

6. Summary and Lessons Learned from the First SFCI Model City Projects

6.1 Evaluation on the Overall Framework of SFCI.

Based on the result of questionnaire and interview survey with representatives of six model cities, all of model cities evaluated SFCI very useful with meaningful result, showing that they highly appreciate SFCI as a whole. More specifically, they evaluated SFCI systematic process of planning, comprehensive planning approach, networking/ coordination with relevant department and other tessaban as well as JICA's input such as conduct of pilot project and study tour in Japan. Generally, the model cities consider the role of NESDB very important and expect to continue SFCI to disseminate to other cities.

Impact of "National-government-guided and Local-driven-development"

Through six model city activities, key concept of SFCI, "national-government-guided and localgovernment-driven" approach has been recognized as an effective approach to promote sustainable urban development in local cities of Thailand as following;

- Through SFCI, tessabans can understand not only national and regional development plan but also **urban development policies of relevant departments.**
- Through SFCI, tessabans can get **technical advice from relevant departments.** However, the first phase of JCC does not include some of key departments since some of key issues were not well recognized during preparation stage of TFCP.
- Through SFCI, national department can understand **local needs effectively**, which have been identified through discussion with stakeholders in the PT meetings.

Coordination with Relevant Departments

Through SFCI, tessabans can coordinate with relevant departments directly linked with the selected issues, and thus to promote SFC projects effectively. Such coordination also makes tessabans find missing points and find solution for them.

There are some cases that relevant organizations hesitated to coordinate beyond their responsibilities, or the roles of those organizations are not clear. Or there are some difficulties to shape up all ideas into the plan and to find the main responsible organizations. In such cases, it is essential for tessaban team or local consultant team to communicate with them continuously and make a common understanding in order to make an integrated plan efficiently.

Impact on Cooperation with Surrounding Municipalities

Through SFCI, it is promoted to communicate with surrounding municipalities from the planning stage and all of tessabans have deepened their understanding on coordination with surrounding municipalities. However, it should be noted that there are still institutional constraints to conduct projects which cover administrative areas of more than two municipalities.

Evaluation of Planning Process of SFCI

SFCI applies **systematic planning process**, starting from current analysis, future prospect, sustainability analysis, visioning, identification of strategies and then project formulation. Since each project is logically explained in the overall SFC plan, tessabans can easily explain rational and

necessity of each project to the relevant ministries, when necessary.

SFCI's holistic approach is highly evaluated as well. SFC plans shall cover various sectors under the selected themes. Such holistic planning approach have made tessaban members think themselves and formulate SFC plan clearer.

SFCI introduced **participatory planning process** as the most important planning concept. At the beginning, each tessaban is requested to identify key stakeholders and organize PT and to hold PT meetings at every planning steps. Such participatory approach enhanced "sense of belongings" of citizens and made the output of SFCI persuasive and enabled it easier for tessaban to implement projects once approved. However, in some cities, some of key agencies were missed in the PT meeting, since municipalities did not notice from the beginning, particularly for private sector. They invited agencies that they had recognized at the beginning. Therefore, it is recommended to continue those participatory process in future.

It should be noted that **strong leadership** of Mayor is also very important factor to proceed SFCI. Regular internal discussion among Mayor, tessaban team, and local consultant team is very important in order to summarize the result of planning meetings with all stakeholders and decide priority issues for each tessaban.

Through **the study tour to Japan**, all of participants from six cities gained various findings, which have been reflected to ideas and methods in urban developments of their own cities.

Impact on the Project Implementation

One of the significant impacts of SFCI is to make tessabans accessible to many channels of budgeting through coordination with relevant agencies. It includes general budget of changwat or changwat cluster, functional budget of national department, funds sources etc. Some SFC projects proposed in the SFC plan are being financed by relevant organizations.

On the other hand, it may take time to get budget for the proposed project. In order to facilitate implementation of SFC projects smoothly, it is essential to **coordinate with existing plans**, Or it is also effective to secure tessabans' own budget to implement small-scale project as a start-up project which can link the time-gap before the budget of other departments are secured.

It is also appreciated that SFCI's participatory approach can enhance **participation of all relevant stakeholders at implementation stage.** Public, private, civil society, and academia discuss implementation, operation, and management of the SFC plan, which can make "Pracharat" in each area.

JICA pilot projects are also appreciated by all of the model cities. It could be a model or a seedproject for other projects preparation and helped to conduct the immediate action to solve the priority issues. It was also useful for tessabans to understand systematic process. However, it should be noted that this budget is special treatment under JICA's technical assistance, which may not be continuously provided for the next phase of SFCI.

Impact on Human Resource Development of Tessaban

Although SFCI does not provide any specific training program for tessaban staff, it is evaluated that SFCI has contributed to enhance capabilities of tessaban staff, including systematic thinking skills and broadened mind of tessabans staff both for planning and designing project.

6.2 Key Urban Development Issues identified in the SFCI

Inner City Problem: Considering population decrease in Thailand, there are two (2) different types of population decrease. First one is "real population decrease" where urban population in that areas has actually decreased due to deterioration of economic centrality of tessaban. Second one is "superficial population decrease" where urban area has expanded to outside tessaban and overall urban population has not decreased.

The tessabans with the first type of population decrease may substantially lose attractiveness as urban area itself. Economic revitalization measurements are strongly required for those tessabans. On the other hand, the tessabans of the second type may have sustained the attractiveness as urban area itself. It is preferable to prepare inner-city development/revitalization plan which focuses on activating the central area and covers various aspects.

Urbanization beyond Municipality Boundary: Since active urban development often occurs outside tessaban, tessaban can't control those private activities as a driving force for development of tessaban. In future, it is better to reorganize tessabans to cover wider areas, at least to include urbanization area as a part of tessabans, but it is also effective to collaborate among surrounding tessabans to promote urban development together.

Infrastructure and Urban Services for Aged Society: Many tessabans realize importance to take proper actions against aged society, which is one of key national policy issues specified in the 12th NESDP as well. Phitsanulok, Chiang Rai and Phanat Nikhom have taken this issue in the SFCI and make different approaches one another. As a result, various types of issues of aged society have been covered in the first phase of SFCI, including human-ware development for tessabans' capacity to handle aged society, multi-generations active learning, software development for integrated database for aged people, economic aspect for job creation for aged people, and hardware for universal design.

Public Transport Development in Local Cities of Thailand: Tessaban Nakhon Khon Kaen have been very active to promote public transport development and focused on it during SFCI as well. Through the process of SFCI, several typical issues to promote public transport services in local cities of Thailand have been identified; (i) little focus on the existing public transport mode, Songtaew, (ii) complicated relationship among authorities on public transport services, (iii) needs to change the mindset of relevant agencies to pay more attention to existing public transport services, and (iv) needs to change image of songtaew by integrating opinions of new generations.

Job Opportunities for Young Generation: One of critical factors causing population decrease is insufficient job opportunities for young generation. Tessabans need sufficient living conditions and job opportunities for young generation to maintain economic and social sustainability of tessaban.

6.3 Issues to Promote Urban Development in Local Cities of Thailand

Shortage of information and data: Various local information and datum make it possible for analysis and planning. Especially population statistical is essential, however there is no data corresponding to tessabans and also no data for the local migration as well as the population of precise unit of areas. The statistics on the industry is in the same situation. Therefor it is necessary to improve various database for the cities.

A questionnaire survey to citizens asking their needs and opinions was conducted in each city

during the research and planning stage of SFCI. Although it was a simple one, it can be the basement of public participation for tessabans to grasp citizens opinion from wide range. It is quite desirable to analyze the change of citizen's awareness and to clarify the issues by the periodical questionnaire survey to citizens.

Preparation of Sectoral Plans for Various Issues: It is found that most of model cities have not prepared any comprehensive plans for each sector. Without systematic or logical list of projects of each sector with priority, local consultant team faced difficulty to identify projects in the short-term once specific themes were identified in the PT meeting. The most desirable way is for tessaban to prepare sectoral plans of major issues beforehand, such as public transport, solid waste management, etc. Considering that most of tessabans in Thailand have little technical capabilities and human resources to formulate such sectoral plan by themselves, it would be useful to prepare a guideline and examples of good practice of Thailand under SFCI or by each line agency. It enables tessabans to prepare sectoral plans or to be good reference for them to improve quality of planning under SFCI.

Necessity of Multi-disciplinary or Inter-ministerial Approach: Those urban development issues consequently requires multi-disciplinary approach to prepare comprehensive measurements in various sectors. Since the roles and responsibility of Thai government is completely divided into several sections, it may be more effective to assign certain organization (NESDB) to coordinate with agencies concerned and to formulate SFCI plan holistically with multi-disciplinary approach or with combining various sectoral development measurements.

Coordination with Regional Universities: It is found that lack of human resources of tessabans in terms of the number of staff and their capabilities are serious issues to develop SFC plans and formulate SFC projects. During the first phase of SFCI, local consultant team was dispatched to each tessaban to support to formulate SFC plans, to proceed participatory planning process, to coordinate relevant agencies, to identify priority projects and find possible budgeting sources for them. Some of the tessabans have collaborated universities as consultant team. Since those universities have collaborated with tessabans for long time, they know well about local conditions. At the same time, universities can provide technical support for tessaban to formulate the plans as well. In this context, it is very useful both for tessabans and universities to work together in SFCI as well.

7. Conditions and Issues to be Clarified to Continue SFCI in Thailand

7.1 Endorsement as a Policy Tool

In order for NESDB to continue the SFCI in Thailand, it is necessary to adopt it as a practical policy tool in order to realize the "People Centered Development" concept of the 12th National Economic Social Development Plan and the required promotion of the "National Reforms", which is a top priority issue of the NESDB.

Once it fits well with its policies, the NESDB can be the right agency in the promotion of the SFCI's "National Government Guided and Local Government Driven Approach" in realizing sustainable cities in Thailand. This is because the SFCI covers several issues and sectors comprehensively and requires inter-ministerial coordination at the central level.

In this context, key components of the SFCI needs to be clarified, including expected output of the SFCI, scope that will be discussed in the SFCI, and the target cities.

7.2 Administrative Mechanism for the SFCI

While the first phase of SFCI was operated under JICA technical assistance project, TFCP, it is necessary to set up administrative mechanism for Thai government to promote SFCI continuously and to promote the six model cities' experiences to other cities. The following key actors need to be clarified, including SFCI Secretariat, SFCI Committee, Changwat Government, Provincial departments of SFCI Committee members, and SFCI Platform

7.3 Budget for SFCI

Necessary budgeting for the SFCI can be divided into three types of budget, namely (i) budget for overall management for the secretariat work, (ii) budget for participating tessabans to prepare SFC plans and projects and (iii) budget for project implementation. While JICA dispatched an expert team to support secretariat work and provided financial support for consultant and some part of SFC project implementation as pilot project for the first phase of SFCI, it is necessary to secure these budgets from the Thai government in order to continue SFCI in Thailand.

8. Proposed Framework for the Next SFCI

8.1 Administrative Mechanism for the SFCI and Stakeholders

Possible organizational structure of SFCI for the next phase is described in the Figure 7.

SFCI Committee: SFCI Committee is the national-level steering committee for SFCI. It approves the selection of SFCI tessabans, evaluates and approves the SFC Plans and Projects, and facilitates inter-organizational coordination to ensure smooth implementation of SFC Plans and Projects. SFCI Committee will be held in time with SFC Plan and Project approval or whenever necessary.

SFCI Secretariat: The NESDC¹ will be in charge of overall management and supervision of the model city activities, as the secretariat of the SFCI. The NESDC shall send invitations, select tessaban at the preparation stage, monitor and evaluate SFC plans and projects at the planning stage, provide necessary coordination including giving instructions to relevant agencies to ensure the implementation of SFC projects.

Tessaban and SFCI Team: Tessaban has the sole authority to carry out the SFCI at the local level. The tessaban shall establish the SFCI Team in the tessaban as the SFCI project owner and the secretariat at local level, which shall manage and operate SFCI activities at the local level as well as liaise with other organizations concerned.



Note: National Economic Social Development Council (NESDC), Department of Public Works and Town and Country Planning (DPT), Department of Local Administration (DLA), Office of Transport and Traffic Policy and Planning (OTP), Department of Land Transport (DLT), Office of Natural Resources and Environmental Policy and Planning (ONEP), Department of Environmental Quality Promotion (DEQP), Pollution Control Department (PCD), Ministry of Public Health (MOPH), Ministry of Social Development and Human Security (MOSSHD), Tourism Authority of Thailand (TAT), Designated Area for Sustainable Tourism Administration (DASTA)Department of Alternative Energy Development of Efficiency (DEDE)

Figure 7 Organization for SFCI for the Next Phase

Planning Team Meetings: The planning team is a platform of participatory planning approach, that discusses and identifies in the formulation plan and the decision to prioritize projects in the

¹ NESDB was reorganized to National Economic Social Development Council (NESDC) based on the National Economic and Social Development Council Act in 2018.

SFCI. The tessaban shall nominate members of the planning team who can join and will be responsible for a series of SFCI activities at local level. The tessaban will organize the planning team meetings at each stage of the SFCI, in order to involve stakeholders' opinion and get their consensus.

Project Coordination Committee: It is important for the tessaban to closely coordinate with changwat office and provincial departments in promoting inter-departmental coordination to cross-cut issues and regional coordination on regional issues and thus to ensure implementation of the proposed SFC plan and projects. PCC shall be established at beginning and be chaired by Changwat Governor to discuss the proposed SFC Plan and Projects and facilitate inter-departmental coordination.

Changwat Office of Relevant Departments: Changwat offices of relevant department will be a member of PT as well as PCC. Active involvement of departments in charge of sectors focused in SFC Plan is inevitable from the first stage of SFCI.

8.2 SFCI Platform

Based on the network established during the first Phase of SFCI, SFCI platform shall be formulated in order to build up a mechanism for tessabans to share knowledge and experiences with other participating tessabans (city-to-city network). SFCI platform can also establish national-to-local networks where national government agencies can understand local needs more clearly and the local government can understand national-level urban issues.

The SFCI platform shall be composed of tessabans that participated or are participating the SFCI, central government departments involved in the SFCI committees, or other organizations related with urban development or local administration, such as KPI and NMT.



Source: JICA Project Team

Figure 8 Conceptual Image of SFC Platform

8.3 Overall Framework and Major Components of SFCI

The overall framework of the SFCI is shown in Figure 9. It is almost same as the first phase, expect for the JICA Pilot Project, which was financed by JICA for some of the small-scale and priority
projects in the SFC Plan. In the next phase of SFCI, all of SFC Projects shall be implemented under financial resources of Thailand, including tessaban's general budget, provincial general budget, and function budget of relevant departments and other financial resources such as development fund.



Figure 9 Overall Framework of SFCI

The core output of the SFCI will be the following:

- **SFC Plan**, including vision and basic directions, strategies to achieve its vision, and projects to realize the strategies (Figure 13.4.2);
- **5-year Action Plan,** a list of short-term projects with priorities, including expected schedules, implementing bodies and possible budget sources (Figure 13.4.2);
- SFC project formulation and its implementation support (Figure 13.4.3); and
- Participatory Planning Process (Figure 13.4.4).

S	FC Plan	SFC Visi	ion and	Basic D)irectio	n	
Strategy 1 Strategy 2 Strategy 3 Project 1 Project 2 Project X Project 1 Project 2							
No.	Project	Year 1	Year 2	Year 3	Year 4	Year 5	Supporting Organization (potential budget source)
1	A Planning						Province
2.	B construction project						DLA
3	C capacity development						KPI
4	D training	E					Tessaban (own budget)
5	E training				I		Tessaban (own budget)
Х	X Construction			C			Cluster Budget
Y	Y Development						MOT
Z	Z Festival						TAT

Figure 10 Image of SFC Plan and 5-year Action Plan



Figure 11 SFC Project Implementation Supports



Note: PR: public relation of the output of each meeting by tessaban

Figure 12 Participatory Processes of the SFCI

8.4 Monitoring by Tessaban

In order to ensure sustainable implementation of the SFC Plan and Projects and continuous improvement through PDCA (Plan-Do-Check-Again) Cycle, it is important to monitor progress of SFC plan and projects together with relevant stakeholders.

Set-up Monitoring Framework: Tessaban will set up monitoring framework to monitor and check the progress of the 5-year Action Plan. It includes monitoring group at tessaban level to follow-up at a regular basis and meeting with NESDC and national departments to check progress of implementation of SFC Plan periodically.

Monitor and Check the Progress of SFC Projects: Progress of the SFC Projects (5-year action plan) will be checked compared to the original ones. Tessaban will make the monitoring sheet and check progress, output, and delays and its causes, if any.

Update and Revise the SFC Plan and Projects: Based on the result of checking of progress of the Projects, tessaban should list up and examine problems and issues to be concerned. Based on the identified problems and issues, tessaban should identify necessary revisions on the SFC Plan and 5-year Action Plan and identify issues and necessary actions to be tackled. NESDC and relevant authorities will also provide advice to support them.

8.5 Preliminary Framework for the Second Phase of SFCI toward the Thai SFCI in the Future

JICA and NESDC have discussed extending the on-going "Project for Promoting Sustainability in Future Cities of Thailand (TFCP)" to cover the Second Phase of SFCI as <u>an intermediate phase</u> and to connect with Thai SFCI initiatives in the future.

In order to ensure continuous implementation of the SFCI as managed by the Thai government, it is proposed that the Thai government play a **leading role as the main secretariat** in the second phase, while the JICA Project Team will work as an advisor.



Figure 13

Proposed Image of Staging of the SFCI

Part I

Sustainable Future City Initiative

1. Overall Framework of Thai Future City Project

1.1 Background

Thailand has successfully achieved economic growth in the last several decades and has reached the status of an upper-middle-income country. However, its urban development trajectory has not always trodden an environment-friendly or sustainable path. While climate change mitigation and reduction of greenhouse gas emissions will be two of the country's most important policy issues from a global perspective and standpoint of energy security, these have to be studied carefully to realize a sustainable society.

The Government of Thailand has identified "green growth" as one of the country's major pillars in policy making which should be pursed, as indicated in the 11th National Economic and Social Development Plan (NESDP) and in Thailand's Country Strategy. The government is also keen to promote green growth from the perspective of city/town development, although the detailed scope, methodologies, and institutional arrangement have not yet been developed.

Bangkok Metropolitan Area (BMA) is the only metropolitan area in Thailand. With a population of 8.3 million, it accounts for about 35% of the country's urban population. Thailand has 2,440 municipalities (tessaban¹), most of which have populations of less than 100,000. The biggest tessaban is Nonthaburi with 256,000 residents. These municipalities face various issues in urban environment, infrastructure, industries, and jobs, as well as an aging population, thereby necessitating the formulation of a development vision and plan.

Since the Decentralization Law was enacted in 1999, powers, funding, and human resources have been transferred from centrally controlled provincial administration to local administration. However, personnel and financial resources have not yet been fully at the same pace as responsibilities. Local administrative organizations find it difficult to develop their own vision and formulate long-term projects for their local strategic development plans, which they themselves prepare. The formulation of the Comprehensive Plan, a spatial development plan which serves as basis for infrastructure development has also not yet been devolved to local administrative bodies. As a result, field offices of the Department of Public Works and Town and Country Planning (DPT) in most cities, except for the really large ones, formulate comprehensive plans for cities but with little coordination with local strategic development plans.

It is in this context that the Government of Thailand requested the Government of Japan (GOJ) to conduct a project entitled "Project for Promoting Sustainability in Future Cities of Thailand" (hereinafter called the TFCP) to learn from Japan's experience and know-how in the field of sustainable city management. Japan International Cooperation Agency (JICA) thereafter sent a preliminary mission to Thailand to discuss the project's scope of work including area, scope, and government requirements. On 31 March 2015, both sides signed the Record of Discussion (R/D).

¹ Tessaban refers to municipalities in Thailand.

1.2 Objectives

The TFCP's objectives are: (1) to establish a development concept of a future city for cities/towns in Thailand, and (2) to develop appropriate implementation mechanisms and measures to realize a sustainable urban development in Thailand.

The expected outputs of the Project are as follows:

- (i) A concept of a future city development in Thailand, addressing current issues in cities/towns, covering policy directions, and offering necessary measures, which is reflected in the Twelfth NESDP;
- (ii) An implementation mechanism and measures for future-city development in Thailand, where local government bodies (municipalities or tessaban) take the initiative in promoting this concept in collaboration with relevant authorities, the public, and the private sector;
- (iii) Planning and implementation guidelines to establish future cities in Thailand, which will help the tessaban in analyzing current conditions, setting its own vision, establishing development strategies, and implementing them by working with stakeholders; and
- (iv) Development and action plans for model cities, where the above-mentioned concept, mechanism, and guidelines will be tested and refined.

1.3 Stages of TFCP Implementation

TFCP commenced in July 2015, TFCP comprises three stages, "Policy Research on Future City Development Concept in Thailand" in stage 1, "Preparation of Development Plans and Conduct of Pilot Projects in Model Cities" in stage 2, and "Finalization and Dissemination of Planning and Implementation Guidelines" in stage 3.

The Draft Final Report describing the output up to Stage 2 was submitted in November 2018, and then JICA and National Economic and Social Development Board (NESDB) started to discuss next phase of Sustainable Future City Initiative (SFCI²) to cover the second round of SFCI activities. Stage 3 was conducted to finalize all the activities and output of JICA TFCP.



² SFCI is described in Chapter 3.

1.4 Implementation Organization of the TFCP

The implementation organization of the TFCP is composed of the Joint Coordinating Committee (JCC) and Counterpart Team of NESDB at national level, tessaban and Planning Team (PT) and Local Consultant Team at tessaban level on Thai Side and JICA, JICA Project Team, and the JICA Advisory Committee on Japan's side as shown in Figure 1.4.1.



Figure 1.4.1 Project Organization

Joint Coordination Committee (JCC)

JCC was established in order to facilitate inter-organizational coordination. It is chaired by Secretary General of NESDB and comprises of relevant national departments, as listed below. JCC has been held in time with reports submission and whenever necessary, in order to discuss project framework, progress of activities, and any other pending issues

- Director General of Department of Public Works and Town and Country Planning (DPT) or representative
- Director General of Department of Local Administration (DLA) or representative
- Director General of Department of Industrial Works (DIW) or representative
- Director General of Department of Land Transport (DLT) or representative
- Director General of Pollution Control Department (PCD) or representative
- Director General of Department of Environmental Quality Promotion (DEQP) or representative
- Director General of Department of Alternative Energy Development of Efficiency (DEDE) or representative
- Director of Thailand International Cooperation Agency (TICA) or representative
- Director of Office of Transport and Traffic Policy and Planning (OTP) or representative
- Secretary General of Office of Natural Resources and Environmental Policy and Planning

(ONEP) or representative

- Deputy Secretary General, National Municipal League of Thailand (NMT) or representative

Planning Team (PT)

PT was established at tessaban level right after commencement of the model city projects, in order to discuss the result of analysis and formulate plan and project in the SFCI. It comprises secretariat members of tessaban and key stakeholders, such as community, provincial offices of government departments, academia, associations, private sector. Member composition of Planning Team are different by tessaban depending on the themes of SFCI of each city.

JICA Project Team

JICA Project Team is composed to cover various fields of expertise to examine sustainable urban development. Integrate project management group will closely coordinate to share issues and manage the Project efficiently and flexibly.

- Dr. Katsuhide NAGAYAMA, Team Leader /Urban Development Strategy/Urban Environmental Strategy
- Ms. Motoko KANEKO, Deputy Team Leader /Urban Development Strategy (2)/Urban Environmental Strategy (2)
- Mr. Atsushi SAITO, Urban Planning (1)/Participatory Planning
- Mr. Junji SHIBATA, Urban Planning (2)/ Infrastructure Planning
- Mr. Haruhiko IMAI, Local Administration/Provincial Administration
- Ms. Mihoko OGASAWARA, Land Use Planning
- Ms. Nobuko SHIMOMURA, Urban Environmental Planning
- Mr. Shigeki KAWAHARA, Industrial Promotion/Local Economic Development
- Ms. Ayako NAKAGAWA, Townscape and Urban Design
- Ms. Ayumi KOYAMA, Local Economy and Society
- Ms. Rui SHIMODAIRA, Project Coordinator
- Mr. Kenta OHNO, Project Coordinator (2)
- Ms. Natsumi SASAKI, Project Coordinator (3) / Participatory Planning (2)

1.5 Records of the Project Activities

During the course of the TFCP, various types of the meetings and seminars have been conducted. JCC was organized and participated by national departments in time with reports submission and at the periodical event of the TFCP, where project framework, progress of activities, and pending issues were discussed.

After model city projects commenced, plenary workshops were organized in order to share progress of model city activities, discuss key development issues, and get lessons learned each other. At tessaban level, Planning Team Meetings and Project Coordination Committee

(PCC) were organized at each stage of model city activities, in order to involve stakeholders' opinion and get their consensus.

Another important activity of the TFCP is Japan Study Tour. First and Second Study Tours were conducted early 2016 and participated by member of JCC, which cover national policies and initiatives to promote sustainable urban development in Japan. Third one was organized in the end of 2016 in the middle of research and planning stage of model city activities in order to get lessons learned on sustainable development for each city. 4-6 members from each tessaban participated the tour and visited different types of cities of Japan, which have similar characteristics and development issues of each city. Detail of the Japan Study Tour were summarized in the Table 1.5.2, of which details are summarized in the Chapter 3 of the Appendix 1.

	Stage 1		Stage 2			Stage 3
	2015		2016	2017	2018	3
	8 9 10 11 12	1234	5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	12345678	9 10 11 12
Plenary Activiti	es					
JCC	Δ	Δ .	Δ.	Δ		Δ
WG ¹⁾	Δ	Δ				
Seminar/WS ²⁾				Δ	Δ	
Japan Study		$\Delta\Delta$	Δ			
Tour						
Model Cities						
Chaing Rai			$\Delta\Delta\Delta$ Δ Δ		$\Delta\Delta$ Δ	
Khon Kaen				$\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta$	\bigtriangleup	
Krabi			ΔΔΔΔΔ Δ			
Nan					\triangle \triangle	
Phanat				$\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta\Delta$		
Nikhom						
Phitsanulok						

	۲able 1.5	.1 Li	ist of	Meetings	and	Activities
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Note: 1) WG: working group, 2) WS: workshop

Source: JICA Project Team, Each tessaban

	First Tour	Second Tour	Third Tour
Period	16 Jan. 2016	30 Jan. 2016	7 Dec. 2017
	~ 24 Jan. 2016	~ 7 Feb. 2016	~17 Dec. 2017
Participants	NESDB (6)	NESDB (4)	NESDB (4)
	PCD	DPT	Khon Kaen (3)
	DEQP	DLA	Phitsanulok (5)
	DEDE	NMT	Krabi (3)
	ONEP	DIW	Chiang Rai (6)
		DLT	Phanat Nihkom (4)
	Total 10 members	OTP	Nan (4)
		JICA Thailand	JICA Thailand

 Table 1.5.2
 Summary of Japan Study Tour

			Total 11 members	Total 30 members
Visited	Cabinet Office		Cabinet Office	MIC
Organization	MIC ¹⁾		MIC	Meiji Univ.
Visited Cities	lida City,	Nagano	Toyama City	Hayama Town
	Prefecture		Kanazawa City	Kanazawa City
				(separate tour)
				Kusatsu City
				Obuse Town
				Toyama City

Note: 1) MIC: Ministry of Internal Affairs and Communication Source: JICA Project Team

2 Analysis on Current Status of Local Cities of Thailand

2.1 Changes in Socio-economic Development and their Implications to Urban Development and Administration

2.1.1 Salient Social and Economic Changes

Thailand has enjoyed rapid economic growth due to the successful growth of the manufacturing and service sectors in the last 30 years, which has in turn resulted in significant changes in people's lives especially in urban areas.

Now, Thailand faces a turning point in its development as a people and as an economy as the international business environment becomes more competitive and traditional values become lost in the frenzied pace of urban life, and this has a significant implication to the country's further economic development and to efforts at improving the quality of life in the urban areas. This part discusses four important aspects of the country's current situation which should be examined carefully because they are key influential elements that will shape future urban development.

1) International Business Climate and Position of Thailand in ASEAN/Global Society

ASEAN member countries have exerted great efforts at obtaining more development opportunities in the context of economic globalization. The basic policy taken by the Association of South East Asian Nations (ASEAN) is to integrate the ASEAN market through trade facilitation using institutional and physical measures.

As for institutional measures, the ASEAN Economic Community (AEC) and Cross-border Transport Agreement (CBTA) of the Greater Mekong Subregion (GMS) are the major mechanisms to ease movement of people and goods among ASEAN member countries. As for physical measures, the development of regional trunk transport infrastructure has been pursued to achieve good connectivity among the countries.

Better connectivity through regional transport infrastructure, more economical transportation, and fewer cross-border barriers are expected to contribute significantly to the generation of new development opportunities in the region. To maximize its benefit from this improved trade environment, Thailand has designated five development corridors, namely, the East–West Corridor, Southern Corridor, North–South Corridor, Northeastern Corridor, and Central Corridor.



Source: NESDB, Draft of 12th National Economic and Social Development Plan

Figure 2.1.1 Economic Development Corridors

As a consequence of the successful economic development led by the manufacturing and service sectors in the last 30 years, Thailand has become one of the economic centers in the region. Thailand has attracted quality human resources, mobilized sufficient capital for further investment, and developed technologies as a foundation for next-generation economic growth.

However, it seems that Thailand might be losing some of its competitiveness in the conventional manufacturing sector in the region because of increasing production costs and decreasing human resources of productive age. In this regard, Thailand may need a new policy to further improve the welfare of its people if it aspires to transition to a "high-value added economy."

The historical path of Thailand's economic growth can be roughly divided into three phases. In each phase, there was a driving force, as summarized in Table 2.1.1.

Table 2.1.1	Phases and Driving Forces o	f Thailand's Economic	Development
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Phase of Economic Development	Driving Force
1st period (up to mid-1980s) "Pre Take-off"	Export-oriented agricultural production
2nd period (mid-1980s to mid-2000s)	Labor-oriented industrialization with FDI ¹⁾
3rd period (mid-2000s to future)	Service and higher-value-added economy

Note: 1) FDI: Foreign direct investment Source: JICA Project Team



Source: World Bank Database 2015

Figure 2.1.2 Comparison of Per-capita GDP among Southeast Asian Countries

There is one important fact to be noted regarding the Thai economy. The country's agriculture and agro-processing sectors have continued to be the stronghold of the Thai economy and has become internationally competitive even after a labor-oriented industrialization appeared as the new driving force of the economy. Foreign direct investment (FDI)-led industrialization after the mid-1980s served as a new layer of economic activities on top of the base layer that is agro-based economic activities. It is a well-known fact that agro-based export was one of the most important factors that quickly pulled the

Thai economy out of the doldrums as a result of Asian financial crisis in 1997. While sometimes underestimated, agro-based economy has made progress, shifting to more profitable modes of production in parallel with the growth in the industrial and service sectors. This aspect is explained more in the following sections.

2) Changes in Economic Structure

Observing Thailand with aggregated indicators as one national economy, there seems to show little change in its structure during the past 20 years. However, in fact, the Thai economy has experienced some significant changes.

Changing Regional Profiles of Non-agriculture Sectors

There have been significant changes in the economic structure when this is observed by region. Among the regions with higher non-agricultural shares in their gross regional domestic products (GRDPs), the Bangkok Metropolitan Region (BMR) has become highly "service-intensive" and much less "industry-oriented," while the Eastern Region has become highly "industry-intensive." The Central Region has absorbed the spillover of industries from the BMR and has shown some signs of accommodating "suburban agriculture."

	Castar	GRDP at M (Billior	arket Price n THB)	Share in GRDP (%)		
Area	Sector	1995	2013	1995	2013	Change in % point
	Agriculture	383	1,459	9	11	2
Whole Country	Industry	1,583	4,773	38	37	-1
	Service	2,252	6,677	53	52	-2
	Agriculture	21	55	1	1	0
Bangkok and Vicinities	Industry	802	1,659	36	29	-7
	Service	1,390	4,009	63	70	7
	Agriculture	55	160	11	7	-4
Eastern Region	Industry	301	1,611	60	69	10
	Service	149	558	29	24	-6
	Agriculture	18	72	7	10	2
Central Region	Industry	142	462	60	62	1
	Service	76	215	32	29	-4

Table 2.1.2 GRDP by Sector in Areas with Higher Non-agricultural Shares, 1995 and 2013¹

Source: Regional/ Provincial GDP 2013, NESDB

¹ At market prices.

Growth of Agricultural Sector

There has been a notable growth in the agricultural sector, particularly in regions with higher agricultural shares in their GRDPs as shown in Table 2.1.3.¹

¹ Among these regions, Southern Region is the only one where the percentage share of non-agricultural GRDP increased more than the agricultural GRDP. This doesn't mean agriculture in the Southern Region is weaker. Rather, this could be explained by the fact that tourism-related sectors, most prominently international tourism in Phuket, have grown quite remarkably during the period.

Decien	Costor	GRDP at M (Billior	arket Price 1 THB)	Share In GRDP		
Region	Sector	1995	2013	1995	2013	Change in % Point
	Agriculture	383	1,459	9%	11%	2%
Whole Kingdom	Industry	1,583	4,773	53%	52%	-2%
	Service	2,252	6,677	38%	37%	-1%
	Agriculture	71	387	19%	28%	9%
Northeastern	Industry	104	340	27%	24%	-3%
	Service	206	677	54%	48%	-6%
	Agriculture	61	378	19%	33%	14%
Northern	Industry	91	276	29%	24%	-4%
	Service	168	482	52%	42%	-10%
	Agriculture	29	102	18%	22%	4%
Western	Industry	59	174	37%	38%	1%
	Service	70	181	44%	40%	-5%
	Agriculture	129	306	32%	27%	-4%
Southern	Industry	84	252	21%	23%	2%
	Service	193	557	48%	50%	2%

 Table 2.1.3
 GRDP by Sector in Areas with Higher Agricultural Shares, 1995 and 2013¹

Source: Regional/ Provincial GDP 2013, NESDB

¹ At market prices.



Source: Henri Leturque and Steve Wiggins, Overseas Development Institute, UK, 2011, "Thailand's progress in agriculture: Transition and sustained productivity growth".

Figure 2.1.3 Growth and Productivity in Agriculture, 1962–2006

Thai agriculture has grown with increasing productivity both in labor and land. There was a transitional period sometime around 1988–1990 when they shifted their modes of agricultural growth from "extensional growth" to "intensive growth," as they run out of new arable lands and surplus labor in rural areas. Emerging higher-value markets, first in BMR and later in local cities in other regions, alongside the country's economic growth, have further encouraged diversification and specialization among farmers in order to focus more on crops with higher commercial values. For example, around the year 2000, packaged ready-to-eat, cut vegetables, a typical form of consumer goods for emerging urban demand, were available only in supermarkets around Bangkok. But now, these processed vegetables are available virtually in all major local cities in Thailand. This agricultural growth has contributed to the growth of the urban economy in up-country in the areas of food processing, trading, and retailing.

Service and Agriculture in Local Regions Generated Most Employment

Given the growth of agriculture and agro-based local urban economies, majority of the net additional employments were created by the agriculture and service sectors in the local regions other than Bangkok and the Central Region. Out of the total increase in employed persons of 2.7 million during 2008–2013, 48% was in the service sector, 40% was in agriculture, and 12% was in industry.



Source: National Statistical Office (NSO), Labour Force Survey 2008 and 2013

Figure 2.1.4 Increase in Number of Employed Persons by Industry, Region, and Area, 2008–2013

Labor Shortage

Thailand suffers from labor shortage. Unemployment rates are below 1% everywhere in the country. There is no more surplus labor in rural areas; likewise, there is much less migration to BMR. As a result, an average level of salary for wageworkers has doubled in the last 10 years.²

² Unskilled workers from neighboring countries became indispensable for Thailand to cope with such shortage of labor. There are approximately 2.32 million foreign workers (1.6 million from Myanmar, 0.2 million from Cambodia, and 0.18 million from Lao PDR), according to Census 2010. There are 310 thousand foreign agricultural workers in the Southern Region, and many of them are working as important labor force in rubber plantations. On top of this, it is said that there are more than 3 million unregistered foreign workers from Myanmar.





Figure 2.1.5 International Comparison of Monthly Salary Data

Shift to High-value-added Businesses

These changes mentioned earlier drastically affect the driving force of the Thai economy. The country can't expand the labor-intensive sectors of manufacturing and agriculture anymore due to labor shortage. Thailand needs to shift to upstream economic activities, such as strategic management, headquarter function, and supply of high-value-added components in manufacturing, or to more sophisticated downstream activities such as marketing and packaging Thai products or services with premium brand to consumers.

Among others, agroindustry can be one of the core industries of local cities. Agriculture and its related agro-processing industries have a chance of becoming more profitable by focusing further on export products and expanding to the high-end market within Thailand.



Figure 2.1.6 Levels of Added Value in a Supply Chain

3) Changes in Investment Pattern

Dramatic Increase in Outward FDIs

FDI had increased since the mid-1980s, which had supported the industrialization of Thailand. However, the investment pattern has changed since the mid-2000s. The most impressive change in investment pattern in recent years is the drastic increase of outward investment to neighboring countries. Manufacturing, mining, and financial services are the major business sectors for outward investment. Singapore is the favored destination of such investment and other ASEAN member countries are also major destinations. Recently, investment into Myanmar, Laos, and Vietnam has increased quickly, which may imply the beginning of relocation of certain factories from Thailand or the development of new subfactories in surrounding countries.

As such, Thailand has become not only an FDI recipient but also an FDI supplier, which have the following two implications. One is that Thailand has large potential to play a greater role in upstream international businesses such as the site for regional headquarters, which Bangkok and its vicinity can provide. Another implication is that with its investment capacity, Thailand can specialize in high-value segments of the international supply chain with better use of local resources.





Figure 2.1.7 FDI Inflow to and Outflow from Thailand

Active Investments in Urban Areas Up-country

Seeing the recent investment trend within Thailand, on the other hand, there is an increase of investment in areas other than Bangkok and the Central Region. Although inward FDIs are still very much concentrated in Bangkok, the Central and Eastern regions, private investments are also active in urban areas up-country, of which the major recipients are the residential and commercial sectors (often located in newly developed suburban areas). These sectors are local-resource-based businesses, which can expand the economies of regional cities as well as those of medium-size and small cities.

4) Changes in Demographic Patterns

Changes in Population Growth Pattern

In the early 20th century, Thailand has a population of about 10 million. This gradually grew at a moderate pace up to around the World War II years. Population increase accelerated after the war, and exceeded 50 million in the mid-nineties. Since the 1990s, population growth has gradually slowed down. Annual population growth is 0.8% per year during 2000 and 2010, and 0.4% per year after 2010 (based on census data).



Figure 2.1.8 Population of Thailand in the Past 100 Years

Looking at the population by region, that of BMA seems to have peaked already; its recent annual growth rate is just 0.8% per year. Meanwhile, BMR continues to grow with the highest growth rate among all the regions, which is followed by the Eastern Region and the Southern Region. Other regions, such as the Northern and Northeastern regions, seem to have enter a depopulation phase.

Pagion		Population	Growth Rate		
Region	2000	2010	2015	'00-'10	'10-'15
BMA	6,355	8,305	8,643	2.70%	0.80%
BMR (excl. BMA)	3,804	6,321	6,936	5.20%	1.90%
Eastern	4,031	5,175	5,559	2.50%	1.40%
Central	2,910	3,118	3,137	0.70%	0.10%
Northeastern	20,825	18,966	18,728	-0.90%	-0.30%
Northern	11,433	11,656	11,483	0.20%	-0.30%
Southern	8,087	8,871	9,156	0.90%	0.60%
Western	3,471	3,569	3,594	0.30%	0.10%
Total	60,916	65,982	67,236	0.80%	0.40%

Table 2.1.4Thai Population by Region

Source: Statistical Year Book, NSO, 2000, 2010

Population growth also varies by type of urban area. Table 2.1.5 shows population increase by type of urban area, namely, large urban areas with a tessaban nakhorn, small to mediumsize urban areas, and other areas. It clearly shows that high population increase is observed in BMR and Eastern Sea Board (ESB) particularly in large urban areas. Large urban areas in ESB (Rayong Province and Chonburi Province), including Tessaban Nakhorn (T.N.) Chaophraya Surasak, T.N. Laem Chabang, T.N. Rayong, Pattaya City has the highest growth rate at 7.1%, which is followed by large urban areas in BMR, including Nakhon Pathom, Nonthaburi, etc. In regions other than BMR and ESB, only large urban areas have experienced population increase at 1.8%, while population in the small to medium-size urban areas have been almost saturated.

	2000	2010	AGR (%/yr) ('00-'10)
ВМА	6,355	8,305	2.7
BMR (ex. BMA)	3,804	6,321	5.2
Large urban areas ¹⁾	1,710	2,868	5.3
Other areas	2,094	3,453	5.1
ESB (Rayong and Chonburi)	1,563	2,376	4.3
Large urban areas ¹⁾	689	1,368	7.1
Other areas	874	1,008	1.4
Other Region	49,194	48,979	0.0
Large urban areas ¹⁾	4,354	5,212	1.8
Small-medium urban areas ²⁾	6,281	6,386	0.2
other areas	38,560	37,382	-0.3

 Table 2.1.5
 Population Increase by Type of Urban Area

Note: 1) Large urban areas are defined as Amphoe (district) with tessaban nakhorn

2) small-medium urban areas are defined as Amphoe Mueang without tessaban nakhorn Source: Statistical Year Book, NSO, 2000, 2010

There seems to be many reasons and backgrounds to slow down population growth; however, two important social changes are to be emphasized here: 1) changes in migration pattern and 2) changes in age structure of Thai society, which will be described below.

Changes in Migration Pattern

In the past, Thailand experienced rapid increase of urban population with a lot of migrants from rural to urban areas. This rural-to-urban migration caused various urban problems, such as poor housing, rise of slums and squatter areas in the early stages of migration, as well as traffic congestion, urban environmental deterioration, and disorderly suburban development in recent years. Accordingly, a national policy was set to restrain rural to urban migrations. Regional growth center development and decentralization were positioned along this principle.

However, this typical and traditional migration pattern has gradually changed. Figure 2.1.9 shows the historical changes immigration pattern in Thailand. The number of migrants in BMA, BMR and even whole country decreased due to the changes in population and economy. As mentioned in the previous section, population growth slowed down, so that

potential migrants in rural area decreased. At the same time, the overall economic growth in Thailand resulted in better economic conditions in rural areas, generating jobs for rural folk who would have otherwise migrated to urban areas.

Accordingly, the concentration of migrants in BMA gradually calmed down. Migration into BMR also decreased, although it was still higher than that for BMA and the whole country, which may be a result of urban area expansion in the BMR due to suburban development after the 1990s.



Figure 2.1.9 Migration Trend in the Past 50 Years

Analysis of overall migration trend by type shows that all types of migration, namely urban to urban, urban to rural, rural to urban and rural to rural, are in a decreasing trend. Rural to urban migration and urban to urban migration, which are supposed to be the main sources of population increase in urban areas, especially BMA and BMR, started to decrease after 2002.



Figure 2.1.10 Recent Migration Trend by Type of Migration

Due to the decrease in migrant numbers, the population growth rate of BMA became low. As a result, the share of BMA in total urban population gradually decreased, while its actual population did not decrease. Considering that the overall urban population in Thailand continues to increase, that in other regions increased at higher rates than that in BMA.



Source: MMC Mahidol University (2011) based on United Nation, World Urbanization Prospects Database (2010)

Figure 2.1.11 Share of Urban Population in BMA and Other Urban Areas

Changes in Age Structure of Thai Society

It is a world trend that the number of children per family has decreased in accordance with economic growth. Thailand follows this trend that the number of children is in long diminishing trend after 1970s. Now, the share of children (below 15 years old) in the total population in 2010 is only 19.9%. This is one substantial reason for the slowdown of population growth in Thailand.

At the same time, the number of aged people (more than 60 years old) has gradually increased. The share of aged people has reached 11.6% in 2010. This influences not only social security but also the need for medical and health care, public services and infrastructure and facilities.

The number of household members has also decreased to less than three (3) persons per household as a result of the increase in the number of nuclear families. This trend has various impact on the demand for urban services, such as childhood education, housing, women's occupation, and public transport.



Source: Census, NSO



Future Perspective

The above-described social changes, i.e., lower population growth, fewer migrants, more aged population, fewer children, and smaller family size, may continue in the future. Particularly, the population of Thailand will reach the peak in the year 2030, then start to decrease, based on population projections. Moreover, the depopulation phase has started in some regions. Such depopulation accelerates the decrease in the number of children and increases the share of the aged in the total population. The aged population is projected to increase to more than 32% in 2040.

These social changes have significant implications to urban policy in the following manner:

- Depopulation will cause more labor shortage in the future. Thailand cannot continue labor-intensive manufacturing and agriculture, which have been the leading driving force of Thailand's economic growth in the past. Accordingly, Thailand is required to shift the economic structure toward more high-value-added industries.
- Due to less migration, cities and towns in remote areas are required to accommodate young generation, which would be a future development potential as well.
- With smaller family sizes, the public sector will be required to pay more attention to social welfare services for children, working women, and the aged instead of family care.



Source: U.N. 2014 Urban Population Prospect



2.1.2 Implications to Urban Development and Administration

Reflecting the socio-economic changes described above, there are different trends in investment (both local and FDIs), employment, and urbanization for different regions. These are summarized in Table 2.1.6.

Region	Investment	Employment	Implication to Urbanization
BMR	 FDIs are shifting to high-level international business services. 	 Saturated and decreasing in terms of number, especially manufacturing is shrinking. 	 Decreasing population in BMA. Concentrated in suburban centers within BMR.
Central and ESB	 FDIs for high-value-added manufacturing. Labor-intensive processes are moving out to the border areas and other countries. 	 Saturated and slightly decreasing in terms of number. Demand for more skilled labor is high. 	 Outer economic zones of Greater Bangkok Area. Concentrated in urban centers servicing large industrial centers.
Other Regions	 Agro-processing wholesale, and retail are growing. Housing sector is also active to accommodate growing employed workers. FDIs are growing but not so large except for few internationally well-known tourism places. 	 Employment base is expanding in services for agro-industry and retails in urban areas. 	 Concentrated around larger urban centers. Accommodating housing and urban services.

 Table 2.1.6
 Regional Economic Trends and Implications to Urbanization

Source: Regional/ Provincial GDP 2013, NESDB

Given the economic contexts and implications to urbanization described above, a conceptual structure of a recently emerging growth cycle of local economies, especially those regions with higher agricultural shares in GRDP, is illustrated in Figure 2.1.14. The core of this cycle is the link between growing urban demand and agro-processing capacity in the local regions.

This is not, however, the best and only model universally applicable anytime or everywhere. Rather, there must be other types of growth cycles for different contexts depending upon local geo-economic characteristics. For example, places with very high potential for international tourism, such as Phuket or Pattaya, definitely have their own unique development scenarios to follow. In some cases where industrial clusters are promoted, growth cycles will be led by FDIs, a situation that is rather similar to what happened in the Eastern Seaboard in the past.

In either case, i.e., international tourism or FDIs for an industrial cluster, it will eventually generate substantial size of demand for urban consumption and services most likely in cities with higher centralities within a cluster. To link these newly generated urban demands to the local resource-based economy is the key to spreading the effects of development to the host localities; otherwise, they could remain as economic enclaves. In this context, a conceptual structure shown below is widely applicable.



Source: JST.

Figure 2.1.14 Emerging Growth Cycle in Local Urban Centers

2.2 National Spatial Structure of Thailand

2.2.1 Overall Demographic Structure

Thailand has approximately 580 thousand sq.km of territory. Its central region is a plain flat land in the Chao Praya River delta. The northern and southern regions have large mountainous areas, while most of the northeastern region is highland area. In those areas, approximately 65 million persons are inhabited.

Figure 2.2.1 shows historical change of population density of the last decade in Thailand. Bangkok and its surrounding areas have highest population density in the country. In other areas, the areas along the major trunk highways like National Road (NR) 1 and NR 2 seem to have higher population density. Furthermore, the northeastern region as a whole has relatively higher density because of its wide arable lands. However, the northern and southern regions have lower population density except for areas along major trunk roads and coastal line due to those limited flat lands.



Source: Statistical Year Book of Thailand

Figure 2.2.1 Historical Changes of Population Density

As described in the previous section, recent population growth pattern widely varies by region. Moreover, it much differs by area or by city within each region. Such recent population changes have impact on the above demographic pattern and significant implications to urban development policy of each city. Figure 2.2.2 shows specific areas that have enjoyed population increase in the last decade, which can be summarized as below;

- Large urban center in each region, such as Chaing Mai in the north, Khon Kaen in the northeast, and Hat Yai-Song Khla in the south.
- Border areas along regional corridor, such as Mae Sot in Tak province and Kanchanaburi-Ratchaburi next to Myanmar, Mukudahan next to Lao PDR, Sa Kaeo and Trat next to Cambodia.
- Areas connecting ESB and Nakhon Ratchasima, including Chon Buri, Rayong, Prachinburi, which are identified as super cluster of Board of Investment (BOI).



Source: Data extracted from Census 2000 and 2010

Figure 2.2.2 Annual Growth Rate of Districts, 2000-2010

2.2.2 Regional Corridor and Transport Network

1) Regional Corridor

Regional corridor development started from Indochina East-West Economic Corridor in the middle of 1990s, which is a typical and symbolic project to materialize regional economic cooperation in the GMS. The East-West Economic Corridor development aims to increase movement of people, goods and money in the GMS and thus to enhance economic development as a single big economic zone. It includes not only physical infrastructure such as highway but also non-physical measures or so-called CBTA to eliminate time and procedures in crossing borders.

Currently, AEC was enforced in 1995 and regional economic cooperation is deeply progressed. To gain and emerge benefits from regional cooperation, several economic corridors have been identified and developed as shown in Figure 2.1.1.

Thailand is positioned at the inter-section of the GMS economic corridors to connect adjoining countries such as Myanmar, Lao PDR, Cambodia and Malaysia, and to provide China (Yunnan province) and Vietnam with an international gateway to the Europe and South Asia. These situations have brought Thailand new development opportunities like business as a logistics hub. Meanwhile, the regional economic corridors have large impact to up-lift economic and industrial structure of Thailand; it has moved its conventional labor intensive process of manufacturing to the border areas or neighboring countries and concentrated on more value-added industries in Thailand.

2) Transport Network

Figure 2.2.3 shows overall transport system in Thailand, which is summarized as below:

International Gateways (Ports and Airports)

Thailand has six international ports and eight international airports. Leam Chabang Port and Bangkok Port are major commercial container port. Suvarnabhumi international airport is the biggest international airport in Thailand.

- International port: Bangkok, Leam Chabang, Maptaphut, Ranong, Phuket, Songkhla, Satun
- International airport: Suvarnabhumi, Don Muang, Chiang Mai, Chiang Rai, Udon Thani, Samui, Phuket, Hat Yai, (Utapao)

<u>Highways</u>

Road transport plays the most significant role in domestic transport. Approximately 85% of goods are transported by road transport. Road transport is made mainly by national highways, which have been quickly developed since 1960s. As a result, major cities in Thailand are connected one another with national highways, which have a total length of approximately 67,000 km. 98 % of national roads are paved.

As an international road network, Thailand has nine Asia highway routes with a length of approximately 5,000 km. All of them have four lanes road (two lanes per direction). Major ASEAN highway are:

- A1: Aranyaprathet (Cambodia border)~Bang Pa-in~Tak~Mae Sot (Myanmar border),702 km, Bang Pa-in~Bangkok, 45km
- A-2: Sadao (Malaysia border)~Hat Yai→Phatthalung~Chumpon~Bangkok, Tak~Chiang Rai~Mae Sai (Myanmar border), 1,459km
- A-3: Chiang Khong (Lao border)~Chiang Rai, 117km
- A-12: Nongkhai (Lao border)~Udon Thani~Khon Kaen~Nakhon Rachasima~Hin Kong (A-1) , 534km
- A-15: Nakhon Phanom (Lao border)~Udon Thani (A-12), 241km
- A-18: Hat Yai~Narathiwat~Sungai Kolok (Malaysia border), 269km

Railways

Thailand has long history of railway development. Railway used to play a significant role in domestic transport, but has gradually lost its significance in transport and replaced by road transport due to rapid and flexible truck transport. However, railways still have certain roles. State Railway of Thailand (SRT) has approximately 4,000 km of railway. Major rail routes are (1) north line, (2) northeast line, (3) east line and (4) south line, which have single rail except for the east line from Bangkok to Laem Chabang.

Currently, Thai Government launches high speed train projects such as:

- North line (Bangkok~Phitsanulok~Chiang Mai)
- Northeast line (Bangkok~Nakhon Rachashima~Nong Khai)
- East line (Bangkok (Suvarnabhumi)~Pattaya)
- South line (Bangkok~Padang Besar)



Note: BOI Investment Promotion Zoning for twenty provinces with low per capita income: Kalasin, Chaiyaphum, Nakhon Phanom, Nan, Bueng Kan, Buri Ram, Phrae, Maha Sarakham, Mukdahan, Mae Hong Son, Yasothon, Roi Et, Si Sa Ket, Sakhon Nakhon, Sa Kaew, Sukhothai, Surin, Nong Bua Lamphu, Ubon Ratchatani and Amnatcharoen

Source: JICA Project Team



3) Traffic Volume

Since most of intercity cargos and people are transported on the national highways, traffic volume may show economic relations among cities. Figure 2.2.4 shows traffic volume of major roads in Thailand. The roads linking with Bangkok particularly in the north and east directions have high traffic volume of more than 30,000 PCU per day. Traffic volume concentrate along major one-digit national highways such as NR 1 to the north, NR 2 to the northeast, NR 3 to the eastern seaboard, and NR4 to the south.

While higher traffic volume branches into NR 1 and NR 117 at Nakhon Sawan in the northern region, there are no other major traffic routes in the north region. It may be due to its limited areas with higher population density. Likewise, traffic volume branches into many roads at Saraburi, Nakhon Ratchasima, Khon Kaen to cover the whole northeastern region, due to its scattered population in the region.



Source: Date extracted from OTP



2.2.3 Urban System

Hierarchy of cities can be determined by coverage of economic influential area and types of available urban services of cities. Each city has unique relations with adjoining cities to form a sort of "cluster" to relay or share economic activities and urban services, which are conventionally called as urban system. Urban system of Thailand is summarized two ways, one is urban cluster analysis and the other is existing national spatial plans of Thailand.

1) Urban Cluster Analysis

In order to understand spatial structure of Thailand, heat map of urbanized area and a distribution map of banks and major supermarkets are created. Urbanized area of heat map is extracted from land cover map of 300m resolution in 2010. Based on the heat map analysis, urban cluster of Thailand have been identified with the following two components;

- Cities and urbanized areas which seem to have a centrality in a certain region
- Influential areas of those cities and urban areas.

The result of heat map analysis is shown in Figure 2.2.5, of which details by region are in the following sections.

Box 1 Methodology of Heat-map Analysis

(1) Data

The following data are used for the analysis:

- in the case of 1992, NOAA, ground resolution 1km, 385 polygons, urbanized areas 12,04.9 sq.km
- in the case of 2000, ESA ground resolution 300m, 8,143 polygons, urbanized areas 77,14.7 sq.km
- in the case of 2010, ESA ground resolution 300m, 8,110 polygons, urbanized areas 76,94.2 sq.km

(2) Process

Process to prepare a heat map are summarize as follows:

- using satellite image data, identify areas(polygons) that can be interpreted as urbanized area.
- determine the center of gravity of each polygon, and give the area of the polygon in this center of gravity as a scalar.
- create a heat map (application of the kernel density function) using the XY distribution and scalar of the center of gravity.
- Using the scale (the area of the polygon) with respect to the Z-axis of the heat map, create a contour.
- the contour is interpreted as representing the urbanized degree of per unit area (urban density).

(3) Interpretation

- High place of contour is interpreted as a city with a relatively centrality.
- The smaller gap between the contour lines is interpreted to be high and continuous.in urbanized area density.
- City that is on the same contour line can be interpreted as a nearly the same distance sensation from the center (the highest from the place of the contour).
- Contour of the pattern and the transportation network read the relationship between the financial (banking) and consumption (large supermarkets).



Source: JICA Project Team

Figure 2.2.5 Urban Cluster based on the Heat Map Analysis

Bangkok and the Surrounding Areas

Bangkok has strong centrality in the region and influence of Bangkok spreads over along the major truck roads. Detail characteristics in this region are as below:

- Bangkok has a distinguished centrality.
- The density of the Eastern Seaboard is high, and it seem to connect from Bangkok.
- Western region appears to be weak continuity with Bangkok, compared to the Eastern Seaboard.
- Nakhon Sawan has unique centrality to receiving influences from Bangkok through NR
 1.
- Saraburi has certain centrality but doesn't form own cluster due to strong influence of Bangkok (other area directory connects to Bangkok).
- Nakhon Ratchasima is an independent urban center with own cluster.



Source: JICA Project Team

Figure 2.2.6 Urban Cluster in Bangkok and Surrounding Area (2010)

Northern Region

Northern region has limited number of urban clusters. Major clusters are located along and strongly linked to NR 1. However, the other urban cluster seems to have weak linkage
with NR 1 due to limited accessibility with mountainous geography. Detail characteristics in this region are as below:

- The centrality of Chiang Mai is overwhelming in the north region. Lampang and Phrae are located under Chiang Mai cluster as one large urban cluster.
- Chiang Rai seems to have independent urban centrality to form its own urban cluster.
- Phitsanuok, Sukhothai and Utaradit have economic centrality with strong linkage with Chiang Mai.
- Urban clusters along NR 1 from Phitsanulok to Chiang Mai are continued.
- Nakhon Sawan seems to have strong linkage with Bangkok rather than with Phitsanulok even it is a gateway to the northern region.



Source: JICA Project Team

Figure 2.2.7 Urban Cluster in Northern Region (2010)

Northeastern Region

Medium scaled urban cluster are formed in the northeastern region. Nakhon Ratchasima is the biggest urban cluster, followed by Ubon Ratchathani, Khon Kaen/Roi Et and Udon Thani. Detail characteristics in this region are as below:

- Nakhon Ratchasima is the biggest urban cluster in the northeastern region. It seems to have strong linkage with Bangkok rather than with other parts of the northeastern region.
- Cities close to the border, such as Udon Thani and Ubon Ratchathani, keep unique higher centrality as its own urban cluster.
- Khon Kaen, Roi Et and Mahasarakam organize large urban cluster. Khon Kaen seems to be a center of this cluster.
- Buriram and Surin organize an individual urban cluster with relatively lower density.
- Loei, Phetchabun, Chyaiyaphum and Sakon Nakhon also have certain centrality to form their own clusters. These are provincial level cluster.



Source: JICA Project Team



Southern Region

Surathani, Songkhla/Hat Yai, Nakhon Si Thammarat, Phuket and Pattani are major urban clusters in the southern region. Specific characteristics in this region are as below:

- Nakhon Si Thammarat, Pattalung and Songkhla/Hat Yai forms large urban clusters. Songkhla/Hat Yai seems to be a center of this large urban cluster. Linkages connecting these urban clusters are weak.
- Phuket, Surat Thani, and Pattani organize their own independent urban clusters.
- Krabi and Ranong also organize small but independent urban cluster.



Source: JICA Project Team

Figure 2.2.9 Urban Cluster in Southern Region (2010)

Overall Map

Figure 2.2.10 overlays the heat map with population density, location of city bank branches and large-scale supermarkets.



Figure 2.2.10 Urban Cluster in Thailand (2010)

2) Urban Hierarchy

The previous national plans like 5th NESDP as well as DPT's national spatial structure plan 2057 proposed a kind of urban hierarchy to consider holistic urban policy as illustrated in Figure 2.2.11. Both plans have very similar concept to identify certain regional centers, while there are minor differences in identifying lower hierarchical cities.





Figure 2.2.11 National Spatial Structure in DPT Plan

3) Urban Hierarchy of Thailand

The results of urban cluster analysis clearly imply existence of a sort of hierarchical order in cities in terms of each economic influential area and available urban services points of view, which are also described in the existing plans as well. Section 2.1.2 also describes implications to urban development from the analysis of socio-economic development. With careful consideration on those analysis, urban hierarchies are described with the following 5 categories of cities (tessabans), which will be a basis for formulation of Sustainable Future City Concept proposed in the Chapter 3 of this Report.

Regional Center City

Regional Center is a large city of each region having strong centrality with large urban cluster, which has strong linkage with adjoining small urban clusters. Regional Center has its own economic activities and service functions covering each region such as regional offices of government, higher educational institutions, high-level medical care center, private businesses, large shopping centers and complexes and recreation facilities.

Strategic City

Strategic City is geographically located on the strategic location, such as on the borders along regional corridors, at the crossover points of regional corridors, and along coastal areas. As ASEAN is targeted to become AEC, more people come and more goods are transported over those cities. Thus, Strategic Cities have new development opportunities, such as logistic hub, new global business development as an international city, and Special Economic Zone (SEZ) development utilizing workforces in the neighboring countries.

Urban Cluster Center

Urban Cluster Center is a medium sized city, which is a center of independent medium scale urban cluster or included in the large urban clusters like its sub-center. It functions as local hub for commercial and logistics, and public service in each cluster.

Provincial Center City

Provincial Center City is a center of each province which formulates a small-scale urban cluster. It provides administrative and urban services for adjoining areas only within each cluster. It is sometimes included in or strongly connected with medium / large scale urban clusters where people of provincial center city can enjoy regional or high-level urban services, such as higher education, high-level medical care services, and so on.

2.3 Urban Development Policy Directions by Hierarchy of Cities

The 12th NESDP aims for a considerably high economic growth target and the achievement of a more equitable and sustainable social growth by reducing social inequality and facilitating environment-conscious communities. This implies the need to integrate the two directions of development efforts, i.e., vertical and horizontal developments. In other words, the Thai government has to build a social mechanism to ensure that benefits accruing from vertical economic growth will be felt all over the country.

Under this mechanism, cities in Thailand will function as distributors of economic benefits over their influence areas. Recognizing such a national necessity as well as national socioeconomic development context, urban development policies should be pursued in the medium and long term, as follows:



Note: Regional Growth Cities refer to regional centers, strategic cities (border cities and cross-points along regional corridors) and centers of urban clusters. Local Urban Centers refer to changwat capitals and other tessaban mueang.



Hierarchy	Key Issue		Economic Role and	Urban Policy Direction ¹⁾		
of Cities	Economy	Pop/Society	Function	orban roncy Direction		
BMA/BMR/	SB					
ВМА	 Globalization Leading service industries and high-value- added industries 	 Saturated population Human resource development Increase of foreigners 	 Core Management and Regional business hub: (Regional HQ International Trading Center, R&D) International city 	 Advanced IT and communication Infrastructure development (to compete Singapore, Hong Kong) Urban redevelopment Foreign-friendly living environment Mobility improvement 		
Cities in BMR	 Decrease of labor-intensive industries 	 Population increase Decrease of employment Demand for more skilled labor 	 Housing for BMA Decrease of Factories Moving out of labor- intensive industries 	 Living environmental improvement (urban services for working generation) Transport network between BMA and suburban area Redevelopment of old factory sites 		
Cities in ESB	 Secure employment Retain production center for Thai industries Regional industries located in suburban areas 	 Saturated population Needs of employment for workers at the conventional labor-intensive industries Sporadic urbanization 	 From labor-intensive to high-value-added manufacturing Mother factory for satellites in regions or neighboring countries Center of commerce/ service/ public service in the region 	 Pollution control Growth management to avoid sporadic urbanization Strengthening central urban functions (centrality) in downtown area Networking with surrounding area for regional infrastructure development and urban service provision and providing tertiary services for surrounding areas 		
Regional Gr	owth Cities in other	Regions				
Regional Center	 Secure employment Growth engine pole 	 Population increase Expansion of urban area 	 Center (regional hub) of commerce, logistics, service, public services in the region Value-added industries in agriculture 	 Growth management to avoid disordered sprawls Responding increasing urban problems (traffic congestions, solid waste management, etc.) Securing urban mobility (public transport) Regional infrastructure development Regional hierarchy for urban service provision (education, medical, etc.) 		
Strategic City	 Regional connectivity New growth potential (border trade, GMS regional corridor and coastal tourism industries) 	 Population increase Migration from other regions (including foreigners) 	 New growth pole at border / at the crossing point of regional corridors / along coastal area 	 Growth management against rapidly increasing population Responding increasing urban problems (traffic congestions, solid waste management, etc.) Networking with the surrounding economic zone Urban security 		
Urban Cluster Center	 Strengthen specific local industries Logistics hub of urban cluster 	- Saturated or decrease of population	 Center of commercial and economic activities in the urban cluster (smaller than region) 	 Provision of higher-level urban services (higher education,, medical services, etc) Strengthen connection within urban cluster and logistics development Administrative service improvement 		

Table 2.3.1	Key Issues ¹ and Urban F	Policy Directions by City	Classification
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Hierarchy	Кеу	Issue	Economic Role and	Urban Policy Direction 1)		
of Cities	f Cities Economy Pop/Society		Function			
Local Urban	Center					
Local Urban Center	 Deterioration of downtown Hollowing out of city centers 	 Population decrease Aging society 	 Commercial and logistics service hub in the urban area Public service hub in the urban area 	 Response to aging society Efficient public services (network, hub) Retain centralitiy of downtown Connection to regional growth cities 		
Other Local	Cities					
Other Local Cities	 Agriculture- based economy Improved productivity of agriculture 	 Population decrease 	 Local public service hub 	 Response to aging society Efficient public services (network, hub) Connection to 		

¹ Focusing on particular issues of each city classification and excluding common issues. Source: JICA Project Team

2.3.1 Globally Competitive BMA, BMR, and ESB

Thailand needs to prepare for its entry into the group of high-income countries by overcoming the so-called middle-income trap during the target period of the 12th NESDP. For this purpose, BMA, its metropolitan region (BMR), and ESB cities should be further strengthened to become the driving forces that will support a national economy that should be more robust than the global market and that of the GMS and ASEAN region. A more sophisticated and attractive metropolitan development needs to be facilitated to accommodate new value-added productions/technologies.

According to the Global Competitiveness Report 2014–2015, Thailand is ranked 31st out of 144 economies in terms of global competitiveness, compared to 37th in the previous year's (2013-2014) ranking. This position is evaluated as favorable, but the country is expected to become more competitive than other Asian economies (see Box 2).

In order to lead a sustainable national growth, Bangkok should be the one of the most capable Asian cities, competing with Hong Kong, Singapore, Shanghai, and Tokyo, in terms of attracting new investments and innovative knowledge/technologies. To this end, urban roadmaps are needed to enhance urban mobility, goods/freight distribution, livable housing, security and safety, disaster-free environment, and energy-efficient systems, all of which are characteristics of a globally competitive city.

Box 2: Thailand's R	lanking i	n Globa	l Competitiveness, 2014-2	015
Overall Ranking:				
<u>Thailand ranks 31st out of 144 ec</u>	onomies,	compa	red with: Singapore, 2 nd , Jap	an, 6 th , Hong Kong,
7 th , Taiwan, 14 th , Malaysia, 20 th , K	orea, 26 th	¹ , China,	28 th , and Indonesia, 34 th .	
Thailand Ranking by Evaluation It	ems:			
Basic requirement: 40 th				
1) Institutions:	84 th	7)	Labor Market Efficiency:	66 th
2) Infrastructure:	48 th	8)	Financial Market:	34 th
3) Macro-economic Env't	19 th	9)	Technological Readiness:	65 th
4) Health & Primary Education:	66 th	10)	Market Size:	22 nd
5) Higher education:	59 th	11)	Business Sophistication:	41 st
6) Goods Market Efficiency:	30 th	12)	Innovation:	67 th
Notes: Thailand earned superior	rankings	are give	n to macro-economic enviro	nment," "goods
market efficiency," and "market s	ize," while	e its infe	rior ranking is on "institutior	ns". Higher
rankings are expected for "techno	logical re	adiness	" and "innovation" in the futi	ure.
Source: Global Competitiveness Reg	ort 2014–	2015 of t	he World Economic Forum.	

2.3.2 Regional Growth Cities

Local economies should be further strengthened to realize balanced development all over Thailand, mitigating some regional economic disparities which have accrued during the period of rapid economic growth. For this purpose, along with the long-pursing national policy, the growth potentials/capacities of pivotal regional centers and strategic cities located on the GMS economic corridors should be further encouraged in order for them to become "Regional Growth Cities" with higher-valued productions by utilizing local resources.

Regional centers with large economic potential should continue to be growth engine poles for each region and as regional hubs of commerce, logistics, service, and public services. They need to secure employment and strengthen value-added industries in agriculture. With increased populations and expanded urban areas, growth management and regional infrastructure development are also key urban development issues that they have to address.

Border cities facing Cambodia, Lao PDR, and Myanmar (CLM countries) need to be strengthened for their locational advantages, providing special incentive policies for SEZs. The national spatial structure comprising north-south and east-west economic growth corridors³ should be strategically highlighted and some strategic cities in/along these corridors should, in the near future or the long term, attract new foreign and domestic investments in local value-added product processing, trading and logistics services, banking and financing services, new management services with advanced Information and

³ Four (4) GMS Economic Corridors have been identified: North-South Economic Corridors; Central Economic Corridors; East-West Economic Corridors and Southern Economic Corridors.

communication technology (ICT) such as the smart-city concept, and more environmentconscious and energy-saving business. In this regard, industrial hubs designated under the new BOI policies of "Super Cluster Development" should be accommodated in urban plans. As regards urban development policy, the increasing numbers of workers, particularly migrants from CLM countries, have raised security issues. Networking with surrounding industrial zones should be coordinated well with managing the growth of urban areas.

2.3.3 Local Urban Centers

There exist approximately 2,400 local cities (tessabans) all over the country, out of which about 200 cities are categorized as tessaban nakhorn and/or mueang, which function as local urban centers and changwat capitals, to support local economies and provide urban services. Their population sizes vary from 10,000 to 50,000. While urbanization is going on in some cities, out-migration is observed in others. Therefore, the urban issues and/or problems that they are/will be confronting are also varied, depending on their location and industrial attributes.

Most local cities seek for the best ways to satisfy their people's needs, including the improvement of sanitary conditions, enhancement of commerce and businesses to ensure the sustainable provision of employment opportunities; less congestion in road transport; improvement of social services and infrastructures for health, education and vocational training; preparedness for disasters; and so on. A progressively aging society, including mobility for the aged, social welfare, etc., is also a critical issue.

The city planning administration needs to be capable enough to respond to such requirements of local cities. "Comprehensive Plans" under the Planning Act, however, cannot cover these comprehensive issues, because they are limited to land-use zoning and physical infrastructure plans. A more holistic approach to city planning that will allow local cities to identify practical roadmaps in collaboration with local communities and citizens should be employed. In this sense, the efforts of local governments to formulate Local Strategic Development Plans (LSDP, which are prepared by tessabans) are appreciated, but their planning capacities should be improved.

The overall distribution pattern of these hierarchically and functionally classified cities, as discussed above, is depicted in Figure 2.3.2.



Source: JICA Project Team

Figure 2.3.2 Distribution of Hierarchically Classified Cities in Thailand

2.4 Environmental Policy toward Sustainable Development

2.4.1 Historical Changes in Environmental Policy and Strategy

The urban environmental issues became salient firstly in mega city, Bangkok and its vicinities due to rapid increase in population, vehicles, and industry. Irreversible environmental degradation due to logging and expansion of industrial estates was found in various areas of Thailand, not only in the metropolitan area. In accordance with rapid industrialization and expansion of commercial agriculture, natural forest coverage reduced by more than 3% annually from the 1980s to the 1990s. Subsequently, forest coverage has been rapidly reduced to 25% in the 1990s. The various disputes on environmental matters, such as land grabbing, water, air pollution, and waste management, have been reported since 1990s.

Environmental problem for tessaban level became serious alongside economic growth and increase of urban population. According to the data of the Population Research Institute of Mahidol University, the actual population in large cities is generally about 47%, while the registered population is only 35%. The large unregistered population can be a challenge to any growing city.

Historical changes in policies related to environmental management are summarized in Table 2.4.1. At the time of the 7th NESDP, the Enhancement and Conservation of the National Environmental Quality Act (NEQA)⁴ was enacted in 1992.

Consequently, the National Environmental Quality Promotion Plan and Policy (1997-2016), which serves as a long-term framework for administration (20 years) was drafted to develop an action plan, entitled "Environmental Quality Management Plan," or a medium-term plan (5 years), which aimed to promote the policy and plan for the target period and to serve as an implementation framework for all sectors relevant to the management of natural resources and the environment.

Introducing the Sufficiency Economy Philosophy (SEP)⁵ in the 9th NESDP in the early 2000s has influenced environmental policies. Natural resource and environmental management have been more emphasized in various national plans.

The first mandatory notification for Environment Impact Assessment (EIA) requirement was issued as early as in 1981, and stipulated under the NEQA (1992). Various projects were granted permission based on the EIA guideline, but this was not regulated strictly. Eight governmental agencies were sued in the case of the toxic leak in the petrochemical plants in Map Ta Phut in Rayong province, a violation of Section 67 of the 2007 Constitution⁶. The decision of the Central Administrative Court in 2009 was to order the government agencies

⁴ NEQA consists of seven chapters including, I. National Environment Board, II. Environmental Fund, III. Environmental Protection, IV. Pollution Control, V. Promotional Measures, VI. Civil Liability, and VII. Penal Provisions.

⁵ "Sufficiency Economy" is a philosophy of sustainable development introduced by the late King Bhumibol Adulyadej after Asian Crisis in 1997. Sufficiency Economy Philosophy (SEP) is a development approach promoting sustainable development with 3 principles; moderation, reasonableness and prudence.

⁶ Section 67 of the 2007 Constitution states that prior to undertaking a project or activity that causes serious impact to the local community, four steps must be carried out: an EIA; health impact assessment (HIA); a public hearing process to obtain the opinions of the people and interested parties; and an independent organization to be established to provide their independent opinion regarding the project.

to suspend 76 industrial projects. This case brought attention to the environmental impact to business and the public, and has promoted the development of a system of impact prevention and enhancement of the efficiency in monitoring and enforcement.

Thailand is one of the countries that agreed to adopt the programs of Local Agenda 21, a non-binding, voluntarily implemented action plan of the United Nations with regard to sustainable development. This was initiated in the Earth Summit during which the deterioration of natural resources and environment caused by non-sustainable and excess activities in production and consumption were widely discussed. The concept of environment-friendly production and consumption was included in the 11th NESDP, under the vision of "A happy society with equity, fairness and resilience," with the aim of adjusting the economic structure toward a "green economy." This is a signal in adjusting the vision of national development which focuses on social participation in the structure of production, consumption habits and creates the mechanism that drives community development toward green society. The issues of environmental management and green economy are widely reflected in the plan of Local Administrative Organizations (LAOs) which was aligned with the 11th NESDP (2012-2016), with emphasis on "creative and green economy";

NESDP	Law and Plan on Environment
7 th (1992–1997) Environmental	• The Enhancement and Conservation of the National Environmental Quality
protection and a higher quality	Act, and establishment of National Environment Board (1992)
of life alongside sustainable	The Energy Conservation Promotion Act (1992)
economic growth	• Establishment of the Environmental Fund (1993–)
8 th (1997– 2001)	National Environmental Quality Promotion Plan and Policy, (1997–2016)
Human-centered development	• Devolution of environmental management such as water supply, sewage and
9 th (2002–2006)	drainage, solid waste and sanitary management under the Decentralization
Sufficiency Economy	act (1999)
	• Enhancement and Conservation of National Environmental Quality Plan
	(1997–2016)
10 th (2007–20011)	• Constitution (2007) to include right to express opinions for any project which
Green and Happiness Society	may affect the quality of the environment, and sanitary conditions in
 Introduction of Green and 	accordance with the public hearing procedure.
Happiness Index (GHI)	National Health Act (2007)
	Environmental Quality Management Plan (2012–2016)
	• Thailand's 20-year National Industrial Development Master Plan (2012–2031)
11th (2012_2016)	• 20 Years Energy Efficiency Development Plan (2011–2030)
Relanced Growth	Alternative Energy Development Plan (2012–2021)
-Introduction of Green GDP	National Master Plan on Cleaner Production (2008–2016)
	• The 1st National Science, Technology and Innovation Policy and Plan (2012–
	2021)
	• National Strategic Plan on Climate Change (2008-2012) and Climate Change
	Master Plan (2014–2050)
	 Submitted two documents in UNFCCC in 2015
	 Intended Nationally Determined Contribution
	 Nationally Appropriate Mitigation Action plan
	Green Growth Strategies (2014–2018)

Table 2 4 1	Recent NFSDP and Related Environmental Policies
1abie 2.4.1	Recent MESDE and Related Environmental Foncies

Source: NESDP, Office of National Environmental Policy (ONEP), and related government documents

In addition to conventional environmental management, climate change has been highlighted owing to the frequent natural calamities in recent years. Thailand has been internationally committed to combat climate change by submitting various documents to the United Nations Framework Convention on Climate Change (UNFCCC) as a member of Non-Annex I, Parties being especially vulnerable to the adverse impacts of climate change, including countries with low-lying coastal areas and those prone to desertification and drought. Adaptation measures for disaster management, conservation of natural resources, mitigation measures for energy efficiency, and use of alternative energy are integrated into the various national policies.

2.4.2 Environmental Conditions in Thailand

1) Environmental Issues in the National Plan

The current environmental issues summarized in the National Environmental Quality Management Plan: EQMP (2012–2016) are 1) endangering biodiversity in the forest area, 2) deterioration of marine and coast resources, 3) soil deterioration, 4) natural disasters, 5) Environmental impacts of minerals and energy, 6) pollution, 7) environmental management system.

Loss of Biodiversity in Forest Areas

Forest areas have been damaged disrupting the balance of the ecosystem and endangering biodiversity. While the total forest coverage area has been improved and stable (approximately 25% in 1995, and 33% in 2009) shown in the Figure 2.4.1. The encroachment for mono-cropping cultivation, illegal logging and, many other development activities are the causes of deforestation. Forest fire which cause haze problems especially in northern area is also difficult to be controlled as shown in Table 2.4.2. Even the reforestation can reach as large as 292 sq.km per year, it will be deforested by forest fire as large as one third. While conservation and reforestation activities are persistently funded by the government, those negative impacts on forest's ecological systems and biodiversity are not small.



Note: The sudden increase of forest cover in 2000 was due to the change of scale and method of calculation, the definition of the forest cover.

Source: Royal Forestry Department "Afforestation and Reforestation to Increase the Forest Cover and Carbon Stock" July 2010

Figure 2.4.1 Forest Cover and Annual Reforestation in Thailand

Voor	No. of FireS	Forest Area De	stroyed by Fire	
fear	Extinguished	(rai)	(ha)	
2005	9,447	189,276	30,284	
2006	4,711	53,885	8,622	
2007	7,757	117,395	18,783	
2008	5,569	70,810	11,330	
2009	5,361	61,084	9,773	
2010	6,570	72,912	11,666	

Table 2.4.2 Recent Statistics on Forest Fire and Forest Area Destroyed by Fire

Source: PCD "Summary of Haze Situation and Open Burning Year 2010"

Deterioration of Marine and Coastal Resources

Marine and coastal resources are deteriorating continually. The overall coastal water quality of 167 samples improved, 11% are categorized as excellent, 52% are good in 2014, almost same level as a decade ago. This, however, does not meet the target of 95% of fair quality at minimum stated in Pollution Management Plan. The main causes for pollution were wastewater generated from coastal businesses, communities, tourist activities and aquatic animal farming. The trans-bordering management of coast is essential, but the implementation is very sporadic.

Soil Quality Deterioration

Soil quality has deteriorated while conflicts over land use continue. These land conflicts have become severe since the 1990s.

Natural Disasters

Natural disasters such as floods and droughts are more frequent and severe. As shown in the Table 2.4.3, recent data on disasters damaged significantly. The value of loss has been increased though incidents are fluctuated. Thailand has to adapt to confront the risks of climate change, natural disasters and incidental circumstances.

Disaster	Indicator	2008	2009	2010	2011
Drought	No. of Affected Households	3,531,570	4,500,861	4,077,411	5,140,316
	Value of loss (Million THB)	103.9	108.3	1,415.20	131.9
Flood	No. of occurrences	6	5	7	N/A
	No. of Affected Households	2,031,943	2,308,969	3,917,333	4,086,138
	Value of loss (Million THB)	7,601.80	5,252.60	16,338.80	23,839.20
Storm	No. of occurrences	1995	1348	2192	N/A
	No. of Affected Households	78,606	110,357	126,866	44,905
	Value of loss (Million THB)	227.5	207.4	198.8	109.1

Table 2.4.3 Data on Disasters, 2008–2011

Source: National Statistical Office "Environmental Indicator in Brief 2012, 2014"

Environmental Impacts of Mineral and Energy Exploitation

Demand for minerals and energy has escalated steadily causing environmental impacts. Demand for mineral has been increased for industry and energy purposes. Mineral exploitation leads to hazards unless appropriate environmental management is carried out. EIA systems have to effectively prevent environmental hazards, such as landslides, health impacts. Total primary energy supply (TPES) has approximately tripled from 1990 to 2012 as shown in the Table 2.4.4. The share of fossil fuels is significantly increased from 64% in 1990 to 80% in 2012.

Energy Category	1000	2000	2005	2010	2012	AGR (%/yr)	Share of TPES (%)	
(million toe) ¹	1990	2000	2005	2010	2012	1990-2012	1990	2012
Oil	17.96	31.88	43.57	44.55	49.02	4.67	42.8	38.7
Coal	3.82	7.67	11.5	16.36	17.44	7.15	9.1	13.8
Gas	4.99	17.36	25.92	32.94	35.17	9.28	11.9	27.8
Hydro energy	0.43	0.52	0.5	0.48	0.75	2.56	1	0.6
Combust. renewables &	14 69	14 61	17 18	22.6	23.4	2 14	35	18 5
waste	14.05	14.01	17.10	22.0	23.4	2.14		10.5
Wind/Solar/Geothermal	0	0	0	0	0.06	_	0	0
Other (electricity trade)	0.05	0.24	0.32	0.49	0.72	12.89	0.1	0.6
Total primary energy supply (TPES)	41.94	72.28	99	117.43	126.56	5.15	100	100

Table 2.4.4Energy Supply Profile

¹ The ton of oil equivalent (toe) is a unit of energy defined as the amount of energy released by burning one ton of crude oil. TPES is energy form found in nature that has not been subjected to any conversion or transformation process, contained in raw fuels, and other forms of energy received as input to a system. Primary energy can be non-renewable or renewable.

Source: UNFCCC Country Brief, Thailand 2014

Pollution

Many environmental problems such as air pollution, wastewater and solid waste are prone to further deterioration due to economic growth expansion and wasteful consumption behavior. Air pollution, especially, Particulate Matter Sized smaller than 10 microns (PM10) has been issues for decades. 26 monitoring locations out of 60 in 29 provinces exceeded the national standard. Severe problems are found in Bangkok, Songkhla, Rayon, and Saraburi. Northern region usually has problem for PM due to haze pollution in dry season. Lower southern region suffers slightly due to haze from Sumatra Island.

Thailand's water supply system coverage rate exceeds 81.9% in 2011, and access to safe water is more than 95%, and access to improved sanitation facilities including piped sewer system, septic tank, pit latrine, ventilated improved pit latrine and composting toilet are estimated over 93% in recent years⁷. The coverage of sewage treatment system rate, however, is limited as 9.6% in 2011⁸. The usage of flush toilet including septic tank are very common, and majority of access to improved sanitation facilities are those which have limited contribution for reducing contamination. Only eight out of 59 surface water resources met the standards of water. Water quality of main rivers was declining, especially of Lower Chao Phraya, Lower Tha Chin, Central Tha Chin, Lower Lamtakong and Lower Phetchaburi. Since major contamination of water resources are fecal coliform bacteria (FCB), total coliform bacteria (TCB), and ammnoia-nitrogen, insufficient community wastewater treatment system is the main cause of water quality problems in Thailand. On average,

⁷ World Bank Development Indicators

⁸ Global Water Intelligence, Global Water Market 2011

wastewater treatment capacity is approximately 29% of total volume of wastewater.

Increased municipal waste is one of the most severe issues in Thailand. As shown in Table 2.4.5, the volume of solid waste per day is more than double in the past two decades. The average municipal solid waste generation rate of 1.11 kg per person per day in 2014 is even more than the same rate of Japan.⁹. Increased volume outside of Bangkok has been significant. Thailand's past solid waste management strategy focuses on bulk collection and mass disposal. Reducing, recycling and reuse, so called 3R has been paid attention by municipalities gradually, but not yet significantly contribute to the consumption patterns and disposal manner.

Further, 46% of municipal solid waste collected were disposed of inappropriate manner, such as by open burning or open dumping into abandoned pits or undeveloped areas. These were mostly the cases of small local administrative organizations.

							(Unit: tons/day)
Area / Year	1993	1995	2000	2005	2010	2012	2014	AGR(%/yr)
BMA	7,050	7,192	9,130	9,356	8,766	11,000	10,798	2.1%
Municipalities & Pattaya City	7,560	10,966	11,785	12,500	16,620	25,472	60,980	
Outside of municipality& sanitary district	16,030	16,334	17,170	18,100	16,146	31,105	-	4.6%
Total	30,640	34,492	38,170	39,956	41,532	67,577	71,778	4.1%

Table 2.4.5	Amount of	Solid Waste

Municipal Solid Waste (MSW), Proportion of Properly Treated and Utilized MSW, and Per Capita MSW Generation, 2008-2013

Source: PCD "State of Pollution Report" in several years.

Environmental Management System

Current management of natural resources and the environment is inefficient. A mechanism used as an important tool was the action plan for Environmental Quality Management at the provincial level. The budget sources under this action plan consisted of 1) the annual government statement of expenditure (specific grants); 2) the environmental fund; 3) the budget for developing provinces/ groups of provinces; 4) the budget of the Local Administration Organization; 5) the investment of the private sectors; and others. The national budget allocation for the pollution and environmental management was as small as 0.35% in 2014¹⁰. The budget allocation share for pollution and environmental management in recent years are limited, between 0.29% and 0.48%, although the pollution status has been deteriorating,

⁹ 1.11 kg per person per day exceeds the same rate of Japan, 0.95 kg in 2014, which reduced significantly from 1.18 kg in 2000. (Ministry of Environment)

¹⁰ The State of Pollution Report 2014, PCD

The budget for municipal solid waste, and wastewater management, is not stable as shown in Table 2.4.6. Since the budget for tessaban is largely for the basic infrastructure such as road and education, the budget allocation for environmental management is limited to millions THB. This amount can hardly afford to invest in physical infrastructure for pollution control, and waste management. Although the mandate of waste management is devoted to LAO, there are no fixed fund which can be used for pollution control.

-	Environmental Quality Management Action Plan (2008–2014).	

Table 2.4.6 Municipal Solid Waste and Wastewater Management Budget under the

Cotogony	Budget per Year (mil THB)										
Category	2008	2009	2010	2011	2012	2013	2014				
Total Budget	1,987	2,041	2,543	1,375	127	567	1,099				
Solid Waste Management	1,184	1,217	1,395	711	0	420	920				
Wastewater Management	803	824	1,149	664	127	147	179				

Source: PCD "State of Pollution Report 2014"

Regarding the data on environment, NSO collects the data from Provincial Statistic Organization (PSO), and not from tessaban. The environmental data on tessaban level might not be standardized. Environmental departments recognize the insufficiency of data quality for tessaban

2) Status of Pollution Control in Tessabans

Based on devolution, environmental management tasks, such as solid waste management, water supply and wastewater management, disaster management formerly done by the Ministry of Interior (MOI), and the promotion of environmental awareness, monitoring control, formerly done by the Ministry of Natural Resource and Environment (MNRE) are now the primary tasks of LAOs. Challenges of tessaban are primarily solid waste management and wastewater management. The issue of climate change is also a concern expressed by tessabans, as disasters and loss of biodiversity are seen. This will be elaborated in the following Section 2.4.3.

Solid Waste

The solid waste management situation has been worse for recent years due to the volume of waste as previously mentioned (Table 2.4.5). Only about 57% of entire LAO or 4,422 provide waste collection and disposal services¹¹. Even those collected, some do not appropriately dispose by openly burnet or open dumping in old pits or undeveloped area. These bad cases have been reported by media and even make it difficult to build a proper landfill site due to strong resistance from neighboring residents. Appropriate disposal sites decrease from 39 to 35 from 2013 to 2014 for private own, but public owned sites are increased from 427 to 445 during the same period as shown in the Table 2.4.7. LAOs are tasked with the appropriate management of solid waste, but some tessabans entrusted the private companies to operate the solid waste management.

¹¹ The State of Pollution Report 2014, PCD

Cluster policies¹² for solid waste management becomes gradually effective. Provincial level will have waste management plans so that all tessaban coordinates/implement the standard waste management policy.

Tupo	Pu	olic	Private			
Туре	2013	2014	2013	2014		
Sanitary Landfills/ Engineer Led Landfills	64	73	9	5		
Control Dumps with the Capacity of less than 50 tons/day	341	356	26	25		
Incinerators with Air Pollution Control System	1	1	1	2		
Incinerators with the Capacity of less than 10 tons/day and	Q	2	0	0		
an Emission Control System (cyclones)	C	۷	0	0		
Integrated System	12	12	0	0		
Waste to Energy Technology	0	0	1	2		
Mechanical Biological Treatment System	1	1	2	1		
Total	427	445	39	35		

Source: PCD "The State of Pollution Report 2014, 2013"

Wastewater

With regard to wastewater plants, there are 84 Sewerage Treatment Plant (STP) exists, and five are under construction, totally 89 STPS exists in Thailand. The system mostly applied is Stabilized Pond, followed by Oxidation Ditch, Activated Sludge. They are financed by DPT (55%), MNRE (19%), Ministry of Science, Technology (19%). Industrial area such as Central and East are mostly financed by DPT, Central (85%) and East (75%). According to PCD, there might be the Plants not in operation due to technical problems or lack of knowledge to run the plant. According to the Data of 2003, 51 STPs were operational, 12 were not operational and 14 were under consideration¹³. During the last decade, compared to current, increased STPs are limited as 11, even including the constructing ones. It is obvious that current capacity of STPs are limited against current volume of wastewater.

The introduction of STP system in population density area are economically validated as the removal rate of biochemical oxygen demand (BOD) is high as 70 to 90%. However, due to high cost for construction and maintenance, coverage of STP in Thailand is less than 10% of population. Due to limited budget, individual on site systems such as septic tank systems, are widely used in the country, the cost of construction, maintenance, and simplicity are advantageous, but the removing rate of BOD is limited as approximately 50%. The removing rate of the BOD by Jokaso system introduced by Japan as early as 1970s are regarded as 90%. Yet, this system is also more expensive than simple septic tank system and the dissemination in Thailand is still limited, partly due to absence of regulations and effective budget system¹⁴.

¹² Clustering of LAO in order to implement the entire and centralized municipal solid waste, hazardous waste and infectious waste management system were continuously proposed by PCD, and gradually some LAOs are prioritizing integrated waste management and a took cluster approach for establishing joint waste treatment facilities.

¹³ JICA, Wastewater Management Authority (2007) The Project for Improvement of Sewage Treatment Plant Management in Thailand,

¹⁴ The subsidy for SPT and Jokaso are stipulated by the Ministries (Ministry of Environment, Ministry of Agriculture, Forestry and Fisheries) in Japan, and regulation of Jokaso

	1				
Region	No.	Name of Tessaban	Fund Source ¹⁾	System ²⁾	Capacity (m³/d)
North	1	Tessaban Mueang Phayao	DPT	SP	9,700
	2	Tessaban Nakhorn Chiang Mai	DPT	AL	55,000
	3	Tessaban Mueang Tak	MOST	SP	5,400
	4	Tessaban Mueang Phichit	DPT	AL	12,000
	5	Tessaban Mueang Kamphaeng Phet	MOST	SP	13,500
	6	Tessaban Tambon Salok Bat, Kamphaeng Phet	DPT	SP	500
	7	Tessaban Mueang Nan	MOST	SP	8,259
	8	Tessaban Nakhorn Mae Sot, Tak	-	SP	11,000
	9	Tessaban Nakhorn Chiang Rai	DPT	AL	27,200
	10	Tessaban Mueang Lamphun	MOST	SBR	10,000
	11	Tessaban Mueang Sukhothai Thani	MOST	SP	8,400
	12	Tessaban Nakhorn Phitsanulok	DPT	SP	25,000
	13	Tessaban Nakhorn Lampang	MOST	SP	24,600
	14	Tessaban Mueang Chumsang,Nakhon Sawan	MOST	SP	1,650
	15	Tessaban Nakhorn Nakorn Sawan	MNRE	MSBR	36,000
	16	Tessaban Mueang Tapanhin, Phichit	MNRE	SP	7,600
		Total			255,809
		Under construction			
		Tessaban Mueang Uthaithani	DOPA & MOST	SP	9,000
		Grand Total			264,809
Northeast	1	Tessaban Nakhorn Sakon Nakhon	DF & DPT	SP-CW	16,200
	2	Tessaban Tambon Taa-Rae,Sakon Nakhon Province	MNRE	SP	2,054
	3	Tessaban Nakhorn Khon Kaen	DPT+MNRE	AL	78,000
	4	Tessaban Tambon Kosumpisai,Maha Sarakham	MNRE	SP	1,500
	5	Tessaban Mueang Chai Ya Phum	MNRF	SP	6.000
		Tessaban Mueang Bau Yai, Nakhon			0,000
	6	Ratchasima	DOPA	SP	3,000
	7	Tessaban Nakhorn Nakhon Ratchasima	DPT	SP &OD	70,000
	8	Tessaban Nakhorn Ubon Ratchathani	DPT	AL	22,000
	9	Tessaban Mueang Buriram	DPT	AL	13,000
	10	Tessaban Mueang Pak Chong,Nakhon Ratchasima	MOST	SP	12,000
	11	Tessaban Mueang Varin Chamrat,Ubon Ratchathani	MOST	SP	22,000
	12	Tessaban Mueang Mukdahan	MNRE	SP	8,500
	13	Tessaban Mueang Yasothon	MOST	SP	7,246
	14	Tessaban Mueang Amnat Chareon	MOST	SP	12,819
	15	Tessaban Mueang Maha Sarakham	MNRE	SP	4,200
	16	Tessaban Mueang Kalasin	MNRE	AL	14,400
	17	Tessaban Mueang Surin	MNRE	SP	13,597
	18	Tessaban Nakhorn Udon	MNRE	SP	46,950
		Under construction			
		Tessaban Mueang Nakhon Phanom	MNRE	SP	8,600
		Grand Total			362 <u>,</u> 066
Central	1	Tessaban Mueang Chainat	DPT	AL	5,800
	2	Tessaban Mueang Baan Mee, Lopburi	DOPA	SP	1,000
	3	Tessaban Mueang Ang Thong	DPT	AL	8,200
	4	Tessaban Nakhorn Nakhon Si Ayutthaya	DPT	OD	24,000
	F	BMA			
	5	- Si Praya	-	AS	30,000

 Table 2.4.8
 Sewerage Treatment Plants by Region

Region	No.	Name of Tessaban	Fund Source ¹⁾	System ²⁾	Capacity (m³/d)
		- Chong Nontri		AS	200,000
		- Rattanakosin		AS	40,000
		- Tung Kru		AS	65,000
		- Nong Kheam		AS	157,000
		- Din Dang		AS	350,000
		- Chatuchak		AS	150,000
		- Bang Sue		AS	120,000
	6	Tessaban Nakhorn Nakhon Pathom	DPT	SP	25,000
	7	Tessaban Mueang Baan Pong, Ratchaburi	DPT	SP	8,400
	8	Tessaban Mueang Potaram, Ratchaburi	DPT	OD	4,000
	9	Tessaban Mueang Phetchaburi	-	SP	10,000
	10	Tessaban Mueang Hua Hin (phase1),Prachuap	DDT	DDC	0.000
	10	Khiri Khan	DPT	RRC	8,000
	11	Tessaban Mueang Hua Hin (phase2) Prachuap Khiri Khan	DPT	OD	8,500
	12	Tessaban Mueang Prachuap Khiri Khan	DPT	AL	8,000
	13	Tessaban Tambon U-Thong, Suphanburi	DPT	SP	6,000
	14	Tessaban Mueang Suphanburi	DPT	SP	12,000
	15	Tessaban Mueang Patum Thani	DPT	OD	11,000
	16	Tessaban Nakhorn Nontaburi	DPT	OD	38,500
	17	Tessaban Tambon Pra intaracha, Ayuthaya	MOST	AS	4,500
	18	Tessaban Mueang Cha-am Petchaburi	DPT	AL	17,000
	19	Tessaban Mueang Ratchaburi	DPT	SP	20,000
	20	Tessaban Mueang Singburi	DPT	SP	4,500
	21	Tessaban Mueang Kanchanaburi	DPT	OD	24,000
	22	Tessaban Mueang Sarabiri	DPT	OD	24,000
		Under construction			,
		Tessaban Mueang Samut Prakan	MOST	AS	525,000
		Grand Total			1,909,900
East	1	Tessaban Mueang Chacherngsao	DPT	OD	24,000
	2	Tessaban Mueang Phanat Nikhom	DPT	SP	5,000
		Tessaban Mueang Sansuk, Chonburi	DPT	OD	5,400
	3	- North Area	DPT	OD	14,000
		- South Area	DPT	OD	9,000
	4	Tessaban Mueang Sriracha	DPT	OD	18,000
	5	Tessaban Tambon Leam Chabang	DPT	OD	25,000
		Tessaban Mueang Pattaya, Chonburi -			
	6	Soi Wat Boonkanchanaram	DPT	AS	20,000
		- Naklua	MOST	AS	65,000
	7	Tessaban Tambon Baan Pae, Rayong	DPT	OD	8,000
	8	Tessaban Mueang Chantaburi	DPT	SP	17,000
	9	Tessaban Nakhorn Rayong	DPT	AL	41,000
	10	PAO Chonburi	DPT	OD	22,500
	11	Tessaban Mueang Klung, Chantaburi	MOST	SP	4,500
	12	Tessaban Mueang Map Ta Phut, Rayong	DPT	AL	15,000
	13	Tessaban Tambon Bang Kla,Chacherngsao	MNRE	SP	5,000
	14	Tessaban Tambon Bang Srae, Chonburi	MNRE	SP	4,400
		Grand Total			297,400
South	1	OBT Baan Tai, Koh Pha Ngan, Surat Thani	TAT	CW	200
	2	Tessaban Mueang Patong, Phuket	DPT	OD&AS	23,250
	3	Tessaban Nakhorn Phuket	DPT	OD	36,000
	4	OBT Ao Nang & PP Island, Krabi	DANIDA*	SP	400
	5	Tessaban Nakhorn Trang	DPT	AL	22,000
	6	Tessaban Nakhorn Had Yai, Songkhla	MOST	SP-CW	1 <u>38,</u> 000

Region	No.	Name of Tessaban	Fund Source ¹⁾	System ²⁾	Capacity (m³/d)
	7	Tessaban Nakhorn Songkhla	DPT	SP	8,400
		Tessaban Tambon Koh Samui,Surat Thani			
		- Na Thon Beach	DPT	OD	2,400
	ð	- Chaweng Beach	DPT	OD	6,000
		- Lamai Beach	DPT	OD	8,000
	9	Tessaban Nakhorn, Krabi	DPT	AL	12,000
	10	Tessaban Tambon Karon, Phuket	MOST	٨٢	6.000
	10	Province	MOST	AS	0,000
	11	Tessaban Tambon Kratu, Phuket	MNRE	AL	6,000
		Tessaban Nakhorn Yala			
	12	- Bridge in front of Yala Temple	MNRE	AL	4.6
		 Pond behind Rubber Factory 	MNRE	AL	3,200
	12	Tessaban Mueang Tung Song, Nakhon Si	MNIDE	Fix Film &	10,000
	15	Thammarat	IVIINKE	AS	10,000
	14	Tessaban Nakhorn, Nakhon Si Thammarat	MNRE	SP-CW	33,700
		Under construction			
	1	Tessaban Mueang Chumphon	DPT	SP	12,000
	2	Tessaban Mueang Pattani	DPT	SP	27,000
		Grand Total			375,750

DANIDA*: Denmark's development cooperation, which is an area of activity under the Ministry of Foreign Affairs of Denmark.

Source: PCD 2016, 1) DPT: Department of Public Works and Town & Country Planning, MOST: Ministry of Science, Technology and Environment, DOPA: Department Of Provincial Administration, DF: Department of Fisheries, TAT: Tourist Authority of Thailand, 2) SP: Stabilized Pond, OD: Oxidation Ditch, AL: aerated lagoon, AS: Activated Sludge, MSBR: Modified Sequencing Batch Reactor, RBC: Rotating Biological Disk Reactor; CW Constructed Wetland.

3) Climate Change

Adaptation

Disturbing effects such as severe rainfall, more frequent flood, drought, coastal erosion, and more epidemics have already been experienced in Thailand, and widely reported that those are caused by global warming. Flood, for example, more than 10 times in almost all provinces in the past 30 years. The most severe floods that Thailand experienced were in 1975, 1983, 1995, 2002, 2005, 2006, and 2011¹⁵. According to the Department of Water Resources (DWR), the damaged areas caused by flooding include 27.2 million rai (43,500 sq.km) of agricultural areas and 6.8 million rai (10,900 sq.km) of urban areas. This data was compiled from statistical data and satellite images from 1982 to the 2010. The DWR identified 65 cities as flood prone areas, which equates to about 845,625 rai (1,353 sq.km) in urban areas and 2.17 million rai (3,500 sq.km) in rural areas. Figure 2.4.2 shows flash flood and landslide prone areas identified by the DWR, and the important commercial zones in flood prone areas in 32 cities. Develop resilience to climate change and natural disasters is one of the key agenda of EQMP, and proposed adaptation measures into urban planning at local level is significant. Climate change surveillance in hot spots and impacts on ecosystems, development of natural disaster warning systems will be mainly led by central governments and academia. LAOs need to develop knowledge and adjust the land use planning and commercial activities, etc. by proper guidance.

¹⁵ Department of Water Resources (DWR), MNRE, "Role in Thailand's Water Management" 2010



Source: Department of Water Resources (DWR), MNRE, "Role in Thailand's Water Management" 2010

Figure 2.4.2 Flood- and Landslide-prone Areas and Important Commercial Zone in the Flood Prone Areas in 32 Cities

Moreover, climate change increases the risk of biodiversity loss such as forest ecology, mangrove forest ecology, coastal erosion and the loss of coral reef. Such loss of biodiversity may affect to stability of food, health, energy and self-sufficiency in community. The public awareness on the adaptation is one of the significant agenda for LAOs located in disaster prone and hot spot area.

Mitigation

Thailand had total greenhouse gas (GHG) emissions amounting to 305.52 million tons of CO₂ equivalent (MtCO₂eq) in 2011. Total emissions can be categorized into the following sectors: energy; industrial processes; agriculture; land use, land-use change, and forestry (LULUCF); and waste. When the 43.19 MtCO₂eq of GHG emissions and -114.13 MtCO₂eq of removals from LULUCF were included, total GHG emissions reduced to 234.58 MtCO₂eq due to the net removal of -70.94 MtCO₂eq (Figure 2.4.3)



Source: Thailand First Biennial Update Report (2014)



The data of country-specific CO₂ emission totals of fossil fuel use and industrial processes (cement production, carbonate use of limestone and dolomite, non-energy use of fuels and other combustion), excluding short-cycle biomass burning (such as agricultural waste burning) and large-scale biomass burning (such as forest fires) is estimated by the Emission Database for Global Atmospheric Research (EDGAR). Utilizing this data, Thailand CO₂ emission can be compared to the world average as shown in Table 4.2.8. The CO₂ emission per capita of Thailand does not exceed the world average (4.936 tons for world, 4 tons for Thailand); however, economic growth and increasing population resulted in higher annual growth rate during 1990-2014 than the world average both in total emissions (4.58%) and emission per capita (3.89%).

CO	2 Emission	1990	1995	2000	2005	2010	2012	2014	AGR (%/yr)
Total	World Total	22,516	23,624	25,611	30,160	33,608	34,948	35,669	1.94%
(mil tons)	Thailand	93	161	171	226	247	262	272	4.58%
Per capita	World Total	4.238	4.121	4.187	4.639	4.87	4.947	4.936	0.64%
(tons)	Thailand	1.6	2.7	2.7	3.4	3.7	3.9	4	3.89%

Table 2.4.9 Total and Per-capita CO₂ Emissions, 1990–2014

Source: European Commission, Joint Research Centre (JRC)/PBL Netherlands Environmental Assessment Agency. Emission Database for Global Atmospheric Research (EDGAR),

In 2014, Thailand submitted to the UNFCCC the Nationally Appropriate Mitigation Action plan (NAMA) to lower GHG emissions below business as usual by 2020. It said: "Thailand will endeavor, on a voluntary basis, reduce its GHG emissions in the range of 7%-20% below the business as usual (BAU) in 2020, with subject to the level of international supports provided in the form of technology, finance, and capacity building for NAMAs preparation

and implementation." The measures include renewable and alternative energy sources, energy efficiency improvements in industry and buildings, bio-fuels in transportation, and a sustainable transit system. The challenges are describing and quantifying as accurately as possible for data together with coordinating other national priorities such as energy and environment¹⁶.

The targets set for the achievement of climate change goals are elaborated in the National Climate Change Master Plan (2013-2050), which has the following features; 1) Long-term plan (continuous response to long-term issue) 2) Comprehensive framework (to guide specific actions), 3) Roadmap of short, medium and long-term goals, 4) Flexibility (rolling plan subject to evaluation every 5 years), and 5) Emphasis on the establishment of policy instruments.

2.4.3 Environmental Planning Instruments

1) Current Policies and Plans on Natural Resources and Environmental Management

The Policy and Prospective Plan for the Enhancement and Conservation of National Environmental Quality, 1997-2016 serves as the long-term national framework (20 years) of natural resources and environmental management in Thailand. It shall be formulated based on the Enhancement and Conservation of National Environmental Quality Act (1992).

The EQMP (2007-2011)¹⁷ translated the above policy, relevant national policies, such as Cash crop plantation promotion policies, specific area development policies, free trade and investment promotion policies, and National Public Administrative Plan (2005-2008) into a range of approaches and measures that are in response to public administration action plan of the central and regional government agencies, regional environmental quality management plan, provincial action plan for the management of environmental quality, provincial strategic plan, provincial cluster strategic plan and local strategic development plan. Planning framework relevant to the natural resources and environmental management is shown in Figure 2.4.4.

EQMP (2007-2011) was reviewed and found that out of 153 measures, some measures especially for balancing utilization and conservation of natural resources in the common area, creating biodiversity-based occupational options for people and communities, building capacity in production and services for communities and community enterprises, searching and developing local wisdom in the management of urban and community environment and upgrading it into global body of knowledge are not sufficiently materialized.

ONEP subsequently submitted the following EQMP (2012-2016) in conjunction with the 11th NESDP so that natural resources and environment aspect is taken into consideration for the balanced and sustainable development. The structure of the EQMP are summarized in the following BOX. This is the national guideline for environmental management, which the LSDP needs to be aligned.

¹⁶ ONEP: http://www-gio.nies.go.jp/wgia/wg12/pdf/0_3_ONEP_N.pdf Confirmed in April 2016

¹⁷ ONEP, The Conceptual and Direction Framework of the Environmental Quality Management Plan, B.E. 2555-2559 (A.D. 2012-2016)



Source: Compiled and translated by JICA Project team based on ONEP "The Conceptual and Direction Framework of the Environmental Quality Management Plan, (2012-2016)

Note: Public Administration Regulation Act, and Public Administration Plan elaborates that Thai public sector shall create high values to the citizens and protect the national interests, attaining a position of high performance and the ability to learn, be adaptive and responsive to changing environment, where good governance principles and ethical behaviors are committed.

1) Cash crop plantation promotion policies, specific area development policies, free trade and investment promotion policies, etc.

Figure 2.4.4 Laws and Plans Relevant to Natural Resources and Environment Management

Box 2: National Environmental Quality Management Plan; NEQMP (2012–2016)

Vision

Thailand is developed on an environmentally friendly basis, through equitable, balance, effective and wholly participatory management of natural resources and environment, which aims to upgrade the quality of life for the people.

Principles

The efficient use of natural resources and environment should be promoted, while avoiding negative impacts to the demand of present and future generations

- 1) **Ecosystem Approach** in Natural Resources and Environmental Management places emphasis on a holistic approach taking into account the interrelationships among different elements in the ecosystem and aims to create a balanced existence of the ecosystem, which can respond to human needs in sustainable terms
- 2) The Precautionary Principle proactively aims to prevent negative impacts by creating resilience in the natural resources and environment, particularly in risk-prone areas and for fragile ecosystems
- 3) The Polluters Pay Principle (PPP) and the Beneficiaries Pay Principle (BPP) are used to apply economic instruments in natural resources and environmental management, by creating incentives, disincentives and accountability with the aim to reduce pollution emission, promote the efficient use of natural resources, promote the restoration and conservation of natural resources, preserve environmental quality as well as create justice and equity for those negatively impacted, helping to reduce social conflicts from natural resources use and creating win-win situations for all parties involved
- **4) Public-Private Partnership** is used to promote accountability and collaboration by different development partners. This should be applied in conjunction with PPP and BPP to allow the private sector for more involvement and investment in natural resources and environmental management
- 5) Good Governance aims to create sustainability in natural resources and environmental management with key components such as participation by all development partners, decentralization taking into account the AFP (Area-Function-Participation) principle, effective and equitable law enforcement, transparency in the decision-making process, public disclosure and accountability by all development partners

Basic Strategies

- 1) Shifting of the production and consumption bases towards environmentally friendly directions
- 2) Conservation and restoration of natural resources in a sustainable manner and restoring natural resources and biodiversity
- **3)** Promotion of environmental governance by enhancing access to natural resources and environment, particularly for low income people.
- **4)** Development of good environmental quality for the people at every level pollution management (water quality/air quality/solid waste and hazardous waste from community and industry) and urban and natural resource management
- 5) Development of resilience to climate change and natural disasters
- 6) Development of manpower and society with a sense of responsibility for environment

Indicators introduced for Green Economy

- Change in the proportion of Green Public Procurement (GPP) value
- Measures on budget & fiscal reform for envi. management implemented
- Ratio of standardized farms endorsed for environmental-friendly practices
- Ratio of factories endorsed for Green Industry practices
- Ratio of eco-labeled products placed in market
- Ratio of eco products & services in the tourism industry
- Ratio of renewable energy in final energy consumption
- Change in energy consumption per change in GDP (energy elasticity)
- Ratio of forested land to total land area (targeted ratio of 40%)
- Ratio of main rivers with acceptable water quality
- Ratio of recycled waste
- Ratio of 24-hour averaged PM10 not exceeding emission standard
- Greenhouse Gas (GHG) emission per GDP and/or per capita
- Establishment of central database on GHG emission.
- Number of programs broadcasting environmental issues

Source: ONEP

2) National and Local Offices Responsible for Environmental Policies

MNRE has 11 organizations of which DEQP, ONEP, PCD directly involve in urban environmental issues. Office of Permanent Secretary has 16 regional branches, Regional Environmental Office (REO) which are responsible for regional environmental policies, which mandated to formulate Regional EQMP and carry out environmental planning activities that align to the national framework and on the basis of the Decentralization Policy of the government. Respective REO covers four to six changwat based on the geographic features, not the same category utilized for the region of Ministry of Interior. I6 REO assists the implementation of environmental projects, by coordinating among different changwat, and departments. It also drafts the regional EQMP. Provincial Office of Natural Resources and Environment (PONRE) represents the focal point of environmental issues of changwat, drafts the Provincial EQMP and coordinates with changwat, LAO for securing the budget for implementing the plan.



Source: Ministry of Natural Resources and Environment

Figure 2.4.5 MNRE Organizational Structure

At the provincial level, PONRE will formulate the plan based on the local context and coordinate relevant LAOs. It has function to request budget for implementing environmental management activities with guidance of REO and technical departments of central level such as PCD, DEQP, and so on. LAO such as Provincial Administrative Organization (PAO), tessaban, Tambon Administrative Organization (TAO) are directly responsible for natural and environmental management, mainly solid waste management, water supply and wastewater management entrusted by the central government agencies.

There are systems for institutionalize the environmental management in tessaban level. However, many tessaban express concerns over mainstreaming environmental policy and actions underpinned by the sound technical analysis and appropriate budget sources. According to LSDP, many tessabans express Natural Resources and Environment as one of the main challenges as shown in the Table 2.4.10.

Technical guidance from the MNRE departments are crucial for LAO to plan and prioritize environmental policies. Sound coordination between MNRE departments and LAOs are key to secure budget and materialize environmental projects. 16 REOs are categorized as shown in the Figure 2.4.6. Environmental projects which require large investment such as solid waste management and wastewater, or water resource management needs to be prepared in larger area. Collaboration with REO, PONRE, and relevant provincial organizations are also necessary for tessaban to materialize effective environmental management projects.

Мар	No.	Area
	1	Chiang Mai, Chiang Rai, Lamphun, Mae Hong Son
	2	Udonthani, Nong Khai, Loei, Nakorn Phanom, Sakon Nakorn
21	3	Lampang, Phrae, Phayao Sukhothai
	4	Khon Kaen, Mahasarakam, Chaiyapum, Nong Bua Lamphu
Y Three	5	Pisanulok, Phichit, Nan Uttaradit
	6	Nakorn Rachasima, Surin, Burirum and Sisaket
	7	Nakornsawan, Tak, Kamphangpetch Uthaithani
562	8	Ubon Ratchathani, Amnat Charoen, Yasothorn, Mukdaharn, Roi Et
	9	Nakorn Phatom, Chai Nat, Suphanburi, Samut Sakorn
	10	Chonburi, Rayong, Trat, Chantaburi, Chacheongsao Sa Kaeo
	11	Nontaburi, Singburi, Ang Thong, Ayutthaya Pathum Thani
	12	Suratthani, Chumporn, Nakhon Si Thammarat, Ranong
	13	Saraburi, Petchaboon, Lopburi, Nakornnayok Prachinburi
	14	Phuket, Trang, Krabi, Phang Nga, Satun
	15	Rachaburi, Kanchanaburi, Samut Songkhram, Phetchaburi,
-		Prachuap Khiri Khan
	16	Songkhla, Narathiwat, Yala, Pattani, Phatthalung

Source: ONEP



3) Challenges in Funding Environmental Projects

Based on the LSDP of tessabans in the country, a number of tessabans expressed natural resources and environment as one of the challenges are more or less industrial areas, namely, north, north east, and south regions. Those more industrialized areas where pollution was much severe, were designated as pollution control areas since 1990s and the Ministry (MNRE, MOI, Ministry of Industry, etc.) supported to draft the environmental management plan and allocated the fund for pollution control. Pollution control caused by urbanization requires budget and technical expertise. The tessabans relatively remote area have faced the problem of reaching the technical advice and financial sources. Some small tessabans entrust the waste/ wastewater management to private sectors and pay little attention. Private waste collectors might end up not complying with the environmental regulation. Since waste management projects have not been regulated strictly by central government, the situation has worsened unless mayors have strong will to combat and finance it.

Region Area of Issue	Infrastructure, Utility	and Facility	Urban Planning and	Landscape		society and security	Natural Resources	and Environment	Religion, Culture,	Iradition, and Folk Wisdom	Education	Education	Economy,	Commerce, and Investment	Tourism, sports, and	recreation	Administration,	Politics, and Internal Issue
/	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Bangkok and vicinities (23)	12	52	7	30	15	65	15	65	6	26	6	26	10	43	1	1	17	74
Central Thailand (13)	8	62	3	23	9	69	4	31	5	38	5	38	9	69	7	54	8	62
Northern Thailand (26)	17	65	8	31	18	69	18	69	9	35	9	34	14	54	12	46	18	69
North Eastern Thailand (35)	20	57	12	34	23	66	25	71	14	40	13	37	20	57	10	29	28	80
Western Thailand (10)	6	60	4	40	7	70	5	50	3	30	3	30	5	50	4	40	8	80
Eastern Thailand (23)	19	83	10	44	9	39	9	39	3	13	3	13	6	26	3	13	19	83
Southern Thailand (41)	26	63	16	39	26	63	30	72	16	30	16	30	22	54	13	32	32	78

 Table 2.4.10
 Priority Concerns of Tessabans by Number and Share

Note: Compiled by the JICA Project Team based on the LSDP

The Environmental Fund which has been an important budget source established in 1992. This is regarded to function as a financial mechanism for supporting LAO, governmental sectors, state enterprises, and private sectors to solve the environmental problems under collaborative procedures of all sectors and to set up the treatment systems for air pollution and effluent, together with sewage disposal system for controlling, treating, and disposing pollution. This was initially financed by the government budget (THB 5 million annually), petroleum fund (THB 4.5 million) and Japan's Yen Loan (THB 3.8 million)¹⁸. According to the State of Pollution Report 2013, the Environment Fund has supported 272 projects in the amount of THB 13.5 billion. This amount was divided into the following projects.

- (1) 104 projects for supporting the effluent treatment and sewage disposal systems for the LAO in the amount of THB 9.4 billion
- (2) 27 projects for loans to private sectors to set up effluent treatment and sewage disposal systems in the amount of THB 1.1 billion;
- (3) 61 projects for supporting the enhancement and conservation of the quality of the environment of both governmental sectors and LAO in the amount of THB 2.8 billion; and
- (4) 80 projects for supporting and conserving environmental quality of private organizations in the amount of THB 0.3 billion.

This had been 100% grant for LAO, but from the year 2008, the pattern of 10% contribution from receiver was introduced. One of the problems is after receiving the budget/fund; the

¹⁸ Thailand Environmental Fund Project Ex-Post Evaluation, 2006 (Japan Bank of International Cooperation)

LAO or beneficial organizations weren't serious enough to complete the project or not strictly followed what it was proposed. In 2013, there is amendment for the Environmental Fund to promote the ownership and responsibility for LAO / beneficial organizations to build and operate the project for the benefit of their own community. Now any LAO who received the Environmental Fund must collect the fee from waste producers/sources or from the services that provide by project outcome and 3.5% from LAO income has been enforced to return to Environmental Fund. There are many complains for receiving the Environmental Fund from LAO due to 1) limited technical knowledge to develop appropriate projects, 2) limited capacity to prepare the feasibility study and basic design required for application, and 3) limited budget to procure the consultants to prepare the proposal, and 4) duration for the procedure (ONEP explained approximately two years from proposal submission to budget/fund is granted, but some tessabans explained even more nearly decade. This is partly due to the procedure to reach consensus for affected residents.

ONEP, who currently manage the Environmental Fund, has made efforts to shorten the time of proposal preparation and to encourage LAO to send more proposals with the handbook and user-friendly proposal form that LAO only needs to fill-in the important information instead of essay as in the past. In addition, ONEP also set-up the training in producing the proposal in many occasions around the country.

Since Leaders of LAO needs to be elected, and gain popularity, they prefer to invest visible infrastructure rather than environmental control projects in the past. Facing difficulties for emphasizing environmental issue in the local policy context, environmental departments try to collaborate more to raise awareness for environmental issues with Ministry of Education, private sectors and public organizations.

Other than this Environmental Fund, large scale financial sources for environmental management is not available from the central government. Respective tessaban has to coordinate with changwat to seek allocation. Since the required budget for infrastructure is not small, and it requires substantial amount of maintenance costs, many smaller tessabans face difficulties to finance for pollution control infrastructure.

2.4.4 Environmental Projects Implemented in Tessabans

1) Green Growth Cities of NESDB

The global Sustainable Development Goals (SDGs) will be used as framework for national development during 2016 – 2031, which comprises 17 goals, including the following: economic growth, employment, safety living, good basic infrastructures, industries and sustainable innovation, sustainable production and consumption, access to clean water and good waste management, sufficient energy for all residents, good awareness and mitigation to climate change, etc.

Green Growth concept is one of the main development directions since the 11th NESDP (2012-2016) under the sustainable management of natural resources and environment. With the objectives in adjusting the vision of development and use it as mechanism to lead Thailand to be low carbon society with environmental friendly economics. Together with the efficiency improvements in energy usage in transportation sectors as well as the increase in capacity in adjusting and dealing with Climate Change. The strategy of Green Growth Development was a framework for related sectors especially for the development of main

economic cities.

The flexible plan and well management of Green Growth development is an important issue of the forthcoming the 12th NESDP for the efficient growth and prevent the effects result from climate change. In 2015, NESDB has started the study of Criteria & Indicators for Green Growth Development which will be used in monitoring & evaluating the level of development of municipality levels. There are two categories of criteria, 1) 1. Criteria for general cities, and 2) Criteria for cities with specific role e.g. industry, tourism, boarder, etc.

"Green Growth Cities" is the city that the growth of economy and social is friendly to the environment. With the efficient administrative management, awareness and well prepare for effects of climate change, the community's activities are done by using the natural resourced and energy efficiently, minimize GHG emission and good waste management so that it will not cause problems to the ecology and lifestyle of the community. In order to promote mutual understanding among stakeholders, criteria and indicators of Green Growth have been summarized as shown in the Table 2.4.11 and they will be evaluated with specific indicators.

Category	No.	Tessaban	Province	Size
General	1	Tessaban Tambon Pa-or-don-chai,		
	2	Tessaban Tambon Nong-Yaad	Chiang Rai	small
	3	Tessaban Tambon Re-nu-nakorn		
	4	Tessaban Mueang Se-na	Ayutthaya	medium
	5	Tessaban Nakhorn Hat-Yai	Constant	laves
	6	Tessaban Nakhorn Songkla	Songknia	large
Tourism	7	Tessaban Phra Nakhon Si Ayutthaya	Ayutthaya	large
	8	Tessaban Nakhorn Chiang Rai	Chiang Rai	large
	9	Mueang Pattaya,	Chonburi	large
Industry	10	Tessaban Tambon Nong-jik	Ayutthaya	small
_	11	Tessaban Mueang Map Ta Phut	Rayong	medium
	12	Tessaban Tambon Klong Tam-rhu,	Chonburi	small
Border	13	Tessaban Nakhorn Mae Sot	Tak	medium
	14	Tessaban Mueang Mukdahan	Mukdahan	medium
	15	Tessaban Mueang Sadao	Songkhla	medium

 Table 2.4.11
 Tessabans Studied under the Green Growth Indicator Projects

Source: Draft Report on Green Growth Development Criteria & Indicators December 2015, NESDB

2) Livable City Awards

Thailand's Livable City Awards started as early as 2004 and provides awards to notable tessabans every two to three years. Giving the sustainable city award is for educational purposes, and focus on capacity building of tessaban. The award's criteria are 1) City well-being, 2) Human well-being and Healthy population, 3) Sustainable environment, 4) Learning and development organization, 5) Good governance. From the meeting, it is found that the data collected are all qualitative data base, not quantifiable data due to lacking of good guidelines and related parties feel more comfortable (less troublesome) to keep doing in their own ways. Therefore, in order to gain public participation and fair judgement for award, DEQP accepts mainly the qualitative data (from the information that each participated tessaban filled in the form) together with the judgement from site visit (by

another group of committees composed of academia and departments). Due to urgent attention on environmental issue, year 2015 is the first year that criteria has only concentrate on No.3) Sustainable environment. DEQP further breakdown the No.3) criteria as follows;

- (1) Natural resources and bio-diversity
- (2) Waste or pollution
- (3) Man-made environment
- (4) Environmental friendly lifestyle and consumption based on sufficient economy
- (5) Learning and good management

ASEAN Environmentally Sustainable City (ESC) Programme of Institute for Global Environmental Strategies (IGES) which promotes the development of ESC across ASEAN by providing seed funding, technical assistance and other forms of support for innovative and voluntary bottom-up initiatives, as well as strengthening national ESC frameworks and action. This is financially supported by the Japan- ASEAN Integration Fund (JAIF). DEQP has been supporting the nationally awarded tessabans for mutual learning through workshops and recommends them to be this ASEAN ESC Model. The awarded cities in the pasts are listed in Table 2.4.12.

In 2016, newly three tessabans are selected as model cities, and sequential workshops for mutual understanding are organized by DEQP to promote knowledge, understanding, participation and awareness on Natural Resources and Environmental Management in order to mitigate and adjust to the climate change, and to promote and strengthen the environmental management efficiency of Learning Center in each model city / tessaban in transferring the knowledge & knowhow to the public. This is to promote the public participation in environmental development toward "Green Society."

According to DEQP, those tessabans selected as environmentally sustainable cities have visions, specific framework for planning, and institutional setup to implement. Sustainability is the key for selecting the tessabans. Recently, replicability and collaboration with neighboring tessabans are also highly recognized as criteria.

City	Population	Province	Region	Nominated by
Cheing-	4,000	Chiang Rai	North	Solid Waste Management by 3Rs, Recycle Organic Waste to
kien				Fertilizer, Collaboration among Villages.
Koh Kha	4,800	Lampang	North	3Rs, Environmental Education, Public participation
Krabi	450,000	Krabi	South	- Conservation of Natural Resources for Conservative
				Tourism
				 Waste and Pollution Control Management
				- Conservation of Tradition & Culture and public park
				Sufficient Economics Philosophy
				- City that promotes the Environmental Friendly life style.

Table 2.4.12 Newly Selected Sustainable Model Cities for the ASEAN ESC Awards

Source: DEQP

City	Population	Province	Region	Nominated by
Bangkok.	8.3 million	-	Central	Waste and green spaces
Phuket	75,000	Phuket	Central	Air quality management
Chiang Rai	70,000	Chiang Rai	North	A city with more than 80,000 unregistered population committed to improving the city's environment by increasing green space and bio-diversity, maintain water balance, and improve air quality.
Maehongson	10,000	Maehongson	North	A small rural city based in mountainous northwest. Currently undertakes a variety of activities including community level waste segregation, grease trap installation and urban greenery and cleanliness.
Mueangklang	130,000	Rayon	East	A small rural city located in the southeast of Thailand in Rayong Province, around 160 km from Bangkok. Currently undertakes workshops on "Green, Clean and Low Carbon City Development" and wastewater treatment as well as undertaking public awareness raising activities. Specially, trained local communities to implement low- carbon city projects focusing on urban biodiversity, energy, sustainable consumption & production, river protection and 3Rs.
Nongteng	12,000	Buriram, northeast	North- east	Established a new community-based solar-powered water supply plant and gave training on solar-powered water supply treatment plant management and sustainable farming.
Phanat Nikhom	12,000	Chonburi,	East	Located in the southeast organizing and conducting training for a citywide 'Green & Clean' Awards for 'Model schools' and 'Model Communities'. Established three 'Public ESC Learning Centers' focusing on organic waste management, eco-schools, sustainable consumption and 3Rs.
Phichit	23,000	Phichit,	North	Located close to the Model City of Phitsanulok. The city trained citizens on community-based solid waste management, recyclable handicraft making and organic farming in households as well as establishing and launching the city's first Public ESC Learning Centre at a local museum in line with the' green tourism' concept.
Phitsanulok	80,000	Phitsanulok,	North	Located in the center of Thailand, is an old and historic city, nominated by reviewing its community-based solid waste management training course and recruiting new trainers to its training pool. Updated the curriculum of the Phitsanulok Model of Waste Management (promoted by the national government as a replicable model) and increased the pool of trainers
Renunakhon	4,800	Nakhon Phanom	North- east	Located close to the Lao PDR border in the far east of Thailand. The city has nominal activities of training community leaders on composting, recyclable handicraft making and organic farming to help achieve 'Green, Clean and Self-sufficiency' villages. Upgraded the environmental education curriculum and activities in its largest school, which teaches organic agriculture, sustainable lifestyle, and 3Rs.

Table 2.4.15 Recipients of ASEAN ESC Awards	Table 2.4.13	Recipients of ASEAN ES	C Awards
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Source: ASEAN ESC Website

3) Notable Tessabans and Their Own Environmental Projects

Above mentioned awarded cities initiates environmental projects from the local initiatives, and are gradually recognized nationally by central agencies such as DEQP and ONEP and further nominated for the international awards such as ASEAN ESC. Some cities gain the capacity by utilizing the external support effectively such as multilateral or bilateral agencies. Detail activities of some of such notable tessabans are described as below, including Chiang Rai, Koh Kha, Phitsanulok, and Phanat Nikhom.

Chiang Rai

Tessaban Nakhorn Chiang Rai is located on a floodplain on the Kok River basin in the north. Its official population is 65,000, while non-registered is as large as approximately 100,000. Its area coverage is about 61 sq.km and density is 1,065 person/sq.km.

Background	 City is expected to continue rapid economic growth and urbanization as trade corridors, especially under the AEC regime. Illegal encroachment of public land or 'low-value land' have been predominant. Huge unregistered population brought pressure for land use, public services, etc. Climate risks are seen such as variable precipitation, warmer winter periods, and pose risk on water sources and agriculture. Haze caused by open burning prevailed every dry season and reached to harmful to health level.
Major	• Chiang Rai is committed to improving the city's environment by increasing green
activities	 space and bio-diversity, maintain water balance, and improve air quality. Activity of large trees conservation is organized by recording a database of large plant species. The bio-diversity conservation activity involves four ecosystem management concepts; 1) City Ecosystem; 2) Agricultural Ecosystem; 3) Wetland Ecosystem and 4) Mixed Deciduous Forest Ecosystem. Various government agencies and non-government sectors, universities, private sector as well as local people participate in environment activities.]
Development	Forest reforestation and culture promotion is also focused.
for further	organizations:
project	 Low carbon city project with TGO: Estimate the GHG emission and promote low carbon transport, reforestation, eco-tourism by providing lesson in park to study about bio-system, public transportation by promoting bicycle, and producing biodiesel by reusing oil from each household, increasing green space such as park, as well as wastewater treatment Transport: Green-tour-tram project to provide tram for tourist to travel in municipality in order to reduce the number of cars, further, it experiments promoting bicycle, and producing biodiesel by reusing oil from each household
External	ACCCRN (Asian Cities Climate Change Resilience Network) funded by Rockefeller
Support	 Foundation Improving the water quality and landscape of the Nong Pung urban reservoir, which local residents and farmers can access for water and recreational purposes Conducting a biodiversity survey of aquatic plants and animals Raising awareness on the urban reservoir among school children and local residents ASEAN ESC Programme Supported to build Public ESC Learning Centre. The Centre has been established with four key sites, with their unique feature being how the ownership and operations are shared and co-managed with the local communities, including residents and schools.

Table 2.4.14 Activities of Tessaban Nakhorn Chiang Rai
Source: Interview by JICA Project Team with various documents of ASEAN ESC Programme and ACCCRN.

<u>Koh Kha</u>

Koh Kha is tessaban tambon located northern part, adjacent of Tessaban Nakhorn Lampang where ceramic is main industry. Official population is 4,700, and area is 4.8 sq.km.

Background	Koh Kha which owns the landfill and share it with neighboring LAO, tried to coordinate
	more effective solid waste management as there were many illegal dumping on-going
Major	1. Solid Waste Management
activities	 Household Organic Waste Management
	\cdot Reduce/manage the waste from the sources (starting from individual to
	household then expand to community
	 Earthworms feed for remove organic waste from household
	Produce compost, and distributed to the members for their household vegetable
	gardens, to communities and also for sale as additional income.
	 Screening recyclable materials for exchange with commodity
	Promote waste segregation/management by establishing the Zero Baht Shop to
	use recyclable waste as cash to purchase the consumer products.
	Various activities provide financial benefit for participated household
	approximately THB 200-300.
	2. House landscaping / Garden Refrigerator
	Expanded benefit from the project of waste & environmental management,
	promote community cooperation to keep household clean and livable by
	encouraging residents to grow vegetable gardens and to separate their own waste
	correctively. The average of decreasing expense for vegetable purchase is THB 20
	/day /household or 600 bath/monthly/household In addition, provide knowledge
	on food hygiene; environmental sanitation.
	3. Environmental Management in School
	The awareness of the value and most effective usage of local natural resources is
	promoted to the students. Six old teachers' house are transformed to learning
	stations (1. Flower, 2. Organic vegetable and herbs, 3.Livable house, 4.Recycle bank,
	5.Biological organic fertilizer, 6.Paper recycle), where in each station, students will
	manage and do the activities by themselves (learning from real operation).
	4. Volunteer Groups for Environmental Protection (waterway spy)
	Due to water pollution from industries and also from the discharge of sewage from
	growing communities, volunteer groups are organized with the support from both
	tessaban and PONRE in order to monitor water quality regularly, and they promote
	conservation activity for their important water sources.
Key to	• Existence of the model of "citizen voice for city development" as an open forum for
success	the public hearing activity as well as self-finding on social capital and local wisdom
	including public participation.
	Promotion of public participation, volunteer leaders and knowledge management
	process which build capable communities are done through solid waste
	management activities.
	· JICA project on Capacity Building of Local Authorities Through Local Cooperation
	and Local Public Standard (2005-2008) assisted to coordinate the neighboring
	LAOs to set up regulation and joint activities.
Challenges	Drainage system has not been coordinated with other LAO, and not effective.
	Though 3R activities prolonged the life of the landfill, that landfill shared with other
	five tessaban needs to be upgraded as absorption capacity is nearly full.

Table 2.4.15 Activities of Tessaban Tambon Koh Kha

Source: Interview by JICA Project Team with various documents of ASEAN ESC, and JICA

Phitsanulok

Phitsanulok City is tessaban nakhorn, located in the north. Official population is 90,000, while non-registered is approximately 108,000. Area coverage, 18 sq km, and density is 4,900 person / sq.km.

Background	Landfill constructed by the government became full, and finding other landfill sites has been issue (strong resistance from the residents nearby). The increase of waste reached up to 1.5kg/person/day or over 140 tons/day in 1997.
Major activities	 Various attempts for Solid Waste Management Promoted CBWM (community-based waste management) via public participation, including 3R and separation, promoting participatory waste recycling business. Aiming for zero waste landfill since 2007. Produced comprehensive training material for solid waste management and continue capacity building activities, and influenced to other cities. Introduced a Mechanical biological treatment (MBT), and segregated plastic for liquid fuel-diesel gasoline through pyrolysis). Refuse Derived Fuel (RDF) are produced approximately 80 Ton/day. Since 2013, nearly 30,000 tons of RDF has been produced. Collecting the wastewater for producing biogas. Through various attempts, solid waste volume decreased more than 46% from 1997 volume, 76 tons /day by 2009.
Kev to	Utilized various external assistance effectively. GIZ support from 1997 contributed
Success	substantially by introducing public participation, 3R, polluter pay principle, compost, recycling business, MBT, etc.
Challenges	 Finance wastewater system. Current countermeasure is only Fat-Trap Pond and Septic Tank, not sufficiently effective to reduce pollution. Coordination of establishing comprehensive drainage system with neighboring LAO. Finance for introducing and maintaining advanced technology for waste management
Development for further projects	 Pursuing the project to implement a measurable, verifiable and reportable (MRV) system for city activities, especially through solid waste management assisted by IGES, Dr. Walter Sholl Foundation, and PCD, ONEP, and TGO. Becoming a Climate and Clean Air Coalition Municipal Solid Waste Initiatives (CCAC) member's city (representative of Thailand), the knowledge platform to support cities and governments in short lived climate pollutant reduction.

Table 2.4.16 Activities of Tessaban Nakhorn Phitsar	nulok
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Source: Interview by JICA Project Team with various documents of ASEAN ESC, and IGES

Phanat Nikhom

Phanat Nikhom City is tessaban mueang, located in the southeast, 87 km from Bangkok. Official population is approximately 12,555, area coverage, 2.8 sq.km, and density is 4,600 person /sq.km

Background	Deterioration of the water quality of the main cannel due to the close down of		
	approximately 30-year-old wastewater system. Residents become conscious of		
	environment, and its cost to the city.		
Major Activities	 Waste Minimization at Source: In order to decrease the cost of outsourcing waste (18 tons / day, THB 1.3 million/year), Phanat Nikom decided to decrease the amount of waste and decrease the amount of GHG with the following activities: Promotion of solid waste separation in every household, advocating for a waste bin for organic waste for every household to separate. Promote the establishment of a recycle waste bank Promote vendors to reduce plastic bags and use reusable bags, and separation for organic waste Promoting the use of biodegradable plastic bags Convert organic waste into environmentally friendly products By applying the local knowledge of herbs and organic garbage, environmental friendly products (detergent, etc.) are developed and sold. It reached to decrease approximately 3 tons /day, and schools all together might have additional income from selling recycles which will total to USD 		
	2. Green City: "Conservation & Registration of Large size Tree in the town" Initiated to create more green by growing & registering the trees, increasing the rest area and improving the town environment aiming for the standard of WHO on green area of 9 sg.m/person,		
Key to success	Setting learning centers and collaborate among LAO, schools, teachers and		
	students with the aim to contribute to livable city, and consequently to reduce		
	GHG. Residents can exchange the knowledge of environmental management in		
	the learning school by briefing, hand-on activities and by sharing the experiences		
Development for	Received monetary award and a budget to support for various projects to		
further projects	combat climate change and improve the municipality's livability. The Learning		
	Center project plans to transform landfill into an education center with		
	demonstrations on good conservation behavior and bringing all projects and		
	activities related to reducing GHG.		

 Table 2.4.17
 Activities of Tessaban Mueang Phanat Nikhom

Source: Interview by JICA Project Team with various documents of ASEAN ESC

4) GHG Inventory at Municipal Level

Based on the strategy to support municipal development toward "Low Carbon City," a GHG inventory was initiated by Thailand Greenhouse Management Organization (TGO) to help municipal governors to grasp the current emission of their city/town, and to emphasize the local development plan toward Low Carbon City, to build the capacity for municipal officer to understand on emission, mitigation, and removal of GHG, to help municipal governor implement the mitigation project, and to be a tool for monitor the progressive of development plan.

Due to the difficulties of data at municipal level, the output will not be able to contribute to the National Inventory. Various scoping approaches were applied to determine the activity data at municipal level, and tap ICLEI¹⁹, IPCC, Tool for Rapid Assessment of City Energy (TRACE) and other models. Lampang, Chiang Rai, Nong Samrong in Udornthani province were model for producing GHG Inventor. Through the project, three cities were trained, and reviewed the data system and learned potential mitigation options.

DEDE has mandate to promote alternative energy and efficiency projects. However, most of the projects are private initiatives, and few projects are executed by tessaban. Some municipal solid waste plants have utilized the energy, such as Pathum Thani, Chachoengsao, Rayong, Chonburi, Samut Prakan, Samut Sakhon, Nakhon Pathom, Phuket, Nakhon Si Thamamarat, Songkhla, Uttradit, Ubon Ratchathani, Buri ram, Chaiyaphun, Nakhon Rachasima. Few attempts are made for energy projects with tessaban. Exceptional cases are the "Our Campas Power project" which university and LAO jointly conduct the energy projects. Siraphacorn Univ. in Nakhon Pathom, and Naresuan Univ in Phitsanulok. The introduced energy was solar, and Building Energy Management System (BEMS). DEDE also implement the low carbon city project in Samui Island with EU and NMT, and introduced energy efficiency technologies and renewable energy projects. DEDE prepares the systems for LAO to introduce more renewable energy systems, but so far, not so productive. Incentive mechanism are missing for introducing these systems.

5) Low-carbon Model Town

DEDE has mandate to promote alternative energy and efficiency projects. However, most of the projects are private initiatives, and few projects are executed by tessaban. Some municipal solid waste plants have utilized the energy, such as Pathum Thani, Chachoengsao, Rayong, Chonburi, Samut Prakan, Samut Sakhon, Nakhon Pathom, Phuket, Nakhon Si Thamamarat, Songkhla, Uttradit, Ubon Ratchathani, Buriram, Chaiyaphun, Nakhon Rachasima. Few attempts are made for energy projects by tessaban. Exceptional cases are the "Our Campas Power project" which university and LAO jointly conduct the energy projects. Siraphacorn Univ. in Nakhon Pathom, and Naresuan University in Phitsanulok collaborated and introduced solar system, and BEMS.

DEDE also assisted the low carbon city project in Samui Island in Surathani Province under the APEC Low Carbon Model Town Project and assessed the feasibility of energy efficiency technologies and renewable energy projects as shown in the box above. DEDE promote to introduce more renewable energy systems for tessaban, but so far, not so productive. Incentive mechanism are missing for introducing these systems.

¹⁹ Local Governments for Sustainability is the world's leading network of over 1,000 cities, towns and metropolises committed to building a sustainable future.

Box 3: APEC Low Carbon Model Town Project: Samui Island, Surathani

Low Carbon Model Town Initiatives were set out by APEC after the 9th APEC Energy Ministers Meeting (EMM9). Samui Island, in Surathani province, developed resort island (228 km2, residents 60,000 persons and Visitors 1,000,000 persons per year was selected as a model. Samui Island, being very popular to tourists, the demands for energy consumption as well as other food and supplies are drastically increased. The growth of economy is fast and not well planned infrastructure will eventually threaten the local community and ecology system, and harm tourist industry.

Various low carbon measures; 1.Town Structure Planning, 2. Transportation Planning, 3. Area Energy Planning, 4. Area Energy Management, 5. Renewable Energy, 6. Untapped Energy Use Planning, and 7. Low Carbon Building, 8. Eco-Lifestyle, 9. Environmental Planning were assessed.

Most of the areas on SAMUI Island have already been developed. People on Island have their own culture and living lifestyle. Therefore, development of low carbon concept on Samui Island will focus on the development of not only technical aspect but also people's lifestyle and activity aspect as well.

6) Smart Cities Projects

A variety of smart city initiatives are proposed and promoted in Thailand. It includes Smart Cities initiative by Digital Economy Promotion Agency (DEPA) to promote digital economy under Thailand 4.0. It identifies five pilot smart cities, including Chaing Mai, Khon Kaen, Bangkok, Chonburi or Eastern Economic Corridor (EEC), and Phuket.

Торіс		Criteria	Point
		Business Model	
		Innovation in term of investment	
	Operation	Creating Competitiveness	
		Participation in business sector	
Economy		Investment supports	100
Economy		Smart tourism supports	100
	Economic	Smart Agriculture supports	
	development under	Smart factory/production supports	
	the city's condition	Online Banking supports	
		Others smart activity supports	
		Smart transportation & logistic systems	
	Smart	Public transportation systems	
	Transportation	Traffic management	
Mobility		Parking management	100
		Security & emergency management	
		Walking Promotions	
	Alternative Support	Biking Promotions	
		Energy usage rate	
	Smart Energy IV	Energy distribution rate	
Enormy		Reduction of CO ₂ emission	100
Energy		Smart systems	100
	Alternative Support	Producing renewable energies	
	Alternative Support	Electricity car supports	
		Security system services	
		Public health services	50
Living		Good well-being supports	
		Aging and disability welfares	
		Universal Designs	
Environment		Green space awareness	50

 Table 2.4.18
 Criteria of Smart City by DEPA

	Торіс	Criteria	Point		
		Water management			
		Waste Management			
		Water and air pollution management			
		Disaster Preparation & Management			
		Development of Smart Workforce			
		Education services & entire life learning			
People		Channel for public participation	50		
		Community Co-working Space	-		
		Cultural heritage preservation			
		Effectiveness of main organization	50		
		Participation of relevance people			
Governance		Effectiveness and quality of operation			
Governance		Successful performance measurement	50		
		system			
		System transparency			
		Broadband (Fixed, Mobile)			
City		Public Wi-Fi			
Infrastructure		IoT Networks	100		
mastructure		Data Center			
		Intelligence Operations Center			

Note: Each city has to develop at least 2 smart topics depending on the city's context along with the development of Smart Governance and Smart City Infrastructure.

Source: http://www.depa.or.th/th/smartcity

Smart cities are also promoted by private sector. In response to the demand to improve public transportation and application of the modern technologies, PTT²⁰ has prepared the feasibility study for the smart city projects. They identified the following cities to be potential smart cities by the criteria shown in Table 4.4.8 and the analysis based on the railway transportation development plan and potential of physical, economics, social and demographic conditions.

For example, the project of Tessaban Mueang Nong Khai to be "Special Genius Economic Zone" was identified to develop area around the station to be new trading center and becomes the future town center with the road network expand to the old areas. In addition, the new residential area will be developed and expanded to the old residential areas. The project also includes; Development of green area / Park, -Expansion of Customs & Immigration area (to serve the expansion of border trading and the increasing of transportation of goods across the border), The development of "Nata Station", 10 km south, to be center Container Yard (CY).

The budget requirement for the concept of these smart cities exceeds the normal government budget projects. The collaboration with private sectors are prerequisite to materialize these ideas.

Category	Tessaban /province	Function		
Smart Bed /	Tessaban Mueang Klong Luang,	Development of electrical public transportation &		
Dormitory Town:	Pathum Thani	double track railway		
Centroid of the North:	Tessaban Tambon Denchai, Prae	Development of high speed & double track railway		

²⁰ PTT Public Company Limited, former Petroleum Authority of Thailand

Category Tessaban /province		Function		
Smart Metropolitan Paholyotin Center, Bangkok		Development of electrical public transportation &		
TOD		high-speed railway		
Smart Border Town	Tessaban Mueang Nong Khai.	Development of rail public transportation & airport		
	Nong Khai			
Smart ASEAN	Tessaban Nakhorn Khon Kaen,	Development of rail public transportation & airport		
Business Center	Khon Kaen			
Smart Logistic Town	Tessaban Mueang Kang Koy,	Development of rail public transportation & airport		
	Saraburi			
Smart Port Town Tessaban Nakhorn Leam		Development of rail public transportation & Port		
	Chabang, Chonburi			

Source: Draft Report of Smart City (PTT and Chulalongkorn University) 2015

Table 2.4.20 Criteria of Smart City by PTT and Chulalongkorn University

	Торіс	Criteria	Indicator	Standard Value
	Economic	Production Value Gross Production Value (GPP)/		Not Less than Gross Domestic
λ	Growth		capita	Product (GDP)/capita
ouo	Distribution of	Employment	Ratio of Daytime: Nighttime	Not Less than National Average
ЕC	Economic		Employee in the Area	
	Return			
	Quality of Life	Educational Services	Teacher: Student in the Area	Not More than 1:20
		Medical Services	Doctor: Patient in the Area	Not More than 1:1500
		Security	Crime Rate in the Area	Not More than 1000crimes /100,000
				of Population
	Social Diversity	Educational Level	People Who Graduated The	Not Less than National Standard
₹			National Standard Level: Total	
iuni			Population	
Ш		Age & Gender	The Different of Population	0%, Maximum
5		Diversity	Pyramid in The Area: National	
-			Standard Pyramid (At The Stable	
			Pyramid Range)	
		Nationality &	Population Who Born Outside	Not Less than Ratio of Population
		Religious Diversity	The Area: The Ones Who Born in	Who Born Outside Thailand to
			Ine Area	National Population in Nationwide
	Curran Auron	Natural Q. Mara	Crean Area (Denvilation	Net Less then 10 same (nersen
	Green Area	Natural & Man-	Green Area / Population	Not Less than 10 sqm/person
		Made Green Area	Biolope Area Factor	Not Less than 50%
			(Fercentage of Residential Area	
Ę	Waste	Garbage	Garbage Reduction: Total	Not Less than 30%
me	Waste	Management	Garbage in The Area	
ron		Wastewater	Reused Wastewater: Total	Not Less than 15%
i.v.		Management	Wastewater	
	Climate Change	Adaptation to	Planned Protection Area / Total	Not Less than 50%
	5	Climate Change	Area	
		Reduction of GHG	Volume of GHG / Total	Not Less than 13.5%
			Population	
	Transportation	Type of Commuting	Ratio of No. of Trips (By Engine-	Not Less than 60%
			Free Trip I.E. Walk Or Bike) &	
			Public Transportation to Total	
lity			No. of Trip in The Area	
obi	Transportation	Types (Rail, Road,	Ratio of Total No. of Goods That	Not Less than 20%
Σ	of Goods	Etc.)	Are Transported By Rail to All	
			Types of Transport	
	Tele-	Distribution of The	Ratio of No. of People Who Can	Not Less than 95%
	communication	System	Access to Broad Band internet to	

	Торіс	Criteria	Indicator	Standard Value
			Total No. of Population	
			Ratio of People Who Can Use	100% Maximum
			3G/4G Services to Total No. of	
			Population in The Area	
		Quality of System	Downloading Speed	Speed Is Not Less than 100 mbps
			(Via Line Connection)	from Domestic Sources
			Downloading Speed	Speed Is Not Less than 10 mbps
			(Via Wireless Connection)	from Domestic Sources
	Renewable	Type (Solar, Biomass,	Ratio of Usage of Renewable	Not Less than 20%
λĘ	Energy (Produce	Wind, Etc.)	Energy: Total Usage of Energy in	
jer	& Use)		The Area	
ш	Efficiency in	Green Building		Not Less than 20%
	Using Energy			
	Ability of	Budgetary	Total Budget of Local	Not Less than National Average
	Organization		Administrative Organization	Value
			(LAO) Per Total Population	
JCe		Human Resources	Ratio of Staff / LAO: Total	Not Less than 1:100
nai			Population	
ver	Transparency of	Public Participation	Ratio of People Who Vote: Total	Not Less than National Average
ß	Administrative		People Who Can Vote	Value
	Management	Public Accessibility	Ratio of People Who Access to	Not Less than 4% of Population
		to News/information	info/News: Total Population in	Who Can Access to internet
			The Area	

Source: Draft Final Report of Smart Cities Project by PTT and Chulalongkorn University

7) Mainstreaming Sustainable Environmental Cities

Regarding the natural environmental management, there are many initiatives of tessabans, but hardly expanded widely to neighboring LAOs. Departments under MNRE have approached to those active tessabans to promote environmental management in various ways, but it is hard to disseminate beyond its boundary, one of the exceptional cases would be the case of Koh Kha which jointly manage the landfill with other four LAOs.

Pollution control and damage caused by climate change are major concern for most tessabans under the limited support from central government. Even the nationally or internationally awarded cities of excellent performance of environmental activities reiterate the difficulties to maintain or establish wastewater treatment plants or introducing well managed on-site wastewater management, and drainage system to combat flood, and upgrade landfills. There are some cases that pollution control infrastructures became not operational. Size of tessabans are generally too small to manage complicated pollution control measures. Since this requires huge funding beyond financial capacity of tessabans, collaboration with neighboring LAOs, Province, national government are prerequisite. In order to control pollution more effectively, not only public participation activities initiated locally, but continuous financial mechanism for appropriate infrastructure is necessary.

Further, tourism, agriculture are important industries for small tessabans. Deterioration of environment directly impacts on social and economic activities. Environmental activities need to be more attention with its social and economic value. Financial mechanism with technical capacity building from national government agencies are necessary for improving the overall environmental situation.

2.5 Decentralization and Local Autonomy in Thailand

2.5.1 Provincial and Local Administration

1) Centrally Controlled Public Administration

Thailand public administration system is divided into three layers, namely central administration, centrally-controlled provincial administration, and local administration. As shown in Figure 2.5.1, provincial administration comprises province (*changwat*) – district (amphoe), sub-district (tambon) – village (mooban). Provincial governors are dispatched by the MOI. Central authorities such as the Department of Local Administration and Department of Public Works and Town and Country Planning of MOI., Department of Land Transport of Ministry of Transport (MOT) and others have field offices in provinces and districts.

Local Administration is based on the concept of decentralization and devolution of powers, which allows people in locality to participate in the administration of their own local affair through local government units in accordance with laws and regulations (Thai Local Government, DLA). Basically, local administration is categorized two types, namely general one and special type. General local administrative organization includes PAO, tessaban, and TAO, while special type of LAO is BMA and Pattaya City.



Note: OPS: Office of Permanent Secretary, DOPA: Department of Provincial Administration, BOB: Bureau of Budget, Source: JICA Project Team based on JICA 2007. (JICA Program on Capacity Building of Thai Local Authorities)



2) Local Administration in Thailand

Types of Local Administrative Organizations

As described earlier, local administration is based on the concept of decentralization and devolution of powers, which is determined in the Constitution of Kingdom of Thailand 2007 and the Act on the Plan and Process of Decentralization to Local Government in 1999 (the Act on Decentralization).

Prior to 1999, most of development activities in local cities were carried out under provincial administration and by field offices of central ministries. When the Decentralization Law was enacted, powers, funding, and human resources were transferred from provincial administration to local authorities. The types and number of local government organizations have been also dramatically changed since then. Provincial Administrative Organization has become *regional government* to administration in rural area. TAO was established in all of the rural area, resulting that all of Thai national land was covered by local government organizations. Sanitary-districts was demolished and upgraded to tessaban tambon in 1999. Recently many TAOs have been upgraded to tessaban tambon. The types and number of local government organizations are summarized in Table 2.5.1.

	Number				Democritica
Type of LAO	1994	2000	2006	2015	Remarks
Provincial	75	75	75	76	One in each Province
Administrative					
Organization (PAO)					
Tessaban	134	1,129	1,162	2,440	
(municipality)					
Tessaban Nakhorn			22	30	(i) with enough financial
					resources, (ii) pop more
					than 50,000, (iii) with great
					economic and social
					development potentials
Tessaban Mueang			120	176	(i) with enough financial
					resources, (ii) pop more
					than 10,000
Tessaban Tambon			1,020	2,234	(i) own revenue not less
					than THB 12 mil, (ii) pop
					more than 7,000
Sanitary District	990	-	-	-	Demolished
Tambon Administrative	512	6746	6 6 1 6	5 2 2 5	-
Organization (TAO)	212	0,740	0,010	5,555	
Bangkok Metropolitan	2	2	2	2	Directly under control of
Area and Pattaya City	2	2	2	2	Minister of Interior.
Total	1,714	7,952	7,855	7,853	-

Table 2.5.1 Types and Number of Local Administrative Organizations

Source: JICA Project Team based on JICA 2007. (JICA Program on Capacity Building of Thai Local Authorities) and National Municipal League of Thailand.

Tessaban is the lowest local administrative organization in municipal area or urban area, which is in pursuance of Tessaban Act B.E. 2496 (1953). Tessaban is classified into three types, namely tessaban nakhorn (city municipality), tessaban mueang (town municipality) and tessaban tambon (sub-district municipality) depending on its size of population, revenue collected by tessaban, and other capacities for urban development. This criterion will be applied nationwide, except for provincial capital which is established as tessaban nakhorn or tessaban mueang regardless of the above general criteria.

Recently the number of tessabans have continuously increased, particularly in 1999, when all sanitary districts were transferred to tessaban tambons. Since TAOs have been also upgraded into tessaban tambons, the number of tessaban is 2,440 as of 2015.

Tessaban is supposed to exercise various duties within its jurisdictions, which is directly closely linked with people's life, including residence registration, public works, primary education, health and sanitary works. It is categorized into two types, namely (1) duties that tessaban must do and (2) duties that tessaban may do.

In addition to the activities within their own jurisdiction, tessabans can perform duties also outside their jurisdiction if consented by relevant Local Administrative Organizations and approved by Governor of its province. In other words, tessabans cannot perform any duties outside of their jurisdiction without approval of Governors.

Two-type of Local Administrative Organizations

Two different type of LAOs are applied in the local administration in Thailand; namely the Provincial Administrative Organization (PAO, or *Obojo*) at changwat level and municipality (*tessaban*) and TAO at city-level. Local administration also includes Special Local Government, namely Bangkok Metropolitan Administration and Pattaya City. Basic concept of local administration in Thailand is summarized as below²¹;

- A mission should be provided and managed by local government organization (tessaban or TAO) that act intimately with people needs in local area
- Unless, if local government organization at city level cannot make them, local government body at changwat level shall make them
- PAO provides public services which have complexity or reciprocity with the other local administration, because they need to coordinate with other local government organizations to provide services related to vast local administrative areas, e.g. wastewater treatment in river which flow in vast areas

²¹ Based on the Woothisan Tanchai, "Factors which Determine the Forms of Decentralization and Local Governance in Asian Countries (Thailand)"

Duty Description		Tessaban	Tessaban	Tessaban
	1 Maintain age and adapting a		Mueang	Tambon
1.	Maintain peace and orderliness	0	0	0
2.	Provide and maintain roads and waterways	О	о	о
3.	Maintain cleanliness of roads or sidewalks and public	0	0	0
	lands including sewage and waste management	0	0	0
4.	Prevent and contain communicable disease	0	0	0
5.	Provide fire extinguishers and equipment	0	0	0
6.	Provide education	0	0	0
7.	Promote women group, youth, the elderly and the handicapped	о	о	о
8.	Preserve local arts, customs, wisdoms, and cultures	0	0	0
9.	Other duties subject to the law	0	0	0
10.	Provide clean water and safe drinking water	0	0	х
11.	Provide cemeteries and crematories	О	0	х
12.	Provide slaughter house	0	О	х
13.	Provide and maintain infirmaries	0	0	х
14.	Provide and maintain waterways	0	0	х
15.	Provide and maintain electricity	0	0	Х
16.	Provide pawnshop or local bank	0	0	-
17.	Provide social welfare for children and mothers	0	х	-
18.	Undertake necessary health activities	0	Х	-
19.	Control sanitation and public health standards in restaurants theaters and other entertainments	о	х	-
20.	Housing and improve dilapidated town	0	х	-
21.	Provide market, port, pier and car parking lot	0	х	х
22.	Undertake urban planning and control building construction	о	-	-
23.	Promote tourism	0	-	-
24.	Provide careers for local people	х	х	х
25.	Provide and maintain hospitals	х	х	-
26.	Provide public facilities	х	Х	-
27.	Establish and subsidize vocational schools	х	Х	-
28.	Provide and maintain public places for sport activities	х	х	
29.	Provide and maintain parks, zoos and recreational places	x	х	
30.	Municipal commerce	х	х	х

Table 2.5.2Duties of Tessabans

Note: o: duties that tessaban must do, x: duties that tessaban may do. Source: DLA, "Thai Local Government"

Organizational Structure of Tessaban

Tessabans' management is divided into two parts, namely legislative section and administrative section. Legislative section is Council. Council members are directly elected by people who reside in that particular jurisdiction as provided by Local Executive and Local Council Member Election Act. The number of council members are prescribed depending on the type of tessabans; namely 24 members for tessaban nakhorn, 18 for tessaban mueang and 12 for tessaban tambon.

Mayors will also be directly elected by people, of which term is four years. Mayors can appoint Deputy Mayors as administrative assistants. The number of Deputy Mayors also varies by the type of tessaban, namely not more than 4 persons for tessaban nakhorn, not more than 3 persons for tessaban mueang, and not more than 2 persons for tessaban tambon. Mayor will do the tessabans management based on the policies and plans approved by the Council.

The municipal office is organized into several divisions. Common to all tessabans are the office of municipality clerk, division of education, division of finance, division of public works, division of public health and environment, division of technical service and planning and division of social welfare. Two examples of a tessaban organization are shown below.



Source: JICA Project Team based on the Local Strategic Development Plan of Khon Kaen

Figure 2.5.2 Organizational Structure of Tessaban Nakhorn Khon Kaen



Source: JICA Project Team based on the Local Strategic Development Plan of Roi Et

Figure 2.5.3 Organizational Structure of Tessaban Mueang Roi Et

2.5.2 Decentralization Process and Local Autonomy

In the 1990s, the administration system of Thailand started to become decentralized. This decentralization has provided certain authority over each jurisdiction and budget to local government organizations including PAO, municipalities (tessaban), and TAO.

While decentralization concept itself needs to wait for the New Constitution, which is under process of draft formulation, process and impact of decentralization, particularly for tessaban are summarized below;

- Administrative powers have been transferred to the local government organizations from central-provincial administration. The Act on the Decentralization determines six local missions, (i) infrastructure, (ii) promotion of quality of life, (iii) maintaining community and society, (iv) plan development, investment promotion, business and tourism enhancement. (v) management of natural resources and environment, (iv) local culture, local wisdom. However, the mission has been transferred at project/activity-based with centrally formulated standard, where there is little authority left for tessaban to adjust to the local conditions. For example, tessaban must provide lunch for students but has no authorities to improve nutrition of students.
- Nevertheless, local government organizations have had more autonomy from central and provincial administration with the increased authorities and through direct election of mayor and local councils²². Local government organizations have to be more responsive to people, resulting in improved quality of life.
- Although financial capacity of tessaban is still small (detail is described in Chapter 2.8), revenue has increased since 1999. The share of local government organizations on total government financial expenditure has increased to 25% and has increased to 28.7% in 2016, which was only about 13% in 1999. However, the government failed to increase to 35% by 2006 that was originally targeted in 1999.
- Since the Constitution 1997 and 2007 encourage community participation, people have become more involved in the local administration, with right to vote, participate in and decision about local management. It has empowered people to learn about local administration, which also improved local public services and then quality of life.
- Along with decentralization trend, some advanced tessabans have succeeded in some innovative policies and projects, with strong and creative leadership, good network/collaboration among regions, and collaboration with communities. Those innovative programs/projects have been further encouraged and recognized by academic-based or government-based award, such as Prajahipok's Award by King Prajadhipok's Institute (KPI) and Livable City Award by DEQP.
- Most of tessaban tambon is too small in terms of population and area to provide urban services efficiently. Also, the number of tessaban tambon is large at 2,234. Government recognizes the need to decrease the number by combining small tessaban tambons and TAOs²³, which is one of the considerations for the new Constitution.

²² Direct election of Mayor was introduced in 2000.

²³ Based on the interview with Office of the Decentralization to the Local Government Organization

2.5.3 Local Autonomy in Urban Planning and Urban Development

From the urban planning point of view, local governments organizations, especially tessabans, have improved planning and project implementation capacities through the experience of developing and implementing city development strategy plans. All LAOs are required to formulate their own LSDP every half-decade and develop 3-year Development Plan and Annual Implementation Plan (as described in Chapter 2.6).

Furthermore, tessabans have accumulated know-how to establish their own unique policies, to cooperate with other tessabans, to collaborate with people's group such as NGOs, and to promote community-based approach in tackling certain urban problems. As described in the previous section, there are some notable tessabans which have introduced innovative policies, conducted creative programs and succeeded community-based development.

Those advanced and innovative tessaban-initiated programs have been actively shared for other tessabans through government or academic-based program, such as KPI Award by KPI, Livable City Award by DEQP, and Low-carbon Program by National Municipal League of Thailand. Table 2.5.3 shows a list of tessabans nakhorn and tessaban mueang who received KPI Award in 2014. It covers wide range of sector, including flood mitigation, urban environment, education, social security, low-carbon city, landscape, etc. Some of notable tessabans include Tessaban Mueang Khao Sam Yot in Lop Buri Province for its environmental policy, Tessaban Mueang Roi Et in Roi Et Province for regional coordination on disaster mitigation, Tessaban Tambon Koh Kha in Lampang Province for regional solid waste management and so on.

Such awarding program provides other tessabans with lessons learned to address urban problems and good models to follow. As a result, participation by the local people has become very active in carrying out activities to improve local livability and environment. Collaboration among neighboring municipalities, with local communities/people/firms is also a key to the further development of tessabans.

Award / Criteria		Tessaban ²⁾	Province	Program/Project	
	Transparency of government and promoting public participation	T.M. Kalasin	Kalasin	 Participation project to organize night market merchants Alternative school for regional development 	
KPI Gold		T.M. Sikhio	Nakhon Ratchasima	 Garbage free community Saving support for community group Health service center Anti-corruption community and tessaban 	
Awaru	Creating Network between Government, private and civil society	T.N. Chaing Rai	Chaing Rai	Asian Cities Climate Change Resilience Network (ACCCRN)	
		T.M. Roi Et	Roi Et	 Canal-bridge landscape reform Regional cooperation for hazard mitigation Education system for children outside or school 	
KPI Award	Transparency of government and promoting public	No T.N. and T.M are awarded			

Table 2.5.3 Tessaban Nakhorn and Tessaban Mueang with KPI Award ¹⁾ 2014

participation				
Duranting Dura	T.N.Phitsanulok	Phitsanulok	 Peace City: environment, culture, quality o life, health 	
Harmonious	T.M. Pattani	Pattani	 Culture festival (Chinese lion dance) City protection volunteer CCTV installment 	
	T.N.Khon Kaen	Khon Kaen	 Youth support network Low Carbon City Universal design 	
	T.N.Nonthaburi	Nonthaburi	 Elderly QOL development Illegal drug prevention and safeguard Environmental network 	
Creating Netwo between Gover	T.N.Yala ork nment,	Yala	 Hazard prevention and mitigation Public social benefit cooperation center Creative City "Yala Bird City" 	
private and civi	I society T.M. Nong Prue	Chonburi	 Children and women network Disabled people network Education, religion, and cultural network 	
	T.M. Kao Sam Yod	Lopburi	 Flooding mitigation network Environmental network (solid waste management) Animal pestilence control and protection network 	

Note: 1) KPI Award covers Provincial Administrative Organizations and Tambon Administrative Organizations as well. 2) T.N.: Tessaban Nakhorn, T.M.: Tessaban Mueang

Source: KPI Award 2014.

2.6 Institutional Framework of Urban Development Planning in Thailand

2.6.1 Urban Planning Systems in Thailand

Planning system in Thailand consists of two major streams; 1. Socio-economic development planning stream and 2. Spatial planning stream as shown in Table 2.6.1. The socio-economic development planning stream stems from the government policies based on NESDP, then breaks down it to region, province (changwat), and local level. LSDP is the plan along this planning stream.

While spatial planning stream doesn't have clear hierarchy in terms of spatial coverage like the socio-economic development planning stream. Comprehensive Plan and Specific Plan have been defined by the law (Town and Country Planning Act) in provincial and local levels. Previously NESDP had certain spatial development policies like eastern seaboard development (3rd NESDP), southern seaboard development (4th NESDP) and regional core city development (5th NESDP), however NESDP currently has little emphasis on spatial development policy. Accordingly, related to the comprehensive plan, DPT develops Thailand National Spatial Development Plan, even though it is not regular and legal plan, to offset hierarchy of spatial planning to draw up overall spatial development policy instead of NESDP.

Looking at local level, plans along the socio-economic planning stream like LSDP correlates with the boundary of LAO such as PAO, tessaban, TAO, while plans along the spatial planning stream like City Comprehensive Plan, sometimes covers beyond boundary of local administration and encompasses parts/all of several tessabans and TAOs.

	Socio-economic Development Planning	Spatial Planning
National	NESDP	Thailand National Spatial Development Plan
Regional	Northern/North- Eastern/Central/Southern/Eastern Regional Strategic Development Plan	N/A
Provincial	Integrated Regional/Provincial Development Plan	Provincial Comprehensive Plan
District	Integrated District Development Plan	N/A
Local	LSDP 3-year Development Plan Annual Implementation Plan	City Comprehensive Plan Specific Plan Action Area Plan, Community Plan, Project Plan

Table 2.6.1Urban Planning Systems in Thailand

Source: JICA Project Team

LAO can develop own LSDP and 3-years action plan. While LAO has to request budget for project implementation to the central government through province due to very limited own budget. LAO requests annual and 3-years budgets for the project implementation to province. The province assesses the requests and compiles as budget request of province to the central government.



Note: CPGA=committee concerning provincial governing and administering provincial clusters SCPGA=Sub-committee concerning provincial governing and administering provincial clusters Source: Department of Local Administration (DLA)

Figure 2.6.1 Process of Development Planning by Level

2.6.2 Local Strategic Development Plan (LSDP)

1) General

Objectives of LSDP are 1) to show goal, framework and guideline for further development, 2) to consider future of city based on capacity and potential of municipality, 3) to give citizens opportunities on participation to local administration, and 4) to share necessary projects among local and central governments.

LSDP has been mandatory for all tessabans under the Ministerial Decree since 2005 in response to decentralization. All tessabans, PAOs and TAOs as local level administration, are required to develop LSDP as a central mechanism of local administration. So, LSDP, positioned as a development plan in local level, is developed keeping consistency with government policies especially NESDP and provincial/district strategic development plan and community plan. Planning hierarchy toward LSDP is illustrated in Figure 2.6.1.

The objectives of LSDP is to share current socio-economic situations, development strategies and projects among the stakeholders including residents (citizen) and clarifying requiring budget for project implementation. Accordingly, LSDP is expected to launch projects in respond to the imposed strategies. To achieve this, LDSP principally consists of three plans: 1) local strategic plan, 2) 3-years development plan and 3) annual action plan.

2) Contents

DLA prepares guideline for local administration organizations to show how to make LSDP under community participation in 2005. The guideline indicates that LSDP should have vision, mission, objective, strategy and projects and long-term development measurements, and also instruct analytical tools for planning such as SWOT analysis and ZOPP technique.

All tessabans prepares own LSDP followed the guideline, so most of the LSDPs have more or less same table of contents:

- Understandings of current situations
- SWOT Analysis
- Strategies
- Projects

DLA as well as tessabans considers LSDP has the following advantages:

- LSDP provides with tessabans important mechanism to formulate future development direction towards implementation according to potential of municipality and citizens' demands
- LSDP provides with a guideline of the municipality to operate development projects in the same direction. Moreover, it can reduce the duplication of the process and the consumption of administration sources.
- LSDP controls the expenditure of the municipality to accord with goals and government policy to manage limited resources efficiently.
- The administration can monitor and evaluate achievements based on the LSDP.





Figure 2.6.2 LSDP and Planning Hierarchy under NESDP

3) **Preparation Stage**

Step 1: LSDP preparation committee

Tessaban establishes LSDP preparation committee and secretariat team to responsible for formulating LSDP such as arranging series of meetings with municipality administrators and relevant officers.

Step 2: Collection and analysis of basic Information on the Tessaban

LSDP preparation committee collects data and basic information including administration, economic and social matters, for example, population data, occupation, income, education, public health, natural resource and environment, transportation, industry and budget etc.

LSDP preparation committee organizes public hearings to understand current problems and demands of citizens.

LSDP preparation committee reviews relevant plans like NESDP, government policies, provincial/district strategic development plan, community plan.

Step 3: Potential analysis to evaluate capacity of Tessaban

LSDP preparation committee assesses strengthen, weakness, opportunity and threat (SWOT analysis) of tessaban.

Step 4: Formulation of LSDP

LSDP preparation committee draft LSDP based on the analyses of the steps 2 and 3, and organizes several meetings such as community meetings and tessaban staff meetings to gather all comments on the draft and reflects their comments.

Step 5: Approval and declaration of LSDP

LSDP preparation committee submits draft LSDP to get approval from tessaban's administrators. After approval, tessaban declares LSDP.

2.6.3 Urban Planning and Comprehensive Plan

1) Urban Planning in Thailand

Town and Country Planning Act in Thailand

In Thailand, there are four layers of plan related to urban planning, namely: 1) National Plan, 2) Provincial Comprehensive Plan, 3) City Comprehensive Plan and 4) Specific Plan. The provincial and city comprehensive plans and specific plan shall be implemented by virtue of Town and Country Planning Act 2518 B.E. amended in 2535 B.E. The Town and Country Planning Act was established in 1975, and amended twice 1982, 1992, and 2015. This Act defines preparation methodology, approval process and required committee of comprehensive plan and specific plan which could be said urban master plan and its detailed plan.

The following figure illustrates relevant acts for urban planning.



Source: JICA Project Team based on BMA, The Outline of Existing Planning Laws and Regulations

Figure 2.6.3 Relevant Legal Acts of Urban Planning in Thailand

Comprehensive plan consists of two levels namely provincial and city comprehensive plans. Provincial comprehensive plan is upper level of city comprehensive plan defines "urban area" in each province. On the other hand, city comprehensive plan shows land use zoning including four major plans such as land use, open space, transport and infrastructure in the urban area. The details will be explained following sections.

Based upon the Town and Country Planning Act, DPT, MOI is legally authorized to prepare the comprehensive plans. Prior to the amendment in 2015, Comprehensive Plan shall apply for a period of five years and extend to seven years at maximum with twice extensions. After expiration, the plans shall lose the enforcements. In other words, once the plan was expired unorganized developments were likely to occur in urban areas. With the amendment in 2015, 5-year expiration (maximum extend to 7 years) of Comprehensive Plan has been abolished. Instead of that, the plan shall validate until next amendment without any expiration.

Specific plan aims to show the details of city comprehensive plan shall be prepared by DPT as well. Specific plan however tends to lose its substance since the plan has not been prepared due to lack of regulations and strong motives of local stakeholders and DPT.

Amendment of the Town and Country Planning Act

Amendment of the Town and Country Planning Act is under process²⁴ of formulation with a basis of the proposal from National Reform Committee with consideration for invalidity of the specific plan and absence of regional plan for the middle plan between national plan and provincial comprehensive plan. The schedule of amendment has not been fixed yet. However, the draft Act has been already prepared. Compared to the exiting act, the major changes of the new one are as follows.

• Board of National Policies and Town Planning shall be newly established in order to

²⁴ As of April 2016

define and approve national and regional plans since Thailand National Spatial Development Plan 2057 has not been approved yet.

- Primary Specific Plan shall be newly established as a part of specific plan with ministerial regulation same as comprehensive plan
- Main planning authorities shall be changed from DPT to Office of Prime Minister (OPM)

2) Provincial Comprehensive Plan

Provincial comprehensive plan as an upper level of the city comprehensive plan aims to indicate urban area, land use zoning, transport network and public services in the entire province. The boundary is basically same as the provincial boundary. DPT provincial office in general shall prepare its own provincial comprehensive plan through coordination with relevant tessabans and TAOs since decentralization of city planning procedure has been enhancing for a recent decade in Thailand.



Source: Provincial Comprehensive Plan Nakon Phatom, 2013



Source: Provincial Comprehensive Plan Ubon Ratchatani, 2015

Figure 2.6.5 Comprehensive Plan for Ubon Ratchatani Province

In general, the land use of provincial comprehensive plan is classified into eight zoning as follows. The community zone colored pink shall correspond to the area of the city comprehensive plan namely "urban area".

<u>Pink</u> Community		<u>Green with brown frame &strip</u> Land reform for agriculture
<u>Purple</u> Industrial and warehouses		<u>Light green</u> Open space for recreation and environmental conservation
<u>Green</u> Rural and agriculture	II	<u>Light green with white strip</u> Forest conservation
<u>White with green frame & strip</u> Rural, agriculture and environmental conservation		<u>Light blue</u> Open space for environmental conservation

 Table 2.6.2
 Land Use Zoning in Provincial Comprehensive Plan

Source: DPT Provincial Office Ratchaburi

3) City Comprehensive Plan

City comprehensive plan, covers tessaban and its surrounding area, aims to indicate the land use zoning, transport network and public services in more detail compared to the provincial comprehensive plan. DPT provincial office in general shall prepare city comprehensive plans in the jurisdiction of its province, through coordination with relevant tessabans and TAOs, except special cities such as BMA and Pattaya City. The boundary of plan does not same as administrative one and is defined by DPT provincial office respectively, which usually cover several tessabans and TAOs. Many city comprehensive plans designate green area at the fringe of the planning area based upon the ideas of green belt for controlling urban sprawl. The green area is also considered as buffer zone between residential and industrial area for taking account of living environment.



Source: City Comprehensive Plan Krabi, 2011





Source: City Comprehensive Plan Nakhon Sawan, 2011

Figure 2.6.7 City Comprehensive Plan for Nakhon Sawan Urban Area

The land use of city comprehensive plan is in general classified into twenty-two zoning as follows.

	<u>Yellow with white strip</u> Conservation area for residential area	TTEP	<u>Green with brown frame &strip</u> Land reform for agricultural area
	<u>Yellow</u> Low density residential area	<i>TTTT</i>	<u>Green with white frame & strip</u> Environmental conservation for tourism area
	<u>Orange</u> Medium density residential area		Light green: Open space for recreation and environmental conservation area
	<u>Brown</u> High density residential area	TATAL	White with green frame & strip Open space for recreation, husbandry and environmental conservation area
	<u>red</u> Commercial and build-up area		<u>Light green with green frame &</u> <u>strip:</u> Preservation area for recreation and environmental conservation
	Purple Industry and warehouse	1111	Light green with white strip Forest conservation area
初始的制度的	<u>Light purple</u> Special industrial area		<u>Olive green</u> Educational institution area
	<u>Violet</u> Warehouses		Light blue Open space for environmental conservation and fishery
1111	<u>White with purple frame &</u> <u>strip</u> Industrial without pollution community or environment and warehouse area		<u>Light brown</u> National identity and cultural conservation area
	<u>Green</u> Rural and agricultural area		<u>Light gray</u> Religious institutional area
	<u>White with green frame &</u> <u>strip</u> Rural and agricultural conservation area	and the second second	<u>Blue</u> Government institution, public utilities and amenities

 Table 2.6.3
 Land Use Zoning in City Comprehensive Plan

Source: DPT Provincial Office Ratchaburi

Comparison of Existing Land Use and City Comprehensive Plan

The comprehensive plans of three tessabans, Phitsanulok, Nakhon Sawan and Krabi, will be examined in the following sections in order to understand the true figure by comparisons between the plans and actual land use respectively.

(1) Phitsanulok City

Phitsanulok City is located in Northern Region. The existing built up area stretches out at the center of Nan River and along the major roads as illustrated in following figure.



Source: JICA Project Team based upon Google Earth Pro

Figure 2.6.8 Built-up Area in Phitsanulok City

From the other perspective, compared to the comprehensive plan, expansion of the builtup area is found outside of the residential area and sprawls in the rural and agricultural area defined by the plan.



Source: JICA Project Team based upon Google Earth Pro



The built-up area in the green belt includes newly developed housings as shown in the following photos. These large sized housings are found in the green belt and just beyond the boundary of the comprehensive plan. Furthermore, the boundary of comprehensive plan has not changed since the previous land use plan established in 1990. In other words, the planning area does not consider the actual urbanization trend effectively.





Housing in the Green Belt Source: Google Earth Pro

Housing beyond the Comprehensive Plan

Figure 2.6.10 Large Housing Developments Outside of Planning Area of City Comprehensive Plan

(2) Nakhon Sawan City

Nakhon Sawan City is located in the Northern Region in Thailand. The existing built up area stretches out at the center of Chao Phraya River and along the major roads as illustrated in following figure.



Source: JICA Project Team based upon Google Earth Pro

Figure 2.6.11 Built-up Area in Nakhon Sawan City

From the other perspective, compared to the city comprehensive plan, the built-up area expands outside of residential area and sprawls into the rural and agricultural area. Furthermore, opposite side of Chao Phraya River, beyond the boundary of comprehensive plan, urbanization seems to be progressed.



Source: JICA Project Team based upon City Comprehensive Plan Nakhon Sawan 2011 and Google Earth Pro

Figure 2.6.12 Built-up, Rural, and Agricultural Areas in the Comprehensive Plan for Nakhon Sawan Urban Area

The built-up area in the green belt includes newly developed housings as shown in the following figures. Accumulations of houses and commercial facilities seem to expand beyond the boundary of comprehensive plan.



Accumulation of Housing beyond the Comprehensive Plan Source: Google Earth Pro



Newly Developed Housing in the Agricultural Land

Figure 2.6.13 Large Housing Developments in the Greenbelt Area in Nakhon Sawan Urban Area

(3) Krabi City

Krabi City is located in the Southern Region in Thailand facing Andaman Sea. The existing built up area stretches out to the coastal area and northeast area along the major roads as illustrated in the following figure. Especially tourism industries area major economic engine of this area.



Source: JICA Project Team based upon Google Earth Pro

Figure 2.6.14 Built-up Area in Krabi City

From the other perspective, compared to the city comprehensive plan, the built-up area expands outside of residential area and sprawls in rural and agricultural area, especially in the sea side area.



Source: JICA Project Team based upon City Comprehensive Plan Krabi 2011 and Google Earth Pro

Figure 2.6.15 Built-up, Rural, and Agricultural Areas in the Comprehensive Plan for Krabi City

The green belt includes relatively new commercial developments such as tourism facilities and shopping center as shown in the following figures. In the southern area of Krabi categorized as rural and agricultural area, many developments for tourism facilities are found near the bay such as hotels, restaurants and shops. On the other hand, in the northeast area, large-sized shopping center has been developed in just beyond the

boundary of comprehensive plan.



Hotel Development Source: Google Earth Pro

Large-size Shopping Center

Figure 2.6.16 Large Commercial Developments in the Suburban Area of Krabi City

Issues in the City Comprehensive Plan

(1) Discrepancy between the Comprehensive Plan and Actual Conditions

Looked through the examples of three cities, differences between the comprehensive plan and actual land use have been identified. In particular, current built-up area seems to expand from the planned residential area and to sprawl along major roads into the planned rural and agricultural area in the comprehensive plan. Beside the green belt seems to work inappropriately since housing developments carry out just beyond the boundary of comprehensive plan. Therefore, the comprehensive plans are likely to lose control its zoning. For taking account of efficient land use and infrastructure, decreasing future population and aged society, urban area should be compact without any sprawl. In order to avoid unplanned urban expansion, the exiting idea of green belt in the comprehensive plan needs to be implemented in efficient manner.

(2) Regular Review of Comprehensive Plans

Since of the discrepancies between the boundary of comprehensive plan and the current urban area, the comprehensive plan is strongly suggested to be reviewed on a regular basis even the expiration years of comprehensive plan will be abolished in the amendment of Town and Country Planning Act. Especially the territorial area, namely urban area, of comprehensive plan needs to be evaluated and updated carefully with consideration of the land use dynamics and future socio-economic changes in the target area.

(3) Implementation Structure of Comprehensive Plans

The boundary of comprehensive plan does not match with the administrative boundaries as shown in following figure. Thus, integrated implementation and controlling the land use requires not only the efforts of tessaban but also firm supports from involved other tessabans or TAOs in the surrounding area. Appropriate implementation needs close cooperation between the tessabans and TAOs.

2-93



Source: City Comprehensive Plan Phitsanulok, 2011 and GDAM (http://www.gadm.org/country)

Figure 2.6.17 Sub-district Boundary and City Comprehensive Plans

Based upon the existing Town and Country Planning Act, the comprehensive plan shall be prepared by DPT. To do so lined officers of DPT have to have internal trainings for preparation of comprehensive plan, they are considered to have certain knowledge and skills about the comprehensive plan. However, tessabans and TAOs have limited opportunities to join the preparation process of the comprehensive plan, even though they have to implement the plan. In order to make an efficient implementation structure, the stakeholders including tessabans and TAOs needs to fully understand as same as DPT in terms of the skill and knowledge about land use planning and controlling. For this the capacity development for them is an essential issue to strengthen the implementation structure of comprehensive plan.

2.6.4 Urban and Landscape Design

1) Urban and Landscape Design in Urban Planning

While quite often urban and landscape design tend to be highlighted only aesthetic aspects, they include fundamental social components such as Health, Safety and Welfare (HSW) as shown in Figure 2.6.18. Protection of HSW is clearly defined as the major obligation of landscape architects and urban planners under the relevant laws and regulations in the majority of the developed countries.

In addition to HSW, conservation of natural, historic and cultural resources is also important component of urban and landscape design and therefore, HSW and conservation of these

resources need to be considered in urban and landscape design as illustrated in Figure 2.6.18.



Source: JICA Project Team

Figure 2.6.18 Urban and Landscape Design Components and Their Priority

2) Current Situation of Urban and Landscape Design in Thailand

Although profession of "Urban Designer" is not legally defined under Thailand's laws and regulations, professions of "Urban Architect" and "Landscape Architect" are defined by Architect Law. In terms of urban and landscape design principles including protection of HSW and preservation of natural, historic, and cultural preservation, Town Planning Act clearly states that they are included as a part of urban planning as follows;

"town planning" means the preparation, making and implementation of a comprehensive and a specific plan in the area of a town and related areas or in the country in order to build or develop a new town or a part of thereof or to replace a damaged town or a part thereof for the purpose of providing or improving situation, **amenity and convenience**, **orderliness**, **beauty**, **use of property**, **public safety**, **and social security**, of improving **economy**, **social affair**, **and environment**, **of preserving a place and an object of interest or value in the field of art**, **architecture**, **history or antiquity**, **or of preserving natural resources**, **landscape of beauty or natural interest**." [emphasis added]

According to the Town Planning Act, urban planning is supposed to be prepared and implemented by comprehensive and specific plan as stated above. While comprehensive plan represents the fundamental physical urban structure by land-use, transportation, infrastructure, and open space plan as stated in Chapter 2.6, specific plan is supposed to provide a practical guideline for development or maintenance of a specific area. Since urban and landscape design in urban planning is expected to clarify the approach to reflect the policy of formulated planning into physical forms by spatial design, it should closely relate to the specific plan in order to implement HSW and natural, cultural and historic preservation as well as other objectives of urban planning stated in Town Planning Act. However, specific plan has never been prepared due to is complicated approval process. Due to the possibility to include land expropriation issues in the specific plan and it triggers the deregulation of Expropriation Act, enforcement of the specific plan requires the Act approved by the parliament while the comprehensive plan can be enforced by the

Ministerial regulation.

Although specific plan has never been formulated so far, DPT published a manual for preparation of specific plan to clarify the contents of the plan. According to the manual, specific plan should include 1. Zoning ordinance, 2. Subdivision regulation, and 3. Building code of ordinance. Regarding the zoning ordinance, each zoning type specifies the location and density of the facility etc. For example, "Recreational and Environmental Conservation Zone (the area provides recreation services such as play yard, zoo, parking etc.)" should occupy at least 10% of total area and "Buffer Zone (the area mitigating the urbanization and preserving the environmental quality, which can be included in "Recreational and Environmental Conservation Zone") should cover at least 15-25% of total area. Regarding the Subdivision regulation, importance of inclusion of public spaces for public facilities, roads, and open spaces etc. is highlighted and land readjustment is introduced as one of the solutions to secure the public space. Building code of ordinance is a set of rules that specifies the minimum standards for constructed objects in both design and construction such as buildings and non-building structures.

Due to the absence of the specific plan, the elements of the specific plan specifying the details of the comprehensive plan as the guideline of urban and landscape design are supplemented by the ancillary laws of Town and Planning Act. For example, Building Act and relevant Ministerial Regulations require certain accessibility through the maximum slopes, steps and minimum width of hallway etc. to secure HSW. Some tessabans actively working on elderly care such as Tessaban Mueang Nonthaburi prepared the original design guideline for universal access according to the national laws and regulations (Figure 2.6.19).



Source: Universal Design Guideline, Tessaban Mueang Nonthaburi

Figure 2.6.19 Example of Design Guideline by Tessaban Mueang Nonthaburi

Regarding the cultural and historic conservation, Fine Arts Department (FAD) under the Ministry of Culture has been a key state agency for preservation and conservation of tangible historic and cultural resources while other departments of the Ministry are in charge of preservation and conservation of intangible historic and cultural resources.

As mentioned in Chapter 2.4, close coordination between relevant departments of MNRE and LAOs is necessary to ensure the environmental conservation through the urban and landscape design. Since tessabans tend to focus on sanitary and energy related projects such as solid waste management, water supply, wastewater management, and renewable energy projects due to the concertation on preparation of Local Plans as described in Chapter 2.4.4, conservation of natural resources in terms of urban and landscape design is generally limited. Several tourist destinations such as Samui Island introduced as APEC Low Carbon Model Town Project in Chapter 2.4.4 and Phuket Province are trying to conserve natural resources through structural and physical urban planning. Phuket Province established a Ministerial Notification (Territory and Environment Protection Measures for Phuket Province) to supplement Environment Quality Promotion and Preservation Act and relevant Ministerial Regulations. The notification specifies the detailed land use and permissible structures for eight different zones including the buffer zones of the area with environmental vulnerability such as coastal areas.

3) Current Issues in Urban and Landscape Design in Thailand

While certain accessibility is secured inside the building by the current laws and regulations, the accessibility and mobility between the building and the major public facilities such as railway and bus stations is not often secured (Figure 2.6.20) due to the unestablished laws and regulations requiring the universal access among facilities (e.g. Barrier-Free Law in Japan). Also, lack of consideration for safety and accessibility is often seen in the current sidewalk design such as limited accessible slope due to the significant rise of the sidewalk from the roadway and inappropriate bike lane design in the sidewalk.



Note: Limited access to BTS station by stairs without elevator (left), bike lane designed in the middle of sidewalk (right) Source: JICA Project Team

Figure 2.6.20 Examples of Lack of Accessibility and Safety

In addition to the lack of securement of HSW through the appropriate urban and landscape design, there are other major issues that stem from the structure of urban planning system described in Chapter 2.6.1. Since the Ministerial Decree obliges tessabans to formulate LSDP, tessabans have been focusing on the preparation and implementation of LSDP as well as 3-year Development Plan and Annual Implementation Plan. These plans are policy oriented and descriptive without any general design guidelines unless the guidelines are prepared specifically for the project (e.g. healthy aged community project in tessaban Mueang Nonthaburi previously introduced as shown in Figure 2.6.19). Due to the concentration of tessabans on the formulation of Local Plans (LSDP, 3-year Development Plan, Annual Implementation Plan), involvement of tessabans for the formulation of the spatial plan
(comprehensive plan) tends to be minimum such as coordination of community meeting required by the Town Planning Act. Such limited involvement in spatial planning triggers the lack of consideration for the urban and landscape design to implement securement of HSW and the conservation of natural, historic and cultural resources. Although there is significant potential for the improvement on urban and landscape design through the preparation of small-scale spatial and physical planning/design such as Action Area Plan, Community Plan, and Project Plan shown in Table 2.6.1, these plans cannot be formulated without City Comprehensive Plan. Due to the limited human and financial resources in tessabans, most of the tessabans are not active to formulate the City Comprehensive Plan and it follows that tessabans are losing opportunity to consider urban and landscape design. In order to raise awareness for the importance of urban and landscape design among tessabans, further involvements in spatial and physical planning and design are needed. Inclusion of design guideline in the Local Plans are also necessary to provide more opportunities for tessabans to consider urban and landscape design.

Limited financial sources also become the major obstacle to implement appropriate urban and landscape design especially in the local cities. For example, while FAD is the leading agency being responsible for the preservation of tangible cultural and historic resources, FAD cannot provide sufficient budget for all major registered cultural and historic structures and areas. Therefore, many of the current urban and landscape design projects have been implemented by the special funding source such as King's projects and the donation from the private companies.

4) Good Practices in Urban and Landscape Design in Thailand

Due to the relatively ample human and financial sources comparing to the other LAOs as well as the existence of significant historic monasteries and buildings, there are several iconic urban and landscape projects have been implemented in BMA area.

In order to inherit the traditions and history of Rattanakosin Island, Rattanakosin Committee was appointed and established under regulations of the OPM in 2003. The committee consist of the following members and is empowered for the following tasks;

<u>Members</u>

- Deputy Prime Minister
- Governor of Bangkok Metropolitan Administration (BMA)
- Permanent Secretary of Ministry of Natural Resources and Environment (MNRE)
- Permanent Secretary of Ministry of Defense
- Permanent Secretary of Ministry of Interior (MOI)
- Permanent Secretary of Ministry of Culture
- Director of Bureau of Budget (BOB)
- Secretary-General of the Office of Natural Resources and Environmental Policy and Planning
- Secretary-General of the Office of the National Economic and Social Development Board (NESDB)
- Lord Chamberlain
- Director of Crown Property Bureau
- Director of Office of Transportation and Traffic Policy and Planning (OTP)

- Director-General of Department of Department of Public Works and Town & Country Planning (DPT)
- Director-General of Department of Treasury
- Director-General of Department of Fine Arts
- Governor of Tourism Authority of Thailand (TAT)
- President of Society for the Conservation of National Treasure and Environment
- President of the Association of Siamese Architects under Royal Patronage
- 7 appointed experts

<u>Tasks</u>

- To define preservation site and conduct a Masterplan for conservation and development in Rattanakosin Island
- To prepare a restoration or development action plan
- To recommend and approve the government project within areas
- To subsidize an operation to the agencies who are responsible for a restoration or development action plan
- To adopt practice guidelines within areas with approval of the cabinet which does not against the laws
- To encourage public and private sector to participate in the master plan preparation
- To monitor and evaluate the plan to ensure that set of objectives is achieved in a given area
- To arrange a meeting for government, public and private sector to clarify their actions within areas
- To appoint sub-committee to collaborate with other organizations under a given powers and duties
- To provide and report overall progress to the cabinet
- To enforce action plan or measurements, under the order of the cabinet, to achieve the master plan's objective.

With the establishment and empowerment of the committee, "Bright Chao Phraya River Project in Honor of His Majesty the King" was launched in 2008 by TAT under the supervision of the Rattanakosin Committee. The project aims at formulation and implementation of a master plan to restore and revitalize the Chao Phraya Riverside. The master plan has various sub-projects including three projects shown in Figure 2.6.21 in collaboration with Crown Property Bureau. The Crown Property Bureau is the quasi-government agency responsible for managing the property of the royal family and highly influential on the planning and development in the Rattanakosin area. These three sub-projects contribute to enhance the significance and dignity of the Grand Place by securing the open space to fully enjoy the view of the palace as well as the consistent historic streetscape around the palace.



Source: Prakitnonthakan, C. (2012). 'Rattanakosin Charter: The Thai Cultural Charter for Conservation'

Figure 2.6.21 Location of Sub-projects of the Bright Chao Phraya River Project

(1) Tha Tian Market Restoration

Tha Thian Market is a very old market and used to be a logistic center connecting Bangkok and local cities. However, such historic reputation was neglected due to the old shophouses with poor maintenance. Since there 55 row houses were located in the project site, it took four years to complete the entire restoration. The first three years were spent for doing research, data collection and analysis, along with the preparation of conservation plan. They investigated the forms, materials, and history of the existing buildings in order to conduct specific guidelines of restoration in the project area. Construction for the restoration was conducted during the last year. Financial source-wise, 75 percent of the total cost was subsidized by the Crown Property Bureau and the rest of 25 percent of the total cost be paid by lessee.



Source: Homepage of the Crown Property Bureau, http://www.crownproperty.or.th/ Figure 2.6.22 Before and After Restoration of Tha Tian Market

(2) Tha Chang Restoration

There are 38 row houses located in project site. It took five years to complete this project. Similar to Tha Thian Market Restoration, the first three years was spent for a survey, analysis and planning. The results of the study were compiled as a restoration guideline specifically for the area of Tha Chang. Last two years were spent for restoration construction. Percentage of defrayal is the same as Tha Thian Market Restoration; 75 percent of the total cost was subsidized by the Crown Property Bureau and the rest of 25 percent of the total cost be paid by lessee.



Source: Webpage of the Crown Property Bureau http://www.crownproperty.or.th/



(3) Thanon Na Phra Larn Restoration

The Crown Property Bureau took initiative to conduct restoration for the project area (approximately 2,000 sq.m) in collaboration with lessee, government agencies, consultants and working group. It took four years to complete and the first three years was spent for research and planning based on the data collection and analysis for the existing building forms, materials and history in order to prepare guidelines of restoration specifically for Thanon Na Phra Larn. Restoration construction was conducted in the last year according to the guideline.



Source: Webpage of the Crown Property Bureau http://www.crownproperty.or.th/





Source: Webpage of the Crown Property Bureau http://www.crownproperty.or.th/



2.7 Current Conditions and Problems of Cities in Thailand

2.7.1 Current Status of Tessabans

1) Overall Status of Tessabans

In Thailand, a municipality is called a tessaban. As of 2015, there are approximately 2,400 tessabans in the country. As described in Chapter 2.5, tessaban is categorized into three types depending on population size and financial capacity namely tessaban nakhorn, tessaban mueang, and tessaban tambon. The range of their population is wide; some have more than 200,000, while many tessaban tambon have less than 10,000. Its area also ranges from less than 1.0 sq.km to more than 1,200 sq.km, of which average is 46.5 sq.km for tessaban nakhorn, 21.9 sq.km for tessaban mueang and 43.2 sq.km for tessaban tambon.

Tessaban	Number	Population		Area (sq.km)		Elderly (%) ¹⁾	
Туре							
Tassahan	30	Average	97,678	Average	46.5	Average	9.7%
ressaban		Max	270,609	Max	277.0	Max	13.3%
пакпогп		Min	51,245	Min	7.3	Min	6.2%
Tessaban mueang	178	Average	24,595	Average	21.9	Average	10.4%
		Max	77,976	Max	182.1	Max	20.7%
		Min	4,448	Min	0.6	Min	1.7%
Tessaban tambon	2,232	Average	6,942	Average	43.2	Average	n.a.
		Max	92,286	Max	1,240	Max	n.a.
		Min	288	Min	0.39	Min	n.a.

 Table 2.7.1
 Overall Status of Tessabans

Note: 1) Over sixties Source: DLA Website, 2015

Each tessaban has its own unique historical background, planning issues, and development potentials. Such differences in population indicate different types of urban challenges.

Other than the physical conditions of tessabans, it should be pointed out that administrative and management capacities of tessaban office vary widely. Some of tessabans have achieved remarkable success in some field of public service under the capable leadership of mayors (Nayok Tessaban). Such tessabans are given significant local government awards (i.e. KPI award).

2) Socio-economic Conditions

Demographic Changes

As described in the Chapter 2.2, urban population or population in municipal are in Thailand as a whole has continuously increased. On the other hand, population in each tessaban have become stagnant or started decreased. While population data at tessaban level is available only for registered population, which does not cover non-registered population and quite different from census population, the analysis of registered population has shown depopulation trend at tessaban level. 17 tessaban nakhorn have experienced population decrease from 2010 to 2014 out of 30 tessaban nakhorn. Out of 96 tessaban mueang of which time-series population data is available, 38 tessaban mueang have experienced population decrease in the same period.

Compared with population change of the whole district, district-population has shown higher growth rate of population than that of tessabans in most tessabans. Figure 2.7.1 shows comparison of growth rate of tessaban and that of district, where most of tessabans are plotted above the blue line. In other word, population growth rate of the whole district is higher than that of the tessaban. Since population of district is based on census data and population of tessaban is registered one, it cannot be simply compared. Nevertheless, it implies that urbanization has expanded beyond administrative boundaries of tessabans.



Note: Blue line means that growth rate of tessaban are equal to that of District. Source: Population of District: Census 2010 and 2000, Population of Tessaban: DLA Website, 2015

Figure 2.7.1 Growth Rate of Tessabans and Districts (Tessaban Nakhorn)



Note: Blue line means that growth rate of tessaban are equal to that of District. Source: Population of District: Census 2010 and 2000, Population of Tessaban: DLA Website, 2015

Figure 2.7.2 Growth Rate of Tessabans and Districts (Tessaban Mueang)

Regional comparison shows that tessabans in the Bangkok and central region and the eastern region have experienced high growth rate both for district- and tessaban-level, such as Samut Sakhon, Leam Chabang, Rayong, etc. It is observed that population have increased both in urban center and in the surrounding suburban areas in those regions.

In the northern and northeastern region, where overall population has started to decrease, most of tessabans have relatively lower growth rate. Most of tessaban nakhorns and some of tessaban mueangs in the northern and northeastern region have experienced depopulation at tessaban levels. On the other hand, some large urban centers have experienced population increase in those areas, such as Khon Kaen, Chaing Mai, and Nakhon Ratchasima.

In the southern region, population has much increased at district level rather than tessaban level, particularly for tessaban nakhorn, such as Phuket, Ko Samui, Hat Yai-Songkhla, which are growing large urban centers. On the other hand, some of tessaban mueangs have experienced lower growth rate of population at district level than that in tessaban level.

As a whole, Figure 2.7.3 shows that population increase has been observed in and around the district with strong growth potentials, such as regional centers at Chaing Mai, Khon Kaen, and Songkhla-Hat Yai, border cities such as Mae Sot, Mukdahan, and Sadao and BMR and ESB area.



Source: Date extracted from Census 2000 and 2010

Figure 2.7.3 Annual Growth Rate of Districts, 2000-2010

Aged Society

As discussed in the NESDP, Thailand is turning in to the aged society. As a whole Thailand, percentage of elderly (over 60 year-old) in total population is 12.9% in 2010 and 14.0% in 2015 in the whole Thailand, which is expected to increase to 19.8% by 2025. (Institute for Population and Social Research, Mahidol University). It is higher in the central and the northern region as seen in the Figure 2.7.4. Seeing by municipality, some of tessabans have much higher percentage of elderly population than national average of municipal area at 11.7%, which is slightly lower than that of non-municipal area at 13.8%. Particularly for tessabans in the northern region such as Lampang, Chiang Rai and Chiang Mai for tessaban nakhorn and Mueang Kaen Phatthana, Dok Khamtai, Lom Rad, for tessaban mueang have relatively higher percentage of elderly population.



Source: JICA Project Team based on the Census 2000 and 2010



2.7.2 Civil Society in Thailand

1) Civil Society Actors

Civil society organizations were increasingly recognized their roles in 1980s, and many nongovernmental organizations (NGOs) and community-based organizations (CBOs) were born in terms of economic and social development, human rights, environmental management etc. Now, many national and international NGOs are working, and networking in issue based.

lssue/Theme	Group
Disaster management and	ASEAN Partnership Group
emergency response	IASC Humanitarian Network for Asia-Pacific
Energy	Mekong Energy and Ecology Network
Health	Interfaith Network on HIV/AIDS in Thailand
	Thai Network of People Living with HIV/AIDS
	Global Fund Country Coordinating Mechanism
Indigenous People's Pact	Asia Indigenous People's Pact
Thai Civil Society	People's Empowerment Foundation
Trafficking	United Nations Inter-Agency Project on Human
	Trafficking (UNIAP) coordination project
Water resources in the	M-POWER (Mekong Program on Water Environment and
Mekong Basin	Resilience)

Table 2.7.2	Civil Society Networks in Thailand
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Source: Arranged by JPT based on ADB Civil Society Briefs Thailand, November 2011

In terms of urban planning and development, it is emphasized to actively involve civil society in every stage of planning, implementation, and monitoring/evaluation. Since each tessaban has its own unique issues and identify, civil society at local level is expected to take important roles to discuss multi issues and promote further development with tessaban as a coordinator. Expected actors of civil society for tessaban's development are as follows;

- (1) Governmental Organization: surrounding Tessabans or TAOs, etc.
- (2) Community people/ organizations: Community Committee, volunteer groups, social club, youth group, etc.
- (3) Academics: local universities and colleges
- (4) Public organization: local public authorities such as police, hospital, school etc.
- (5) Business Sector: Provincial office of Chamber of Commerce and Federation of Thai Industry, private enterprises and factories as corporate social responsibility (CSR)
- (6) NGO: local or international NGO especially working with tessaban
- (7) Opinion Leader: religious leader, local politicians, teachers/ professors, doctors etc.

2) "Community" in Governmental System

The word "community" is popular in Thailand now and many governmental and private projects apply community participatory approach to strengthen and empower the people. One of the reasons to this status is that both of the 8th NESDP and Constitutions of 1997 referred "community". The 8th NESDP emphasized to "strengthen communities" and Constitutions 1997 recognized "community right". In this context, "community" was officially recognized and identified as one of the key actors along with the national

development policy.

However, even before 8th NESDP and the 1997 Constitution pointed out the community, system of the community had been mentioned by the Permanent Secretary Order of the Ministry of Interior that all tessabans should establish communities in their area.

Community System

Community is the lowest group of the people in public administration system. As mentioned in Chapter 2.5, public administration system of Thailand is a complex with a dual system: provincial administration and local administration. "Village" is the most fundamental layer and the lowest group of the people under the provincial administration. Village head is elected by villagers and working for five years to transfer governmental policies/directions to local people. On the other hand, "community" is the lowest group which was prescribed by the Permanent Secretary Order of Ministry of Interior, issued in 1987 (the 1987 Order) in order to promote community participation in public service provision. "Community" is applied in both of tessabans and TAO, each of which has a community committee as community representatives. Member of community committee are on voluntary basis without any payment from the government. Table 2.7.3 sorted the "Village" and "Community" in Thailand public administration system.

Item	Village	Community
System	Provincial administration system	N/A
Head	Elected	Recommended/Candidacy
Salary	Paid by MOI	N/A
Belonging	Tessaban Tambon and TAO	Tessabans and TAOs

Table 2.7.3 Outline of Village and Community

Source: Arranged by JPT based on Permanent Secretary Order of MOI No.4 1987 and case study report on JICA Program on Capacity Building of Thai Local Authorities

Community Committee

Although the establishment of the community is mentioned in the above order, criteria of the community establishment are not stipulated in detail. Size and location can be decided freely based on the local situation, and usually, main road, river, canal, and bridge are applied as community boundary. If there are some communities established before the order issued, it is not necessary to establish new community in that area. Therefore, it can be said that "community" is flexible and respect existed community tie.

Each community set up "Community Committee" for management of their community. The organization chart is mentioned in Figure 2.7.5.



Source: JICA Project Team

Figure 2.7.5 Organization of the Community Committee

There are seven divisions under one chairman, and one deputy chairman. One representative is appointed in each division, and total number of committee member is fivenine ²⁵. This set up is similar with organizations of the Municipality, so Community Committee can closely work with Municipality in each issue.

Community Plan

All communities also formulate community plan for three years. Contents of the community plan are similar with three-year development plan of Municipality which contains; basic information, community analysis, and project list in main part. In appendix, SWOT analysis, vision of the community and directory of community representatives are included.

The community plan is not under local plan shown in Figure 2.6.1 in Chapter 2.6. But for budgeting of the projects listed in the community plan, some of the projects need to be financed by tessaban's budget due to limited source of budget by community themselves. Therefore, contents of both community and local plan should be coordinated each other.

Coordination between Tessabans and Communities

(1) Public Hearing

One of the duties of the tessaban is to promote community participation in development works. On the process to formulate annual implementation plan, Municipality should hold public hearing to collect community opinions. Frequency and ways of facilitation of the public hearing is decided by each Municipality, but they should hold at least once²⁶.

Example of Tessaban Nakhorn Khon Kaen

Tessaban Nakhorn Khon Kaen has 129,581 people and those people are divided in 93 communities. Each community has about 270 households and 1,000 people on average. 93

²⁵ In the case of full appointment of the committee, total number can be nine; however, some position might be vacant or plural depend on the available human resources.

²⁶ From the interview result to Tessaban Mueang Ratchaburi made on 26th November 2015.

communities are divided into four areas and categorized into six types of communities (see Box 4).

Box 4 Type of Community in Tessaban Nakhorn Khon Kaen

Tessaban Nakhorn Khon Kaen categorizes its community into the following six types. (Local Strategic Development Plan of Khon Kaen)

Sub-Community means community that gathers in the same geography such as road, alley or same build line/blocks.

Warren or Slum means high dense community with bad sanitary conditions. Housing is not well organized, unstable, and deteriorated. Most of them do not have land ownership and always migration from other area, facing environmental, social and economic problems.

Urban community means community that is grouped for business as a new society. They have various culture and exchange benefits each other. They have stable business and income as well as sufficient utilities and good living environment.

Semi-city means original community that live with relatives and keep their own culture and tradition for new generations. They usually do business of their predecessor such as agricultural sector and combine them with trading suitable in the recent growth of the city. There are also people from outside migrated to the area living in large community. Most of housing are stable with land ownership as well as good infrastructure and environment.

Housing development means community who live in new building that are well organized with sufficient infrastructure and good living environment. Most of them have stable economic and certain income.

Government means home of retired civil servants and officials. Such village is stable, beautiful with land ownership.

Tessaban Nakhorn Khon Kaen is one of the main tessabans in the north-eastern Thailand, and usually such big tessaban tends to face difficulty to have close communication with communities. For the situation of Tessaban Nakhorn Khon Kaen, on the other hand, holds public hearing/community meeting in every one to two months, and share the information of the progress of development projects from the tessaban to communities, as well as community leader to the tessaban and other community people. Also, some community people can ask any questions to the tessaban for unclear matters.



Source: JICA Project Team

Figure 2.7.6 Photos of Community Meeting in Tessaban Nakhorn Khon Kaen on 10 March 2016²⁷

Even the detail of the public hearing is up to tessabans, they try to work with community people closely considering the local situation. It can be read that such tessabans already

²⁷ On the day which JICA Project Team visited, around 50 community people, representatives of community and others, participated the meeting.

recognized the importance of community involvement for Municipality development. However, promoting community participation imposes coordination works and cost, and expected not all tessabans are now conducting enough public hearing/ community meeting.

(2) Community Development Officer

Each Municipality appoints community development officers in the Division of Social Welfare of tessaban in order to be a liaison between community people and tessaban. They understand community situation well. When tessaban wants to mobilize community people in the specific project, community development officer and representatives of community committee will be the coordinators.

Example of Tessaban Mueang Phanat Nikhom

Communities in Tessaban Mueang Phanat Nikhom are one of the most active participation in any projects. The Municipality is joining low carbon city activities, and applied all communities. Phanat Nikhom has a famous festival called "Bun Klang Ban", and it shows basketry parade with traditional Thai, Lao, and China clothes to respect historical context of Phanat Nikhom. To hold this festival is organized by Tessaban Mueang Phanat Nikhom with active participation by community people through community committee members.

Those successful collaborations with community are assumed to be caused by warm support from the Municipality, and close relationships. Tessaban Mueang Phanat Nikhom supports THB 100,000 annually for implementation of community plan to each community. It is unique arrangement by Tessaban Mueang Phanat Nikhom.

However, even in Tessaban Mueang Phanat Nikhom, well-known for community participation, minor conflicts or small discontents among community members must happen in the process of the project implementation. Under such situations, someone who is reliable and can facilitate the case is inevitable. Community development officers in Tessaban Mueang Phanat Nikhom are taking such roles too. In other words, community development officers are recognized as reliable persons by community.

3) Community-initiated Activities

The following are some examples of activities initiated by communities.

Activity Title	0 Baht Shop
lssue	Environmental Management
Tessaban	Tessaban Tambon Koh Kha, Lampang
Activity	"0 Baht Shop" is advanced system from "waste recycle bank". In order to sell
outline	recyclable wastes by high price, people bring their wastes to one place and
	sell them in big amount. Each people possesses their "waste recycle bank
	account" to record how much baht they earned by their wastes. This system is
	very famous in all over the Thailand, and usually applied in school to make
	students manage.
	In Tessaban Tambon Koh Kha, they applied waste recycle bank in their
	community for the first time in Thailand. With ideas proposed by some
	community people, commodities are stored to exchange up to their money in
	waste recycle bank account. The commodities are usually donated by temples
	and others, and people can buy a bit discounted price, such as THB14 for toilet

Table 2.7.40 Baht Shop Activity

paper, even original price is THB 15.

Activity Title	Volunteer for Elderly and Handicapped People
lssue	Social Welfare
Tessaban	Tessaban Mueang Phanat Nikhom, Chonburi
Activity	Volunteers from community people are working on:
outline	 Identifying existence and the number of elderly and handicapped people in each house
	2. Supporting elderly and handicapped people in their daily life
	One volunteer works for around 3-5 households, and cooperate with local
	hospitals and the Tessaban for further assistance.

Table 2.7.5Volunteer for the Elderly and

4) Business Sector Involvement

Each province has a provincial office of Chamber of Commerce, and Federation of Thai Industry. They are constituted of local business organizations, and their duties are not only to maximize their profits, but also vitalize the area from business aspects.

Besides of above provincial offices, CSR-Network initiated by Department of Industry under Ministry of Industry promotes CSR activities to member factories of Thailand. This network is maintained by voluntary work of large companies in Thailand such as IRPC²⁸, AGS Flat Glass, BLCP Power²⁹, Siam Sement Group, Eastern Polypack, PTT, EGAT³⁰, etc. They have worked since 2008 and more than 630 factories join this network up to 2015. CSR-Network awards new and continuous outstanding factories every year, and it is good incentives for factories to apply CSR activities. CSR-Network report 2015 points out that one of the important points is to cooperation with local communities in activities to foster good relations. Followings are examples of activities by members of CSR-Network:

- Cement garbage convert to materials for agriculture and make more job opportunities.
- Construction footbridge and training for safety road transportation to community people toward to 0 road accident
- Technical support for waste recycle bank
- Upgrading income to use garbage from potato productions to mushroom production which has high added value
- Opening learning center to make handicraft from wastes, and marketing
- Re-allocation of profit to hill tribe people by selling T-shirts drawn by hill tribe children

2.7.3 Urban Problems and Issues of Tessabans

Since all of tessabans have their own uniqueness and thus are facing different urban problems, it is difficult to describe current conditions of tessaban of Thailand in general. Nevertheless, urban problems and issues have been identified based on the LSDP of tessabans.

²⁸ IRPC Public Company Limited, petroleum and petrochemical company

²⁹ BLCP Power, company for power station

³⁰ EGAT, Electricity Generating Authority of Thailand

As mentioned in Chapter 2.5, all tessabans develop LSDP after the year 2005 following the LSDP guideline prepared by DLA. Therefore, almost all of LSDP have same contents, including data analysis, problems and issues, potential analysis by SWOT analysis, and urban vision and mission. JICA Project Team collected 78 LSDPs, consisting of 20 tessaban nakhorn and 58 tessaban mueang and analysed the section of "Problems and Issues" in order to identify major types and characteristics of urban problems and issues that tessabans of Thailand are currently facing.

As a result, urban problems and issues have been characterized into the following as shown in Figure 2.7.7;

- Insufficient local administration
- Insufficient infrastructure
- Insufficient cooperation and awareness on public
- Insufficient land use and land use control
- Insufficient public services under tackle rapid increase of urban population
- Difficulty of further industrial development (human resources problem and external circumstance)

Insufficient Local Administration

It is interesting that many tessabans points out problem regarding administration. It may be a sort of reverse-side how staffs of tessabans think to improve their service to citizens.

Many tessabans feel that the local administration is not satisfactory done due to mainly two problems such as budget problem and administrative problem. As the budget problems, many tessabans point out that insufficient amount of local budget, delay of budget allocation and long way/process from request to gain budget. While, as the administrative problem, many tessabans point out that vulnerability of administrative structure like frequent change of organization, insufficient monitoring system in tessabans to improve services, and insufficient urban planning and development management in tessaban. Instability on central government is also pointed out in this category.

Insufficient Infrastructure

Infrastructure provision, such as road and traffic, waste way solid waste and electricity supply etc., is always one of big issues of tessabans. Many tessabans list up infrastructure as problem. Among the infrastructure, many tessabans emphasize solid waste and sewerage as critical insufficient infrastructure.

It is also interesting that tessabans consider problem of insufficient infrastructure from three aspects: development, capacity, and management. Problems on infrastructure development means shortage of infrastructure in respond to urban population, problems on capacity means insufficient performance of infrastructure, and problems on management means low efficiency of operation and maintenance of infrastructure.



Source: JICA Project Team based on LSDP



Insufficient Public Cooperation and Awareness

It is interesting that many tessabans point out peoples' participation as a problem. It seems that tessabans may consider good governance requires sufficient peoples' participation into local administration. Insufficient peoples' participation is considered to be caused by weak community and limited knowledge on administration due to limited opportunity of peoples' participation and lack of information.

Insufficient Land Use and Land Use Control

Many tessabans consider difficulty of physical and spatial development in downtown of tessabans as a problem, which is considered to be caused by highly dense existing land use with very little open land and higher land price in downtown. It causes suburban development. Weak control on building development fails to occur disordered development and sprawl development in suburban area.

Insufficient Public Services

Tessabans suffer from increase of urban population to make public services to citizens. Currently, many tessabans increase their population with unregistered in-migration., which becomes heavy burden for them to provide with public services.

Difficulty in Promoting Industrial Development

Economic development is one of important concern for tessabans. Tessabans consider that major obstacles of economic development would be insufficient human resources having enough expertise and skills. Lack of supporting institution and infrastructure are also pointed out by many tessabans.

2.7.4 Visions of Tessabans

Like analysis of urban problems based on LSDP, analysis on urban visions of tessabans is carried out. As a result, tessabans raise the following urban visions as their development goals during LSDP period which could be characterized into seven urban visions as shown in Figure 2.7.8 such as:

- Strengthening of local administration
- Development of infrastructure
- Improvement of environmental management
- Local Economic development
- Encouragement of education and culture
- Human resources development
- Improvement of social welfare

Strengthening of Local Administration

Along decentralization, tessabans has strong desire to expand authority and capacity to manage own jurisdiction as local autonomy. Accordingly, it is natural that almost of tessabans raise good governance via strengthening of local administration as their vision. Tessabans emphasize two important aspects to achieve good governance. One is

improvement of own administration and the other is enhancement of implementation capacity of LSDP. For the improvement of own administration, promotion of public and community partnership and enhancement of services and transparency. While, for the enhancement of implementation capacity of LSDP, tessabans emphasize planning and monitoring capacity of LSDP.



Source: JICA Project Team based on LSDP

Figure 2.7.8 Urban Vision of Tessabans in the Local Strategic Development Plan

Development of Infrastructure

Most tessabans raise better infrastructure as a vision. Many tessabans still emphasize infrastructure development, but not few numbers of tessabans emphasize better/appropriate operation and maintenance of existing infrastructure as well. Roads and drainage systems are major infrastructure pointed out by tessabans and few tessabans point out water supply as focal infrastructure due to high coverage of water supply at this moment.

Improvement of Environmental Management

Almost all tessabans have vision relevant with environment. Environment is one of most important key words of urban vision in LSDP. Focal point as urban vision is to balanced development with reducing environmental burden. In this regard, many tessabans emphasize improvement of wastewater and solid waste management, disaster mitigation and natural resource conservation.

Local Economic Development

Active and prospecting local economy is one of common vision in tessabans. Accordingly, some tessabans emphasize supports for local economic development. Major supports are promotion of new industry like tourism, agri-business and commerce, supports to local businesses, and promotion of new investment.

Encouragement of Education and Culture

Many tessabans emphasize maintaining traditional culture in accordance with improvement of economic sufficiency in local level. For this purpose, many tessabans emphasize education of local culture for inheritance of local culture, tradition and local knowledge as well as encouragement of basic education and moral education.

Human Resources Development

In relation to the vision of local economic development, many tessabans emphasize human resources development. Overall aim of human resources development seems to enhance peoples' capacity and opportunity. Accordingly, the focal point of human resource development is to skill-up supports, supply of personal training, and carrier network and carrier-up supports.

Improvement of Social Welfare

Many tessabans focus on social welfare as one of urban vision, which consists mainly of two different aspects such as safety and security and quality of life. As security aspect, many tessabans raise to improve drug, safety and security of society from accidents, crimes and disasters. While, many tessabans raise to improve as quality of life through efforts on living standard, public health service and health care system and services for aged peoples.

2.7.5 Characteristics of Projects by Region

Tessabans in Bangkok and Vicinities

Tessabans in Bangkok and Vicinities have a strong trend to highlight on economic and urban growth. As Bangkok and vicinities attract new businesses commerce and investment, tessabans enjoy economic and urban growth on one hand, however tessabans also receive negative impacts in many areas like congestion, lower living environment and disaster risks due to exceeded intensive land use with heavy environmental burden and social deterioration on the other hand. Numbers of tessabans accordingly prioritize the projects to tackle increase of non-formal population by providing better living environment, introducing jobs to those migrants in factories as well as social negative impacts such as lower tax collection, security issues and social issues.

Tessabans in Central Region

Tessabans in central region tend to emphasize history and local culture as vision. Each tessaban in this region has a long history so that they have a strong intention to preserve their unique background and ancient remains in order to support. It links to raise heritage tourism city as a vision.

As most of the tessabans have large historical and military preserved areas, it obstructs the expansion of the city. The challenges are found on the low of quantity and quality of the existing infrastructure system. The people demand in supports of general facilities for local economic development.

However, tessabans in eastern part of central region especially ESB area are in completely different situation. Major concerns of tessabans in eastern area come from industrialization in the area to reduce negative impacts and to induce more industry as well. Accordingly, there are several and different sorts of projects for examples, infrastructure and transportation system, migrant workers, unemployment of women, housing for workers, pollution and wastewater, etc.

Tessabans in Northern Region

Tessabans in northern region are generally located in abundant natural resources, nature, and good environment. Culture, tradition and local wisdom are considered as social assets, which seems to generate strong uniqueness, too. These may be a reason why tessabans in the northern region tend to have a vision of tourism town with heritage and ecotourism.

Another concern of tessabans in the region is progress of ageing society and illegal (non-registered) migrants. Many tessabans have several projects to support these groups of people, for example, social welfare providing for elders and people living with HIV, and public services providing for the migrants.

Tessabans in Northeastern Region

Tessabans in northeastern region is a sort of service center of surrounding agricultural area. Some LSDP reveals a problem stating from its geography, a problem of poverty and agriculture-based economy in surrounding area. Accordingly, problems and projects go to improve reliable services for agriculture and agricultural community by providing welfare and facilities and projects to eliminate poverty.

Another concern of tessabans is to provide good governance. Tessabans in this region seems to pay special and careful attention on governance.

Tessabans in Southern Region

Tessabans in southern region well recognize their strategic potential on further development, which is good international connectivity to Malaysia and Indonesia. Based on abundant nature resources and suitable weather capable to produce massive volume of agricultural products and Andaman Sea, tessabans raise a policy to be developed as ecological tourism and international businesses. Accordingly, major concerns of tessabans are to eliminate obstacles of development and social safety against terrorism and natural disaster.

2.8 Financing and Project Implementation of Tessabans

2.8.1 Financial Capability of Tessabans

In general, most tessabans have very limited financial capability. Total revenue differs depending on the size. The highest one is THB 2,215 billion of Tessaban Nakhorn Nonthaburi for tessaban nakhorn and THB 351 billion of Tessaban Mueang Hua Hin for tessaban mueang. The lowest one is THB 410 billion of Tessaban Nakhorn Mae Sot and THB 56 billion of Tessaban Mueang Chaeramae in Ubon Ratchatani Province. However, average total per capita revenue is almost about THB 10,000 per capita both for tessaban nakhorn and tessaban mueang, because tax allocation by central government has adjusted financial disparities.

Tessabans' revenue can be divided into the following three sources; (i) own revenue (locally collected tax and non-tax), (ii) allocation of centrally collected tax (tax allocation and shared tax), and (iii) subsidy (general grant and subsidy).

Tessaban Type	Category	Own Revenue	Allocated from the gov.	Grant/ Subsidy	Total Revenue	% of Own Revenue	Revenue per capita
			(THB billi	on)		(%)	(THB)
Tessaban	Average	173.7	397.2	388.2	957.3	18.1	10,111
nakhorn	Max	448.5	1,184.0	690.9	2,215.4	43.6	15,173
(30)	Min	51.6	135.9	145.9	409.7	6.5	7,170
Tessaban	Average	32.1	99.6	114.0	245.7	13.1	10,571
mueang	Max	416.8	365.8	351.0	784.2	53.5	37,963
(178)	Min	1.5	24.8	14.7	56.4	2.0	3,925

Table 2.8.1Status of Financial Resources of Tessaban, 2013

Source: Local Income Information, 2013

Share of own revenue is relatively low, of which average is 18.1% for tessaban nakhorn and 13.1 % for tessaban mueang. In general, there is no strong relationship between share of own revenue and total revenue per capita. In other words, tessaban with higher share of own revenue does not necessarily have higher revenue per capita. It shows that allocation of centrally collected tax and grant from central government somehow have a role in adjusting disparity of revenues. (see Figure 2.8.1 and Figure 2.8.2).

However, there are some prominent tessabans with very high share of own revenue, including Tessaban Nakhorn Leam Chapang and Tessaban Nakhorn Ko Samui, and Tessaban Mueang Map Ta Phut, Tessaban Mueang Pa Tong. All of them have strong industrial basis, such as industrial estates and tourism industries.



Source: Population of District: Census 2010 and 2000, Population of Tessaban: DLA Website, 2015





Source: Population of District: Census 2010 and 2000, Population of Tessaban: DLA Website, 2015

Figure 2.8.2 Revenue per Capita and Share of Own Revenue of Tessabans (tessaban mueang)

Subsidy portion of tessabans' revenue is directly connected with project implementation of tessabans. Total amount of subsidy and its distribution is basically decided by Committee of Decentralization to Local Government Organization. At present, most of grant/subsidy to LAOs (PAO, tessaban, and TAO excluding BMA and Pattaya City), have been provided through DLA. As of 2016, THB 237.1 billion or 97% of grants for LAOs are provided by DLA and remaining includes THB 200 million provided by Office of Prime Minister for good governance projects and THB 3,106 million by ONEP for environmental action plan projects.

Grants to Local Administrative Organizations through DLA comprises (i) general grant and (ii) specific subsidy. As of 2016, about 85% of total grant of DLA are provided as general grant and 15% is by specific grant. As described in the Figure 8.1.3, the use of general grant is specified by the central government without little choice for local government such as teacher salary and aid for children as educational support. On the other hand, specific subsidy is to provide for some particular projects of the specific LAOs, which cover various sectors such as education, environment, infrastructure and so on. Since specific subsidy can be big number of financial sources with much discretion of LAOs, the use of specific subsidy has been somehow decided through political negotiation of the head of LAOs.



Note: DLA: Department of Local Administration, OPM: Office of Prime Minister, ONEP: Office of Natural Resource and Environment Plan, PAO: Provincial Administrative Organization, TAO: Tambo Administrative Organization Source: Office of the Decentralization to the Local Government Organization

Figure 2.8.3 Allocation of Grants to LAOs in Fiscal Year 2016 (THB million)

2.8.2 **Project Implementation by Tessabans**

1) **Project Implementation by Tessabans**

Projects implemented by tessaban can be generally categorized into the following three types. First one is investment projects financed with tessaban's own revenue sources. Second one is project under specific subsidy from DLA. Third one is project subsidized by other agencies, such as ONEP.

First category, tessaban's own investment projects include durable goods and land and building construction cost, which are categorized into investment expenditure of tessaban's expenditure. Although overall data of investment expenditure at tessaban is not available, some data of tessaban's expenditure show that the share of investment expenditure varies by tessaban and even by year.

Some tessabans, even tessaban nakhorn or tessaban mueang, spend less than 5% of total expenditure for investment, such as 2.6% for 3.8% in Tessaban Mueang Roi Et in 2011, 4.4% in Tessaban Nakhorn Rangsit in 2014, and 8.5% in Tessaban Nakhorn Chaing Rai in 2011. In those tessabans, share of operational expenditure such as personal expense is high in general. On the other hand, the share of investment exceeds 20% in some tessabans, such as Tessaban Mueang Rai Khing at 30.1% in 2014, Tessaban Mueang Cha Am at 27.1% in 2014, and Tessaban Nakhorn Patong at 38.1% in 2013. In Tessaban Mueang Chaing Mai, the share of expenditure exceeds 20% in 2011.

Second type of projects, specific subsidy is provided for specific project by DLA. It includes various types of projects, such as road construction, water supply, CCTV and healthcare center construction. Specific subsidies are decided in accordance with national policy and not provided to all tessabans. Based on the request of tessabans, the projects shall be selected by Provincial Committee and sent to DLA, which shall be approved by BOB and finally by the Cabinet.

The last type of projects includes projects financed by other ministries. As of 2016, it includes environment action plan projects of ONEP and project to motivate tessaban to increase its potentials by OPM.

2) Project Implementation in the Central-Provincial Administration

As described earlier, financial capacities of tessabans are still limited in spite of national policy to promote decentralization. The ratio of expenditure of LAOs has increased to 28% as of 2017. In other words, large amounts of public expenditure are still under control of central and provincial administration, which also include urban development activities for local cities such as water resource management, industrial promotion, disaster preservation, wastewater treatment facilities and so on.

In addition to such centrally controlled activities, Provincial Administrative Organizations, one of the LAO, have recently increased their own financial capacities and implemented some development projects in tessabans, particularly for regional infrastructure development such as regional road and wastewater treatment, regional tourism promotion, and so on.

While it is hard to describe all budgeting program, some of notable programs or projects implemented by central and provincial administration and related to urban development or local cities are summarized below;

Integrated Budgeting Program

Integrated Budgeting Program is a strategically integrated budget under some specific purposes, which started in 2015. The selected themes of this newly-started budgeting program are consistent to the national strategic framework and government urgent policies. Each program combines budget of related agencies in one program, where relevant agencies can coordinate closely, support each other, and work toward the same directions efficiently.

Each program shall clearly specify target, objectives, schedule, and key performance indicators as well as participating agencies such as supervisor and secretariat. It covers national departments and state enterprise but does not integrate with local administrative organizations. As of 2016, there are 18 programs have been identified.

Program	Secretariat
Ready for ASEAN Community	Dept. of ASEAN Affairs
	Dept. of Social Development of Welfare
	Dept. of International Trade Promotion
	BOB, NESDB
Promoting Small and Medium	Office of Small and Medium Enterprise Promotion
Enterprises (SMEs)	Dept. of Industrial Promotion
	BOB, NESDB
Developing National Trade	OTP
Transportation and Services	BOB, NESDB
Integrated Special Economic Zone	Office of the Permanent Secretary
(SEZ)	BOB, NESDB
Solving South Thailand Insurgency	Office of National Security Council
Problem	Internal Security Operations Command
	Southern Border Provinces Administrative Center
	BOB, NESDB
Alien Workers and Human	Dept. of Employment
Trafficking Management	Ministry of Social Development and Security
	BOB, NESDB
Water Resource Management	Royal Irrigation Department
	Dept. of Water Resources
Dramating Dessenth and	BUB, NESDB
Promoting Research and	
Creating Income from Tourism and	DOD, NESDB Ministry of Tourism and Sports
Sonvicos	
Creating Harmony and	Ministry of Interior
Reconciliation	
Long-life Human Development	Ministry of Social Development and Security
	BOB. NESDB
Drug Prevention, Repression, and	Office of Narcotics Control Board
Addict Treatment	BOB. NESDB
Disaster Rehabilitation, Protection	Dept of Disaster Prevention and Mitigation
and Management	BOB, NESDB
Waste and Environmental	Pollution Control Department
Management	BOB, NESDB
Protect and Anti-Corruption in	Office of Public Sector Anti-corruption Commission
Public Sector	BOB, NESDB
Development and Promotion of	Ministry of Energy
Efficient Sustainable Energy	BOB, NESDB
Natural Resources Protection and	Royal Forest Department
Solving Land Problem	Dept. of National Park, Wildlife, and Plant Conservation
	BOB, NESDB
	Treasury Department
	Department of Land
Organizing Commerce in Public	Department of Local Administration
Area	BOB, NESDB

Table 2.8.2	Integrated	Budgeting	Programs	2016
Table 2.0.2	megrateu	Duugeung	Frograms,	2010

Source: BOB, List of Organization for 18 Integrated Program Budget in 2016

Provincial Budget

Each Province has its own Provincial Development Plan, which include the following three types of projects, namely (i) provincial development project, (ii) provincial cluster development project, and (iii) community projects. Most of those projects shall be implemented by field offices of central ministries and departments. As of 2016, there are 40 field offices under central ministries' departments and two independent provincial organizations at each province (Table 2.8.3). Provincial Development Plan also includes projects jointly financed by central ministries' departments, LAOs, or private sector.

Ministry	Department and Provincial office
Ministry of Finance	The Treasury Department (Provincial Treasury Office)
	The Excise Department (Provincial Military Recruit Office)
	The Revenue Department Provincial Revenue Office
	The Customs Department (Regional Customs Bureau)
	The Comptroller General's Department (Provincial Office of The General-Comptroller)
Ministry of Interior	Provincial Waterworks Authority
	Provincial Electricity Authority
	Provincial Local Administration Office
	Public Works and Town and Country Planning Provincial Office
	Department of Community Development (Community Development District Office)
	Department of Community Development (Community Development Provincial Office)
	Department of Land (Provincial Land Office)
	Office of the Governor (Provincial office)
	Provincial Administration Organization Office
	Department of Disaster Prevention and Mitigation- (Provincial Disaster Prevention and
	Mitigation Office
Ministry of Social Dev. and Human Security	Department of Social Development and Welfare (Provincial Public Welfare Office)
Ministry of Transport	Department of Land Transport (Provincial Land Transport Office)
Ministry of Tourism and Sports	Department of Public Relations (Provincial Public Relations Office)
Ministry of forest	Department of Forest (Provincial Forest Office)
Ministry of Agriculture and	Department of Land Development (Land Development Regional Office)
Cooperatives	Department of Livestock Development (Provincial Livestock Office)
	Department of Fisheries (Provincial Fishery Office)
	Department of Irrigation (Office of Regional Irrigation)
	Bank For Agriculture and Agricultural Cooperatives
	Cooperative Auditing Department-Provincial cooperative auditing office
	Agricultural land reform office
Ministry of Commerce	Provincial Commerce Office
Ministry of Labour	Department of Labour Protection and Welfare (Provincial Labour and Social Welfare Office)
	Social security Office
	Department of Employment (Provincial Employment Office)
Ministry of Information and Communication Technology	Provincial Statistical Office
Ministry of Public health	Provincial Public Health Office
Ministry of Education	Department of general education (Provincial General Education Office)
	Provincial Education Office
Ministry of Foreign Affairs	Temporary Passport Office
Ministry of Justice	Office of The Attorney General (Provincial Office of State Attorney)
	Regional Office of the Administrative Court
	Office of consumer protection board
Ministry of Natural Resource and Environment	Provincial Natural Resource and Environment Office
Ministry of Culture	Department of Culture (Provincial cultural office)
Independent Organization	Provincial Office of The Election Commission
	Office of the auditor general of Thailand (Regional Audit office No.)

Table 2.8.3 List of Provincial Offices of Central Ministries and Departments

Source: JICA Project Team

When formulating Provincial Development Plan, Changwat office shall coordinate with relevant LAOs, including PAO, tessabans and TAOs and ensure the consistency among relevant development plans. Each LAO is also required to follow the overall development directions of the Provincial Development Plan in each development plan.

On the other hand, annual budget of each changwat office is only about THB several million, which is almost equivalent to annual budget of one tessaban. Annual budget for PAO tends to be much higher than that of Changwat. For example, budget of Chonburi changwat for FY 2014 is THB 228.5 million, while that of Tessaban Mueang Chonburi for FY 2015 is THB 384 million. Annual budget of Chonburi PAO is about THB 2 billion. Therefore, there are few cases that changwat office implement projects upon request of PAO.

In this context, changwat office shall play a role of coordinator rather than implementing body. It has an important role to coordinate between central ministries and LAOs through those provincial offices.

Provincial Administrative Organization

As described in the Chapter 2.5, PAO's was rearranged as regional local administrative organization in the Decentralization Act 1999. It shall formulate its development plan and integrate it into Provincial Development Plan which is prepared by changwat, support LAOs within each province for their development activities, and to coordinate and cooperate with LAOs.

As a regional local administrative organization, PAO shall provide financial and technical support for tessabans for the following activities;

- (i) regional infrastructure project, such as road connecting tessaban and TAOs,
- (ii) large-scale infrastructure projects based on the request of tessaban and TAO. In case of Tessaban Mueang Chonburi, projects with more than THB 10 million shall be requested to PAO,
- (iii) joint-implementation of regional infrastructure with relevant tessabans,
- (iv) operation and maintenance of infrastructure projects which are implemented by tessabans and TAOs as well as those implemented by PAOs, and
- (v) other various projects.

PAO also cooperate with central government to conduct various types of projects. It includes the following;

- (i) joint-implementation of regional infrastructure by central ministry and PAO; such as large-scale landfill site development jointly implemented by Chonburi PAO and MNRE,
- (ii) request to central government for large-scale development projects; such as road development financed by MOT, educational facilities financed by DLA, and reservoir development financed by MNRE,
- (iii) O&M of infrastructure implemented by central ministries,
- (iv) development of regional infrastructure of which O&M is done by central ministries, and,
- (v) other various projects.

3. Development of SFCI

3.1 Rationale of and Need for Sustainable Development in Local Cities of Thailand

Considering the result of current status analysis of local cities of Thailand in Chapter 2, there are some key implications that should be noted and taken into considerations as a set of prevailing phenomena, often in common among the local cities, when they make their development policy.

Firstly, there are some prevailing trends of socio-economic changes in the context of changes of Thai society, such as depopulation and aging of the communities that causes diminishing economic dynamics in the existing urban centers. As described in the previous sections, urban areas are economically, socially, and physically influenced by socio-economic changes because such changes have important implications on urban policies.

Nevertheless, it is important to note that local cities are redefined to become local growth centers in the current 12th NESDP that constitutes the first 5-year of 20-year National Strategy. Local cities are expected to be "Livable Cities" for all and to take more proactive roles and functions as development bases for a province or a cluster of provinces.¹ This calls for practical and strong actions based on "organized city planning" in order to change the trends of diminishing dynamics in the existing urban centers.

Given these two aspects, there are five key implications for sustainable urban development in local cities, which should be well considered both in national urban development initiatives and local government development policies. These are briefly described here based on an analysis of recent socio-economic changes, the relevant policies of 12th NESDP, and what we learned from experiences of the TFCP.

3.1.1 Self-sustaining Economic Competitiveness / Promotion of Centrality of City

Many tessabans face the fact that dynamics of economic activities in their central areas are diminishing, of which the long-term causes and effects on the local economy are not addressed in the process of making urban development policy.

Most tessabans described economic development as one of the major targets/visions in local strategic development plans. However, there is little diagnosis on the recent situation of their local economy. The plan also has proposed only a few significant projects to boost local economy. With the recent trend of relocating factories and urban development activities to the fringes of urban areas, central tessabans run the risk of losing economic sustainability. Centrality of city is diminishing as opposed to what 12th NESDP expect a local city to be "a development center".

¹ Page 2, Part 1. Overview of the Twelfth Plan, 12th NESDP. NESDB. In the 12th NESDP it is read "... the spatial development and enhanced economic potential of cities must be emphasized. This will be accomplished through improved environmental standards, rationalization of land use, organized city planning, and strengthened urban security which is consistent with Livable Cities benchmarks. The spatial development of cities and the realization of their economic potential has the purpose of spreading economic and social opportunities and creating new economic and income-generating bases, thereby decreasing social inequality in Thailand and increasing competitiveness by promoting livable cities as the new economic bases in both the interior up-country areas and the major border areas."

From the viewpoints of national development, Thailand calls for the rebuilding of an economic growth engine, which is essential for breaking out from the "middle income trap." To this end, Thai cities are to be part of the key players. Cities are required to identify their own new driving forces, taking advantage of the opportunities presented in the recent trend of labor shortage, higher production costs, increasing agricultural productivity, increase in outward foreign investment and local investment, and regional integration such as the AEC. Urban development should emphasize the provision of support for economic competitiveness through infrastructure development and land use planning.

Medium-size and small cities have started losing their centrality due to depopulation and decrease in commercial activities in their respective city centers. This in turn is partly due to increased investment in suburban areas for such projects as large commercial complexes, new residential towns, and new industrial estates. In order to avoid urban decay and to strengthen centrality, medium-size and small cities should promote new high-value economic activities, especially agro-processing and tourism, by utilizing local resources.

Besides economic encouragement, it is important to keep the centrality of existing urban areas by paying attention to spatial and physical approaches, i.e., by improving livability and convenience. In this regard, it is necessary to include urban redevelopment in the plan, improve mobility, and promote habitation in existing downtowns to attract more people. Tourism development is also another option.

3.1.2 Sustainable Environmental Strategy/ Limited Capabilities of Tessabans

Good urban environment is an essential element to realize a "livable city". As described in local strategic development plans (prepared by tessabans), most of the tessabans emphasize environmental sustainability as an important development vision. People have also become more conscious about urban environment improvement.

On the other hand, the policy outlined in "Strategy 4: Strategy for Environmentally-Friendly Growth for Sustainable Development" in the 12th NESDP highlights that local cities are also expected to "Build environmentally-friendly cities or green cities to create a good environment for the people."² In "Strategy 9: Strategy for Regional, Urban, and Economic Zones Development" in the 12th NESDP, it is also stated as a key development "to endorse integrated urban environmental management with inclusive participatory approaches."³

The major constraints to implement environmental projects are financing, land availability, and technical capabilities in tessabans, which have been addressed in some ongoing activities. Regarding financing, the Environmental Fund has provided financial support to tessabans. Regarding land availability, some tessabans collaborate with neighboring LAOs to secure land as landfill site. Regarding technical capabilities, simple and appropriate technologies are applied by local experts, NGOs, and local communities to improve their urban environment. These ongoing activities have promoted local participation, as well.

² Page 138, 12th NESDP.

³ Page 217, 12th NESDP.

3.1.3 Attractiveness and Identity of Cities/ Pride of the Local Community

In order for Thailand to be a developed country, cities need to promote livability to attract people and investment. Against the backdrop of overconcentration of population in Bangkok Metropolitan Area, cities need to enhance their attractiveness, distinction, and competitiveness.

In "Strategy 9: Strategy for Regional, Urban, and Economic Zones Development" in the 12th NESDP, it is also stated as a key development "to preserve township identity and create value from local resources for local income distribution."⁴

Many tessabans pay special attention to cultural heritage conservation and promotion of indigenous cultures and festivals to showcase their uniqueness and avoid becoming lost in modern society. The increasing availability of jobs and education opportunities in local cities have reduced rural to urban migration, and this should be enhanced further. Unique identities and a strong sense of local pride can help attract people. In this context, the more attractive local cities become, the more people have a sense of ownership of their cities, generating a sense of *nar yu* (comfortability).

3.1.4 Depopulation, Aging, and Low-fertility Society/ Livable City for All

Tessabans are facing fast pace of "aging society". Social changes have a big influence on urban structure and public services. In particular, depopulation, aging societies with fewer children, and smaller family sizes will significantly affect the urban structure as well as the needed public services tessabans should provide.

Accordingly, the 12th NESDP pays special attention to these social aspects, in particular emphasizing "Promoting elderly-friendly urbanization with universal designs..." as part of "Development Guidelines" in "Strategy 1: Strategy for Strengthening and Realizing the Potential of Human Capital."⁵

While some tessabans are already aware of such social issues, detailed actions are not implemented well and are limited to providing welfare facilities for the elderly. A more holistic approach will be required in the future to tackle emerging issues of depopulation and aging.

3.1.5 Strengthened Initiatives of Tessabans in Development

Local initiatives are essential because every tessaban is unique. Tessabans have different development visions, strategies, and project priorities to tackle issues incurred with socioeconomic changes, which largely depend on their sizes, financial and administrative capabilities, as well as the characteristics of the regions of which they are a part. They know the local realities better than anybody else.

The 12th NESDP expect LAOs including tessabans to take more initiatives in local development. While Local Strategic Development Plans of tessabans focus on infrastructure

⁴ Page 218, 12th NESDP.

⁵ Page 89, 12th NESDP.

development, environment improvement, as well as economic and social development as development targets, more emphasis should be put on improving administrative capacities.

Increasing numbers of tessabans have conducted unique activities along with the recent trend of decentralization. For example, there are a variety of collaborations on urban development among central tessaban, adjoining LAOs, local communities, NGOs, and local companies.

However, existing provincial and local administration system in Thailand has several constraints for tessabans to undertake its own development to meet local needs. It has limited financial capacities and human resources to conduct development projects to meet local needs. Or it is not allowed to conduct any projects outside of its own administrative boundary and it is difficult to develop wide-scale projects, such as solid waste management, public transport, flood protection etc. and administrative authorities. Even though leaders of tessabans are well aware of local issues and needs properly and has clear vision, it is difficult for tessabans to manage their own development properly. There is a strong need of government policy to support local efforts and initiatives.

3.1.6 Strengthened Peoples' Participation in Development/ Core of Sense of Ownership

People's participation is also a key to enhance local development capacity. The active participation of local communities has achieved good outcomes particularly for projects relating to urban environmental improvement, welfare promotion, and cultural preservation. These activities are important seeds of local urban development.

The 12th NESDP identifies good public administration as one of the ten important strategies which reads "The decentralization of power, coupled with public participation and the fair distribution of responsibilities among national, regional and local actors, should also be promoted."⁶ Self-support, mutual support, and public support through participation are important considerations in defining the role of tessabans in urban development and in designing certain actions for urban development.

3.1.7 Linkage between National Government Program and Local Reality

Since the previous Constitution in 1997, Thailand has gradually proceeded decentralization in terms of fiscal and authorities. However, financial resources allocated to the local government are still very limited, which account for only 27.3% of total state revenue as of 2013. Therefore, most of projects conducted in the area of local cities are mostly implemented by each department, such as flood protection projects are managed by DPT, tourism development by Department of Tourism, wastewater treatment projects by DPT, universal design project by Department of Older Persons (Ministry of Social Security and Human Development), etc.

However, those central departments face difficulties to understand actual local needs and to formulate their own project effectively, even though some of them have regional offices

⁶ Page 23, 12th Plan. NESDB
at each province.

As described in the NESDP, regional economic development becomes key development issues in Thailand in order to overcome middle-income trap and to establish the fundamentals for Thailand to become a high-income country by 2037. Thailand government has set special budget to promote regional development with total amount of THB 100,000 million or THB 5,000 million for each provincial cluster.

There are strong needs of tool or channel for national government and each line department to understand local needs effectively and to implement projects along with their own policies and programs.

3.2 Establishment of Sustainable Future City Initiative (SFCI)

3.2.1 Objectives and Overall Concept of SFCI

In order to undertake key urban development challenges as described in the Section 3.1, Sustainable Future City Initiative (SFCI) was proposed as an implementation mechanism to realize sustainable urban development. Overall concept and outstanding features of SFCI are summarized as below.

1) National-government Guided and Local-Government Driven Development

With an overall goal to make cities sustainable under the emerging socio-economic changes, SFCI set an overall concept of "National-government-guided and Local-government Driven development.", which has the following three principles, (i) local-driven development, (ii) people-centered development, and (iii) national government guided and supported development.

- (i) **Local driven development:** Local government should have initiative to formulate its vision and strategies and propose projects to achieve its vision.
- (ii) People-centered development: All of the planning process should be done by participatory approach in order to understand actual issues and needs of stakeholders and to ensure collaboration of such stakeholders in implementation and operation stage.
- (iii) **National government guided and supported development:** It is important to connect local-proposed plans and projects with financial and institutional support of national government, which does not exist in Thailand at this moment.

SFCI supports local cities in identifying unique and practical solutions to key issues and achieving their visions which are shared by local communities. This initiative applies a people-centered and comprehensive approach in planning, starting which vision, strategy-building, and programing of priority actions, in consideration of upgrading the existing Local Strategic Development Plan.

2) New and Different Approaches of SFCI

SFCI focuses on four key planning approaches, namely (i) holistic approach, (ii) regional approach, (iii) long-term approach and (iv) collaborative approaches, which are new and different to urban development of local cities in Thailand,

- Holistic approach: Based on the global common concept of sustainable urban development, SFCI covers economic, social and environmental aspect comprehensively at the planning phase.
- (ii) Regional approach: Regional approach or inter-municipal coordination is key of SFCI for effective urban management considering the recent trend of urbanization beyond administrative boundaries of tessabans. It is also important for tessabans and adjoining TAOs to provide urban services efficiently, since most of tessabans and TAOs are too small in terms of area and population and financial capacity.

- (iii) **Long-term approach:** Visioning and planning of SFCI has long-term perspective, including future framework of socio-economic conditions and long-term perspectives of national and regional development trend.
- (iv) **Collaborative approach:** Through collaboration with various stakeholders including citizens, community-based organizations, private sector, tessaban can expand its planning scope and scale, and thus ensure sustainability of their own development as well as reduce financial burdens of government sector.



Figure 3.2.1 Image of Key Approaches of SFC Initiative

3) Common Visions of Sustainable Future City

Sustainable urban development is global common concept to balance economic, social and environmental aspect. While sustainable cities concept can be applied in any city, future visions of Sustainable Future City (SFC) vary, depending on uniqueness of participating cities. Five (5) characteristics that participating cities should aspire for in preparing own SFC visions to undertake key urban development challenges of local cities of Thailand. It is called SFC Common Visions, as below:

- (1) the city where self-sustaining industries are promoted by utilizing local resources (selfsustaining competitive city)
- (2) the city where people and investment are attracted with locally unique culture, lifestyle and landscape (attractive and distinctive identity);
- (3) the city where is sufficiently liveable with basic infrastructures and public services as well as well-managed green and natural environment, thereby being resilient against disasters (eco-friendly and resilient city);
- (4) the city where people will safely and healthily grow up and equally be educated, and mobility is ensured for the weak such as aged people, handicappers and pregnant women (safe, secured, and inclusive city);
- (5) The City which all citizens feel proud of and confidently succeed for next generations

This SFC common visions were reflected into one of the priority policies of the 12th NESDP#



Source: JICA Project Team

Figure 3.2.2 Common Concept of Sustainable Future City

3.2.2 Target Cities of SFCI

Target cities to participate SFCI are regional growth cities and local urban centers. Since SFCI aims to serve as a policy tool to direct more equitable and sustainable development all over the county, those cities can be centers of their respective regions. Specifically, it includes all of tessaban nakhons and tessaban mueangs. Surrounding tessabans and TAOs should be integrated to consider sustainable development of the integrated urban areas.

3.2.3 Organizational Structure

Organizational structure of SFCI is described in the Figure 3.2.8. expected roles of each organization are summarized as below:



Figure 3.2.3 Organization Structure of SFCI

1) Joint Coordination Committee (JCC)

JCC shall evaluate and approve the SFC Plan and Projects and facilitate inter-organizational coordination to ensure smooth implementation of SFC Plan and Projects. SFCI Committee will be held in time with SFC plan and projects approval and project and whenever necessary.

A member of JCC is described in Chapter 1. Each member shall provide necessary advice for planning and project formulation to tessaban and provide necessary institutional arrangement such as deregulation for the proposed projects and coordination among relevant agencies.

2) Secretariat: NESDB

NESDB is in charge of overall management and supervision of model city activities, as a secretariat of SFCI. NESDB shall send invitation and select tessaban at the preparation stage, monitor and evaluate SFC plan and projects at the planning stage, and provide necessary coordination among and give instructions to relevant agencies to ensure implementation of SFC projects.

3) Tessaban: Project Owner and Secretariat at local level

Tessaban will establish SFCI Team in tessaban to manage/ operate SFCI in local level as well as the liaison to other organizations concerned.

Tessaban's SFCI team will closely coordinate with the Consultant to do research and planning, to organize PT meeting, to formulate SFCI plans and projects, to submit necessary documents to the NESDB, and so on.

Head of SFCI Team will be Mayor or Deputy Mayor, who can be responsible for the overall SFCI Projects to facilitate a series of SFCI activities smoothly and to ensure commitment of tessaban on the output of SFCI. The Consultant will assist tessaban overall management of SFCI in local level.

4) Planning Team (PT) Meeting

The PT meeting aims to discuss analysis, plan and projects in the SFCI.

Tessaban will nominate PT including responsible persons and contact person to conduct a series of SFCI activities at local level and organize PT meeting at each stage of activities, in order to involve stakeholders' opinion and get their consensus at each planning stage.

Through a participatory approach, tessaban can (1) identify actual issues and needs of the people, (2) find key players of the city and find various implementing body including private sector, (3) ensure public support and increase implementability and so on.

It is expected to invite the representative from the following organizations:

- Relevant departments of provincial government;
- Relevant departments/sections of tessaban;
- Community people/ community-based-organizations;
- Academics, particularly for regional universities, if any;

- Public organization, such as hospital, school, police;
- Business sector, including provincial Chamber of Commerce. Federation of Thai Industry, and any other key business actors; and
- NGOs.

The Consultant will assist the tessabans though providing with technical support on analysis,

5) **Project Coordination Committee (PCC) at Provincial Office**

Tessaban will establish PCC as an inter-departmental and regional coordinator for crosscutting issues and regional issues. Expected missions of PCC are as follows

- To facilitate coordination with provincial offices of departments
- To promote regional coordination with adjoining tessabans and TAOs
- To ensure conformity with legal and institutional aspects of the plan and projects
- To identify appropriate agencies and budgeting sources to implement the SFCI Projects.

3.2.4 Implementation Framework of SFCI

The SFCI will commence with a clear commitment of the national government to achieve a national policy fully aligned with the 12th National Economic and Social Development. As a policy document, the SFC Development Guideline has been prepared by NESDB with technical assistance by JICA and approved by the JCC of which secretariat is NESDB and members are comprised of relevant national departments. The SFC Development Guideline will provide a strategic framework for their sustainable development, describe key urban development challenges (as described in Chapter 3.1), establish SFCI guiding principles, common visions, SFC implementation framework (as described in the following Section 3.2.4),

Based on the SFC Development Guideline, participating tessabans will conduct SFCI projects. The SFCI is mainly divided into three components; (1) Preparation, (2) SFC Research and Planning, (3) SFC Project Implementation. Project implementation support will be provided by national and provincial organizations and the dispatched Consultant accordingly. Overall framework of SFCI is illustrated in the Figure 3.2.3.

1) Preparation

At preparation stage, participating tessabans need to understand the objectives and overall concept of SFCI. Tessaban will mobilize SFCI implementation organization, as described in 3.2.3. It includes SFCI Team as SFCI project owner and secretariat at local level, which shall be chaired by Mayor or high-rank officer, and Planning Team, which is composed of major stakeholders. Tessaban also needs to coordinate with Changwat office at beginning to set up Project Coordination Committee (PCC) to coordinate with relevant provincial offices.



Figure 3.2.4 Overall Framework of SFCI

2) SFC Research and Planning

Planning Steps

Research and Planning Stage consists of three steps as follows;

1. **Basic analysis:** Basic aims to examine current status of tessaban and identify critical issues to be solved and future potentials of tessaban. Basic analysis shall cover the

following components.

- Review of the existing plans, such as 12th National Economic Social Development Plan, Provincial Development Plan, DPT's Comprehensive Plan, Local Strategic Development Plan, and other important sector plans,
- Questionnaire survey to examine the level of people's needs or people's priority and that of people's satisfaction on various aspects, of which sample size will be more than 200 samples.
- Data collection and analysis to clarify current status and problems of tessaban and its surrounding areas, which will cover social, environmental, and economic aspects urban management comprehensively. Qualitative information will be also collected if any quantitative information is not available.
- 2. Analysis for Future: It includes analysis of socio-economic framework of tessaban and surrounding urban areas based on the past trend of population and aged structure and future population forecast prepared by NESDB. Based on the result of basis analysis and future socio-economic framework, future perspectives will be examined as following;
 - Anticipated problems on economic aspect of the inner tessaban and surrounding areas
 - Anticipated problems on society of tessaban and surrounding areas
 - Anticipated problems on environment of tessaban and surrounding areas
- **3.** Sustainability Analysis- Visioning and Strategic Directions: Future Vision of existing plans will be reviewed particularly for those of tessabans. The result of the above analysis will be complied as SWOT analysis. Based on the result of SWOT analysis, strategic directions will be drafted as a basis of the SFC Plan. Once strategic directions are drafted, sustainability, or future continuity of the city and its region will be assessed from the various aspects as following;
 - Continuity of society in the future,
 - Economic continuity especially potential future leading industrial sectors,
 - Future employment opportunities for young generation in tessaban,
 - Attractiveness of town for aged, middle aged, and young generations, students, and kids,
 - Living environment for all people and social service available for vulnerable people
 - Environmental sustainability
- 4. SFC Plan Formulation: Based on the above result, SFC Plan will be formulated.

Structure and Coverage of SFC Plan

SFC Plan is a core output of the SFCI. Based on the result of sustainability analysis, the SFC Plan is formulated to identify issues and projects to achieve the SFC vision, of which main concept is to keep sustainability of economy, society and environment of tessaban. The SFC

Plan includes vision, strategies, and projects, of which structure is shown in the Figure 3.2. 4.

SFC Plan is not designated by specific law in Thailand such as Comprehensive Plan under DPT or LSDP under DLA. The Comprehensive Plan is a statutory urban plan and mainly focuses on land use and urban facilities in the urbanized area, of which planning coverage is usually beyond administrative boundary of central tessaban. On the other hand, the LSDP is a 5-year action plan of tessaban and mainly focuses on projects to be implemented by tessaban in the next 5 years.



Figure 3.2.5 Structure of SFC Research and Planning

SFC Plan should be a holistic plan to keep sustainable urban growth in the longer term. Accordingly, the SFC Plan and projects can cover any sector which is authorized either by central, provincial administration, or local administration. The SFC Plan can also cover the surrounding tessabans and TAOs depending on the issues identified in each city, while the Comprehensive Plan covers urban areas in the surrounding tessabans and TAOs (see Figure 3.2.5). In other words, the SFC Plan can include projects which will be implemented by central and provincial ministries, changwat, PAOs, or surrounding tessabans/TAOs. It is important for the SFC Plan to harmonize with the relevant plans of these agencies and, at the same time, for SFC projects to be included in those relevant plans.



Figure 3.2.6 Coverage of SFC Plan

SFC Project Formulation

A list of SFC projects are formulated as potential actions to be taken to materialize strategies. Each strategy will have several programs and projects. In the SFCI, a list of projects will be preliminary formulated as action plans for further elaboration, where detail consideration such as engineering design, procurement list etc. will not be included. The action plan will identify, at least but not limited, initial implementation schedule and potential project financial sources of each project from the possible budgeting sources which are listed in the Chapter 3.2.6 (see Figure 3.2.6).

Tessaban will identify priority projects as early harvested actions to be taken through discussion with PT. The priority projects will be considered more details to apply to the possible budgeting sources.

No.	Project	Year 1	2	3	4	5	Organization (potential budget source)
1	AA Planning	-					Changwat
2.	BB construction project		-		-		DLA
3	CC capacity development						КЫ
4	DD training	-	-				Tessaban (own budget)
				-			
Х	XX Construction		-		_		Changwat Cluster
γ	YY Development	C					DPT
Z	ZZ Festival						TAT



Participatory Planning Process through PT Meeting

Participatory planning process will be introduced through PT meetings as shown in the Figure 3.2.8. This SFCI planning process is established based on the conventional

participatory planning approach, which includes (i) issues identification "where we are?" at the first step, (ii) vision formulation "where we want to go?", (iii) plan formulation "how can we achieve vision?", and then (iv) project identification.

Tessaban and Local Consultant closely work together to prepare each PT meeting. Output of the PT meeting was summarized by tessaban and local consultant in order to proceed to the next step.

Each tessaban may change agenda of each PT meeting flexibly depending on the local conditions.



Note: PR: Promotion



Ownership of SFC Plan

Since SFCI is implemented along with SFCI Development Guideline, which is administratively authorized by NESDB, core output of SFCI, SFC Plan and Projects, will be eventually owned

by NESDB as a main secretariat of NESDB. SFC Plans and Projects will be a part of Regional Development Plan of NESDB.

3) SFC Project Implementation Supports

Based on the approved SFC plan and projects, tessaban will receive implementation support to promote implementation of those projects, including the following;

Collaboration with National and Provincial-level Authorities

Tessaban or Changwat office will be the main actors and are expected to collaborate with relevant government agencies such as provincial office of ministries PAOs, neighboring tessabans and TAOs. Private sector, universities and communities will be also actively coordinated. Tessaban will make memorandum of understanding (MOU) with relevant organizations, which are directly related to the formulated projects.

Technical and Institutional Support by National Departments

Technical and institutional support will be provided by national departments through discussion

Project Financial Supports

Potential budget to implement SFC projects under the existing Thai administrative system are summarized as below;

- **Municipal General budget:** Some of SFC projects, particularly for the small ones and short-term ones can be included in the LSDP and implemented directly under municipal general budget.
- Specific subsidy of DLA: Specific subsidy of DLA is allocated to the specific projects depending on the policy issues as described in the Chapter 2. DLA is only one national department to provide direct subsidy to local administrative authorities such as PAO, tessaban, and TAO. Once SFCI is identified as key urban policy issues, DLA can provide specific subsidy to the selected tessabans.
- Changwat and Changwat Cluster General Budget: Tessaban can apply general budget allocated to changwat and Changwat cluster, which shall be screened and approved through discussion in the regional committee. NESDB is also a member of that committee.
- **Functional budget:** Functional budget is budget of each department of line ministries. Each tessaban can coordinate with relevant departments depending on the sector of SFC plans to get budget. However, since budget allocation depends on policy of each ministry, it is difficult to put priority under SFCI.
- **Fund:** There are several funds available for tessabans in Thailand. It includes Regional Urban Development Fund, which was established by WB and operated by Government Saving Bank, National Village and Urban Community Fund. However, Mayor is not willing to take loans.

In addition to the above existing budgeting, there is special budget system to respond to

the urgent policy issues as below;

• **Special budget:** Special budget for local economic development started several years ago. A total amount of THB 100,000 mil. was allocated by provincial cluster in 2017 and by region in 2018. Tessaban can submit project application to changwat and Changwat shall approve the projects. NESDB is one of screening committee member.

It is also proposed to set up budgeting system, which is earmarked under SFCI in the future.

 SFCI Matching Fund: This is a proposed funding mechanism for SFCI to ensure stable budgeting for SFC projects. One of the options is that national government provide grant for 60-70% of total cost and tessaban pay 30-40% by themselves, which needs further consideration.

3.3 Implementation Program of SFCI Model City Activities (the First Phase of SFCI)

3.3.1 Purpose of SFCI Model City Projects

In order to examine the implementability of the SFCI on the practical ground as well as the relevance and appropriateness of the SFC Development Guideline, first phase of SFCI was conducted as model city projects including Pilot Projects with financial support of JICA. The main purposes of the model city activities are as follows;

- To examine implementability of the SFCI
- To check the relevance and appropriateness of the SFC Development Guidelines,
- To make leading cities for sustainable urban development of local cities of Thailand, and
- To identify issues on existing administrative systems on urban development that need improvement, such as institutional and budgeting mechanism, if possible.

3.3.2 Target Model Cities

Model City for the first phase of SFCI covered 6 tessabans, in order to cover different types of cities in terms of the following;

- Size of municipality (tessaban nakhorn and tessaban mueang)
- Four regions (northern, north-eastern, central, and southern region)
- Urban typology in the national development context (regional center, strategic city, urban cluster center, provincial center, others)
- Urban development issues
- Development mechanism

3.3.3 Implementation Process of SFCI Model City Projects

SFCI Model City Projects are separated into the following nine (9) steps. Its schedule and role sharing among each actor are shown in the Figure 3.31.

- (1) NESDB and JICA Project Team prepare SFCI Guidelines and send invitations to the shortlisted tessabans.
- (2) Tessabans submit applications to join SFCI.
- (3) NESDB and JICA Project Team select 6 model cities and JCC approve them.
- (4) NESDB and JICA Project Team dispatch local consultant teams to support tessabans for SFC Planning
- (5) Tessabans formulate PT and develop SFC Plan and identify SFC Projects
- (6) Tessabans submit SFC plan and projects to NESDB and JCC for approval.
- (7) Tessabans identify pilot project, to be financed by JICA
- (8) Tessabans formulate detail plan of priority SFC projects for budget application



(9) Relevant departments are expected to provide budget to implement SFC projects.

Note: Red Line describes budget-related process



3.4 SFCI's Relevance to the NESDP and National Reform Implementation

Given above described concepts and its operational features, SFCI was proved to be a useful and effective policy measure to implement the current national development policy framework. SFCI can be applied as one of the practical prototypes of implementation platforms for the national development plans, namely "20-year National Strategy (2018-2036)" and "12th National Social and Economic Development Plan (2017-2021)" as following;

- SFCI puts focuses on mobilizing the local initiatives in drawing development directions and plans for tessabans with a wide range of participation.
- Through participatory approach with academia and private sectors as well as local communities, SFCI can pay attention to local resources and local technologies.
- With its holistic and integrated approach, SFCI can be used to widen tessabans' scope of thinking to cover the whole picture of upcoming issues, such as ageing society, depopulation, etc.
- Lastly, but not least, SFCI can be a significant tool to link local visions and projects with financial and institutional support of national government.

3.4.1 SFCI's Relevance to National Reform

On the other hand, SFCI is also applicable to implementation of "National Reform" (2018-2022). The National Reform is to focus more on institutional and organizational side of development at the same level of the 12th NSEDP (2017-2021). It is intended to reform the existing mechanisms and systems of Thai administration (Thai society at large) in order to promote realization of "20-year National Strategy (2018-2036)".

The National Reform identified the following 11 priority areas: (1) Politics, (2) State Administration, (3) Legislation, (4) Judicial Process, (5) Economy, (6) National Resources and Environment, (7) Public Health, (8) Mass Media and Information Technology, (9) Society, (10) Energy and (11) Prevention and Suppression of Corruption and Abuse of Powers.

Among these 11 areas of reform, there are at least two aspects where SFCI has significant relevance.

1) "To promote public participation in local administration and development"

National Reform includes promotion of public participation in many aspects, most notably in local administration and development, which is in the larger context of decentralization. Under "National Reform 1: Politics, Issue 3 Decentralization, Local Administration Organization and resources allocations" there are missions that read,

- "Accurate promotion for decentralization and mission's transfers to LAOs in order to promote the local public participation and to provide opportunities for citizens to develop their own hometown."⁷
- "Allocate sufficient and suitable resources to LAOs in order to provide good public

⁷ Ibid., 37.

services and to develop quality of life in locality leading to reductions of social and economic disparities.⁸

SFCI can be used as an operational framework that promotes both public participation and better allocation of resources to tessabans (LAOs).

- Firstly, SFCI is useful and effective to introduce participatory approach to identify local needs.
- Secondly, SFCI is useful and effective to promote close coordination between national (provincial) departments with local government.
- Thirdly, SFCI is useful to provide a platform to match financial and technical resources of national departments (including Changwat) with local needs.

The most significant fact is that SFCI has already tested with model cities in Thailand. Through the first phase SFCI in six cities, it is found that SFCI's <u>national-guided and local-driven approach</u> is very useful to fill the gaps that have long been causing big challenges to create good collaborative network and relationships among different parties responsible for urban/city development both in planning and implementation in Thailand system. SFCI has the following built-in operational features that provide missing pieces in urban/city development.

2) SFCI's Relevance in "Regional integration/ Development of main city and city center"

There is another aspect here SFCI is relevant and applicable. "National Reform 5: Economy" includes promotion of "Regional integration/ Development of core city and regional center". Under the item of "National Reform (NR) 5: Economy, NR5-1: National Competitiveness Enhancement, NR5-1-2, Regional Integration", there are missions that read,

- "Economic activities, whether domestic or oversea trading, the development of targeted industries and regional connectivity can generate income for relevant sector. Also, it can increase an employment in areas of targeted industry and surrounding. Therefore, the strategy of core urban developments of clustered areas and transportation routes is highly necessary to serve the economic growth and urbanizations.⁹
- Beside this, the core urban development is to enhance an income generation and to spread prosperity (economic growth) from major cities to secondary cities and surrounding areas.¹⁰

The six model cities to the first cycle of SFCI included two regional center cities namely Phitsanulok and Khon Kaen. Through experiences with these cities, SFCI is proved to be effective as an operational platform that facilitates organized planning and collaboration between different parties, which is an essential element of regional integration. Regarding development of city centers, SFCI has also been proved to be effective as described in the previous sections.

⁸ Ibid., 37.

⁹ Ibid., Reform Issues3: Development of core cities and regional center, 148.

¹⁰ Ibid., 148.

Part II

Model City Projects

4. Model City Activities

4.1 Identification of Target Tessabans and Selection of Model Cities

4.1.1 Overall Steps in the Selection of Model Cities

Model Cities for SFCI were selected through several steps. The criteria and each step in the selection of the tessabans are summarized in Table 4.1.1 while their details are described in the foregoing chapters.

Ste	ep of Selection	Selection Criteria (number)	No. of Selected Tessabans
1.	Overall Target Tessabans	Tessaban Nakhorn (30)Tessaban Mueang (178)	208 tessabans
2.	Target tessabans by type of tessaban	 Regional growth cities (28) Local urban centers (135) 	163 tessabans
3.	Longlist of candidate model cities	 Qualitative evaluation mainly on the following points, Strong leadership and capability for city development Possibility of replication in other cities Recommendation from relevant agencies (KPI, DLA, DEQP, PCD, NMT) 	34 tessabans
4.	Shortlist of candidate model cities	 Socio-economic vitality, including population growth rate, Financial capacity, revenue per capita, share of own revenues Tessabans' capacity, including record of awards Possibilities to discuss key issues of local cities 	13 tessabans
5.	Invitation and proposal	 Invitation was sent to the shortlisted 13 cities Proposal was submitted by 9 tessabans 	9 tessabans
6.	Final Selection Criteria	 (1) Evaluation of Proposal Understanding on SFCI readiness to join SFCI (2) Variety of model cities Regional balance City typology (3) SFCI dissemination Possible issues and themes in the common visions implementation mechanism 	6 tessabans

Table 4.1.1 Summary of Criteria and Selection Step of Model Cities

Note: The numbers of tessabans are as of 2015.

4.1.2 Selection of Overall Target Tessabans of SFCI

As shown in the Table 4.1.2 below, the tessabans of Thailand are classified into tessaban nakhorn, tessaban mueang, and tessaban tambon. The classification is generally

dependent on the tessabans' population size and financial capacity.

Tessaban	Number	Рори	ulation	Area (so	q.km)	Elderly	(%) ¹⁾
туре							
Toccobon		Average	97,678	Average	46.5	Average	9.7%
nakhorn	30	Max.	270,609	Max.	277.0	Max.	13.3%
пакнотт		Min.	51,245	Min.	7.3	Min.	6.2%
Teesekee		Average	24,595	Average	21.9	Average	10.4%
Tessaban	178	Max.	77,976	Max.	182.1	Max.	20.7%
mueang		Min.	4,448	Min.	0.6	Min.	1.7%
Tassahan		Average	6,942	Average	43.2	Average	n.a.
tambon	2,232	Max.	92,286	Max.	1,240	Max.	n.a.
tambon		Min.	288	Min.	0.39	Min.	n.a.

 Table 4.1.2 Overall Status of Tessabans

Note: 1) Over sixties

Source: DLA Website, 2015

Tessaban tambon, the smallest tessaban with an average population of 7,000, functions as the center of rural villages rather than as urban areas. This is because their status was upgraded from TAO or local administrative organizations for rural areas. Since tessaban tambons cannot be the centers of sustainable and sustaining urban development, which is the main objective of the TFCP, the TFCP focus on the role of tessaban nakhorns (30) and tessaban mueangs (178) in pursuit of sustainable urban development in Thailand.

The hierarchy of Thai cities was developed within the context of national economic and social development, to wit:

- **BMA and Tessabans in BMR (29):** They will be the driving force of a robust national economy in the global market as well as the GMS and in the ASEAN region. They need to enhance their attractiveness and level of urban mobility to invite new investment and to become one of Asia's leading cities competing with Hong Kong, Singapore, Shanghai, and Tokyo.
- **Tessabans on ESB (16):** As growth engines that will move Thailand toward further economic development and the achievement of a high-income country status, they need to attract more FDIs in the high-value-added manufacturing sector.
- **Regional Growth Cities (28):** As growth poles in the regions, they are expected to lead regional development to realize a balanced development all over the country. These include regional centers with large economic potential and urban clusters functioning as regional or cluster hubs for commerce, logistics, and public services. Border cities facing Cambodia, Laos, and Myanmar and cities along the regional border need to be strengthened to optimize their locational advantages and attract new foreign and domestic investments in the production of local products.
- **Local Urban Centers (135)**: As the centers of provinces or urban areas, they will provide public services to residents in the area.
- Local Cities (2,232): Tessaban tambons



Source: Date extracted from Census 2000 and 2010

Figure 4.1.1 Location of Tessaban Nakhorn and Tessaban Mueang

The 12th NESDP elaborates two priority policies for Thailand to successfully enter a new

stage of development, namely to pursue more economic growth toward a high-income country and to facilitate more equitable and sustainable social development all over the country. As proposed in Part II of this report, the SFCI aims to facilitate a national government-guided and local-driven development as a policy tool to direct the above second policy. The target tessabans of the SFCI should be, in all respects, centers of their respective regions in order for them to carry out regional coordination. They should also have socio-economic potential sufficient enough to spill over to their surrounding areas. Based on these parameters, local cities, or tessaban tambons, are excluded from the selection. Also excluded are the cities in BMR and ESB because they have been directly affected by central government policies to promote national economic development. Therefore, they are not in a position to promote local-oriented and people-centered development approaches, both of which are espoused in the SFCI. Therefore, the SFCI focuses on tessabans categorized as **regional cities** or **local urban centers**.

4.1.3 Longlist of Candidate Model Cities

At the beginning of the project, the selection criteria for model cities were preliminarily set as follows:

- **Existence of strong leadership and capability for city development:** whether or not candidate model cities can execute locally driven planning processes rather than depending on support from JICA and the NESDB.
- **Possibility of replication in other cities:** whether or not pilot activities in model cities can be replicated in other cities in the next phase of the SFC Initiative.

After the TFCP commenced, the TFCP team members discussed the above criteria with various agencies which have worked directly with tessabans, such as the DPT, DLA, DEQP, PCD, and NMT as JCC members, academic institutions such as KPI, and the Department of Urban and Regional Planning of Chulalongkorn University. The TFCP team members also visited several tessabans in order to identify key urban issues and constraints, as well as to see the urbanization status in these areas. As a result, a longlist of candidate cities was prepared and the same was proposed in the first JCC meeting (see Table 4.1.3).

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

				Socio-	economic Indic	ator		Final	ncing	Awai	q
		Longlisted Tessaban	Registered tessaban Pop. (2014)	Growth Rate (%, '10-'14)	Census District Pop. (2010)	Growth Rate of Dist. (%, '00-'10)	Elderly (%)	%of Own Rev	Rev. per capita (THB)	KPI Award ²⁾	Livable Cities ³⁾
BMR		1. Nonthaburi	270,609	-0.5%	481,487	3.8%	11.4%	19%	8,187	06,11,12,14	09(C)
	Regional	2. Khon Kaen	129,581	0.5%	510,763	3.6%	8.2%	16%	10,565	01, 03, 06(G), 10. 11, 14	09(3),12(3)
	Center	3. Phuket	72,380	0.5%	311,585	7.5%	8.9%	22%	15,173	01, 10, 11	60
		4. Hat Yai	157,467	0.2%	438,576	3.1%	9.8%	22%	10,715	12	
		5. Nong Khai	46,180	-0.1%	131,965	-0.4%	%6	11%	9,365	ı	
		6. Mae Sot	52,350	-2.8%	121,062	1.3%	6.2%	13%	7,825	ı	·
4+	Strategic	7. Phitsanulok	89,480	-1.4%	306,594	2.2%	9.6%	16%	8,049	02, 04, 06(G), 13, 14	09(2),12(C)
	Cities	8. Lampang	69,226	-1.1%	227,137	-0.5%	13.1%	19%	9,941	10	09 (C), 12(2)
Cellfel		9. Nakhon Sawan	95,237	-0.9%	258,882	1.2%	11.1%	15%	9,840	ı	
		10. Ayutthaya	60,919	-0.6%	150,856	1.4%	%6'8	12%	8,678	ı	·
		11. Trat	15,501	1.2%	101,241	1.2%	%71	19%	10,064	ı	I
	Center of	12. Chaing Rai	64,817	0.2%	224,436	1.2%	11.6%	17%	11,676	05, 06, 09 10(G), 12, 13,	09(3),12(2,E)
	Urban	13. Surat Thani	78,359	0.6%	172,412	1.3%	13.2%	12%	14,063	04,05,06,08,12	09(C)
	Cluster	14. Surin	41,818	-0.1%	231,945	-0.5%	%8	17%	9,661	06,07,08(G), 09,14	09(C)
	North	15. Nan	22,273	1.1%	84,098	%6.0	13%	13%	10,831	1	I
	North-east	16. Roi Et	37,131	0.5%	145,849	0.05%	8%	11%	12,146	12, 13, 14(G)	I
	North-east	17. Karasin	36,955	-1.1%	127,635	-0.8%	7%	15%	9,602	I	I
Provincial	South	18. Krabi	24,611	2.8%	83,211	0.4%	9%	22%	13,151	I	12 (W)
Center	South	19. Yala	77,045	-0.7%	145,319	-0.6%	7.4%	6%	12,538	04,05,06(G),08,0 9,10,11,12(G)	09(3),12(1)
	Central	20. Saraburi	67,858	-0.03%	127,431	1.85%	8%	11%	9,636		-
	Central	21. Sing Buri	21,148	-0.9%	53,252	-0.86%	13%	10%	13,880	I	I
	Central	22 Chai Nat	16.499	-1.4%	67 918	-1.38%	10%	12%	13.067	ı	ı

Table 4.1.3 Longlist of the Candidate Model Cities¹⁾

4-5

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

				Socio-	economic Indic	ator		Fina	ncing	Awa	ġ
		Longlisted Tessaban	Registered tessaban Pop. (2014)	Growth Rate (%, '10-'14)	Census District Pop. (2010)	Growth Rate of Dist. (%, '00-'10)	Elderly (%)	%of Own Rev	Rev. per capita (THB)	KPI Award ²⁾	Livable Cities ³⁾
	Central	23. Ang Thong	13,134	0.1%	49,651	0:05%	11%	15%	17,250	1	1
	East	24. Phanat Nikhom	12,555	0.5%	119,749	%5'0	14%	8%	15,434	I	09(2),12(W)
	East	25. Kabin Buri	4,564	I	117,240	1.79%	I	I	I	ı	1
	West	26. Hua Hin	41,859	1.6%	109,327	4.7%	8.3%	27%	18,733	I	ı
	West	27. Khao Sam Yot	14,776	%6.0	264,338	%29.0	17%	%9	7,685	I	I
	North	28. Ko Kha	5,342	1	60,828	%69'0-	-	I	I	10,11,12(G),14	ı
Local Cities	South	29. Thung Song	27,244	1.2%	147,333	-0.2%	10%	8%	17,394	09,10,11,12(G),1 3	09(C),12(C)
	South	30. Prik	5,787	-	131,095	2.5%	1	1	1	05,09,10(G),11,1 2,13,14(G)	1
	South	31. Betong	24,385	0.9%	46,578	-0.8%	10%	7%	15,012	08,09	I
	South	32. Renu Nakhon	2,032	T	35,892	-1.7%	-	-	1	I	12(W)
	South	33. Khao Chaison	2,101	-	43,912	-0.05%	-	1	I	I	
	South	34. Sadao	17,615	1.9%	131,095	2.5%	10%	11%	14,409	-	ı
Note: 1)	Proposed durin	g the first JCC meeting w	hich was held in	n October 20	15, 2) KPI Award	l: G-Golden Aw	ard, 3) Livał	ole city av	vard code:	w=winner 1= 1 st P	rize 2= 2 nd Prize

Source: Pop: DLA, Population increase: http://www.citypopulation.de/Thailand-Cities.html, Elderly: DLA website, Financing: Summary of LAO Income 2013, 3=3rd Prize c=Consolation prize

4.1.4 Evaluation and Shortlisting of Candidate Cities

The above longlist was examined, and the results were as follows:

- **Socio-economic Vitality:** The socio-economic conditions, including population growth rates and ageing rates of each tessaban were analyzed to identify which tessabans showed strong vitality or face depopulation and ageing.
- **Financial Capacity:** Revenue per capita and share of their own revenues were quantitatively analyzed to identify tessabans with strong financial basis.
- Tessabans' Capacity: To determine this, the TFCP team members reviewed some of the awards given to tessabans, including the KPI Award and the Livable City Award, as well as some award-winning activities of tessabans. The tessabans' capacities to implement model city activities were evaluated based on such award-wining activities and direct discussions with tessabans or comments from relevant agencies.
- Possibility to Discuss Key Issues of Local Cities: Key issues of local cities were identified in the Concept Paper on Sustainable Future Cities, as shown below. Candidate model cities were selected to cover such issues as much as possible. The following were the identified key issues:
 - (i) Strengthening of self-sustaining economic competitiveness/promotion of centrality of city;
 - (ii) Preparation for depopulation, ageing and low fertility society;
 - (iii) Attention to/acknowledgement of sustainable environmental strategy and global warming;
 - (iv) Strengthened regional connectivity; and
 - (v) Strengthened initiatives of tessabans and people's participation in development.

Based on such evaluation, 13 cities were made it to the shortlist of candidate model cities (see Table 4.1.4) and were approved by JCC members in a working group meeting held in March 2016.

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

First	Priority ⁶⁾				0									U	þ				C	D												
			Gov		ı					ı		I		l					C	D					0					ı		
	Î	Cities 5)	AEC		0					ı		C	C	U)				C	D					ı					ı		
4)		of Local	Env		0				C	D				-					Ċ	5					0				Ċ	2		
her Cities		ey Issues	Ageing		0					ı				,						ı					0				C	2		
lity to Otl		۶۹ K	Comp		0				C	D		C	2	C	>				C	5									C	2		
Applicabi		Issue to discuss		 Population increase and sub-urbanization 	 Urban public transport development (compact city) 	- Education city	- Low-carbon city	- Smart city (smart mobility,	Touriem city	 rounsminuty Regional transport network 	- Urban public transport	- AEC and Border city	 Security / foreign workers 	- AEC and Border city/ SEZ	 Security / foreign workers 	- Environmental city	(Community-based solid	waste management,	wastewater management)	- Urban mobility (public	transport)	 Strategic cross-point of 	regional corridors	- Population decrease and	aged society	- Environmental city	- Deterioration of city center	 Flood mitigation (regional 	cooperation)	 Strategic cross-point of 	regional corridors/ Centrality	of regional economy
		Leadership	3)		٩				<	٢		<	٢	Δ	¢				<	٢					۷				<	٢		
y of City		Human	resources ²⁾		۲				<	£		<	¢	Δ	¢				<	ſ					٩				<	٢		
Capacit		Financial	capacity		В				<	٢		-	a	Я	נ				۵	٥					٨					۵		
		Socio-	economy ¹⁾		٩				<	٢		٩	a	ш	C				<	ť					В					۵		
:	Shortlisted	Tessaban			1. Khon Kaen				toolinde C	z. Pnuket		2 Nene Vhai	o. NUIIG NIIdi	A Mac Sot	4. IVIAE JUL					o. Phitsanulok					6. Lampang	-			7. Nakhon	Sawan		
						Pacinal		Centers													Stratenic	Ju accelo	Cities									
																Growth	Centers															

Table 4.1.4 Evaluation of the 13 Short-listed Cities

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

		-		Capacit	y of City		Applicabi	lity to Oth	er Cities	4)			First
		Shortlisted											Priority ⁶⁾
		Tessaban	Socio-	Financial	Human	Leadership	Issue to discuss	Ke	y Issues (of Local (Cities ⁵⁾		
			economy ¹⁾	capacity	resources ²⁾	3)		Comp	Ageing	Env	AEC	Gov	
		8. Ayutthaya	В	В	٨	A	 Cultural and heritage city Compact city 	0	I	0	,		
							- Tourism city						
							- City of diversity (bio-,						
	ļ						cultural)						
	Centers												
	0041140	O Chines Doi	2	۵	<	<	 Low-carbon city 	C	C	C	C	C	C
		9. CIIIAIIY NAI	a	a	٤	٢	 Education city/ international 	þ	>	2	>	0	C
	Clusters						collaboration						
	_						- Arred society						
							- Culture and heritage city						
							canale and menuage end						
							 Environmental city (regional 						
	North	10. Nan	в	В	A	4	disaster management)	0	'	0	0	0	
	_						- International tourism						
	_						development						
					,		- Regional coordination						
Provincial	Northeast	11. Roi Et	В	ш	A	A	(disaster prevention)	0	·	ı	ı	0	0
							- E-governance						
Centers							- Environmental city (Solid						
	_						waste management,						
							wastewater treatment,						
	South	12. Krabi	A	A	A	A	education)	0		0	ı	0	0
	5						- City promotion (art city)						
							- Regional cooperation						
							(tourism, environment)						
							- Community-tessaban						
							collaboration,						
Local		13. Phanat	ſ				 Community-based activities 		(((
Cities	East	Nikhom	ß	A	A	۲	(3R, wastewater treatment	ı	D	C	ı	D	
							management organic						
				_			pi oddeerij		-			_	

1) A= population increase / big city/ rapid sub-urbanization; B= population decrease / stable population/ high elderly populations. 2) Award-winning, staff capability/ community.

3) Leadership= strong leadership/ political stability/ willingness to join the SFCI.

4) Including current issues which each city face at present and expected issues.

Key local issues identified in the draft of the 12th NESDP and based on analysis: Comp= to ensure competitiveness; Ageing= preparation for an ageing society and depopulation; Env= sustainable environment including disaster management and global warming; AEC= regional connectivity; Gov= governance including regional coordination and community participation.
 First priority cities based on a preliminary evaluation.

4-9

4.1.5 Invitation and Proposal Submissions

Invitations to participate in the SFCI were prepared by the NESDB and the JICA Project Team. The invitations comprised the following aspects:

- Invitation Letter signed by Mr. Porametee Vimolsiri, Secretary General of NESDB;
- Executive Summary on the Sustainable Future City Project;
- Instructions for Application to the Sustainable Future City Initiative Model City Projects;
- Submission Letter of Application on SFC Initiative; and
- Form of Proposal on SFCI Model City Project. (see Table 4.1.5)

Instructions for applying to the SFCI Model City Project included the scope of the SFCI Model City Project with the overall process and schedules. It also explained the application process, including the documents to be submitted by an interested tessaban and the selection process, including the evaluation criteria.

Invitations also included indispensable conditions necessary in the participation to the SFCI such as:

- Responsibilities of the tessaban, including establishment of Planning Team for SFCI within Tessaban and PCC, and involvement of stakeholders in the Planning Team Meeting;
- Expenses to be borne by the tessaban to carry out the SFCI, including expenses to attend meetings regarding the project in Bangkok;
- Reflection of results of SFCI to next Local Strategic Development Plan; and
- Continuous efforts to realize the projects proposed in the SFCI.

On 8 April 2016, a set of the above-mentioned documents were sent to each of the mayor of the above 13 short-listed tessabans by post and by e-mail. By the proposal deadline on 29 April 2016, 9 out of 13 short-listed tessabans had submitted proposals to participate in the model cities project.

Table 4.1.5 Application to Join the SFCI Project (from Phase 1)

Name of Mur	nicipality:		
District	•	Province :	

1. Implementation Organization for SFCI

(1) Contact
Responsible Person: (please indicate the person responsible for overall SFCI)
Name
Position
Contact Person: (please indicate the contact person in the Municipality to implement SFCI)
Name
Position
Tel
Fax
EM address
Address
(2) SFCI Team in tessaban (please indicate structure and list of staff for SFCI Team to implement SFCI in your municipality)
 (3) Preliminary list of relevant agencies at Changwat level (please preliminary identify organizations at Changwat level to be coordinated in the SFCI, such as Changwat office, provincial offices of departments, PAO, the existing committee, such as Smart City Committee)
(4) Preliminary Identified Major Stakeholders(please preliminary identify stakeholders which will be invited for Planning Meeting, such as private sectors, community leaders, and universities)

2. Expectation and Acceptance to Participate in the SFCI

(1) Expectation to SFC Initiative (please describe what you expect to participate in SFC Initiative))
(2) Tessaban in SFC Initiative Model City Project has to follow these conditions.	
Establishment of SFCI Team in tessaban	
Invite stakeholder to Planning Meeting to formulate SFC Program and Projects	
Coordinate with Changwat-level organizations	
Expense of meeting of Planning Team	
Expense to attend meeting regarding SFCI at Bangkok	
Reflection of results of SFC Initiative to next Local Strategic Development Plan	
Continuous efforts to realize the projects proposed in SFC Initiative	

3. City Vision and the SFCI

Г

(1) City Vision (please describe city's vision, desc	ribed in the local str	ategic developm	nent plan or other)	
		<u> </u>		
(2) Major Issues to achieve the ab	ove Vision			
(3) Expected Sectors/fields to be (please select (fill "P") expected describe in detail below.	taken in the SFC Init sector/fields to be	tiative, in accorda taken into acco	ance with the City's ount in the SFC In	Vision itiative and
1) Economy2) Society &&CommunityEmployment	3) Culture & Tourism	4) Natural environment	5) Land 6) use Tra & 1	nsportation nobility
7)Disaster mitigation8) Solid waste management	9) Preventive health	10) Social education	11) Capacity enhancement of local government	12) Others
Please describe in detail.				

(4) Reason to focus on the sectors/fields selected in (3)(please describe background and reason to select the sectors/fields among others)
(5) Expected project (please indicate projects that your tessaban expect in the SFC Initiative, if there is)
(6) Current Obstacles to implement the projects mentioned in (5)
(please indicate current difficulties/ obstacles/ shortage to realize the project above)
(7) Previous Studies on the project mentioned in (5)
(7) Previous Studies on the project mentioned in (5)(if you have any previous studies related to the project mentioned in (5), please indicate its details below, including name of studies, year and client to conduct studies, etc.)
 (7) Previous Studies on the project mentioned in (5) (if you have any previous studies related to the project mentioned in (5), please indicate its details below, including name of studies, year and client to conduct studies, etc.)
 (7) Previous Studies on the project mentioned in (5) (if you have any previous studies related to the project mentioned in (5), please indicate its details below, including name of studies, year and client to conduct studies, etc.)
 (7) Previous Studies on the project mentioned in (5) (if you have any previous studies related to the project mentioned in (5), please indicate its details below, including name of studies, year and client to conduct studies, etc.)

4.1.6 Evaluation of Proposals and Selection of Model Cities

The final list of model cities was selected based on the following three points:

(1) Content of the Proposal

Acceptance of conditions to join the SFCI

Level of understanding on SFCI (for dissemination to other cities)

- Conformity to key issues of SFCI
- Comprehensiveness (multi-sector) of the vision and integration the focused sectors
- Necessity of regional coordination
- Necessity of central-Local coordination

Readiness to join SFCI

- Mobilization for SFCI Activities (PCC, Planning Team, Stakeholder)
- Motivation and willing to join SFCI
- Project experience, including donor-funded projects
- (2) Variety of model cities
 - Regional balance: northern, north-eastern, central, southern region.
 - Type of city: size and characteristics
- (3) SFCI dissemination

Possible issues and themes in the common visions

- Self-sustaining and competitive driving force
- Attractive and distinctive identity
- Eco-friendly and resilient city
- Creation of safe, secured, and inclusive society
- Civic pride for future generations

Implementation mechanism

- Coordination with National/Provincial Administration
- Technical Cooperation by NESDB Regional Office
- Regional Coordination
- Private Sector Participation
- Community participation

Based on the above evaluation, six tessabans were selected as model cities for the SFCI. They were: Tessaban Nakhorn Ching Rai, Tessaban Mueang Nan, and Tessaban Nakhorn Phitsanulok in Northern Region, Tessaban Nakhorn Khon Kaen in North-eastern Region, Tessaban Mueang Phanat Nikhom in Eastern Region, and Tessaban Mueang Krabi in the Southern Region. After the approval in the JCC on 30th May 2016, the Notification Letters of Selection as SFCI Model City were signed by the Secretary General of the NESDB and sent to each city and each changwat respectively.



Source: JICA Project Team

Figure 4.1.2 Location of Short-listed and Selected Tessabans

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

Name of Tessaban	Chiang Rai	Lampang	Phitsanulok	Nan	Khon Kaen	Nong Khai	Krabi	Phanat Nikhom	Roi Et
1. Proposal Evaluation									
(1) Acceptance of Conditions	0	0	0	0	0	×	0	0	0
(2) Level of understanding on SFCI	Ø	\bigtriangledown	0	Ø	0		0	Ø	0
(3) Readiness to join SFCI									
Mobilization for SFCI Activities (PCC, Planning Team, Stakeholder)	Ø	0	Ø	Ø	Ø		Ø	Ø	0
Motivation	Ø	\bigtriangledown	\triangleleft	Ø	0		0	0	0
Project Experience	Ø	Ø	Ø	Ø	Ø		Ø	Ø	0
Total of the Proposal Evaluation	12	7	6	12	10		10	11	8
2. Variety and Dissemination to Other Cities									
(1) Regional Balance	North	North	North	North	North-eas tern		South	Eastern	North
(2) City Typology	Urban Cluster Center	Strategic City	Strategic City	Provincial Center	Regional Center		Provincial Center	Other Tessaban Mueang	Provincial Center
Need to be selected	0	0	0		0		0	0	
3. SFCI Dissemination									
(1) Possible Issues and Themes in the Common Visions									
Self-sustaining and competitive driving force	Ø	\bigtriangledown	Ø	Ø	0		Ø	\bigtriangledown	\bigtriangledown
attractive and distinctive identity	Ø	Ø	\bigtriangledown	Ø	Ø		Ø	\bigtriangledown	\bigtriangledown
eco-friendly and resilient city	O	\bigtriangledown	0	0	0		0	Ø	\bigtriangledown
creation of safe, secured, and inclusive society	0	\bigtriangledown	Ø	0	0		\bigtriangledown	Ø	Ø
civic pride for future generations	0	0	0	Ø	Ø		Ø	Ø	Ø
(2) Implementation Mechanism									

Table 4.1.6 Final Selection of the Model Cities

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

Coordination with	¢	<	C	¢	¢	(<	<
National/Provincial Administration	٥	1	C	٢	٥)	1	1
Technical Cooperation by NESDB	<	<	<	~	¢	<	0	<
Regional Office	1	1	1	1	٥	1	٥	1
Regional Coordination	Ø	\bigtriangledown	\bigtriangledown	Ø	Ø	Ø	0	0
Private Sector Participation	Ø	\bigtriangledown	\bigtriangledown	\bigtriangledown	\bigtriangledown	0	\bigtriangledown	Ø
Community participation	Ø	0	Ø	Ø	Ø	\bigtriangledown	Ø	\bigtriangledown
Sub-total of 3.SFCI Dissemination	27	15	20	25	28	21	22	17
Final Selection	0		0	0	0	0	0	

4.2 Schedule of Model City Activities

Overall Schedule of SFCI Model City project activities are shown in Figure 4.2.1. After five model cities (Chiang Rai, Nan, Khon Kaen, Phanat Nikhom, Krabi) were selected in May 2016 through proposal evaluation, the JICA Project Team and Local Consultant Team started to visit model cities and commenced model city activities officially during the Kick-off Seminar on 5th July 2016.

After kick-off seminar, five model cities started SFC research and planning, including basic analysis, issues identification, vision formulation, plan formulation, and project identification. In the end of October 2016, Phitsanulok was selected as the sixth model city, which was officially accepted by Phitsanulok Mayor on 31st October 2016.

During SFC Research and Planning Stage, in November 2016, a Plenary Workshop was organized in order to share identified issues, the formulated visions, and selected themes of the SFCI project. Phitsanulok also attended this workshop to start up their model city activities. A study tour in Japan was organized in December of that same year in order to get lessons learned for planning and project identification of each city. At the end of the SFC Research and Planning Stage, each city presented SFC Plan and Program and proposed plan for JICA pilot project during the JCC on 21st April 2017.



Source: JICA Project Team

Figure 4.2.1 Implementation Schedule of the SFCI Model City Project

During the SFCI Implementation Stage, each city formulated its SFC Project as well as conducted JICA Pilot Project. In October 2017, the second Plenary Workshop was conducted in order to share the progress of each model city activities and learn lessons from each other. Group discussions were organized on the three selected urban development issues, which have been focused on the six participating tessabans, namely: (i) How to promote collaboration among relevant authorities in order to respond to critical issues of an ageing society? (ii) How to integrate community-based tourism (CBT) into your sustainable future city program and facilitate them with regional tourism market?, and (iii)
How to ensure mobility with public transport in the urban area beyond tessaban's boundaries?.

All of the SFCI model city activities were expected to be completed by the end of July 2018 and the Third Plenary Workshop was to be organized in July to summarize the result of SFCI model city project and discuss the next phase of SFCI.

4.3 Formulation of Planning Team (PT) and Project Coordination Committee (PCC)

Since one of the important concepts of SFCI is its "local-driven approach", the Tessabans had to have strong initiatives to lead their respective SFCI activities. At the same time, multi-sectoral local stakeholders urged to get involved from the planning stage to achieve criteria in the success of the concept, which was SFCI's "collaborative" regime.

At the first stage of the model city activities, each tessaban and JICA Project Team together with the local consultant firstly worked together to identify the required stakeholders from the public, private, academic, and community organizations to cover comprehensive aspects of urban development, including social, economic, environment and urban management.

Tessabans and JICA Project Team conducted interviews with important stakeholders to understand their expertise, relationships with the Tessaban, their ideas of urban development directions, identified influential persons/organizations in the city, and analyzed their possible contributions to SFC planning. Through these steps, the Tessabans showed their initiatives to identify stakeholders in their development directions that involved diverse stakeholders for promoting collaborations.

Based on the result of the above interviews, each Tessaban finalized a list of Planning Team (PT) members, which were chaired by each mayor of the respective Tessaban. Each city had its own characteristic of members depending on the development issues.

The findings from the stakeholder analysis and the selection of the PT are summarized below.

For example, Tessaban Nakhorn Chiang Rai had significant experience on community environmental activities, so that the relationships between the Tessaban and its communities were basically well developed. For the composition of its PT, the Tessaban decided to involve more members from the academic and educational organizations as key members of the PT to integrate lifelong and active learning of all ages into urban development. These organizations were expected to mobilize students to get involved in the activities.

Khon Kaen involved many members that worked on its on-going "Smart City Project" in order to keep consistency of SFCI with Smart City project as well as accelerate the implementation of the proposed projects. Khon Kaen University (KKU) has worked as a key facilitator for a long time and had involved the communities and the private sector, including in its Smart City Project. They also have good relationships and mutual understanding with the Tessaban as well. Therefore, Khon Kaen University showed a strong commitment as was expected. Another important stakeholder in Khon Kaen is Khon Kaen Think Tank (KKTT), a private think tank and association in Khon Kaen. Since all of those stakeholders have worked well, the Tessaban decided to implement the SFCI through the same partnerships.

As for Nan, its strong and active community leadership, allowed it to work together with the Tessaban. Many academia, including Chulalongkorn University, were involved in urban

development in Nan and had strong knowledge and relationship with the Tessaban for certain sectors. Therefore, these members from the academe were selected to be part of the PT members. Designated Areas for Sustainable Tourism Administration (DASTA), a national organization for tourism promotion, is one of the most influential organizations in Nan, which had connections not only with the communities and the Tessaban, but also local private companies related to tourism sector.

Phanat Nikhom has many retired governmental officials and/or business people who have much experience in their respective specialties and have shown a willing to work for Phanat Nikhom. Communities of Phanat Nikhom are very active and have conducted a variety of community-based projects and activities. The Tessaban has also been active in communicating with communities through frequent meetings with leaders and community representatives. Because an ageing society was focused in Phanat Nikhom, health organizations and hospitals gave crucial voices in the PT meetings.

Table 4.3.1 shows the PT members of each city, which are categorized into four aspects. Besides these members, each Tessaban has assigned officials in various departments of the Tessaban as members of the PT members.

	Chiang Rai	Phitsanulok	Phanat Nikhom
Social	 The 6th Tessaban School Ratchabhat University Mae Far Luang University Educational Institution Committee Tessaban school teachers Representative parents of Tessaban school Community Leaders 	 Former Director of Tessaban School Naresuan University Community Leaders 	 Tessaban Schools Community Leaders Community Public Health Volunteer Phanat Nikhom Hospital Elderly Club Amphor Cutural Council
Environment	 Provincial office of Environmental and Natural Resources 	• IGES	Save the Earth Club
Industry & Employment	 President of Chamber of Commerce Provincial Tourism Council 	Local commercials	 Chamber of Commerce Handicraft Promotion Center
Urban Management	• Tessaban Council		• Tessaban Council
Description	 Many educational organizations join Management and Tourism department of Ratchabat University join 	Several departments from Naresuan University join	 Many health-related organizations join Active community organizations join

 Table 4.3.1
 Planning Team (PT) Members of Each Tessaban

	Krabi	Nan	Khon Kaen
Social	 Amphor Cultural Council Community Leaders Krabi Technical College Kindergarten School The 3rd Tessaban School 	 Provincial Office of National Buddhism Nan Hospital Provincial Office of Public Health Mahachulalongkornrajavi dyalaya University Nan (Buddhism University) Rajamangala University of Technology Lanna Nan Community College Rachabat Uttaradit University Nan campus Office of Non-formal and informal education Love Nan City Foundation Office of Nan Community 	 Khon Kaen University Community Leaders
Environment	 Krabi Environmental Project Group 		
Industry & Employment	 Chamber of Commerce Krabi Food Club 	 DASTA Chamber of Commerce Federation of Thai Industry Provincial Office of Sports and Tourism 	 Khon Kaen Next Decade Foundation Chamber of Commerce
Urban Management	City Council		
Description	 Local rooted organizations are relatively active Well-balanced members 	 Many academic institutions join Tourism-related organizations are also active 	 Several departments of Khon Kaen University join "Smart City Project" members are main part of PT members

Table 4.3.2	Planning Team	(PT) Members	of Each City (cont.)
		()	

Source: JICA Project Team

4.4 Output of the Model City Project

As a result of planning process of SFCI, all six model cities formulated their respective SFC Plan and identified specific SFC programs as well as a list of SFC projects. JICA Pilot Project was also selected as a priority project which included preparing activities, and start-up projects. The outputs of the model cities activities are summarized below. Their details are summarized from Chapter 5 to Chapter 10.

Table 4.4.1 Summary of SFC Plans of the Six Model Cities

SFC Vision and	Vision: Chiang Rai, City of Happiness for All.	
Strategies	Strategy 1: Infrastructure System Development for Safety in Life and Property.	
	Strategy 2: Generation of New Values by the Interaction of All Ages.	
	Strategy 3: Development of Health Service for All Ages.	
SFC Program	 Generation of New Value by the Interaction of All Ages To provide opportunities to encounter various people. 	
	 Sister City Development Create places to interact all generations at Doi Saken 	
	 To provide educational opportunities for capacity development. The University of Third Ages (U3A) 	
	- Digital education for life-long learning	
	- Promotion of philosophy of Sufficiency Economy	
JICA Pilot Project	The Project for Promoting Interactions among the All Ages through Active	
	Learning.	
	Component 2: Camp Program for Students	
	Component 3: Organic Vegetation Training for Community People	
	Component 4: Tourism Spot/ Program at Doi Saken	
Expected output of SFC Program	Active learning can make people develop skills.Platform for interactions with all ages, which can make strong communities.	
	• Learnings and interactions can make people have more confidence on the local culture, products, and identity.	
Long-term impact of SFC	• Expect to upgrade the local culture, products, and identity new Chiang Rai values through interactions with all ages.	
Plan	• To enhance Sustainability of Chiang Rai, in terms of sustained population,	
	tourism promotion.	

Tessaban Nakhorn Chiang Rai

Tessaban Nakhorn Khon Kaen

SFC Vision and	Vision: "Make the City Global, Create a Happy Society" and "Smart City"		
Strategies	Strategy 1: Enhance "Centricity" in Isan		
	Strategy 2: Smart and yet Traditional Urban Renewal		
	Strategy 3: Green and Quality Amenity City		
	Strategy 4: Beyond car-oriented development		
	Strategy 5: Sustainable Urban Growth with Nature		
	Strategy 6: Design for All		
	Strategy 7: Safe, Secure and Quality Living Environment		
SFC Program	Beyond Car-oriented Development		
	Transit-oriented Development.		
	• Development of high-order transit system along NH 2 as the main transit axis.		
	• Extended feeder transit network in a hierarchical manner (smart bus stops with		
	bicycle parking system, para-transit, taxis).		
JICA Pilot Project	Public Transport Promotion		
Expected output of SFC Program	 Higher number of public transport passengers and bicycle users. Reduce barriers in the shift from private to public transport. Improve security of bicycle parking facilities. 		
Long-term	• The project can promote public transportation multimodal connectivity,		
impact of SFC	accessibility and information facilities and services. It can encourage more		
Plan	people to use public transport and non-motorized transport and reduce traffic		
	issues by shifting behavior from private transport to public transport.		

Tessaban Mueang Krabi

SEC Vision and	Vision To make Kushi City of Art and Culture City with Tourism	
Si C Vision and	VISION: TO Make Kradi City as Art and Culture City with Tourism	
Strategies	Strategy 1: Conservation & promotion of environmental and tourism resources	
	program.	
	Strategy 2: Conservation & promotion of cultural and tourism resources.	
	Strategy 3: Promotion of CBT.	
SFC Program	Enhancement on Dissemination of Andaman Culture	
	Improvement of Andaman Cultural Center	
	Development of Andaman OTOP Shop	
	Marketing and public relation promotion	
	Promotion of arts activities and cultural learning and teaching	
	Establishment of local support/volunteers group and their activities	
	Krabi Art Olympic 2018.	
	National artists exhibition	
	Development of international arts hall	
	Construction of historical tracing ship	
JICA Pilot Project	The Project for Improvement of the Entrance Area of Andaman Cultural	
	Center, Design and Construction of Local Beverage and Sweets Shop and	
	Marketing and Public Relations Promotion.	
	Sub-project 1: Improvement of entrance area of Andaman Cultural Center	
	Sub-project 2: Design and construction of local beverage shop	
	Sub-project 3 :Marketing & public relations promotion	

Expected output of SFC Program	 Increase of visitors of Andaman Cultural Center through collaboration with other tourism destinations. Increase of tourists visiting historical and cultural sites in Krabi Municipality
	through Community-based Tourism.
	Revitalization of agricultural industry and relevant local industries.
	 Increase of employment opportunities.
Long-term	• Establishment of distinguished cultural tourism hub for people in the Tessaban
impact of SFC	Krabi and neighboring communities as well as domestic and international
Plan	tourists, which will promote sustainability of Krabi and its surrounding areas.
	• Provide lessons learned to other tourism cities, in terms of coordination
	between tessabans and regional tourism, community-based tourism, strategic
	tourism marketing, etc.

Tessaban Mueang Nan

SFC Vision and	Vision: Nan, The Happiness and Living Old Town		
Strategies	Strategy 1: Revitalization of Value of Nan's Existing Culture and Traditions.		
	Strategy 2: Improve the quality of life Nan-style.		
	Strategy 3: Improve & Conserve the Quality of the Environment.		
	➔ Cross-cutting project of all 3 Strategies.		
SFC Program	 Experience Nan Live Museum along the Bicycle Route 1) Establishing bicycle routes or routes for demonstrating Nan's museum Increase attractiveness of routes to attain a HEALTHY NAN 2) Solid Waste Management for Nan for CLEANER NAN (to contribute in beautification of bicycle routes) 3) Increase green area for GREENER NAN (to contribute to beautification of bicycle routes) 		
JICA Pilot Project	"Experience Nan-the Living Old Town along the Bicycle Route" cross-cutting		
	 project Component 1: Long Nan Information Center Component 2: Lighting for Temples and Archeological Sites Projects Component 3: Solid Waste Management 		
Expected output of SFC Program	 Encourage residents and tourists to acknowledge their unique traditions such as architecture, herbs /food, crafts, etc., and ways of life. Improve solid waste management to be suitable for Nan's lifestyle and contributing in the beautification of the bicycle lane. Increased green area in houses and riverbanks and along the bicycle lane for beautification. 		
Long-term impact of SFC Plan	 Value of old town and Nan's way is promoted both for tourists and locals Improve health and happiness for both tourists and locals by consuming clean and safe food and through bike-riding exercises Increasing green areas and apply proper solid waste management to reduce pollution and improve environmental quality 		

Tessaban Mueang Phanat Nikhom

SFC Vision and	Vision: Livable City		
Strategies	Strategy 1: Strengthen Phanta Nikhom as urban service center		
	Strategy 2: Improve livability in Multi-generation		
	Strategy 3: Utilize local resources for uniqueness as Phanat Nikhom		
SFC Program	Provision of Urban Services for Various Generations and Their Lives in		
	Comfort		
JICA Pilot Project	 Project for Introducing Universal Design in Phanat Nikhom To develop universal design guidelines for Phanat Nikhom 		
	• To develop of a "long-term strategy" to introduce universal design in Phanat		
	 Nikhom and to identify "required projects" Priority project improvement 		
Expected output	Guideline for universal design including the components of infrastructure,		
of SFC Program	building, facilities/equipment and public awareness		
	Diagnosis map through workshop/ interview survey and location of problems		
	Long-term strategy and project list		
	Implementation of priority project		
Long-term	• Livable city for all ages can enhance centrality of Phanat Nikhom, which can		
impact of SFC	sustain people in Phanat Nikhom and thus sustainability for Phanat Nihkom.		
Plan • To provide lessons learned for other cities with similar ageing c			
	terms of comprehensive strategies for universal design.		

Tessaban Nakhorn Phitsanulok

SFC Vision and	Vision: Central City with Nice Landscape and Happy Citizens		
Strategies	Strategy 1: Encouragement of next leading businesses		
	Strategy 2: Improvement of Naa Yuu (sustainability) and Local Pride for All		
	generations		
	Strategy 3: Provision of Infrastructure Utilities for Safety and Sufficient Living		
	Environment		
SFC Program	Preparation for Aged Society		
	Hardware improvement		
	Software improvement		
	People-ware development		
	• Database and IT system to serve social welfare and medical services for the		
	elderly		
JICA Pilot Project	The Pilot Zone for Creating Sustainable Ageing Society		
	• Apply universal design concepts to design infrastructure and public facilities		
	(hardware)		
	Care system integration (software)		
	Capacity development (people ware)		
	10-year strategic plan		
Expected output	• Improve infrastructure supporting all standards for the elderly and people with		
of SFC Program	disabilities		
	• The integrated care system can make people get efficient social welfare services		

Long-term impact of SFC Plan	• Contribute to create "a livable city for all people" including the elderly and people with disabilities. It may generate social sustainability for Phitsanulok in the long-term.
	• Transfer lessons learned to other similar-size Tessaban Nakhorn including their surrounding tambons.

Source: JICA Project Team

Table 4.4.2	Summary of Short-term Actions wit	h Expected Budgeting
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Project	Project Description	Budget (THB)	Status	Implementing Body
Chiang Rai	Developing Doi Saken Community Keeree Chai Yama. Most short-tern following mid-to-long term actions	Area to be a sour n actions will be con are being coordina	ce of learning and nducted under the ated with relevant o	as a new tourism spot: Tessaban's budget. The departments.
Construction of Sky Walk.	 Foot path development within Doi Saken area. 	15 mil.	Being prepared under FY 2019 budget	DLA Subsidy
Construction of buildings supporting the use of children, youth, people and elderly.		22 mil.	Being prepared under FY 2019 budget	Northern Regional Dev. Budget
CBT for touching lifestyle following sufficiency economy philosophy.	 To realize sufficiency economy philosophy through community-based tourism. 	1.0 mil. (200,000/year)	Being prepared	For short-term by Tessaban/ Ministry of Tourism or Sport
Sports field improvement.		300,000	Being prepared under FY 2019 budget	DLA Subsidy
Khon Kaen	Roadmap for public transport pron Plan is shown below, of which the Committee after completion of JIC	notion has been de detailed financial s A Pilot Project.	veloped under the ources will be disc	SFCI. Short Term Action ussed under Smart City
Linkage information	- Create route map for transit system.	1.0 mil.	2018 -2019	Khon Kaen Smart City Operation Center
Place information	- To create map surrounding each bus stop.	10.0 mil.	2018-2022	Tessaban
Public transport support	- To improve facilities in the bus stop.	10.0 mil.	2018-2022	Tessaban
Data management	- To create mass transit management system including data collection and analysis.	10.0 mil.	2019-2020	KKU
Public transport app	- To develop application software to support songthaew users.	5.0 mil	2019-2020	KKU
Cashless payment	 To introduce RFID smart card system for songthaew operating system. 	1.0 mil.	2019-2020	PPP (public-private partnership)
Skills development of service providers	 To improve management of service providers. 	2.0 mil.	2019-2021	ККО
Accessible public transport transit	 To develop an integrated transit hub. 	2.0 mil.	2019-2021	Tessaban

Multimodal	- To promote multimodal public transport.	20.0 mil.	2019-2023	РРР
Marketing campaign	 Marketing campaign to encourage use of public transport. 	2.0 mil.	2018-2019	РРР
Public space	- To create attractive public space.	2019-2023	Tessaban	
Krabi	Action list under SFC Strategy "Con Krabi urban area and Surroundin projects are shown as below.	servation and Prom g Beaches" was p	iotion of Cultural ar repared, of which	nd Tourism Resources in the short-term action
Construction of Local Community Products and Andaman OTOP Shop	 Construction of OTOP shop building. Café next to this building is being developed under JICA Pilot Project. 	21 mil.	Under Procurement process	Community Development Department
Thailand Biennale Krabi 2018	 International Arts event in Andaman Cultural Center 	50 mil.	2018.11~2019.2	Krabi Cultural Office
International Art Hall	- Development of Arts Hall	90 mil.	Being prepared under Regional Development Plan (FY2019)	Krabi Changwat
Nan	Under Nan Old Town Museum D strategies, of which the short-term	evelopment Plan, action projects are	action lists have b shown below.	een prepared under 3
Design Installation of Lighting at historical sites	 Installation of lighting based on the detailed design prepared under JICA pilot project. 	30 mil. (first year) 62mil. (overall)	2019 2020-	Department of Fine Arts
Underground electric lines project	 Put electric lines in the city center underground. 	700 mil.	2018-2022	Provincial Electricity Authority
Phanat Nikhom	Action list under SFC Strategy "Imp was prepared, of which the short te	rove Livability in Mu erm projects are sho	ulti-generation" and own below.	d barrier-free guidelines
Phanat Nikhom Stadium Improvement Project	 Renovation of the stadium to be suitable for all ages (based on the guideline prepared under JICA pilot project). 	2 mil.	FY 2019-2020	Tessaban Thai Health Promotion Foundation
Tessaban Mueang Phanat Nikhom Park Improvement Project	 Renovation of the public park to be suitable for all ages (based on the guideline prepared under JICA pilot project). 	3 mil.	FY 2019-2020	Tessaban Thai Health Promotion Foundation
Bike Lane Suggestion Program Project	 development of the 2.6 km bike lane. To promote activities for all ages in communities. To reduce cars in Tessaban. To improve livability of Tessaban. 	1.04 mil.	FY 2019	Tessaban
Public Parking Lot Improvement Project	- To add more facilities for public transportation in the Tessaban.	190,000	FY 2020-2021	Tessaban Thai Health Promotion Foundation
Phitsanulok	10-year Strategy for Sustainable A strategies and 49 projects. Most Tessaban's budget. The following n departments.	Ageing Society was of the short-terr nid-to-long term a	prepared through n actions will be ctions are being co	n SFCI, comprising four conducted under the ordinated with relevant

Promotion of career training and income generation	-	Career training for the elderly (vegetable planting, food processing, invention etc.)	300,000/year	FY2019	Tessaban/ Provincial Ministry of Society
Construction and renovation of footpath and road for all	-	Universal design strategy Construction and renovation of the footpath.	150,000/year	FY 2019	Tessaban/ Changwat

Source: JICA Project Team

5. Tessaban Nakhorn Chiang Rai

5.1 SFC Plan, Program, and Projects

5.1.1 Outline



Figure 5.1.1 Location of Chiang Rai

1) Location and Position in Regional Context

Tessaban Nakhorn Chiang Rai is located in the northernmost part of Thailand and the borders are connected with Lao PDR and Myanmar. It is surrounded by mountainous area on the west and flatlands on the east. The Kok River runs through the center of the city.

2) Regional Accessibility

There are several transportation methods for commuting to or from Chiang Rai. First, there are available International flights to Kunming (China) and Hong Kong as well as domestic flights to Bangkok and Chiang Mai from Chiang Rai International Airport. Second, there are major transport routes from Chiang Rai to different points as follows: to Phayao via NR 1; to Chiang Mai via NR 118/109; to Mae Sai (Myanmar border) via NR 1; and to Chiang Khong / Huay Xai (Lao border) via NR 1123/1152/1174. In addition to these, the main roads within Tessaban Nakhorn Chiang Rai are NR 1 and NR 1020.

3) Position in National and Regional Development Policy

Tessaban Nakhorn Chiang Rai is the hub of economy, politics, and services for Chiang Rai and the surrounding provinces. Moreover, Tessaban Nakorn Chiang Rai functions as a center for border trade. It is also interesting to note that Chiang Rai is considered as a major attraction point for tourism purposes in the Upper North of Thailand. The NESDB and DPT have identified and designated Tessaban Nakhorn Chiang Rai as the core of the Upper North.

4) Chiang Rai Urban Area

Chiang Rai Urban Area covers Tambon Wiang, Tambon Rob Wiang, Tambon San Sai, Tambon Rim Kok, Tambon Pa Aor Don Chai, Tambon Ban Du, and Tambon Tha Sai. Its population is approximately 122,000 in 2015 and still increasing. Its area is approximately 360 km² with a population density of about 340 persons/km².

5) Tessaban Nakhorn Chiang Rai

Tessaban Nakhorn Chiang Rai's population is approximately 68,000 as of 2015 and growth rate is essentially stable. Its land area is approximately 60.85 km² and population density is 1,131 persons/km².

5.1.2 Current Situation

1) Economy

Chiang Rai started as an ancient city since the 13th century (capital of the Lanna Kingdom). The three (3) major industries of Chiang Rai Province are agriculture, tourism, and crossborder trade. The number of economic benefits has been increasing in recent years. There are approximately 3,070,000 tourists visiting Chiang Rai Province of which 550,000 are foreigners and 2,520,000 are domestic tourists.

In Tessaban Nakhorn Chiang Rai, the major industries are tourism, distribution of agricultural products and agricultural materials (seeds, agricultural chemical, farm equipment), processing of agricultural products, retailing and service industry. Due to an increase of tourists, Tessaban Nakhorn Chiang Rai has rapidly developed recently. Furthermore, Tessaban Nakhorn Chiang Rai is also a hub of administration and service industry (medical and educational services) as well as a hub of economic activity, which has been identified as the core of the Upper North by the NESDB and DPT.

2) Society

Population of Tessaban Nakhorn Chiang Rai has only been increasing at an annual growth rate of 0.1%. Decrease in population is mostly caused by migration from Tessaban Nakhorn Chiang Rai to the surrounding tambons. In other words, urban area of Chiang Rai is expanding. However, the number of unregistered students and foreign laborers who live in Tessaban Nakhorn Chiang Rai has been increasing.



Figure 5.1.2 Population Trend in Chiang Rai Urban Area and Tessaban Nakhorn Chiang Rai

The population of Chiang Rai Province is slightly increasing with the annual population growth rate of the province of about 0.49%. Population is steadily flowing out from the rural areas. A percentage of the younger generation is decreasing while that of the older generation is increasing. The percentage of aging people is around 18%, which is almost the same as the national average.



Figure 5.1.3 Population Pyramid in 2005 and 2015

There are many private and provincial pre-schools, kindergartens, primary, middle and secondary schools within Tessaban Nakhorn Chiang Rai. Chiang Rai urban area is a hub of higher education of the Upper North of Thailand with four (4) universities and four (4) technical schools which are located within Tessaban Nakhorn Chiang Rai. As a result, the Chiang Rai urban area attracts schoolchildren from surrounding areas and students from other provinces, reaching a student population of approximately 50,000.

Tessaban Nakhorn Chiang Rai is popular not only for the education but also job opportunities that it can offer. There are various employment opportunities in the tourism, trade, logistics and service industry. Since many employment opportunities for the younger generation are available mostly in the tourism industries, large numbers of young people in Chiang Rai choose to remain instead of migrating to larger cities.

3) Environment

Generally, the water and air quality in Tessaban Nakhorn Chiang Rai meet the environmental standards. However, there is presence of smoke due to burning of straw from February to April. Other than that, there are no other types of pollution reported. Of the total city area

only about 16% is covered by wastewater treatment. It is then necessary to expand the coverage of the wastewater treatment in the future. At present, no deterioration of the water quality of rivers was recorded. There is also no large-scale flooding that was reported within Tessaban Nakhorn Chiang Rai.

The volume of solid waste of the Tessaban is 90 tons per day. The final disposal site can handle the waste for another year. Although recycling is highly implemented in the city of which 21.5% of the garbage is recycled, a facility for separating the types of garbage has not been in operation due to lack of coordination with the surrounding TAO.

Since 2008, Tessaban Nakhorn Chiang Rai has conducted "Urban Ecosystem and Biodiversity Project" which sets the goal to reduce greenhouse gases emission by 15% from the current level by 2020. Likewise, Tessaban Nakhorn Chiang Rai has established "Climate Change Center" to enhance people's awareness on climate change and adaptation.

4) Urban Development and Infrastructure

The urban area has been expanding along the following roads: NR 1, 1020, 1232, 1211, and 1233. In five years, the urban area expanded roughly by 1,000 hectares as shown in Figure 5.1.4.



Figure 5.1.4 Changes of Urban Area in 2010 and 2015

Urbanization has been spreading outside of Tessaban Nakhorn Chiang Rai and outside of the city areas that was planned. As a result, population growth inside the Tessaban has steadily decreased. Heavy traffic congestions are observed during peak periods in the morning and evening caused by a large volume of commuting workers and students using the main roads (NR 1, 4034). It is important to note that the songthaew (truck bus) and taxi are the only vehicles considered as modes of public transportation.

5) Urban Management

One of the strengths of Tessaban Nakhorn Chiang Rai is strong leadership. The mayor of Tessaban Nakhorn Chiang Rai and the Chamber of Commerce have shared the vision of the Tessaban while the provincial administrators have not been involved in the process of implementing the SFCI. In addition, the Tessaban has applied participatory approach to involve citizens' opinions into the Tessaban's administration.

5.1.3 Future Perspective Under Current Trends

1) Economy and Society

The economic structure of Chiang Rai City is based on agriculture, tourism and cross border trade. As international trade is expected to increase along with AEC, the economy of Chiang Rai will also become more robust. Although the population of Chiang Rai urban area is expected to increase, the population of Tessaban Nakhorn Chiang Rai becomes stagnant. With the current pace of continuous development in suburban areas, however, there is a risk to deterioration in the central area of Tessaban Nakhorn Chiang Rai because senior citizens are gradually increasing. Consequently, the Tessaban needs to take comprehensive measures to deal with its aging society.

2) Environment and Urbanization

New urban development has been extensively transforming the suburban area. In order to manage urban growth properly, it is necessary to revise and expand the city planning to avoid environmental degradation as areas continue to swell. With urbanization, more areas need sufficient water supply and sewerage system and garbage disposal system have also been expanded. It is also necessary to continue current successful efforts to manage waste such as expanding the sewerage system and securing the landfill sites and campaigns to reduce garbage to avoid major environmental problems in the future.



Figure 5.1.5 Mapping Analysis of Tessaban Nakhorn Chiang Rai

5.1.4 Assessment of Sustainability

1) Economic Sustainability

The number of tourists entering Tessaban Nakhorn Chiang Rai has been increasing. The economic basis of the Tessaban can be sustainable as a tourism center and economic hub of the Upper North of Thailand. Although there are no large-scale factories or large companies to provide employment opportunities in the Tessaban, there are ample job opportunities available in tourism, tourism support industries and trading. Therefore, Tessaban Nakhorn Chiang Rai can keep its economic centrality in the future.

2) Social Sustainability

With well-developed primary and secondary educational facilities, Tessaban Nakhorn Chiang Rai can attract a large number of schoolchildren and students from the surrounding areas. As a hub for higher educational institutions in the Upper North, Tessaban Nakhorn Chiang Rai has a large variety of learning environments (universities, technical schools, etc.). Another strategy is internationalization in higher education, which has progressed based on these higher educational recruitments - enrollment of foreign students and cross-border education exchange as well as increasing number of foreign tourists interested in education tourism activities.

3) Environmental Sustainability

In a short period of time, on-going sub-urbanization can result to serious risks of uncontrolled development, traffic congestions, and other environmental deterioration. In the long run, it will require huge costs for development and maintenance of infrastructures in such extended urban areas. These risks will strain the budget of the Tessaban. Rapid urbanization will result to more wastewater treatment facilities and waste disposal sites needed to be developed.

5.1.5 Review of Existing Plans

Based on the above viewpoints, Chiang Rai City has been examining the LSDP and Comprehensive Plan.

1) Local Strategic Development Plan (LSDP)

The city's vision is "Chiang Rai, Livable City, City of Happiness". Based on this vision, the strategies are as follows: 1) Quality of Life; 2) Infrastructure and Public Service; 3) Human Resources Development; 4) Economic, Social and Administration Development; and 5) Natural Resources and Environmental Conservation.

Due to the movement of population into the suburbs, traffic congestion has become a problem, which requires appropriate traffic measures. While the population growth has become essentially stable, its age composition is continuously changing inside the Tessaban. In anticipation of the aging society, it is necessary to reconsider various measures and actions.

2) Comprehensive Plan

Figure 5.1.6 shows the 2007 Chiang Rai City Comprehensive Plan. The expansion of the urban area has caused discrepancies between city planning area and actual urban areas. At the next revision of the Comprehensive Plan, the city-planning boundary also needs to be revised. In order to reduce large maintenance cost of infrastructure in the future, it is desirable to consider compact urban structures and to revise the fundamental land use plan of the city.

3) Provincial Strategic Development Plan

The strategies to achieve the vision "Lanna Cultural City, International Trading and Citizen Live with Happiness," are as follows:

- Create more value of the economy trading, tourism, agriculture, and processing industry;
- Support local culture, tradition, religion, environment, and enhance social capital; and
- Enhance safety and security and good governance.



Figure 5.1.6 Chiang Rai City Comprehensive Plan

5.1.6 Sustainable Future City Plan

1) Future Vision

The future vision in LSDP is: "Chiang Rai, City of Happiness for All". Tessaban Nakhorn Chiang Rai has a strong economic basis and is still a growing city. Looking at the viewpoint of urban sustainability, it is important to take long-sighted actions to get ready for the expected changes in the future. In this regard, Tessaban Nakhorn Chiang Rai focuses on "Safety" as an overall strategy toward this vision.

2) Issues to be Addressed

Chiang Rai urban area should pay more attention on the countermeasures for physical and spatial development of Chiang Rai on one hand and countermeasures for changes of socioeconomy in the near future on the other hand rather than full attention on its economy, which seems to be in a sufficient "cruising speed." In this context, the key issues to be addressed are as follows:

- Preparation for forth-coming aging society;
- Maintenance of safety and security of society against increased number of foreign visitors and border trades;
- Support citizens to survive globalization of economy and society; and
- Efficient preparation of infrastructure and control of urbanization to manage increasing population and visitors.

Strength	Opportunity
 Substantial employment opportunities Opportunities to interact with foreign and local tourists in cross-border trade and tourism. Large numbers of students 	 Increasing number of tourists, due to AEC and so on. Expansion of cross-border trade
 Weakness Discrepancies between efforts in governance in the large area and the speed of urban expansion Rapid increase of unregistered population 	Threat Urban problems due to the expansion of the urban area, promotion of industry and population increase Aging population Loss in the regional identity due to the influx of tourists and the increase in population Deterioration of safety and security due to increase of tourists and cross-border trade and tourism

3) SWOT on Future Vision

4) Basic Direction

Chiang Rai urban area serves as a regional center of the Upper North Region of Thailand

and has a great potential to be an economic growth engine of the region, which offers agroprocessing, tourism and cross-border trade. Urban service industry particularly higher education institutions will be another source of growth of Chiang Rai.

"Safety" is the pathway toward "City of Happiness" to avoid anticipated risk of society. Tessaban wants to focus on four (4) aspects of "safety" to survive in the coming decade, namely:

- Personal safety, which means personal security of lives and properties;
- Health safety, which means healthy in physical, mental and social well-being of citizens;
- Safety infrastructure, which includes the following safe infrastructure systems for its citizens: 1) road, including bridge, drainage pipeline, direction sign, road light, traffic light and footpath; 2) public transportation; 3) electric system; 4) waste disposal system; 5) water management system including water supply system, flood control and waste water treatment systems; and 6) communication system; and
- IT safety, which means all people have sufficient capacity to use information and technology for the next decade.

5) SFC Strategy, Programs, and Projects

Strategy 1: Infrastructure System Development for the Safety of Life and Property

Target: Infrastructure should be sufficiently upgraded to meet future demands that can address the continuing needs of a changing society. For this purpose, public transportation system should be improved for citizens of all ages and groups (children, the elderly and persons with disabilities), create open spaces with universal design and beautification of city landscape within a short period of time. Then, Tessaban Nakhorn Chiang Rai focuses on expanding waste and water management system and improvement of public facilities such as roads, bridges, traffic signs, and footpaths for the safety of the citizens of all ages and groups.





Target: Loss of regional identity due to an increasing number of foreign visitors and elderly people will be addressed by promoting interaction among people of all ages and groups. In short term, the Tessaban tries to encourage elderly people, students, and surrounding community people to interact with each other at Doi Saken. It is expected to generate a new value system of Chiang Rai through the interaction among people from all age groups.



The following figure shows the programs and the projects under this strategy.

Strategy 3: Development of Health Service for People of All Age Groups

Target: The Tessaban makes efforts to realize that people of all age groups can access excellent medical services and to prepare for the aging society. In mid-term, the Tessaban tries to achieve longer average life expectancy and high-quality health services.



6) Progress of Overall Project of SFC Plan

The Tessaban is seeking the budget for the project implementation to achieve SFC plan. Some of the projects have been financed by the Tessaban's efforts and additional budgets are in the pipeline as described in Table 5.1.1. Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

Strategy	Program	Project	Progress	Source of budget	Budget
Strategy: 1 Infrastructure System	To address safety and convenience to prevent potential	CCTV system	The Tessaban is now consulting with the police office in Chiang Rai.	Tessaban Nakhorn Chiang Rai Budget	10 mil. baht
Development for the Safety of Life and Property	problems caused by outsiders	New comprehensive plan for sustainable society, culture and ecology	The Tessaban had a meeting with Public Works sector and provincial organizations to make a consensus on zoning and land usage in the Tessaban area.	Tessaban Nakhorn Chiang Rai budget	1 hundred thousand baht
	To prepare people centered city arrangement, and future development	Improvement of public transportation as eco and customer friendly	The budget supported by the upper northern region (Chiang Rai, Phayoa, Phrae and Nan) is for the application of the electric bus system. It is now in the procurement process.	Provincial Cluster Budget	16 Buses 2 Parking Spots
		Beautification of landscape of city by laying all cables underground	The Electricity authority is designing the blueprint for this project. The budget of 110 M was approved.	Northern Region Budget	Phase 1: 110 mil. baht Phase 2: 322 mil. baht
	To engage the community to	Strengthening of 3Rs in waste management	The Tessaban requested Payao University to support know-how and designs the equipment.	1	-
	improve the living environment		The project for enhancing participation in waste management	Tessaban Nakhorn Chiang Rai budget	4.8 mil. baht
		Improvement of public spaces and facilities by applying universal design	Mahasarakham University have studied and designed the city of Nakhorn Chiang Rai. During the process, universal design was also taken into account. In addition to Mahasarakham University, Srinakharinwirot University is also helping the Tessaban to design the city.	Tessaban Nakhorn Chiang Rai budget	3 mil. baht
Strategy: 2 Generation of New	To provide the opportunities to	Sister city development	Dependent on the coordination with the candidate municipality of Japan	1	-
Value System by the	engage with various	Create the places to	The Tessaban is planning to get the budget from	Northern Region	15 mil. baht

Table 5.1.1 List of Projects under SFC Plan of Chiang Rai as of August 2017

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3)

Strategy	Program	Project	Progress	Source of budget	Budget
Interaction among People of All Ages	people	interact all generations at Doi Saken	provincial cluster to create herb garden and plant center.	Budget	
		(Project C: Doi Saken Forest)	Tentative budget for design and improvement of the existing building, 22 M Bhat, which is the proposed funding by Ministry of Finance, is underway.	Northern Region Budget	22 mil. baht
		Expand IT accessibility	No concrete progress at this moment	Tessaban Nakhorn Chiang Rai budget	1 hundred thousand baht
	To provide educational for	University of third age (Project A: U3A)	- The school buildings have been built by the Tessaban budget.	Tessaban Nakhorn Chiang Rai	- 5 mil. baht (management buddaet)
	development		 recrimical advices to prepare course curriculum and course operations is supported by JICA Pilot Project Some equipment used in the classes shall be purchased by JICA Pilot Project 		- 10 mil. baht (building renovation)
		Digital education for life- long learning	To procure and develop media materials and technology equipment for education	Tessaban Nakhorn Chiang Rai budget	- 3 mil. baht
			Intelligent classroom project for skills improvement	Tessaban Nakhorn Chiang Rai budget	- 1 mil. baht
		Promotion of philosophy of Sufficiency Economy (Project B: Doi Saken Community)	The budget is supported by JICA to stimulate people applying the Sufficiency Economics in their routine. Doi Saken is a pilot project site and get extra budget from Thai Health Promotion	- Budget from Thai Health Promotion Foundation	- 3 mil. baht
			Foundation to establish learning center for elderly people at Doi Saken by focusing on health care and the use of economic sufficiency in life.	- Tessaban Nakhorn Chiang Rai budget	- 2 hundred thousand baht (solider training)

Future Cities of Thailand (TFCP)	I Report of Phase 1 (Stage 1-3)
.⊆	Ein
Sustainability	-
Promoting	
for	
Project	

Strategy	Program	Project	Progress	Source of budget	Budget
				- Tessaban Nakhorn Chiang Rai budget	- 1 mil. baht (Tessaban Nakhorn Chiang Rai Project)
Strategy: 3 Development of Health People of All Age Groups	r Services for	Advanced health care system for all ages especially for children and the elderly	 8-10 million baht for improvement of existing facility is secured. Chiang Rai Prachanukroe Hospital is supporting improvement of equipment and human resources equivalent of 5 million baht. Receiving the budget from Thai Health Promotion Foundation to establish learning center for elderly people spreading over the Chiang Rai City Municipality area that focused on promotion of health care for the elderly. 	 Tessaban Nakhorn Chiang Rai budget Budget from Budget from Promotion Foundation 	 5 hundred thousand baht (The budget for activity arrangement about holistic health care) 3 mil. baht
		IT liaison and hot-line system development (quick rescue for patients, the elderly, and people with disabilities)	Now on its trial phase with 30 sets of equipment borrowed from Burapha University.		-

5.2 Project Implementation Support

Nowadays, the major concern of Tessaban Nakhorn Chiang Rai is its aging society. Its aging population has increased by around 18%, similar to its national average. During the Japan Study Tour, Tessaban Nakhorn Chiang Rai was interested in the case of "Share Kanazawa", a community where people including the elderly and persons with disabilities live and work together. Therefore, they would love to apply those experiences in their own communities.

"Share Kanazawa" has various activities to enjoy and to enhance the quality of residents' lives. In the community, people can live equally regardless of age and whether or not the residents have disabilities. There are various facilities designed to support all ages, especially the elderly and people with disabilities. "Share Kanazawa" also supports people to work together without any barriers. Residents can participate in social, economic, cultural, and mental activities. It enables people to create and manage their own lives.

Hence, Strategy 2: Generation of New Value System by the Interaction among People of All Ages was selected by Tessaban Nakhorn Chiang Rai and PT members to prepare SFC programs and projects to cope with the ageing society and to develop the city for all. As one of the SFC projects, the University of Third Ages (U3A), a learning center for the elderly people, was selected to develop the quality of services and courses. The programs and curriculum were supported to make a long-term plan for confronting various changes. This mainly aims to promote the quality of life of the elderly though the creation of various lifelong learning activities.

In addition, Doi Saken, a small community forest in the Tessaban with fertile lands and high biodiversity, was selected to develop as an active learning spot. The students use this area to learn its biodiversity while elderly persons and the community can exchange their experiences together at an open-air learning set-up. Through these SFC projects, Tessaban Nakhorn Chiang Rai can achieve the vision of "Chiang Rai, City of Happiness for All" by encouraging and integrating activities among senior citizens, students, communities and tourists in the Doi Saken Area.

SFC Plan of Tessaban Nakhorn Chiang Rai consists of three strategies to achieve the vision of "Chiang Rai, City of Happiness for All". Tessaban Nakhorn Chiang Rai selected two programs for Strategy 2: Generation of New Value System by the Interaction among People of All Ages. SFC Program consists of six projects as seen in Figure 5.2.1. Three of the six projects were selected as the JICA Pilot Project. These three projects are then categorized as follows: Project A is University of Third Age (U3A); Project B is Doi Saken Community; and Project C is Doi Saken Forest. These three categories are re-categorized into one project named "Promoting Interactions among People of All Age Groups through Active Learnings".



Figure 5.2.1 Position of the JICA Pilot Project

Construction and renovation of the necessary facility for the JICA Pilot Project were already underway specifically the process of securing budgets from the government. Therefore, with advanced efforts by the Tessaban Nakhorn Chiang Rai, the JICA Pilot Project was organized mainly to support the technical advices and activity operations.

PT of Tessaban Nakhorn Chiang Rai decided to conduct the project "Promoting Interaction among People of All Ages through Active Learning" combining the U3A, Doi Saken community and the Sufficiency Economy Philosophy into a JICA Pilot Project with the strong initiatives from Tessaban Nakhorn Chiang Rai.

1) Development of Project Plan

Strategy 2	Contents	Duration (year)
	 Establishment of the University of Third Age (five- year project) 	
Project A University of Third Age (U3A)	2. Course and curriculum development of the University of Third Age (Pilot Project)	
	 Procurement of necessary equipment for the University of Third Age (Pilot Project) 	
Project B	1. Promotion of the philosophy of sufficiency economy	
Promotion of the Philosophy	for the community people (Pilot Project)	
of Sufficiency Economy (Doi Saken Community)	2. Training of organic vegetation and local product for the community people with sufficiency economy	

Table 5.2.1 The Plans and Activities Included in the Pilot Project and Five-Year Projectfor Sustainable Future City (Future Plan)

	philosophy (Pilot Project)			
	3. Doi Saken community area development (five-year			
	project)			
Project C Creation of a Place to Interact among All Generation (Doi Saken Forest)	1. Camp Program for the students (Pilot Project)			
	2. Organic vegetation (Pilot Project)			
	3. Local product training for the community people			
	(Pilot Project)			
	4. Tourism spot/program development in Doi Saken			
	(Pilot Project)			
	5. Doi Saken Forest area development (five-years			
	project)			

According to Table 5.2.1, the pilot projects are the foundations for the future projects in U3A and Doi Saken to be conducted in the next five years. The following details explain the plan of the pilot activities for the long-term development plan:

• Project A (University of Third Age: U3A)

Active Learning Courses for Elderly People (Component 1 of JICA Pilot Project)

Development of the course and curriculum	•	To develop detailed contents of some units to be conducted in Doi Saken area utilizing the resources available. To develops detailed contents of "Religious Ceremony" under "Religious" curriculum to collaborate with students' activity.
Procurement of the necessary equipment	•	To support the Tessaban to procure necessary equipment in order to develop the courses and curriculum with the highest benefit and value.
Conduct of the courses	•	To coordinate both preparation and operation for daily courses.

• Project B (Doi Saken Community)

Camp Program for the Students (Component 2 of JICA Pilot Project)

Development of the Camp Program	•	To develop camp programs to learn the biodiversity at Doi Saken forest area and utilize existing resources following school curriculum (elective course). To develop camp programs to learn local knowledge and cultures from community, following school curriculum (elective course).
Procurement of the necessary equipment	•	To support Tessaban to purchase necessary equipment in order to develop the activities in each elective course with the highest benefit and value.
Conduct of the Program	•	To coordinate necessary arrangements for the program preparations and operations.
Renovation of the greenhouse	•	To plan and manage the existing greenhouse renovation at Doi Saken

• Project B (Promotion of the Philosophy of Sufficiency Economy in Doi Saken Community)

Training of Organic Vegetation and Local Products for the Community People (Component 3 of JICA Pilot Project)

Development Training	of	the	•	To develop the training programs to promote organic vegetation and local products in the local communities around Doi Saken area.
Procurement necessary equi materials	of pment	the and	•	To support the Tessaban to procure the necessary equipment for agricultural activities at selected household to develop organic vegetation and local product with the highest benefit and value.
Conduct the tra	ining		•	To coordinate necessary arrangements for the preparation, training, and operations.

• Project C (Creation of a Place to Interaction among People of All Generations at Doi Saken Forest)

Development	of	the	•	To develop tourism spots and programs at Doi Saken in terms			
Tourism Spot/Program				of Eco-tourism and Community-based tourism.			
			Remark: The results of component 1-3 shall be incorporated				
				to the tourism route and program.			
Procurement	of	the	•	The Consultant supports the Tessaban to procure necessary			
necessary equipment				equipment in order to develop tourism route and program			
				with the highest benefit and value.			
Operation of the Tourism			•	The Consultant coordinates necessary arrangements for the			
Program				program preparations and operations.			

Tourism Spot/Program at Doi Saken (Component 4 of JICA Pilot Project)

2) Five-year Projects for Sustainable Future City (Future Plan)

The pilot projects lead to five-year projects in terms of the development of Doi Saken community area to build wealth, stability, and sustainability for people to have a good quality of life through the Sufficiency Economy Philosophy as a guide for life and career. As a result of these projects, people will be able to gain more income. The projects aim to develop Doi Saken community area, which is named Kiri Chai Yama, as a learning source and new tourism spot. The former means the development of infrastructure for safety of life and property, and the latter means the development of the interaction of people from all age groups to create new value.

Tessaban Nakhorn Chiang Rai was selected to be 1 of 6 model cities under TFCP, which aims to promote sustainable urban development in local cities of Thailand. As a five-year project, Tessaban Nakhorn Chiang Rai has implemented the project for **"Development of Doi Saken Community Area to be Learning Source and New Tourism Spot: Kiri Chai Yama"**, details of which are as follows:

Name of the Project:

Development of Doi Saken Community Area to be A Learning Source and New Tourism Spot: Kiri Chai Yama

Project Duration: 2018 – 2022 (five-year project)

Objectives:

The development of Doi Saken community with its rich natural resources has three objectives as follows:

- Develop Doi Saken forest area to be Eco-Tourism spot.
- Increase the level of household in the community, which engages in agriculture based on the philosophy of sufficiency economy and concept of CBT.
- Develop Ban Thoong Mon Derm School area to be a learning center for people of all age groups.

Maximizing the value of existing resources in the Doi Saken community will generate income for the people in the community and its surrounding areas. These developments will in turn contribute to an improved quality of life for the residents.

Goals:

- Construction of Kiri Chai Yama Skywalk.
- Construction of small store and toilet for travelers to Doi Saken.
- Renovation of community route landscape.
- Installation of electric streetlights and improvement of open spaces to have more identity as a community.
 - Renovation of pedestrian in the community.
 - Plant perennial flowers along community route.
- Construction of small shops along tourist routes in Doi Saken community.
- Provision of support for households selling backyard agricultural products.

Expected Outputs:

The community of Doi Saken, Rob Wiang sub district, Mueang district, Chiang Rai province have become a learning source and new tourism spot of Tessaban Nakhorn Chiang Rai and Chiang Rai province, which is distinguished by the forest in the city. The area is to be used for short and long-time camp activities and CBT spots which tourists can adapt the citizens' lifestyle following the philosophy of sufficiency economy.

Expected Impact:

- Area in Doi Saken forest is developed and its landscape is improved as eco-tourism spot.
- The level of the household in the community, which practice organic agriculture, is increased following the philosophy of sufficiency economy as CBT spots.
- Thoong Mon Derm School area is developed to be a learning center for people from all age groups.

Beneficiaries:

- Students in 8 Tessaban Nakhorn Chiang Rai Schools
- Children, youth, and elderly people
- Domestic and foreign tourists

3) Action Plan

Table 5.2.2 The Project for Doi Saken Development as Learning Center and Tourism Spot

Droiget		2019	2010	2020	2021	2022	Total	Pudaat
Project		2010	 Doi Sak	2020 an: Kiri Ck	2021	2022	TOtal	Buuget
1.	Construction of Sky Walk		15,000,000				15,000,000	DLA (2019) Subsidy (under consideration)
2.	Water system renovation	250,000					250,000	Tessaban Budget (2018)
3.	Electric and street light improvement	105,000					105,000	Tessaban Budget (2018)
4.	Installation of CCTV system	200,000					200,000	Tessaban Budget (2018)
5.	To proceed sign of learning source.	450,000					450,000	Tessaban Budget (2018)
6.	To improve landscape appropriate to Doi Saken.	500,000					500,000	Tessaban Budget (2018)
7.	Construction of facilities supporting the use of children, youth, people with disabilities and elderly.		22,000,000				22,000,000	Northern Regional Development budget (under consideration)
8.	Camping Area	500,000	500,000	500,000	500,000	500,000	2,500,000	Tessaban Budget (2018)
9.	Hiking Trail	100,000	100,000	100,000	100,000	100,000	500,000	Tessaban Budget (2018)
10.	To organize CBT for touching lifestyle following sufficient economy philosophy.	200,000	200,000	200,000	200,000	200,000	1,000,000	Tessaban Budget OR Ministry of tourism and sport (under consideration)
11.	To offer meeting rooms, seminars and recreational activities arrangement.	50,000	50,000	50,000	50,000	50,000	250,000	Tessaban Budget (2018)
12.	Improvement of sports facilities (football field, gymnasium)		300,000				300,000	DLA (2019) Subsidy (under consideration)

5.3 Pilot Project under JICA's Financial Support

Name of the Project: "Promoting Interaction among People of All Ages through Active Learning"

1) Component 1: Active Learning Course for Elderly People

The courses of U3A were derived from the needs of the elderly in Tessaban Nakhorn Chiang Rai. After the studies on the needs of the elderly, Tessaban Nakhorn Chiang Rai organized the workshop for developing courses for the elderly in the community. As a result of the studies and workshop, the Tessaban came up with eight (8) courses, namely 1) Religion, 2) Culture, which includes Northern music, Fawn-Lep and Fawn-Jeng, 3) Environment, 4) Tourism, 5) Technology and Communication, 6) Social and Happiness which includes Line Dance, Ramwong and Social Dance, 7) Health, and 8) Economic.

JICA supported three (3) of eight (8) courses, particularly 1) Culture course, 2) Technology and Communication course, and 3) Social and Happiness course by procuring the necessary equipment and supporting its operations.

Objectives of Component 1

- Develop courses and curriculums of U3A that compatible with the elderly's needs.
- Support learning activities of three courses, namely: i) technology and communication,
 ii) culture, and iii) social and happiness.
- Develop joint activities between the elderly and youth in Doi Saken learning center.

Implemented Items of the Component 1

- Develop of eight (8) courses, curriculum and activities in response to the elderly's needs.
- Procure the necessary equipment to conduct three (3) courses.
- Create joint activities between the elderly and the youth.

Implementing Procedure of the Component 1

- Hold a series of meetings to collect information on problems and obstacles found in the courses of U3A.
- Conduct studies and workshops on the needs of elderly people to develop the courses.
- Develop eight (8) courses based on the result of the meetings.
- Procure the necessary equipment for the courses supported by JICA
- Set up the evaluation guidelines for all courses.
- Organize the evaluation committee, which comprises of experts on education to provide advice to the U3A committee on the style of management and evaluate the quality and level of U3A.
- Support the development of the handbook for students of the U3A, which consists of information on the subject, school record, and classroom attendance statistics, etc.

2) Component 2: Camp Program for the Students

Doi Saken forest area is an open-air learning place for the students to get knowledge of Lanna philosophy, such as herb, culture and customs. The area is also a place for people to enjoy activities together such as hiking and day camp activity with the suburban ambiance and local knowledge. The activities to enjoy in Doi Saken forest area were supposed to be designed by people in the community and municipality school in Tessaban Nakhorn Chiang Rai by connecting with its curriculum. The first schools to join camping activities in Doi Saken was the Chiang Rai Municipality School 6, and all activities were designed by the school in combination with their elective courses.

Four (4) kinds of activities were developed and JICA supported its operation, namely: i) camp activity, ii) biology field, iii) agricultural subject, and iv) social and cultural subject as a model activity for other schools. These activities have been conducted in Tung Mon Derm School connected to Doi Saken. Through these activities, students can learn outside the classroom and build relationships with elderly people from U3A and people in Doi Saken community.

Objectives of the Component 2

- Support students to learn outside the classroom.
- Conduct students' camp activities with the elderly and people in Doi Saken community.
- Develop Doi Saken area as a place for people to do creative activities together.

Implemented Items of the Component 2

- Develop the students' activities at Doi Saken including the activity to interact the elderly and people in Doi Saken community
- Procure the necessary equipment for the camp activities
- Improve Doi Saken as an open-air learning place
- Implement students' activities

Implementing Procedures of the Component 2

- Hold a series of meetings with teachers and committee members of Chiang Rai Municipality School 6 to find out the possibilities to conduct the activities in Doi Saken. The activities must be compatible with the students' actual courses. For example, free elective subjects can be utilized to develop the activities because students join the subjects easily and it doesn't increase the teachers' workload.
- Implement three (3) kinds of activities based on the meetings of teachers and committee members as follows:
 - Activities on Biology By collaborating the classes on botanical diversity at Doi Saken, which Municipality School 6 had conducted in some semesters, new activity that community people would be allowed to join was developed. Through these activities, students can learn botanical diversity, birds, insects and ecosystem in Doi Saken. The elderly of U3A also can join these activities.

- 2. Activities on agriculture Students can practice agriculture with people in the community such as pesticide free farming, hydroponic farming and mushroom farming.
- 3. Activities on social and culture These activities increase knowledge about Lanna culture and customs such as Bai Sri Soo Kwan (Welcoming Ceremony) and Lanna dance. These activities also encourage the elderly people to share their knowledge to the students of Chiang Rai Municipality School 6.
- Procure the necessary equipment and improving the environment of Doi Saken, such as renovation of house plantation, improving water system, and installation of sign boards displaying plants and animals in Doi Saken as a preparation for conducting students' activities.
- Implement activities on biodiversity in July to September 2017, and activities on agriculture in November 2017.
- Hold an online survey on the students' opinions for activities in Doi Saken to increase the number of students who want to join the activities. Its contents are as follows:
 - General information of the students, such as name, sex, age, educational level
 - Twenty Interesting Activities namely: 1) survey on the variety of bird species,
 2) survey on botanical diversity, 3) lichen survey, 4) insects survey, 5) local food preservation (food chemistry), 6) toys from local wisdom, 7) little tourist guide at Doi Saken, 8) performance art of Doi Saken leaders, 9) learning of local wisdom from Doi Saken, 10) Lanna lantern design with GSP, 11) local literature,
 12) hydroponic farming, 13) mushroom farming, 14) crafting, 15) food preservation (crispy pork skin), 16) Bai Sri, 17) embroidery, 18) fertilizer making from earthworm, 19) vegetable farming with sand (greenhouse), and 20) commercial animal farming (frog and catfish)
 - Other interesting activities are the following: 1) study of community's need in conducting the activities with students of Chiang Rai Municipality School 6 and the elderly of University of Third Age, 2) develop activities that conform to students in Chiang Rai Municipality School 6, the elderly of University of Third Age and people at Doi Saken, 3) purchasing of necessary equipment in the activities, 4) setting the Doi Saken management community group and assign the role and responsibilities for the group member, and 5) improvement of house plantation and demonstration plot of Thai herb as a learning center of youths and the elderly joining activities in Doi Saken.

3) Component 3: Training of Organic Vegetation and Local Products for the Community People.

The households of Doi Saken community engaging in organic agriculture can be a new learning source in Doi Saken area. The survey was conducted to select potential households, capable of doing organic agriculture on their own. To develop the information, places and agricultural CBT spots for learning organic agriculture and enhancement of knowledge on organic agriculture for other households in Doi Saken, training based on the sufficiency

economy philosophy was provided.

Objectives of Component 3

- Promote organic vegetable farming in Doi Saken based on the philosophy of sufficient economy.
- Develop Doi Saken as an agricultural learning center and CBT spot.

Implemented Items of the Component 3

- Organize the committee to develop Doi Saken.
- Implement the organic agriculture training for the households in Doi Saken community to promote agricultural tourism and to develop a learning center under the philosophy of sufficient economy.
- Procure the necessary equipment.

Implementing Procedures of the Component 3

- Conduct a survey on Doi Saken community to find out its potential to be developed as an agricultural learning center and a CBT spot.
- Introduce the project to the community and research on the households' willingness to participate in the project
- Recruit households willing to participate in the project: Tessaban Nakhorn Chiang Rai together with Doi Saken community leader appointed 22 households as a committee responsible for agricultural and tourism development of Doi Saken. The 5 of 22 households were selected as tourism spots where tourists can join agricultural activities and learn organic agriculture.
- Develop the training courses compatible with the project's objectives and households' needs.
- Procure the necessary equipment and materials to conduct the training and improve the level of agriculture of the households.
- Conduct the training on organic agriculture and CBT, the field trip to learn how to develop and manage their own land efficiently and get ideas from successful community to develop organic agriculture, CBT and sufficient solid waste management.

Figure 5.3.1 shows the location of the households that has been developed as agricultural learning centers and CBT spots under the project.


Figure 5.3.1 Doi Saken Community Map

4) Component 4: Tourism Spot/Program Development at Doi Saken

Doi Saken has much potential to be developed as a tourism spot, such as community forest with fertile soil and biodiversity, Phrathat Doi Saken and community learning center. Agricultural products, Bai-Sri (flower arrangement for the Lanna ceremony) and craft products represent local products of Doi Saken.

Development of tourism spots and programs in Doi Saken and Doi Saken community forest with community participation to create new tourism activities are divided into two (2) programs as shown below:

- **Program1:** Development of Doi Saken to be an eco-tourism and agro-tourism spot.
- **Program2:** Development of tourism program which tourists can enjoy in Doi Saken and Doi Saken community forest as a community-based tourism spot with community participation.

Objectives of the Component 4

- Develop Doi Saken community forest as an eco- and agro-tourism spot.
- Develop tourism activities and programs in Doi Saken with community participation.
- Generate income for residents by promoting tourism.

Implemented Items of the Component 4

- Organize the committee to develop Doi Saken.
- Improve the environment of Doi Saken
- Develop tourism activities and programs in Doi Saken community forest.

Implementing Procedures of the Component 4

- Introduce the project to Doi Saken community and conducting a research of the community's willingness to participate in the project.
- Conduct a survey of Doi Saken community forest to find out its potential.
- Appoint the community people and the Tessaban as the working committee.
- Select the households to be developed as learning sources of organic agriculture and agro-tourism spots.
- Conduct a survey on tourism routes and tourism spots in Doi Saken forest.
- Clean up and improvement of the area of Doi Saken.
- Brainstorm ideas on Doi Saken development as a tourism spot.
- Procure the necessary equipment and materials for developing eco-tourism spots.
- Improve the households to become learning centers of organic agriculture and ecotourism spots.
- Develop tourism activities in Doi Saken (i.e. tour activities around Doi Saken community forest and agricultural activities at selected households in Doi Saken by collaborating with teachers, students and people in the community).
- Develop tourism programs in Doi Saken community forest.
- Conduct farm-trip to simulate the tour before launching the actual tourism course.

Output of the Component 4

- Doi Saken community forest was partially developed as an eco-tourism spot.
 - o Doi Saken tourism information center was renovated.
 - Some signboards were displayed in the information center and in Doi Saken community forest.
- The CBT working committee, comprised of cleaning unit, information center, Kiri Chai Yama unit, and tourism management unit, were established.
- At least three (3) activities for tourism in Doi Saken community forest were developed.
- Two (2) kinds of half-day tour and a full-day tour program in Doi Saken community forest were developed.
- The route map and brochure of tourism in Doi Saken were developed.



Figure 5.3.2 Brochure of Tourism in Doi Saken





Figure 5.3.3 The Linkage of Each Component of the Pilot Project

Figure 5.3.3 shows the linkage of each component of Tessaban Nakhorn Chiang Rai's pilot project, "The Project for Promoting Interactions among All Ages through Active Learning." Components 1 to 4 aim to build up relationships of people of all ages. As a part of Component 1, active learning for elderly people, a joint activity that creates interaction between the elderly and the youth was designed. This activity links to Component 2, camp program for the students, strives to encourage the elderly to transfer the knowledge of local culture and tradition gained from active learning courses in U3A to the students. Students from Chiang Rai Municipality School 6 were set as its pilot group, and the target will be expanded to other eight (8) municipal schools in Tessaban Nakhorn Chiang Rai, which have approximately 8,000 students. The students will be able to disseminate the skills and knowledge received from the elderly to their families and to the society. The combined activities of Components 1 and 2 will also be developed as activities for tourists for example, Lanna dance and flower arrangement for Lanna traditional welcome ceremony.

Component 3, training of organic vegetation and local products for the community people, aims to bring students and the community people together in Doi Saken community and learn from each other. Students can learn organic agriculture from the community people through the classes, which can create interaction between the community people and the students.

Components 3 and 4, link in terms of the development of Doi Saken. Under Component 3, Doi Saken community was aimed to develop as an agricultural learning center and CBT spot. Component 4 highlights the latter. In addition to this, activities where tourists can embrace the community's lifestyle are expected to generate income to the community.

Components 2, 3 and 4 bring people from all age groups together in Tessaban Nakhorn Chiang Rai to manage and develop Doi Saken, which has rich natural resources and the potential to be developed as tourism spot. Doi Saken has been developed as a CBT spot based on the activities developed in components 2, 3 and 4. Tourists can enjoy these activities with children and the elderly and embrace the community's lifestyle. While student participants of Chiang Rai Municipality Schools support tourism in Doi Saken as little guides, the elderly taking the course of "Third Age Tourist Guide" support tourism in Doi Saken by sharing their knowledge.

Tessaban Nakhorn Chiang Rai has a strong leadership to preserve and develop Doi Saken area. It has close relationship with the community people and the development of Doi Saken area was based on the community people's needs and for the benefit of everyone. This area will encourage people to interact and take care of each other and will become a town that blends people from all age groups and a center of knowledge transfer from generation to generation. Moreover, Doi Saken Community or Kiri Chai Yama will be a new tourism destination of Chiang Rai Province.

5.3.2 Implementation Plan

	Component	Activities	May-	Jun-	Jul-	Aug-	Sep-	Oct-	Nov-	Dec-	Jan-	Feb-	Mar-	Apr-
			17	17	17	17	17	17	17	17	18	18	18	18
. .	Active Learning Courses for Elderly People	Develop the Course Curriculum												
		Purchase the equipment												
		Conduct the course												
i~	Camp Programs for Students	Develop the Camp Program												
		Purchase the Equipment												
		Conduct the Program												
		Renovate the greenhouse												
с.	Organic Vegetation and Local Products	Develop the Training												
		Purchase the Equipment and materials												
		Conduct the Training												
4	Tourism Spot/Program at Doi Saken	Develop the tourism spot/program												
		Purchase the equipment												
		Operate the tourism program												

5.4 Lessons Learned

As a whole, collaboration and participation of all relevant sectors are important to advance city development. As all key stakeholders were involved into the planning process, Chiang Rai could plan systematically and get their own holistic plan. It is also important for the leaders to have a clear vision and share it with the citizens. Roles and significance of nonformal leaders, community leaders, and volunteers in the context of Tessaban Nakhorn Chiang Rai should be highlighted. Especially in Chiang Rai, strong communities are vital to lead the projects in reality. In the future, communities should more participate in the planning and implementation process realize the municipality's vision.

Lessons learned of each component are listed below.

5.4.1 Component 1: Active Learning Course for Elderly People

Under Component 1, the elderly people got involved in skills training and enjoyed these activities even after their retirement. Moreover, the elderly people achieved happiness both physically and mentally by gaining more friends and a lot of knowledge. The courses of U3A were suitable for their age because it was developed based on the elderly's needs.

Based on the evaluation of the students of U3A, on the other hand, they felt some difficulties in the curriculum, operation and facilities of U3A. They raised the following suggestions: bigger rooms for the students to use, school bus for people who have difficulty traveling to/from U3A because of their age, consider individual student's knowledge, ability and background, and, more hours for each class or additional classes to build more confidence.

While many elderly people got interested in studying in U3A, it was found to be difficult to manage and operate U3A effectively, especially in terms of student registration and maintaining the quality of teachers. The Executive Board, therefore, decided to invite the Faculty of Education of Chiang Rai Rajaphat University to oversee the recruitment of the teachers for the future batch. There are two (2) more expected problems to be considered relating to the operation of U3A. First, there was a decline in popularity of some courses that have already been offered for 3 batches. Therefore, enhancement of the curriculum is required to attract the elderly people. Secondly, the operational cost of U3A is financed solely by Tessaban Nakhorn Chiang Rai. So, this can cause financial problem if the number of the students increase. Operational model of U3A should be considered to operate effectively in the future.

5.4.2 Component 2: Camp Program for the Students

Based on the students' opinions and teachers' evaluation, the following courses: 1) biodiversity, 2) agriculture, and 3) social and culture were properly developed. The development process suited the students participating in these activities.

The courses developed under the Component 2 provided the students the opportunity to learn in the open-air learning set up. But, it also increased the responsibility of the teachers and schools for their students' safety. Additionally, the duration of courses is quite limited while open-air learning courses require large amount of time to learn. These issues should be considered when these kinds of activities are expanded to other schools. It is also necessary to cooperate with subject teachers to continue operating these open-air learning activities.

Another issue under Component 2 is in terms of community involvement. Community involvement was limited only to specific group of people, particularly for the agricultural activity. The community, however, has expressed its willingness to participate in the instruction of the activities as well as in the open-air learning activities. In the future, the Community Plan needs to include the personal and community activities that are attractive to the students.

5.4.3 Component 3: Training of Organic Vegetation and Local Products for the Community People.

The households selected to be developed as agricultural activity spots for tourists as well as residents have good productivity of seasonal vegetable only in winter. Therefore, it is impossible for tourists and residents to enjoy visiting the learning center during off-season.

The community people manage the agricultural learning activities for tourists and residents. However, they are engaged in their own community activities and each member has regular obligations to do. So, it is difficult for them to engage in the management of these agricultural learning activities. Therefore, it is necessary to appoint community people in advance as management members who can engage in these activities at their best time.

Even though organic farming was promoted and the trainings were provided, some farmers didn't change their traditional way of agriculture. So, it is necessary to continue promoting organic agriculture and prepare market for organic products.

5.4.4 Component 4: Tourism Spot/Program Development at Doi Saken

While the community people are expected to be the key players to operate tourism in Doi Saken area, most of them are farmers who lack experience in doing business and tourism promotion. Therefore, the community people need to learn service industry to promote tourism in that area. Additionally, members of the household selected as learning centers are elderly people. This will negatively affect the development of tourism in Doi Saken.

Doi Saken area has been partially developed under the Component 4. It is necessary to develop further the whole community particularly the houses of farmers and the Doi Saken forest to be agro-tourism spots.

6. Tessaban Nakhorn Khon Kaen

6.1 SFC Plan, Program, and Projects

6.1.1 Outline

1) Location and Position in Regional Context



Figure 6.1.1 Location of Khon Kaen

Tessaban Nakhorn Khon Kaen is located in the center of the Northeast Thailand (Isan). It is located 152 km from Nakhorn Ratchasima and 137 km from Udon Thani. Topographically, the area is flat.

2) Regional Accessibility

There are no international flights available from Khon Kaen airport (still planning stage). Domestically, there are air routes to Bangkok, Chiang Mai and Hat Yai. The main road access is via NR 2 and 12. Going southbound on NR 2, Nakhorn Ratchasima can be reached while Vientiane can be reached via Udon Thani in the northbound direction. Eastbound on NR 12 leads to Kalasin while on the westbound route will lead to Mawlamyine (Myanmar) via Phitsanulok. In the Khon Kaen urban area is a circular bypass road (NR 230) located 10 km from the center and this is the border of the metropolitan area of Khon Kaen. Bangkok, Laos, Laem Chabang (via Kaeng Khoi and Khlong 19) are connected to Khon Kaen via railway.

3) Position in National and Regional Development Policy

Khon Kaen is located on the intersection of the east-west GMS and north-south corridor and is the economic, political, services and logistics center of Northeast Thailand. Also, Khon Kaen is the education and medical hub of Northeast Thailand.

4) Khon Kaen Urban Area

Khon Kaen Urban Area includes Tessaban Nakorn Khon Kaen (Tambon Nai Mueang), Tambon Samran, Tambon Sila, Tambon Muang Kao, Tambon Tha Phra, Tambon Phralab, and Tambon Baan Ped. Its population is 256,000 and area of 283.24 km² with a population density of 900 persons/km².

5) Tessaban Nakhorn Khon Kaen

Tessaban Nakhorn Khon Kaen has a population of 118,262 although its population has flat-lined (a slight decrease in population). Its area is about 46 km² and population density is 2,550 persons/km².

6.1.2 Current Situation

1) Economy

Khon Kaen is an ancient city having been continuously inhabited since the 17th century. Khon Kaen became the center of Northeast Thailand because of the Friendship Road (NR 2) that was built in the 1950s and the 1st NESDP from the 1960s. It attracted strategic investments (such as the Khon Kaen University, Khon Kaen Airport and the Ubol Ratana dam), large economic growth has continued in Khon Kaen area.

In Changwat Khon Kaen, the main industries are manufacturing and trade. The financial and service industries are currently growing. In terms of employment, agriculture accounts for 30% while sales/service accounts for 20% and is growing. On the one hand, Khon Kaen urban area, the main industries are trade, finance, services and logistics. From the 1960s, a number of local enterprises have grown and most of them have continued to be in business. These local enterprises have a strong presence in the Khon Kaen business community although in recent years, the vitality of the trade businesses inside the city has stagnated.

As a result of Thailand's economic growth, the income levels in the surrounding agricultural areas have correspondingly increased and the purchasing power has also increased. Under such a trend, a number of commercial facilities concentrated in Khon Kaen urban area and Khon Kaen has grown making the area a center of regional commercial activities. In addition, 2015 data show that around 3.8 million (3,880,000) tourists annually visit Khon Kaen, of which 60,000 are from overseas. A big percentage of these visitors are business visitors since the city of Khon Kaen doesn't have many tourist attractions.

2) Society

From 2005 to 2015, the population of Khon Kaen province had annually increased by 0.3%, which implies an annual outmigration of 0.2% compared with the national population growth at 0.5%. For the same period, in the Khon Kaen urban area, the population growth was the same as the provincial level, at 0.3% annually, which implies a population outflow as well at around 0.2% annually. In Amphoe Muang Khon Kaen, the population as of 2013 was 396,510.

In Tessaban Nakhorn Khon Kaen, the population in 2005 was 120,350 and has decreased at a rate of 1.4% annually by 2012 (based on the number of registered residents). After 2012, the population started to increase again.







Figure 6.1.3 Population Pyramid in 2005 and 2015

Considering the growth in the economy, although the registered population has decreasing, the un-registered population might have increased. (It's still unknown why the registered population decreased). The young generation (less than 20 years of age) has been decreasing while the population of the young adults (ages between 20-24) has been increasing and so the proportion of young adults is high. Furthermore, the aging population has progressed (13.9% elderly as of 2015), which is lower than the national average.

There are many kindergartens, nursery schools, primary middle and secondary schools operated by private sector, provincial and municipality. Khon Kaen is a good location for all kinds of education facilities. Within the Khon Kaen urban area, there are six universities. Khon Kaen is an education hub for higher education in Northeast Thailand or even one of the hubs for higher education in all of Thailand. Khon Kaen attracts children and students from surrounding areas so its daytime population is large. The Khon Kaen urban area also attracts students from surrounding areas (there are around 75,000 students), Therefore the proportion of 20-24-year-old people is extremely high. Besides, Khon Kaen has various employment opportunities in the tourism, trade, logistics and service sectors. In spite of the employment outside of the Khon Kaen urban area. (According to the data, compared to the proportion of 20-24-year-old people, the proportion of 25-29-year-old

people instantly decreased)

3) Environment

The water quality in rivers and canals and the air quality in the Khon Kaen urban area meets the environmental standards. Even though, in 2006 at the Rong Muang Canal, BOD value exceeded the water quality standards. Generally, Tessaban Nakhorn Khon Kaen, so far, has no report on environmental pollution. Although the Tessaban has 100% coverage of water supply, the sewage system covers around 78% of the Tessaban area. At this moment, there is no water pollution in the rivers. Because of its lowlands, the eastern side of the Khon Kaen urban area (the light green area in the map) is a high risk for flooding.

Volume of waste is 250 tons per day, of which around 40 tons are taken in from surrounding areas. Around 0.5% of the garbage is sorted into different types of waste. Tessaban Nakhorn Khon Kaen has a final disposal site in Amphoe Non-Thon, 17 km away from the city of Khon Kaen. Inside this disposal site, an incineration facility is currently being constructed. It will have the ability to process 600 tons of garbage per day.

4) Urban Development and Infrastructure

The urbanized area is being expanded on the north-south direction along NR 2 and east-west directions of National Highways 12. The urbanized area has expanded by 800 ha from 8500 ha in 2010 to 9,300 ha in 2015. The population has been moving from the Central Business District (CBD) to the suburban area. However, urban renewal has not been aggressively pursued in the CBD.

On the main roads (NR 2, NR 12 and the bypass road), there is heavy traffic. In particular, there are large numbers of accidents on the friendship road. The NR 2, an intercity arterial road runs through the central area of the city. Because there is a bypass, trucks do not enter the city but large through-traffic runs NR 2. There are some public transportation modes provided within the Tessaban which are songtaew and taxis. Moreover, the bus terminal (located on the ring road) and the CBD is not well connected.



Figure 6.1.4 Mapping Analysis of Tessaban Nakhorn Khon Kaen

5) Urban Management

The city has many strengths when it comes to the issue of future management. First, Tessaban Nakhorn Khon Kaen has a strong leadership of the mayor and top administration officials. The mayor, city government and local chamber of commerce share a common goal and vision. Another point is that local entrepreneurs have formed a think-tank that proposes policies for the city and has organized the formation of businesses and conducted investments. Moreover, Khon Kaen University also helps Tessaban Nakhorn Khon Kaen by providing intellectual resources to support the city. There is a strong framework of linkage with the surrounding tessabans and TAO. They have concluded an MOU to promote public transport and have organized a committee. On the other hand, In the process of this SFC, there is few involvements from the Changwat

In order to incorporate the opinions of residents in the decision-making process, the city has applied participatory process. Results of interview surveys show that residents are satisfied with Khon Kaen's living environment but they expressed a necessity and a dissatisfaction when it comes to issues on housing, disaster prevention and construction of urban utilities.

6.1.3 Future Perspective under Current Trend

1) Economy and Society

The economy of the Khon Kaen urban area is based on manufacturing, trade, finance, services and has potential for the city to be a hub for agricultural products processing and a hub for logistics. The city now has a potential for continued smooth economic growth.



Figure 6.1.5 Population forecast between 2010 and 2035

The city holds a lot of potential as a strategic city located on the intersection between the GMS north-south corridor and the east-west corridor, and the arrival of the AEC. It important to note that there is the possibility of growth in the trades and service sectors. The metropolitan area and city of Khon Kaen are both experiencing an increase in population. However, the growth rate is gradually decreasing and this growth will reach its peak in 2030 and then decline afterwards. Thanks to the universities and other educational institutions in the area, the young population is relatively large and its aging population is not advancing.

2) Environment and Urbanization



Figure 6.1.6 Change of Urbanized Area

New urban development is expanding in the suburban area. This means that the prevention of disorderly development and sprawl is necessary. The increasing population will increase demand for urban utilities, which will require the construction of additional facilities. Since the population will reach the peak by 2030, there is the possibility that compact urban development in the long term is necessary. An urban development plan should consider such a trend as well.

6.1.4 Assessment of Sustainability

1) Economic Sustainability

The economics of Khon Kaen is stable with the service and manufacturing industries as the main industries. The tourism industry is also bullish even if majority of visitors are for MICE and business trips. Interestingly, the area holds a potential for international logistics, where Khon Kaen can become the logistics center for Northeast Thailand along with the concomitant establishment of processing and logistics of agricultural products. These industries have the possibility to help the Tessaban develop a next generation economy for Khon Kaen. Consequently, from now and onwards, Khon Kaen can probably sustain the centrality of the economy. However, in order to strengthen Khon Kaen's role as the center of the economy in Northeast Thailand, Khon Kaen needs to develop white collar industries such as those for management, planning, sales, technical jobs, IT, manufacturing

innovation and logistics sectors in the metropolitan area.

2) Social Sustainability

The Khon Kaen urban area has many higher educational institutions and many job opportunities for young people. Every generation can continue residing in the Khon Kaen urban area in a sustainable manner, which is a testament to the positive cooperation with the local industries, universities and the local government. Another point is that medical facilities are also satisfactory and Khon Kaen attracts patients and medical practitioners from surrounding provinces. Consequently, it is evident that social stability and sustainability will continue in the future.

3) Environmental Sustainability

Due to the risk of floods in the eastern area of the Khon Kaen urban area, it is desirable to focus on the development of north-south and western directions. As a result, main issues of urban management would be to control the development on the eastern side (It should be noted that to completely restrict development would mean that the tambon would have no growth), to encourage development on the north-south direction and western direction, to restrict urban development along suburban roads, to ensure access between the new urban areas and the CBD, to construct infrastructure, and to supply urban services. The issue for the provincial and national governments is infrastructure development and the improvement of the urban environment in the small-scale and financially weak tessabans and TAOs which are located on the outskirts of Khon Kaen. It is important to know that urban transport countermeasures, such as public transport, will become high priority in the CBD of Khon Kaen. Since population is shifting toward the suburban area, there is the fear of a "hollowing out" in the central area.

6.1.5 Review of Existing Plans

Based on the above viewpoints, the LSDP from the city and the Comprehensive Plan were examined.

1) Local Strategic Development Plan

Tessaban Nakhorn Khon Kaen's vision: "To Create A Happy and Global City through the following five objectives: 1) To improve its economic and cultural centrality, 2) To promote infrastructure development, 3) To improve its living environment, 4) To make a healthy city and, 5) To improve governance.

The plan comprehensively covers economic, environmental, and social aspects with a special focus on governance as a basis to promote comprehensive development. It is quite significant in the need to promote a sustainable future city in Khon Kaen.

The "Smart City" concept comprises the following elements: 1) Smart Economy, 2)Smart Transport, 3)Smart Space. The Smart City concept is a vital measure that will address LSDP's objectives of: 1) To improve economic and culture centrality, and 2) To promote infrastructure development and improve its living environment.

2) Comprehensive Plan

Considering the current population and its existing urbanized area, the future urbanized area in the Comprehensive Plan seems quite large for its future population. Since there is a projection that the study population will start to decline after 2030, a compact city structure can be an alternative for the Khon Kaen urban area.

In the Comprehensive Plan, the planned CBD area is envisioned to grow and expand along NR 2 and NR 12, which is different from the existing CBD area. In order to realize the planned urban structure, strong measures are required to promote urban development. (i.e., infrastructure development and special district treatment to induce urban development with tax exemptions and floor area ratio bonuses.)

The TAO and tessaban on the east of Khon Kaen have few development potentials. At least, existing urbanized area should be considered, such as multi-polar compact cities that connect to each other.



3) Provincial Strategic Development Plan

Figure 6.1.7 Khon Kaen City Comprehensive plan

6.1.6 Sustainable Future City Plan

1) Future Vision

Vision of Tessaban Nakhorn Khon Kaen: "Create a Happy and Global Society"

"Smart City" concept is shared among many of the PT attendees.

2) Issues to be Addressed

The sustainability of Khon Kaen can be kept at a high level by bringing out its maximum economic driving force with continued careful consideration on the environment in the course of its urban expansion.

The Khon Kaen urban area is expected to become an Isan's economic growth center that is supported by national development policies with a focus on: 1) decentralization of the Bangkok centered economy and 2) equal and balanced development of the country.

In this context, four key issues were identified:

- How to bring out its potential as an attractive destination for industrial development (investment) with consideration on global trends, such as the globalizing world economy, tendency towards soft/service economy, increasing use of ICT/AI in production process, etc.
- · In this context, what kind of spatial development strategies should be employed?
- How to tackle the hollowing out phenomenon (de-population and de-industrialization of the central part of Khon Kaen) and uncontrolled urban sprawl in the sub-urban areas.
- How to increase the degree of satisfaction of Khon Kaen residents.

3) SWOT on Future Vision

Strength	Opportunity
 Strength Institutions of higher education. Existing urban facilities. Existing business entities. Quality and young labor force. Transport infrastructure (roads, railway, airport). 	 Opportunity Increasing purchasing power of residents in the surrounding areas of Khon Kaen urban area in Isan. Increasing purchasing power and preference of urban residents in major cities in the country such as Bangkok for quality agricultural products and processed foods.
	 Induced traffic volume of commodities will lead to new logistics business. Increased opportunity for having branch offices of major companies.

We	akness	Thr	eat
•	Shortage of urban infrastructure.	•	Loss of growing opportunities caused by
•	Flood problem in the western part		lack of industrial policy and promoting
	of the city.		attraction of companies to Khon Kaen.
•	Limited job opportunities for	•	Hollowing out of the central urban areas.
	younger generations.	•	Uncontrolled urban sprawl and
•	Limited number and scale of		corresponding environmental
	retailing business.		deterioration.

Strengths: existing capabilities that can help with the overall strategy.

Weaknesses: existing limitations that can prove to be obstacles to the strategy.

Opportunities: external / future factors that could help the strategy.

Threats: existing and emerging external factors that can prove to be obstacles to overall strategy.

4) Basic Direction

Maximum Utilization of Existing Assets: to bring out the potential for the existing accumulation of business entities, industries, educational facilities, etc, and to promote further development of economic infrastructure that can attract more social and economic activities as one of the centers in Isan and for the subsequent generations.

Quality Infrastructure Development: economic infrastructure such as transportation, communications, energy, logistics network should be developed using state-of-the art technologies, even as careful consideration on the traditional aspects is also encouraged at the simultaneously.

Inclusive Infrastructure Development: include all stakeholders in the opportunities for development. This can be achieved through enhancing opportunities for the participation of all stakeholders in the planning process. The future of the people in the area should be developed in an inclusive manner by paying attention to various and different aspects, fields, values, etc.

5) SFC Strategy

Strategy 1: Enhanced "Centricity" in Isan

Program

- Regional Creative Center leading smart city
- Regional Transport Center
- Regional Logistics / Trade Center
- Regional Industrial Center
- Regional Financial Center
- Regional Cultural Center
- Regional Conference Center
- Regional Education Center
- Regional Medical Center
- Regional Shopping Center

- Regional Entertainment Center
- Regional Tourist Attraction Center

Strategy 2: Smart and yet Traditional Urban Renewal

Program

- Revitalization of the existing commercial streets retain the cultural identities of smaller businesses and communities, support their sustainable growth with modern and advanced technology
- Enhanced connectivity between existing commercial streets and the emerging new development centers (new Transport Oriented Development (TOD) Axis)
- Urban renewal / regeneration with TOD and ICT increase modern housing units and offices with high-end ICT service in TOD centers

Strategy 3: Green and Quality Amenity City

Program

- Maintain the existing urban parks, water bodies and natural green spaces
- Green network connected urban parks through a green network
- High quality garden development in TOD centers

Strategy 4: Beyond car-oriented development

Program

- Transit oriented development promote high quality TOD centers with a mixed- use, mid density form of development and connecting to TOD centers through transit systems
- Development of high-order transit system along NR 2 as the main transit axis with TOD through a mixed- use, higher density form of development
- Extended feeder transit network in a hierarchical manner
 - Smart Bus Stop with bicycle paring facility
 - Para-transit
 - Taxi

Strategy 5: Sustainable Urban Growth with Nature

Program

- Controlled urban expansion (urban growth boundary) and encourage TOD centers through a mixed-use, medium density form of development and discourage scattered housing development in a form of lower density
- Yet, create high quality, low density neighborhoods that will contribute to the cultural identity of Khon Kaen (or Thailand)
- Design with nature city-wide flood disaster management

Strategy 6: Design for All

Program

- Plan urban block sizes that promotes connectivity for public transit and a vibrant public realm
- Promote equitable access to community facilities and social amenities
- Application of Universal Design for urban renewal / regeneration

Strategy 7: Safe, Secure and Quality Living Environment

Program

- Enhanced safety and security of the living environment for child-rearing
- Comfortable living environment that will cater to an aging society
- Increased community engagement

6.2 Project Implementation Support

6.2.1 Roadmap Development

Due to its ideal location sitting at the crossroads of a significant route along the north-south east-west regional corridors, Tessaban Nakhorn Khon Kaen will be a regional center of transportation. For it to maximize the desired benefits, the city's public transportation should be improved not only to promote the city's economy but also to develop its quality of life and environment through an efficient transport services. An efficient transportation system can negate the negative impacts associated with poor transportation planning and services such as traffic congestion, pollution, a stagnating commercial center, etc. It is for these reasons that Tessaban Nakhorn Khon Kaen should focus on transportation issues.

Therefore, the project to promote the use of public transportation under Strategy 4: Beyond car-oriented development was selected as the sustainable transportation plan. As informed by the SFC Plan, it is a significant challenge to encourage Khon Kaen residents to use public transport services in their daily routines. In addition, there is an urgent necessity to find a smart way to encourage residents to use the public transport systems in the near future. Therefore, it is important to prepare a roadmap for the public transportation promotion program. The objective of this is to develop the current services and qualities of public transport behavior of citizens in favor of public transport services, especially for urban public transportation.



Figure 6.2.1 Process of Roadmap Development

Figure 6.2.1 shows the Roadmap Development process. It began by reviewing the literature to identify the main indicators that would promote the use of public transportation. With this point, research on various promotion methods for public transport in the world could be conducted to encourage the use of public transport in the context of Tessaban Nakhorn Khon Kaen. After that, the conditions of the existing and future public transport systems and services; including smart bus, songtaew and proposed light rail transit (LRT) system; were collected and analyzed following a series of in-depth interviews with relevant agencies and site visits.

In order to realize the roadmap, Smart Mobility Committee was established to act as a sub-committee to the Smart City Committee at the beginning of project. The sub-committee is chaired by vice governor and its members are comprised of representatives of the Provincial office of Department of Land Transport, Manager of office of the Digital Economy (Central Northeastern), Assistant Director of Khon Kaen University (infrastructure division), Representative of enterprise: Khon Kaen City Bus Transit, two representatives of songtaew enterprise, Representative of Khon Kaen City Municipality, Representative of Khon Kaen Provincial Administration Organization, Representative of Traffic Police, Representative of DPT, Representative of Khon Kaen Transit System and Representative of Chamber of Commerce with Assist. Prof. Rawee Harnpachern as secretariat. Their main duty is to plan and formulate a strategy on public transportation that would enhance a sustainable and concrete Smart City development as well as to integrate, coordinate and inspect relevant projects that has the responsibility between the public and private sectors or other relevant agencies, including the supervision, monitoring and evaluation of the implementation of projects in support of the overall Smart city development goal.

Next, the above researches were reflected in the questionnaire design in order to identify current issues, supplies and demands of users, non-users and operators. In order to gather current demands and supplies of transport services, the questionnaire for users, non-users and operators was developed using the methodology below.



Figure 6.2.2 Questionnaires Framework

In Figure 6.2.2, the proportional quota sampling, stratified random sampling, and random

sampling were deployed to a selected 1,109 respondents that included public transport operators and public transport users, along with 109 respondents from urban public transport operators including both drivers and owners of vehicles, and 1,000 respondents coming from urban public transport users within Khon Kaen City. Mainly, the questionnaire was designed to evaluate the quality of the transport system and the satisfaction of users, non-users and operators. The result of questionnaire was used for roadmap development and the identification of projects that promote the use of public transportation. Details of the questionnaires sampling are described in Table 6.2.1.

Туре	Target numbe	r Locations	Total
Household	400 (40%)	Amphur Mueang	196
		Sila	85
		Mueang Kao	47
		Bann Pet	72
Student	200 (20%)	Khon Kaen University	100
		Khon Kaen Vit	50
		Technic school	50
Passenger	400 (40%)	Bus terminal 1	50
		Bus terminal 2	50
		Bus terminal 3	50
		Bus stops along the road	250
Total	100	00	1000

Table 6.2.1	Number of	Questionnaire Samp	ling
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Source: Local Consultant for Khon Kaen City

A focus group discussion (FGD) was conducted to present the results of the questionnaire survey and to gather ideas/comments from relevant sectors. The FGD was comprised of representatives from 38 organizations; such as the members of smart mobility committee, Director of Tourism Authority of Thailand, Khon Kaen Office, Director of Customer Service of CAT¹, Region Northeast (CAT), National Statistic Office, Social Enterprise Organizations (Mayday), Khon Kaen University (Dean of the College of Local Administration), operators of paratransit, and private sectors, especially those coming from local companies. In the discussion, the principles and rationale of the project and the results of the data analysis were presented and discussion focused on the current situations and problems of public transport in order to gather their concerns and comments. The results of FGD were concluded and converted as part of the roadmap to promote public transport in Khon Kaen city.

6.2.2 Existing Public Transport in Khon Kaen

The potential and rapid growth in Khon Kaen has been substantially aided by the existence of the Khon Kaen Airport; where is located a few kilometers west of downtown;

¹ CAT Public Company Limited, which was corporatized from the Communications Authority of Thailand under the Corporatization Act B.E. 2542.

and Railways Station whose line lies on the northeastern route in Nai Mueang Subdistrict, running from Hua Lumphong Station in Bangkok, passing through Khon Kaen to Nong Khai province; mainly serving outsiders or visitors. Both modes play a key role in the region's infrastructure development both geographically and economically. Linking up accessibility with these transportation system, Khon Kaen also has an urban public transportation system that mainly serves residents and citizens who travel within the urban area. The urban public transportations can be divided into three existing modes and one future mode. The details of these modes are summarized as follows:

1) Songtaew

Songtaews are covered pickup trucks with rows of seats in the back that transport and pick people up along routes that functions both as a share taxi and a bus that is popularly used in local cities of Thailand. Songtaew is a part of an informal public transportation system and serves fixed routes in most urban areas both within the city and is also used for longer routes between towns and villages. They usually run fixed routes using a preset fare matrix. They are very popular among locals as well as travelers and typically is the cheapest mode of transportation available.



Figure 6.2.3 Songtaew Route

Currently, in Khon Kaen City, there are 629 songtaews, divided into 19 routes, as shown in Figure 6.2.3. These routes include 2, 3, 4, 5,6, 8, 9, 10, 11, 12, 13, 16, 17, 18, 19, 20, 21, 21, 22, and 23 that are being operated within the city. They can be distinguished by their color and numbers, which correspond to their respective route origins and destinations. They also have an interchange spot from one to another. The fare for songtaew has been set from 9-13 baht for each trip. The operating time mostly starts from 06.00-19.00 daily. There are seven major operators of the songtaews who have registered to operate within the city. However, each company may own more than one route of service that is

provided to them.

2) Khon Kaen City Bus

Khon Kaen City Bus is an urban bus service that registered in 2015. The bus line operates day and night for a 24-hour service. Daytime service runs from 06.00-20.00 with an interval every 10 minutes while its nighttime service runs from 20.00-06.00 with an interval every 30 minutes. The fare is 10 baht for student passengers and 15 baht for ordinal passengers for all routes. Currently, the service has 10 buses, which serves three lines, namely Red, Green, Blue lines. Each line has different destinations but has interchange spots to enable passengers to shift their trips and destinations from one to another line or to another mode of transport. As of now, the Khon Kaen airport route is currently open and serves commuters from 7.30-22.30 daily with the same fare as those of the other three lines.



Figure 6.2.4 Khon Kaen City Bus



Figure 6.2.5 Khon Kaen City Bus Image

This bus is such a modern urban public transport mode because each bus is equipped with up-to-date technology such as CCTV, GPS, Internet (free WIFI) and convenient seats and comfortable air-conditioning. In addition, to make the passengers easy to trace the movement of the bus running, the company also provides a free internet application as KK Transit so that passengers can learn the following information: when a bus would arrive, their designated waiting points, and what bus is coming allowing passengers to avoid long queues and waiting time at the bus stops.

3) Khon Kaen University (KKU) Shuttle Bus

The Khon Kaen Shuttle Bus service mainly serve students in Khon Kaen University although it is connected to other urban transport modes with a carrying capacity of about 40 passengers. The bus service operates from 7:00 a.m. up to 21:00 p.m. It charges no fare for all passengers within Khon Kaen University. There are six routes, each differing from the other through colors codes (i.e. blue, red. orange, green, yellow, and purple.) The bus service has comprehensively covered its destinations within its area such as the faculty buildings, learning institutions, libraries and all the other areas within the university route like the Complex and night markets.



Figure 6.2.6 Khon Kaen University Shuttle Bus

Interestingly, to avoid a long waiting time at bus stop, KKU shuttle bus also has its internet application, known as KKU Smart Transit, where passengers and students can access the movement of the buses and know when and where the buses are. Each shuttle bus is equipped with services as Khon Kaen City Bus. Moreover, the bus station also applies new technology and conditions to let the passengers know when a shuttle will arrive and can protect them from rains and hot weather. To keep environmental qualities, all KKU shuttle buses use NGV for their daily services.

4) Light Rail Transit (LRT)

This project was originally initiated from the mass transit in Khon Kaen known as Bus Rapid Transit (BRT). It was first started in 2012 as a BRT plan and then was switched to an LRT in 2015. Due to the fact that Khon Kaen citizens have the same opinion and need for a public transport system as an LRT, all sectors in Khon Kaen, both public and private also support and agree to develop an LRT in Khon Kaen. As a result, Khon Kaen was analyzed and approved by OTP and is deemed with a potential for the location and development of an LRT system as a viable mass transit network to solve transportation problems in the future.



Figure 6.2.7 Light Rail Transit Route in Phase 1

Khon Kaen LRT is recognized as part of Khon Kaen Smart City development project. It aims to integrate with future plans that include a two track-rail project, airport development program, and North East High-speed rail in Thailand. The LRT line will run on a north-south axis along Mittrarhap road going through the center of Khon Kean city consisting of 21 stations from the first station located at Samran (Samran station) to the 21 stations located at Tha Phra (Tha Phra station). Khon Kaen LRT will pass through five municipalities with 26 km of system length. Its first phase was planned for 22.6 km consisting of an initial 16 stations serving up to 180 passengers per train. The stations will be built in six different types. Phase 2 of the project will extend the line by 3.5 km and add five more stations.



Figure 6.2.8 Light Rail Transit Stations

In order to operate and manage the LRT, Khon Kaen Transit System Company Limited (KKTS) was established under Ministry of Interior by five relevant municipalities. Tessaban Nakhorn Khon Kaen has an 80% stake in the company while Tessaban Mueang Sila, Tessaban Tambon Muang Kao, Tessaban Tambon Samran, and Tessaban Tambon Tha Phra each own a 5% share. The company's missions are to operate and manage the urban transportation project in Khon Kaen, to operate and manage the development project relevant to transportation for making commercial profits and to control the operations of counterparties, LRT, maintenances, services and commercial developments that the safety, convenience and punctuality should be focused mainly.

In terms of para-transits, Khon Kaen has both formal and informal modes operating within the city including minibus (van), taxi, tuk-tuk and hired motorbikes. Most of these modes run in unfixed routes. Exceptionally, the minibus/van operates as a fixed route and is owned by Khon Kaen Transport Industry Club Company Limited that has been operating since 2011 in three locations, namely KKU, Central Plaza, and Bus Terminal 3. There are now 14 minibus/vans that serve these important nodes. The rest of the modes have unfixed destinations, fare and operational hours that mainly depend on the service and passenger's destinations. In particular, the taxi and tuk-tuk are more expensive than the other urban public transports in Khon Kaen City.

Conversely, Khon Kaen City has different types of bus stops that also have formal and informal formats even though most bus stops were designed and supported by

corporations working in tandem with the Department of Land Transport and the local government. Presently, there are 61 bus stops that are distinguishable by the presence of a simple pole or a flag sign marking the location along with a rudimentary shelter (seating place) and the modern structures (electronic passenger information systems). These 61 bus stops are located the Mueang Khon Kaen along the main streets including Klang Mueang Street, Na Mueang Street, Lang Mueang Street, Srichand Street, Pracha Samoson Street, Lao Na Di Street, Nasoon Rachakan Street, Langsoon Rachakan Street, and Ruenroem Street. The bus stops are arranged from north to south or west to east. The bus stops within Khon Kaen University are not included in these 61 bus stops.



Figure 6.2.9 Types of Bus Stops

6.2.3 Results of the Questionnaire Survey

Respondents, which were stratified per gender and age of the users, had clear delineations. Among the 1,000 respondents, the majority of urban public transport users were female, accounting for 64% over the male gender, which had 36% only. The urban public transport was not only used by Khon Kaen residents (74%) but was also patronized by outsiders (26%). Most of the users were within the 20 and 29 years old age bracket (35.9%). Nineteen years old also had a high usage rate (26.8%) compared with other age brackets. However, it was glaring that older passengers (59 years old and older) only had a 4.9% share of all users of the urban public transport system. It is evident that users of public transport were the young generation and working age people (53% of the respondents were students followed by workers and self-employed, 20% and 15%,

respectively.) Household incomes were ranked from less than 10,000 baht per month up to more than 55,000 baht. Respondents who earned more than 55,000 baht a month had the highest proportion (20.67%), followed by users whose house incomes were between 10,000 baht and 15,000 baht (17.94%).

All in all, it can be concluded that most of transport users in Khon Kaen City are students and workers, with an average income of around 32,500 THB and that the public transport system serves for both Khon Kaen citizens and visitors. In this context, the promotion for the use of public transportation rightly serves the project target.

The results of questionnaire also showed that only 35% can afford private vehicles, especially cars, while 65% rely on public transportation. One of the common reasons was the inability to afford to purchase of cars and in procuring a driving license. Other reasons that prevented citizens from using car were traffic congestion, road safety, the issue of parking spaces, health condition, the lack of a driver's license, and high cost of fuel /insurance.



Figure 6.2.10 Percentage of Transportation Modes

In terms of percentage of the transport modes, as shown in Figure 6.2.10, Khon Kaen citizens preferred the use of private vehicles rather than use of public transport. Noticeably, the share was 38.82% for motorbikes and 36.68% for cars. On the other hand, those who used public transport (e.g. bus and songtaew) was only about 19.41%. For the other modes (paratransit, walking, cycling and others) were even less common amounting for just 2.34, 1.62 and 1.12, respectively.

Regarding urban public transportation, the most popularity was songtaew (65%) followed by Khon Kaen Shuttle Bus and Khon Kaen City Bus, garnering 27% and 25%, respectively. In this context, it can be implied that songtaew has become the common mode of transport for passengers in Khon Kaen city because the service can reach the passenger's locations and can literally transport them to wherever they want to go in the city thereby adding an advantage on convenience to songtaew users especially in light of the frequency of its service. This means that songtaew will play key role as small vehicle feeder that collects passengers from lower density areas and feed them onto larger vehicles for the line haul (LRT, Bus, high speed train etc.) to the destination of passengers. They will also function as a small vehicle distributor transporting the passengers from larger vehicles, or line hauls, to the destination if the passengers who are unable to complete their trips with pedestrian component within the walking radius area. Hence, the promotion of the use of public transportation focuses on "songtaew".

In order to improve quality and promote the use of songtaew, the questionnaire considered factors that had a correlative impact on the use and non-use of this mode. Table 6.2.2 shows the factors that contribute to the use of the songtaew. Obviously the scope of service (the convenience in servicing origin and destination) was the most important factor. Also, the convenience and frequency of service was the second factor.

Service Aspects	Frequency	Percentage
Service reached the passenger's destination	391	27.08
Service reached the passenger's location	352	24.38
The convenience of getting to the vehicle	273	18.91
Frequency of service	189	13.09
No personal vehicle (car/motorbike etc.)	71	4.92
Connections or transfers to another mode of transport	65	4.50
Comfortable	34	2.35
Others	32	2.22
Help the city to be environmentally-friendly	11	0.76
Safety	11	0.76
Good conditions of stop/station	8	0.55
Punctuality	7	0.48
Total	1,444	100

Table 6.2.2 Reasons for Using Songtaews

Source: Local Consultant for Khon Kaen City

In contrast, Table 6.2.3 shows the factors that make people decide not to use songtaew. Personal reasons accounted for more than half of the factors which delved on service in the origin, destination and safety; while concerns on bus and station usage was the second most important reason at 12.73%. Also, convenience, frequency of service and lack of information had similar percentages at 3.27%.

Results of the satisfaction for the songtaew service (Table 6.2.4) mostly show a moderate level of satisfaction. However, the ease of transfer, fare and frequency had a good level, which implies that it is necessary to improve these aspects in order to reach a better service to provide effective options for the people. The travel time, frequency and punctuality stood at similar levels. It can be implied that the quality of its services should be improved to control people's time or to allow them to plan their trips.

On the provision of information, the level of passengers' satisfaction was moderate (Mean=2.47, SD=1.05) when it come to the information system for the songtaew. It was found that both public transport users and operators had problems relative to the

information and data of the transport service. Passengers who made complaints on public transport mainly voiced the absence of available services, especially service in areas where passengers converged, such as information on departure and arrival time that can make the service follow punctuality, absence of service availability and alternatives where passengers can go (no route toward their expected destination), and insufficient information at stops/stations. Therefore, lack of detailed information, can limit the choices of using public transportation and can generate problems on public transport usage including the lack of connecting system, overlapping routes, insufficiency of service, conflict among the public transport operators, traffic congestion, accidents, quality of service, and the loss of trust from the public.

Service aspects	Frequency	Percentage
Personal reasons (unnecessary, having personal vehicle)	148	53.82
No service reached the passenger's location	35	12.73
Safety	28	10.19
The inconvenience of getting to the bus	11	4.00
Frequency of service	9	3.27
No information	9	3.27
Poor connections or transfers to other modes	9	3.27
Other	8	2.91
No service in origin and destination	7	2.55
Punctuality	6	2.18
Limited hours of operation	3	1.09
The location of stop/station is too far	2	0.73
Total	275	100

Table 6.2.3 Reasons for Not Using Songtaews

Source: Local Consultant for Khon Kaen City

Table 6.2.4 Satisfaction of Songtaew Service

Armanta of unhield commission	Song	gtaew	Level of
Aspects of vehicle services	Mean	S.D.	satisfaction
Ease of Transfers	3.42	1.11	Good
Affordable fare	3.59	1.10	Good
Frequent service runs	3.55	1.09	Good
Travel Time	3.05	1.08	Moderate
Bus Frequency	3.21	1.08	Moderate
Bus Punctuality	2.94	1.07	Moderate
Detailed information System	2.74	1.05	Moderate
Good attitude/usefulness of staff	2.93	0.97	Moderate
Quality of bus stop/station	2.76	0.95	Moderate
Safety	2.85	0.93	Moderate
Overall quality of buses' services	3.05	0.91	Moderate
Cleanliness	2.79	0.91	Moderate
Comfort	2.89	0.89	Moderate
Current bus service	3.05	0.89	Moderate

	Tota	I			3.06	1.00	Moderate
	1	171	17	<u> </u>			

Source: Local Consultant for Khon Kaen City

In details, information on stop/station is the easiest way for songtaew users. 53.2% of the users had some form of information on the songtaew, such as time of operation, schedule and accessibility of services relative to the timetable at the bus stops/stations. On the other hand, 35.1% of users knew of such information through friends, family, and social media.



Source: Local Consultant for Khon Kaen City

Figure 6.2.11 Information Sources

The proposed aspects to improve the quality of songtaew services in the future were prioritized by respondents (Table 6.2.5). It presented that waiting time for songtaew was still the main problem for users, since the need to reduce waiting time still had the highest priority. The second priority is on stops/stations of songtaew, including more comfortable spaces at stops and convenient shelters. Since stop points or stations for songtaews is not identified clearly, most of songtaew users wait at the notable places or bus stops. The passengers paid their fare directly to drivers and sometimes passengers were required to stand in line to pay even when crowds of passengers took off in the same area. However, the smart payment card aspect got low priority in improving the songtaew.

	Song	taew	Priority Level
Aspects of vehicle services	Mean	S.D.	
More frequent service operation to reduce waiting time	3.58	1.09	Agree
Bus stops should be near residential areas (house) to reduce	3.41	1.18	Agree
walking distance from the house to bus stop			
Cheaper fare and discount service (e.g. discount fare for the	3.37	1.19	Neither agree nor disagree
elderly)			
More comfortable space at bus stop (e.g. comfortable shelter)	3.42	1.21	Agree
Provision of clear information about routes and trips	3.32	1.22	Neither agree nor disagree
The moral about priority seats for the disabled and the elderly	3.30	2.16	Neither agree nor disagree
Detailed timetable	3.17	1.25	Neither agree nor disagree
Have smart application (Smart Apps) on mobility of the services	2.83	1.34	Neither agree nor disagree
Smart payment card	2.56	1.26	Neither agree nor disagree
Very few stops	2.94	1.25	Neither agree nor disagree
Evening service	3.22	1.22	Neither agree nor disagree

 Table 6.2.5
 Prioritization of Vehicle Services

Late-night service	2.94	1.27	Neither agree nor disagree
Wheelchair accessible	2.97	1.35	Neither agree nor disagree
Total	3.16	1.31	Neither agree nor disagree

Source: Local Consultant for Khon Kaen City

6.2.4 Results of Focus Group Discussions

The FGD indicated the need to upgrade the condition of bus stops/stations and access to bus stops/stations. Most of passengers and operators voiced complaints about the bus stops/stations of the public transport services. The major cause of complaints and concern about bus stops issues were related to the lack of the stops/stations and the provision of shelter from the elements for commuters, etc. during their waiting time. This included the location of bus stops/stations (inconvenient access such as far distance), and insufficient information available at the bus stops/stations.

The concern also confirmed the need to come up with a comprehensive database on public transport, especially on the songtaew. Comments include having transport information in both Thai and English, the update of information on route connections and route interchanges, adjusting routes or re-routing taking into account the city's nodes, the preparation of the Khon Kaen Travel Information which can function as a center-transit information center or a user concentration and traffic intelligent center, arranging main routing adjustments (cut - close - overlap route) by taking into account future planning, differentiating color of vehicles, vehicle number, origin and destination and installation of CCTV on the public transport, and the conduct of a study on the residential areas and large communities to make the mass transit system within the city and service coverage, including the social behavior that will add to the zoning of city and improve the routes of public transport.

6.2.5 Road Map for Public Transport Development in Khon Kaen City

1) Development of the Roadmap

The roadmap was obtained from the results of the questionnaire survey and focus group discussions with the relevant stakeholders. The roadmap consists of database, place making, promotion plan, management of transit, operations, multimodal, terminal, new route, integrate route, and re-route as shown in Figure 6.2.12.





While the roadmap can indicate the process and streamline of the public transport development of Tessaban Nakhorn Khon Kaen, the roadmap was selected inclusive of the pilot projects, short-term projects, and mid-term projects. The details of each project are summarized in Table 6.2.6.

Period	Project	Details	Organizations
	Database	This project is the data management system with data collection on the mass transit system. Data on users and service routes are collected to be analyzed to improve the overall service in the future.	
Pilot Project	Place-making	This project is to create a space to respond to the city by focusing on the part of the public space considering these following aspects: accessibility and connectivity, image (features) and comfort, users and their activities, and using places to build people's relationships.	
	Promotion Plan	This project is to promote the use and public relations management to attract and create image to the mass transit of the city by focusing on improving on existing things to be easily accessible and interesting to use including the promotion management system.	
Short-term Project	Management of Transit	This project is a mass transit management system that focuses on data management system of the mass transit system from data collection, analysis, and results that are used to mobilized and develop the mass transit system. Overall, the travel information center may be set up to support both users and service providers to utilize the information in order to plan their travels and services in the future.	To be discussed
	Operation	This project is the management of service providers:	To be discussed

Table 6.2.6	Roadmap	Summary
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		public bus drivers and minibus drivers (songtaew) to raise the living standards while creating a stable working environment. This project also includes skills development and occupation and services in order to promote the service provider establishment and increase capacity that can drive the management system to work effectively.	
	Terminal	This project is the construction of a central station that will be the massive transit network. The terminal will not only be a place for switching and for remote users through complementation as an integrated travel hub. It also includes the development of surrounding areas around the station in order to conform with urban development.	To be discussed
	Multimodal	This project is the generation of alternative choices for users to use the mass transit; this includes the connection of public transport in the city with other public long-distance transport systems; such as long-distance buses, trains, and planes. Also, the connection with the short-distance and long-distance transport system will increase the travel networks, provide convenience, and elevate overall system's performance.	To be discussed
Medium-term project	New Route	This project is the creation of new mass transit route by using information/data gathered from the data collection in order to respond to service providers and users. After applying the information/data, it will address the creation of new route services to meet the needs of users in these areas where current service routes are inaccessible.	To be discussed
	Integrate Route	This project is the integration of paths (routes) based on the data collected through pilot project which will combine existing routes in order to deliver higher levels of services.	To be discussed
	Re-Route	This project is the application of data collection to allocate new routes, integrate existing routes or cancel the original routes, and reset all new routes in order to respond to the city's growth and the needs of mass transit system users.	To be discussed

Source: Local Consultant for Khon Kaen City

2) Selection of JICA Pilot Project

The above identified three pilot projects (database, place-making, and promotion plan) are very important to the project implementation in the next stage because the results of the pilot projects can be extended to form the short-term and mid-term projects. They can also be applied to develop long-term public transport planning to help attain sustainability for the city.


Figure 6.2.13 Summary Framework of Public Transport Projects

Figure 6.2.13 shows that the pilot projects are expected to support the short-term and medium-term projects, especially for policy-makers and operators. The main objective is to develop and improve quality of public transportation in Khon Kaen City. Therefore, the relevant organizations can extend the output of pilot project in further initiatives.

3) Short-term Action Plans

The short-term project is summarized in Table 6.2.7. They include quick actions to support and improve transit system in Khon Kaen, which can be a continuation of JICA-funded Pilot Projects, focusing on connection, management, and service providers. Some of the proposed short-term projects are expected to start in 2018, while others would take off in 2019. These timeframe could change depending on budget availability. The key project players, or responsible organizations, are Khon Kaen Smart City Operation Center, Municipality (tessaban), KKU, and PPP arrangement. The details of each project are summarized in Table 6.2.8.

No.	Name of Project	Duration	Responsible organization	Budget (Baht)	Budget Source
1	Linkage information	2018 -2019	Khon Kaen Smart City Operation Center	1,000,000	Public
2	Place information	2018-2022	Tessaban	10,000,000	Tessaban
3	Public transport support	2018-2022	Tessaban	10,000,000	Tessaban
4	Data management	2019-2020	KKU	10,000,000	PPP
5	Public transport application	2019-2020	KKU	5,000,000	PPP
6	Cashless payment	2019-2020	PPP	1,000,000	PPP
7	Skills development of service providers	2019-2021	KKU	2,000,000	PPP
8	Accessible public transport transit	2019-2021	Tessaban	2,000,000	PPP

 Table 6.2.7
 Short-term Projects for Khon Kaen Public Transport Development

9	Multimodal	2019-2023	PPP	20,000,000	PPP
10	Marketing campaign	2018-2019	PPP	2,000,000	PPP
11	Public space	2019-2023	Tessaban	30,000,000	Tessaban

Source: Local Consultant for Khon Kaen City

Table 6.2.8 Brief Description of Short-term Projects

for Khon Kaen Public Transport Development

No.	Name of Project	Brief Description
1	Linkage information	To create a route map of the transit system that connects to each place. This can help public transport users to plan their trips, understand how to travel in Khon Kaen city, to estimate the travel time for each line, when they want to switch the route.
2	Place information	To create the map surrounding each bus stop improve connectivity and promote interesting places around each area. These benefits both transit users and commercial sectors in the area, since people always look for different places throughout the city. In addition, the public board can let people passing the areas know about the activity in the surrounding areas or can advertise the business vendor promotion. This aims at creating activity reaction and events in surrounding places and community activity announcement.
3	Public transport support	To improve bench, shelter, lighting, phone charger, and solar panel to make people use the bus stop more conveniently
4	Data management	To create a mass transit management system within the city including data collection and analysis. Its results will be used to develop the mass transit system. The travel information center may be set up to support both users and service providers to use the information to plan travel and service planning in the future.
5	Public transport application	To develop application software or any platforms on smart phone in support of songtaew passengers and to help people in the rural areas to easily have access to reasonable transportation modes.
6	Cashless payment	To introduce RFID smart card system for fare of passengers in Songtaew operating systems. Currently, RFID system is operated in Khon Kaen smart bus called as Dino card. It should be merged into Khon Kaen songtaew operating system. Khon Kaen songtaew system will be one of key drivers for the Khon Kaen smart city in the future.
7	Skills development of service providers	To improve management of the service providers, including public bus drivers, minibus (songtaew) drivers, by raising the living standards and creating a stable working environment. It is also included the skills development of the occupation and service to promote the establishment of service providers who are ready to drive the city's mass transit system to increase capacity in which it can provide users and management systems effectively.
8	Accessible public transport transit	To develop a public terminal as an integrated travel hub for users to switch modes. It should also be integrated with the development of areas around stations to promote transit-oriented development.
9	Multimodal	To promote multimodal public transport to provide alternative choices to use mass transit, including the connection to the public transport in the city with other public long-distance transport systems such as long-distance bus, train (SRT) and airplane. Connecting the short distance and long-distance transport together will increase the travel networks, provide convenience, and elevate the overall system performance effectively.
10	Marketing campaign	Marketing campaign to encourage citizens to use the public transportation by inviting some influencers, opinion leaders in different profiles to use public transportation, record videos and communicate to others.

No.	Name of Project	Brief Description
11	Public space	To make agreement or regulation with multi-stakeholders to create public space. This will help developing urban spaces more easily and conveniently. Khon Kaen should set up permanent spaces for urban-community activities such as workshops, meetings, and social activities to encourage people to conveniently participate in the city development.

Source: Local Consultant for Khon Kaen City

4) Medium- to Long-term Projects

Medium-term projects are proposed to jump off from the short-term projects and focus on the management of the public transportation route that are integrated with the overall network. Private Public Transportation Agency (PPTA) plays an important role in the preparation and establishment of new routes as well as in integrating them into existing ones. In addition, PPTA should prepare and rearrange existing routes to connect and link the public transport system appropriately and diminish the missing spots in the public transport service within city and its surrounding areas.

Consequently, the guideline for the long-term design and management will make people to think critically about public spaces including the transportation network as well as the proposal to improve them and the development of Khon Kaen City in the future. The long-term design and management should focus on the transit service timetable, public space regulation, as well as management and maintenance.

Table 6.2.9	Proposed Midterm	Projects for Khon Kaen Public	Transport Development
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No.	Name of Project	Duration	Responsible	Budget	Budget
			organization	(Darit)	Source
1	Now Pouto	2018 - 2019	Private Public	3 000 000	Privato
	New Route	2010-2019	Transportation Agency	3,000,000	Flivate
r	Integrate route	2019 2020	Private Public	2 000 000	Drivata
2	Integrate route	2018 - 2020	Transportation Agency	3,000,000	Private
S	Do Douto	2020 2021	Private Public	2 000 000	Drivata
C	Re-Roule	2020 - 2021	Transportation Agency	5,000,000	Frivale

Source: Local Consultant for Khon Kaen City

Table 6.2.10Brief Description of Midterm Projectsfor Khon Kaen Public Transport Development

No.	Name of Project	Brief Description
1	New Route	To create new mass transit route based on the result of data analysis to meet the needs of users in areas where current service routes are inaccessible or are not covered. Moreover, this design concept proposes connectivity between songtaew and other transportation systems, such as those for the airport, bus stations, urban smart bus etc. By using data collected in the JICA pilot projects, it is important to develop new routes to respond to the growth of the city and the needs of user of the city's mass transit system. In addition, the relocation of Terminal 3 to the new location will require more new public transport routes to accompany terminal users, since the existing routes are not directly linked to the new terminal 3.

No.	Name of Project	Brief Description
2	Integrate route	To integrate routes based on data collected in JICA pilot projects by combining existing routes and new routes to deliver higher levels of service. The integration of overlapping paths, planning and service management to deliver more effectively in the path. The new routes are carefully required to link and integrate with existing routes to give better choices of public transport service providing to the all users.
3	Re-Route Concept Design	Songtaew route can cover concentrated residential areas in Khon Kaen city with this re-route concept. This guideline intends to suggest Khon Kaen songtaew transportation system improve quality, efficiency, safety and comfortability. Consequently, it is expected to reduce traffic congestion in Khon Kaen city through its re-routing concept. This design concept covers all concentrated residential areas of Khon Kaen city. Thus, this re-routing concept design will motivate people of Khon Kaen city to shift from passenger cars to songtaew cars for some trips. The re-route of songtaew should be focused on songtaew line 2, 3, 5, 8, 9, 17, 20-16, and line 23. These routes are important to link and fill up to mass transit system and to diminish the blind spot of public transport service providing to the users. Other routes will be re-routed to comply with the change of Khon Kaen's growth context.

Source: Local Consultant for Khon Kaen City

6.3 Pilot Project under JICA's Financial Support

6.3.1 Sustainable Future City Pilot Project

According to the result of questionnaires and FGD in compliance with the principle of Transport Demand Management (TDM), Khon Kaen City Municipality shall prepare a suitable information system and development direction/guideline as well as people to handle future improvements. Moreover, songtaew is the main public transport mode for citizens. Therefore, the songtaew system should be emphasized in the pilot project as the first step in increasing the number of passengers and shifting the public's commuting behavior from private to public and an efficient transport regime. In order to prepare future plans and build public awareness for citizens, the project to promote the use of public transportation in Khon Kaen city shall include the following three components:

1) Transit Database and Datacenter in Khon Kaen City

According the TDM, data and information on mode of transport is crucial for the passengers. Data and information can be used to make plan for future public transport both within Khon Kaen City and cross-border transportation, including the reduction in the problems on travel and helping the city to be a smart sustainable city in Thailand. This database will be useful for both public transport operators and users through various ways. Also, the determination system for the bus stops and stations is necessary since it will aid in the service planning, accessibility and convenience for commuters. In parts of the bus stops or waiting areas, factors will also come in such as area patterning, facilities and security that are important elements for users as they wait to use the public transport system.

Currently, Khon Kaen City has 629 songtaews divided into 19 routes (2, 3, 4, 5,6, 8, 9, 10, 11, 12, 13, 16, 17, 18, 19, 20, 21, 21, 22, and 23) that are operating within the city. Figure 6.3.1 shows each songtaew's route is differentiated by their origins and destinations through colors and numbers, although most of them have various interchange points from one to the other. There are seven registered owners of songtaews (songtaew operators) that operate their services within the city. Each company may own more than one route of service provided to them. The songtaew fares are set from 9-13 baht for each trip. The operating time mostly starts from 6:00-19:00 every day. Moreover, Traffic Analysis Zone (TAZ) which includes homogenous, the socioeconomic and land use variations that exist within the zones are collapsed to an average zonal number without any reference to variance and attributes, as they were aggregated and analyzed.



Figure 6.3.1 Generality of Songtaew

The information on the songtaew, such as number of operators, routes, distance of services, travel time and etc. are described in Table 6.3.1. In terms of fare structure, the system was fixed-price depending on the type of passengers as shown below:

Children (Less than 9-year-old):	5 baht
Student:	6 baht
General passenger:	9 baht
After 17.00 pm all passenger pays:	9 baht
Out of Khon Kaen City:	13 baht

Origin Destination maximum maximum of common types	Point of DestinationPoint of maximumCommon types of maximum	Point of Point of Common types maximum	Point of Common types maximum	Common types		Common gender of	Maximum passengers	Average Time travel
Origin Destination maximum maximum of passei unload of passei	Destination maximum maximum of passei of passei	maximum maximum of passei load unload of passei	maximum of passei unload	of passel	ngers	gender of passengers	/time	^
ghai village Nonghai village Central plaza Central plaza General Dassenger	Nonghai village Central plaza Central plaza General passenger	Central plaza Central plaza General Dassender	Central plaza General passender	General passenger		Female	8/ 12.06 pm	
jlamphu Banglamphu Tessaban ban Central plaza General	Banglamphu Tessaban ban Central plaza General	Tessaban ban Central plaza General	Central plaza General	General		Female	11/15.36 pm	0.7
					T			
unam Market Pratunam Market Pratunam Bus terminal 1 General Market Market	Pratunam Market Pratunam Bus terminal 1 General Market Dassenger	Pratunam Bus terminal 1 General Market passenger	Bus terminal 1 General passenger	General passenger		Female	8/14.36 pm	0.87
siam kornsiam kornsiam Bangkok hospital Student	kornsiam kornsiam Bangkok hospital Student	kornsiam Bangkok hospital Student	Bangkok hospital Student	Student		Female	7/14.49 pm	0.80
plaza Fairy plaza Fairy plaza Suanmon village General	Fairy plaza Eairy plaza Suanmon village General	Fairy plaza Suanmon village General	Suanmon village General	General		Female	11/13.29 pm	1.53
d. tapra passenger	d. tapra passenger	d. tapra passenger	d. tapra passenger	passenger				
plex KKU Complex KKU Bus terminal 3 General	Complex KKU Complex KKU Bus terminal 3 General	Complex KKU Bus terminal 3 General	Bus terminal 3 General	General		Female	14/13.12 pm	1.53
a iort village Nong iort village Bus terminal 1 Ton tan market General	Nong iort village Bus terminal 1 Ton tan market General	Bus terminal 1 Ton tan market General	Ton tan market General	General		Female		CU U
passenger	passenger	passenger	passenger	passenger				
terminal 1 Bus terminal 1 Bus terminal 1 Khon Kaen General	Bus terminal 1 Bus terminal 1 Khon Kaen General	Bus terminal 1 Khon Kaen General	Khon Kaen General	General		Female	8/10.42 am	1.00
hospital passenger	hospital passenger	hospital passenger	hospital passenger	passenger				
rd village Sa-ard village KVC Sa-ard village General	Sa-ard village KVC Sa-ard village General	KVC Sa-ard village General	Sa-ard village General	General		Female	19/17.32 pm	0.93
passenger	passenger	passenger	passenger	passenger				
t city hall Front city hall Nongbua Pratunam market General	Front city hall Nongbua Pratunam market General	Nongbua Pratunam market General	Pratunam market General	General		Female	4/13.18 pm	1.07
deemee village passenger	deemee village passenger	deemee village passenger	passenger	passenger				
yanawat Kalayanawat Ban toom Donbom village Office	Kalayanawat Ban toom Donbom village Office School school	Ban toom Donbom village Office	Donbom village Office	Office		male	11/15.45 pm	1.07
j sa darn Kung sa darn Ban-non-tan KKT General	Kung sa darn Ban-non-tan KKT General	Ban-non-tan KKT General	KKT General	General		Female	3/11.12 pm	0.80
school passenger	school passenger	school passenger	passenger	passenger				
lareeya village Puchareeya village KVC Kalayanawat General	Puchareeya village KVC Kalayanawat General	KVC Kalayanawat General	Kalayanawat General	General		Female	10/12.04 pm	0.93
School passenger	School passenger	School passenger	School passenger	passenger				
vanawat Kalayanawat Kalayanawat Dong pong General	Kalayanawat Kalayanawat Dong pong General	Kalayanawat Dong pong General	Dong pong General	General		Female	11/12.24 pm	1.13

Table 6.3.1 Information on the Songtaew

Average Time travel)hour(0.67		1.00		1.20		0.67		1.53		
Maximum passengers /time		17/12.26 pm		9/12.57 pm		11/14.17 pm		11/11.00 am		12/14.17 pm		
Common gender of passengers		Male		Female		Female		Female		Female		
Common types of passengers	bassenger	Student		General	passenger	General	passenger	General	passenger	General	passenger	
Point of maximum unload	village	Putthamon temple	curpic .	Bus termianal 1		Fairy plaza		Khon Kaen	hospital	Nong bua	deemee village	
Point of maximum Ioad	School	Ban non muand school		Nong pailom	market	Phue village		Bus terminal 1		Front	plumbing ruen	rom road
Destination	School	Nong pailom market		Bang lamphu	market	Nong hoi village		Bus terminal 1		Front plumbing	ruen rom road	
Origin	School	Nong pailom market		Nong pailom	market	Nong hoi village		Bus terminal 1		Front plumbing	ruen rom road	
Route		19		20		21		22		23		

Information on quality and capacity of public transportation modes; especially songtaew, should be focused in order to provide efficient services and support decision-making. Therefore, the number of trips, nodes, links, network characteristics, traffic directions, volume, flow, delays, speed; and other related information in the contexts of Khon Kaen City relative to the aggregation of spatial networks and data, were collected.



Figure 6.3.2 Process of Data Collection on the Songtaews

In order to collect current data, such as real time traffic and the number of actual passengers, the data collections were presented through a Geographic Information System (GIS) and Traffic Simulation through Smart Censor on the songtaew as shown in Figure 6.3.2.

All in all, information shall be integrated into the SMART CITY DATA CENTER of Khon Kaen City. In particular, the database is expected to support the Short and Medium-term project and in the future re-routing initiatives (such as the LRT). In other words, the current condition on traffic development in Khon Kaen City will be identified in order to provide inputs for policymakers, such as the re-routing of the songtaews and to oblige operators to increase the quality of public transportation. This will all contribute in improving comfortability, safe driving conditions, the reduction of traffic congestion, optimum management of a navigation system and the identification of solutions to issues affecting public transportation.

2) Place-making in Transit System Service in Khon Kaen City

A bus stop is a designated place where buses stop for passengers to board or alight from a bus. Bus stops are, in some locations, clustered together into transport hubs allowing interchange between routes from nearby stops and with other public transport modes to maximize convenience. Bus stop infrastructure ranges from a simple pole and sign, to a rudimentary shelter, to sophisticated structures. The construction of bus stops tends to reflect the level of usage, where stops at busy locations may have shelters, seating, and possibly an electronic passenger information system; less busy stops may use a simple pole and flag to mark their locations.

The main transportation system in Khon Kaen is still the songtaew, which has the most users. Currently, there are 24 lines of songtaews running throughout the city. The density of the songtaew's routes is focused in the city center (Klang Mueang road, Na Mueang road, Lang Mueang road, Srichan road), as well as the main road, which is Mittraphap road. It was found that the route, of which there are usually many lines running to serve the service, is the district within the city along the major nodes which are the turning point or commercial district and education districts including Khon Kaen Wittayayon School, Kulayanavat School, Banglumpoo Market, Pratunam Wholesale Center, bus terminal 1, bus terminal 2 (Air Conditioner), bus terminal 3, A. Jira Market. The number of line density gradually declines and spreads around the outside due to the density of the population or the behavior of public transportation use in the area or even nodes or important districts followed by other routes.

Criteria

The factors on site selection were based on four main sections including the initial eligibility criteria, comfort and good image, accessibility, and people's activities.

- **The Initial Eligibility Criteria:** the initial eligibility criteria for the selection of sites as a qualified requirement were as follows:
 - 1. Accessibility;
 - 2. Existing user base (having people coming to do activities in the area);
 - 3. Comfort and good image; and
 - 4. Popular point for people to meet up.
- **Comfort and Good Image:** The comfort and image of the area reflects on the infrastructure and ease of current use of space, which were based on the following:
 - 1. Have the facilities;
 - 2. Have a safe feeling;
 - 3. Clean areas; and
 - 4. Have enough seats.
- Accessibility: accessibility to the area is the convenience in access and connection to the area and the surrounding areas, which is an important point for usability. Accessibility can refer to area that had the following factors:
 - 1. Can be noticed from a distance;
 - 2. Can accessible by walking easily;

- 3. Availability of various public transport services; and
- 4. Parking or transfer areas.
- **People's Activities:** This reflect usage and behavior of users in the area, as well as the importance of the site to its surrounding areas, such as the following factors:
 - 1. Have various shops and services;
 - 2. Have an area for event activities nearby;
 - 3. Have space to respond to events occurrence; and
 - 4. Available space effecting on the surrounding economy.

Site Selection

The site selection for the place-making project was based on the criteria on place-making and data obtained through observation of the transit use around the city and interviewing local citizens to figure out maps and networks of urban transit use. After the map and location of the used was plotted out, the next step was to calibrate them with the route map of the songtaews and the future LRT route. There were some areas that was not supported by the future LRT route although these areas served as a major hub of transit between the city core and its outskirts.

The survey and interviews with people in the area revealed the overall behavior of the use of songtaews and the main factors why majority of commuters use the songtaew service. There are 20 notable nodes of route network as follows:

- 1. In front of Srinakarin Hospital
- 2. In front of the Demonstration School of Khon Kaen University (Moodindaeng)
- 3. Sihachai Decha Chai Camp Intersection 4. Kham Hai Market
- 5. Sam Liam Khon Kaen intersection
- 6. In front of A. Jira Market
- 7. Ban Nong Yai Market
- 8. In front of Medical Education Center Khon Kaen Hospital
- 9. In front of Khon Kaen Wittayayon School
- 10. In front of Khon Kaen Police Station
- 11. Tou Rong Market intersection (Klang Mueang road)
- 12. Behind Fairy (Na Mueang road)
- 13. Tou Rong Market intersection (Na Mueang road)
- 14. In front of Kaennakhorn Witthayalai School
- 15. Pratunam Market
- 16. Talat Ke Hak Mueang Kao (Old Town Housing Market)
- 17. Chompon Market
- 18. Ban Don Market
- 19. Phothisan Rd lakeside of Bueng Kaen Nakhorn
- 20. Central Plaza Khon Kaen

The design of the bus service should be based on clearly visible design, with an ability to listen to feedback, standard service point, and multi-level service information and waiting area. Surveying and collecting data were divided into four zones according to the characters of the area or the behavior or activity in each district. The proposed 20 sites have different physical aspects or user's behavioral use, the number of songtaew's service

available for each area, as well as density of use (timing), all of which were analyzed and scored based on the set criteria for the next site selection as shown in Figure 6.3.3.

Site Selection : KhonKaen Urban Transit Network

JICA has set the initial eligibility criteria for the selection. The comfort and image of the area will reflect the

Section 1: The initial eligibility criteria of JICA of sites in which all selected sites require to have

qualified requirement as following.

infrastructure and ease of current use of space.

Section 2: Comfort and good image

Section 5: Social aspects surrounding and users in various areas to know about the

Show value of the characteristics of society

conditions of user and location.

in the area, as well as the importance of the area This will reflect the usage and behavior of users

connecting to the area and surrounding area which Accessibility to the area is a convenience in access

Section 3: Accessibility

to surrounding areas.

Section 4: People's activities

3. The area with sense of ownership

3. Have space to respond to events occurrence

3. Availability of various public transport services

d. Parking or transfer area

2. Can accessible by walking easily

1. can be noticed from a distance is an important point for usability.

> 2. Have a safe feeling 4. Have enough seats.

3, Clean area

(having people coming to do activities in the area).

2. Existing user base 1. Accessibility

3. Comfort and good image

1. Have the facilities

2. Have area for event activities nearby

1. Have various shops and services

4. Available space effecting on the surrounding

4. The area is maintained.

2. Have a variety of people 1. Have people as groups

1			JICA CH	RITERIA		G	OMFORT AL	VD IMMAGE			ACCESSIB	SILITY .			USER AC	TIVITY			SOCIAB	LITY			
	SITE	Access	People Engage In Activity	Comforta- ble And Good Image	People Choose To Meet	Conveni- ent	Feeling Safety	Clean Of Place	Enought Df Sitable	Visible From Vistance	Easy Walk-in O	Variety Of Transit	Parking Or Drop- Off	Variety Of Store And Service	Close to Public Area	Area Related To Activity	Economic Related Area	Group Of People	Variety Of People	Owner-	Aaintena-	Have Unique Characteri -stic	Total Score
	Front of Srinakarin Hospital	5	s	3	5	2	5	5	2	5	5	5	3	e	1	4	n	ŝ	5		5	YES	76
	KKU Demonstration school	5	5	2	.5	1	4	4	5	5	5	1	1	1	5	5	-	5	3	1	4	ON	11
	Soi Sriharat-Decho Fort	2	1	2	2	1	4	4	5	5	1	4	в	2	1	2	T	P.	1	1	n	ON	44
	Kam-Hai Market	4	4	4	9	4	4	4	0	4	3	1	5	5	4	2	4	е	3	e	4	YES	68
	Sarm-Learn Intersection	4	5	1	9	3	3	4	0	2	3	4	1	2	1	1	e	5	5	1	3	YES	54
	KhonKaen Bus Station 1	5	5	4	5	5	5	4	0	4	5	'n	1	s.	5	1	5	s	5	6	4	YES	81
	Nong-Yai Market	3	3	3	4	4	4	4	0	e	4	2	2	5	1	3	3	S	5	1	4	YES	8
	KhonKaen Hospital	5	đ	5	5	4	4	5	0	5	5	5	3	4	2	4	4	5	5	2	5	YES	81
de	chonkaen Wittayayon School	5	5	4	4	4	4	4	4	5	5	5	4	4	5	4	5	5	4	4	4	YES	88
	Police Station	5	urj	4	5	5	5	2	4	4	5	4	1.	5	Ŀ	4	5	5	5	5	1	YES	83
12.5	Front of Night Market	5	5	3	5	3	3	3	0	4	5	9	1	4	3	1	e	s	4	1	3	ON	2
	Back of Fairy Plaza	5	5	5	5	5	4	5	0	5	4	5	2	2	5	3	5	ŝ	3	5	5	YES	86
	Back of Night Market	5	5	4	4	3	6	3	0	3	4	4	1	5	3	1	3	5	5	2	2	YES	65
1.0	KhonKaen Wittayalai School	5	3	5	5	4	4	4	3	5	5	4	2	5	5	4	2	ŝ	2	4	5	YES	81
- 1	Pratunam Market	4	5	3	1	5	3	3	0	3	3	4	4	4	4	4	4	4	5	1	2	NO	67
	NHA Village Market	4	4	2	6	3	4	4	0	4	4	1	2	a	2	4	4	5	5	5	5	YES	69
1	Jom Phon Market	4	5	5	4	5	4	5	0	5	4	1	5	5	5	4	4	4	5	4	5	YES	83
	Ban Don Market	4	2	3	9	5 5	2	3	0	2	2	1	1.	4	E.	4	4	en.	4	1	3	ON	50
	Entrance of Soi Photisan	4	5	4	4	3	3	4	0	4	3	2	5	3	5	4	3	n	5	2	4	YES	70
	Central Plaza	5	5	5	5	4	3	2	0	5	3	s	1.	4	5	2	2	4	5	1	S	YES	76

Figure 6.3.3 Prioritization of Selected Sites

There is a distinction of area or frequency of varied public transport uses. From the data collection and analysis to select the area, the 10 sites were selected according to the criteria of place-making and data obtained by the field survey of the transit around the city and interviewing with the local citizens to figure out the map and network of urban transit.

These sites include in front of Srinakarin Hospital, Kam-Hai Market, Sam-Leam Intersection, Khon Kaen Bus Station 1, Nong-Yai Market, Khon Kaen Hospital, Police Station, Back of Fairy Plaza, NHA village Market, and Central Plaza which is located in Figure 6.3.4.



Figure 6.3.4 Location of Selected Sites for Place-making

Table 6.3.2 show the information on the selected sites. However, the distinct information of each site shall be addressed based on urban transit behavior, rural transit, facilities and road condition as well as stakeholders.

	Remark			
-	Key Stakeholders	 Hospital users People who live nearby People who interchange transit 	 Vendors in the market People who shop at the market People who want to go to park 	 People who waiting for a bus Shop-owners around that area Sonctaew
-	Road	8-lane highway with traffic island and 4 side lane	4-lane lake side road without traffic island, on street parking is available	8-lane city-highway with traffic island, on street parking is available
-	Facilities	 Bus shelter on both side Over- Crossing Retail shop 	1. Car parking space 2. Playground 3. Retail shop	1. Crossing path 2. Retail shop
-	Rural Transit	 Songtaew to rural areas Long range vans Long range coaches 	None	 Songtaew to rural area Long range coach service
-	Urban Transit	- Songtaew route 19,20 - Shuttle van service	- Songtaew route 2	- Songtaew route 4,5,8,9,10,13, 19,20
	Spatial Problems	 Considering transit of the users, this area should be a transit node, but it does not have a proper design to serve transit. Since it faces the National Highway, passenger cars also use this road. So, the transit cars cannot get into the transit lane Do not have enough lighting at night 	 A lot of vendors on the walk path There is street parking in this area which makes transit cars stop on the traffic lane and cause traffic congestion Without road crossing signs, people cross the street in a disorderly manner. 4. Heavy traffic congestion in the late afternoon 	 The activity of the user makes this area act as a transit node, but the area does not have a proper design to serve the activity. Narrow walk nath
-	Characteristics	This area consists of regional service hospital, university campus, mixed of retail service, and residential. The activities have shown to be used as node of transit	This area is the edge of community market and Nong Kotara Lake Park with the recreation area; includes playground and soccer fields	This area is a business area along the road with office buildings and it connects to the big market. The activities have shown to he
-	Locations	Srinakarin Hospital	Kamhai Market	Sam Leam Inter- section

 Table 6.3.2
 Data Collection in Selected Sites

Project for Promoting Sustainability in Future Cities of Thailand (TFCP) Final Report of Phase 1 (Stage 1-3) 6-44

Locations	Characteristics	Spatial Problems	Urban Transit	Rural Transit	Facilities	Road	Key Stakeholders	Remark
	used as a transit node	 Do not have enough light at night 					drivers - Interchange transit users	
Bus Terminal 1	This area is a complex of bus station, market, and government office. People recognize this area as the gateway of Khon Kaen City. So, they always use this area as a node of transit	 The activity of the user makes this area act as a transit node, but the area does not have a proper design to serve the activity On the market side, it does not have any sitting area or shelter Double lane street parking causes traffic jams 	 Songtaew route 2,3,4,5,8,9,10, 13,19,20,22,2 4 Khon Kaen city bus green line 	 Songtaew to rural area Long range Van service Long rang service 	 Bus shelter on station side Overcrossin Retail shop Public toilet 	6-lane city street with traffic island, on street parking is illegal on the bus terminal side	 Vendors in the market People who shop at that market Interchange transit users Shop owners around there 	This place is the center of Khon Kaen city in term of transit route, density, and node.
Nong-Yai Merket	This area is the community market that serves people who have single trip passes or live near this area	 Double lane street parking Heavy traffic congestion in this area around 5pm The vendors sell items alongside the street Narrow walk path 	- Songtaew route 2,18,22	e V	1. Retail shop 2. Crossing path	6-lane city street traffic with traffic island, street parking is available	 Vendors in the market People who shop at that market People who travel pass the area Shop owners around the area 	
Khon Kaen Hospital	This area is consisting of hospital and technical college that serves people who lived either inside or outside of the city. The activity along the street in this area is	 Some mobile vendors sell items on the traffic lane On college side, there is street parking along the road due to the private vehicles on weekdays. There is no sitting area for people to wait for transit 	- Sontaew route 2,3,10,16,18, 22	1. Songtaew to rural area	1. Retail shop 2. Overcrossin 9	6-lane city street with traffic island, on street parking is available	 Technical College Students Hospital users Old people are the main users of the hospital Shops around 	

Locations	Characteristics	Spatial Problems	Urban Transit	Rural Transit	Facilities	Road	Key Stakeholders	Remark
	that serve people from hospital and college.						the area	
Police	This area is the center	1. There is only one bus	- Sonataew	None	1. Bus shelters	4-lane citv	- Vendors in	This place is
Station	of trading around the	shelter on Post Office	route		on the side	street	the market	the center of
_	city with a lot of	side.	2,3,8,9,10,11,		of the post	with side street	- People who	Khon Kaen
_	wholesale and retail	2. On the market side, there	13,16,17,21,2		office	parking	use the post	city in terms
_	shops in the market.	is no space for bus	2		2. Crossing		office	of transit
_	Kanlayanawat School,	shelter.	- Khon Kaen		path		- People who	route,
_	Police Station, and	3. Street parking makes	city bus		3. Public toilets		use the police	density, and
_	Post Office it is also a	transit cars have to stop			4. Retail shops		station	node.
_	transit node for	on the traffic lane.					- Student of	
_	people around the	4. Without specific place for					Kanlaya-	
_	city.	drop-off on the market					 nawat school 	
		side, so people have to					- Shop owners	
		wait along the street.					around there	
Fairy Plaza	This area is a local	1. The activity of users	- Songtaew	None	1. Crossing	4-lane city	- People who	*People who
_	department store	makes this area a transit	route 4,9		path	street with	go to Fairy	shop at Fairy
_	which located at the	node, but the area does			2. Retail shop	on-street	Plaza*	Plaza usually
_	center of business	not have a proper design				parking	- Fairy Plaza	students and
_	area in the city	to serve such activity.					- Vendors	college age
_		2. It does not have any					inside Fairy	shoppers.
_		shelter or sitting areas					Plaza	
_		3. It does not have enough					- Shop owners	
_		lighting at night.					around there	
_		4. Motorbike parking on						
		footpath.						
NHA	This area is a	1. It does not have enough	- Songtaew	None	1. Bus shelter	8-lane city	- People who	
Village	community market	parking spaces which	route 8,23		2. Retail shop	highway with	live in the	
_	along the road which	causes traffic jams along			3. Parking	traffic island,	NHA village	
_	located next to a	the route.			space	on street	- People who	
_	large residential area.	2. The road does not have				parking is	travel pass	
_		the crossing path.				available	that area	
_		3. There is no bus stop sign					- Vendors in	
_		at the market side.					the market	

Locations	Characteristics	Spatial Problems	Urban Transit	Rural Transit	Facilities	Road	Key	Remark
							Stakeholders	
							- Shop owners	
							around the	
							area	
Central	This area is located at	1. The activity of user makes	- Songtaew	1. Songtaew	1. bus shelter	8-lane city	- Central Plaza	
Plaza	the front of a big	this area act as node of	route	to rural	and	highway with	customer	
	department store.	transit, but the area does	2,3,6,9,24	area	drop-off for	traffic island,		
	Along the road, there	not have a proper design	- Shuttle van	2. Long range	van service	on street		
	is a business district.	to serve the activity.	service	van	at central	parking is		
	The activities have	2. There is no crossing path		3. Long range	plaza side	available		
	shown to be use as			coach				
	node of transit.			(nonofficial)				

In order to achieve sustainable transportation planning, the 10 selected sites were evaluated and designed in through workshops with stakeholders coming from the public, private and civil sectors many of which particularly collaborates with MAYDAY, KKU, and Tessaban Nakhorn Khon Kaen. In addition, 30 volunteers were recruited to join this workshop, called "MOVERS", as shown in Figure 6.3.5: Recruitment Poster, in order to share ideas and identify solutions to promote the use of public transportation in Khon Kaen. The purposes of the workshops are explained in the table below.

Types of local campaigner	Date/Schedule	Purposes
Fieldwork	December 23-24, 2017 (9.00-17.00)	Getting information about the context of public transportation in Khon Kaen. The team finished the field survey to interviewed drivers, users and also non-users of public transportation to understand more about the uses of public transportation.
Workshop I	February 10-11, 2018 (9.00-17.00)	Define problems, field-survey and group discussions
Workshop II	February 24, 2018 (9.00-17.00)	Solution brainstorm & Field test: Offer in-depth solutions, model simulation field work solution testing, testing summary.
Workshop III	March 10, 2018 (9.00-17.00)	Prototype testing, solution offer and implement planning: Rapport of previous workshops results and summary and propose implement plan.

Tabla 6 2 2	Summary of Loca	Compaignor Workshops
Table 0.5.5	Summary of Loca	i Campaigner workshops



Figure 6.3.5 Recruitment Posters



Figure 6.3.6 Workshop Ambiance

After finishing all the workshops, the budget was allocated for each group of the campaigners to enable them to exercise their projects including mobile application development, software development for a songtaew queuing management, service workshops for songtaew drivers, and the design of marketing materials and production to promote the use of public transportation.



Figure 6.3.7 Testing Prototypes

All in all, these ideas and problems were extracted and developed by specialists in order to come up with a "mock-up" to test and develop the placemaking plan for each site. After the implementation of a mock-up was completed, guidelines on long-term design was developed. The guideline prepares strategies that shall fit into the proper contexts of Khon Kaen and include suitable projects for long-term development based on actual human dimensions, mobility network, placemaking, safety, accessibility, branding, experiential, and resilient-place-social, culture, and civic, transit hubs and corridors.

3) Promotion Design for Public Transportation in Khon Kaen City

Developing an attractive design is necessary in order to build public awareness, improve

public perception and increase songtaew users.

(1) Corporate Identity (CI) of "Smart Songtaew"

An Ethnographic Analysis was conducted to identify the contexts of Khon Kaen which includes Persona Mapping, User Journey scenarios, Information Architecture & Wire-framing for User Interface in order to identify Modern/Young/Fresh mood & tone with clear, concise and direct communication style for Khon Kaen City. This analysis supported the Logo Design, Key Visual Design, and CI Manual for supporting further design in Khon Kaen, as shown in Figure 6.3.8.



Figure 6.3.8 Logo Design and Key Visual

(2) Information Design

The creation of information design for public transportation facilities was considered based on content, structure, and correlation of information. In order to make information and design content distinguishable and standardized, the design theme should be directly relevant to building a culture and a strong public awareness on public transportation.

Transit Map and Signage

Three important nodes were identified based on the results of the current status analysis and observation from the design team and workshop participants. It includes Khon Kaen Hospital, Srinagarind Hospital and Fairy Plaza, which have high density of users especially those coming from outside of the city, since information on public transportation is basically to outsiders. Transit map and signage were used as techniques in the design to develop the bus stops. Bus Stop Design is expected to be easily accessible and comprehensively decorated, relevant to information, procedure, time and space.



Figure 6.3.9 Transit Map

Bus Signage Template

The context of songtaew were identified based on the result of the literature review and questionnaire survey in order to prioritize and select the 50 bus-spots and install the bus signages. Bus stop designs can provide sufficient information that include the location of the bus stops, the number and the name of songtaew lines passing the bus-stop, the station of those songtaew lines, types of vehicle, and other elements. In addition, the name of bus stops were identified by locality through interviews.



Figure 6.3.10 Bus Signage Template



Figure 6.3.11 Image of Bus Signage

Interior and Exterior Designs of Songtaews

Identical image of songtaew was identified as characteristic of public transportation, based on which interior and exterior designs of a songtaew was prepared. This activity is expected to change the physical image of songtaews and is known as Songtaew 3.0. The design aims to improve public perception of the songtaew and to attract people's attention.



Figure 6.3.12 Interior and Exterior Designs of Songtaews

Mock-up Bus Stops

Necessary facilities and information to improve bus stop areas were identified through discussion with the local residents and through place making activities. It included bus and songtaew route information boards, chairs, parking for bicycles, and mobile chargers. Mock-up of those facilities were installed at seven bus stops, such as Bus Terminal 3, Central Plaza, in front of school, and so on.



Figure 6.3.13 Mock-up of Bus Stop Improvement

(3) Public Relations Materials and Media

Brochure

The transit map and leaflet consisting information on the public transit in Khon Kaen city was prepared and distributed at transportation nodes such as Khon Kaen airport, bus terminal, shopping center and also distributed to songtaew drivers.



Figure 6.3.14 Brochure Design

Online Media

Results of the questionnaire showed that most of citizens wanted the provision of information on the songtaews. Information should not only be through handouts/hardcopy, but also through the social media in order to reach a wider scale of age groups. The online media is expected to focus on common information on the songtaew, with attribute questions and information such as What is SMART SONGTAEW? Songtaew routes? Know more about SMART SONGTAEW drivers and the SMART FUTURE SONGTAEW.



Figure 6.3.15 Online Media

All of activities of the Pilot Project in Khon Kaen including Khon Kaen MOVE workshops were posted on the social media as well. All groups of campaigners with assistance from MAYDAY! produced their contents about the promotion of public transportation



solutions and the promotion of posts on social media.

Figure 6.3.16 Artwork Content for Posting on Social Media

6.3.2 Implementation Schedule for the Pilot Project

Overall implementation schedule for the three pilot projects are shown in Table 6.3.4.

Drojecto	Tasks				2018		
Projects	Täsks	12	1	2	3	4	5
t Database	Geography Information System for Transportation (GIS-T) and Traffic Simulation -Literature Review -Data Collection and Analysis -Data Representation on GIS-T -Traffic Simulation						
ansi	Guideline						
Tra	-In-depth Analysis						
	Guideline						
	Place-Making	g Guideli	ne		-		
	Geographical and Context Analysis -Literature Review -Assessment of Public Space Challenges -Site Selection and Stakeholders Identification -Data Collection in Selected Sited						
ace-making	Making a Place Plan -Visual Concept Plan Development -Suggestion and Evaluation on the Actual Installation of Short-term Action						
P	Guideline for Long-term Design and Management						
	Co-Creation Workshop	with your	ng genera I	ation			
	Session 2						
	Session 2						
	Session 5						
	Press Conference and Summary Meeting						
	Corporate Identity (CI)	f SMART	I SONG T	Δ.Ε\.//			
	Co-Creation with Song Taew operators						
	Logo Design of SMART SONG TAEW						
	Key Visual						
	Cl Manual Guideline						
	Provision of SMART SO	NG TAEW	- / Informa	tion			•
Ē	Bus Stop Design						
esig	Bus Stop Template						
Ď	SMART SONG TAEW Interior and Exterior Design						
tior	SMART SONG TAEW overview brochures with MAP						
not	Online Media (Fa	acebook	Posts)				
lo	What is SMART SONGTAEW?						
-	Songtaew KKC routes?						
	Voxpop users and non-users						
	Knowing more about SMART SONG TAEW's driver						
	SMARI SONGIAEW in the future						
	Content to promote KKC young gens team						
	Any related contents that created from KKC young gens team workshops						

Table 6.3.4 Implementation Plan for Pilot Project

6.4 Lessons Learned

Public transport is an important infrastructure to realize effective urban development and to meet the needs to travel to the city center and to ensure mobility of cities in diversity. Efficient public transport system will exalt urban economies as well as improve people's livelihood.

In Khon Kaen City, bus, songtaew, and other paratransit modes are in service. It is important for all parties to participate in the process of urban transport development, including government agencies, public and private sectors, citizens, academic as well as international organizations. It is particularly critical for songtaew, since it should be well integrated with other public transport services as a feeder mode. However, at present, there is no official platform to discuss songtaew improvement. Songtaew is recognized as an informal mode. Therefore, it is necessary to build people's awareness on songtaew's functions and its impact including positive and negative side through participation of local people who are potential users of songtaew.

In this context, Tessaban Nakhon Khon Kaen has prepared its Sustainable Future City Plan to increase use of public transport services in Khon Kaen. It is a significant challenge to encourage people in Khon Kaen to use public transport services in their daily life. There is an urgent need to find a smart solution to encourage residents to use public transport system in the near future. To that end, the following three pilot projects have commenced.

- Database of public transport: Data collection and management system has been developed focusing on the existing public transport system, songtaew. It includes data of its service coverage and its use, of which analysis can be used to improve the overall services in the future and can be also applied to make detail design of short-term and medium-term projects. The result of database development showed that current issues and potentials for future development, such as blank areas, overlapped area, average speed of peak and off-peak hours, congestion, etc. Such data management is essential for policy makers to improve quality of songtaew services, such as re-routing and increase of service frequencies. Real-time travel information is also useful for passengers to monitor songtaew car by themselves.
- **Place making:** It focused on key transit areas, such as bus stops, stations, considering accessibility and connectivity, comfort, area availability for activities to enhance people's communications. It has provided concept and principle designs for the selected 10 sites, which are considered as potential areas for practical implementation and offered new innovative place making for promoting public transport use in Khon Kaen. Guidelines for long-term design management has been prepared to provide framework to analyze public spaces and provide suggestions to develop Khon Kaen City in the future.
- **Promotion Plan:** Public transport promotion includes to create better image of public transport so that people feel songtaew more easily accessible and more interested in using it. Since such public transport promotion plan has been prepared through participation of all parties, including government agencies, transport

operators, citizens, academia, and international agencies, all of them enhanced their awareness on songtaew, including its function, impact of its use, including negative and positive side, and relationship with other public transport modes, such as bus transport. It also helps for policy makers to find solutions and to make a plan for public transport development. Promotion plan includes 50 bus stop signages, 3 transit maps, and 30 wrapping of songtaew.

7. Tessaban Mueang Krabi

7.1 SFC Plan, Program, and Projects

7.1.1 Outline

1) Location and Position in Regional Context



Figure 7.1.1 Location of Krabi

Tessaban Mueang Krabi is located in an undulating area surrounded by mountains and a coastal line. The Province is adjacent to the Andaman Sea, Phuket Province and Phang-Nga Province. It has many beach resorts along its coast and inlands.

2) Regional Accessibility

There are many international flights from Krabi International Airport that connect to Singapore, Kuala Lumpur, Penang, Shanghai, Kunming, and Guangzhou, while its domestic flights connect it to Bangkok, Chiang Mai, and Ko Samui. NR 4 connects Krabi to Phuket via Phang-Nga on one hand, and Trang via Hat Yai on the other hand. The main roads of Krabi City are NR 411 and 4034. NR 4034, 4204, 4201, and 6024 lead to major beach resorts in the southwest of the Tessaban.

3) Position in National and Regional Development Policy

Tessaban Mueang Krabi is a center of Krabi Province in terms of economy, administration, and services. It is also the logistics, supplies and service center for the beach resorts.

4) Krabi Urban Area

Krabi's urban area covers Tessaban Mueang Krabi (Tambon Krabi Yai, Tambon Pak Nam), Tambon Sa Thai, Tambon Tub Prik, Tambon Khlong Pra Song, Tambon Krabi Noi. Its population is approximately 75,000 (as of 2015), which is increasing. Its area is approximately 333.04 km^2 .

5) Tessaban Mueang Krabi

Tessaban Mueang Krabi has a population of approximately 31,000 (as of 2016), which is also increasing. Its area is approximately 19 km².

7.1.2 Current situation

1) Economy

Krabi was developed based on the port that was established to act as an out-port of Nakhon Si Thammarat. Tessaban Mueang Krabi is also the core urban center of the Krabi urban area. Major industries of Krabi Province ("Changwat") are rubber, palm oil, fisheries, and tourism, which is still a growth industry.

Krabi Province ranks 8th in provincial income and 4th in income from the tourism sector. The annual number of tourists reaches 5.6 million (2015), out of which 3.5 million are foreign tourists, and 2.1 million are domestic tourists. The number of hotels has increased by 30%, which signifies that Tessaban Mueang Krabi is growing because of its tourism industry. Particularly, Tessaban Mueang Krabi has both the tourism industry that includes the travel business, transportation, hotel, restaurant, and services, and the tourism support industry like the supply of consumer goods, food supply, repair and maintenance etc., which are the main growth drivers of the whole economy of Tessaban Mueang Krabi. However, integration that combines both inside and outside tourism sites into one program is still limited.

There are increasing number of shops managed by younger generations especially those who returned to the city to start new businesses in the city. In the past, most of the families were engaged in agriculture, a sector that has not attracted the young to come back to the city. Another interesting point is that Tessaban Mueang Krabi has highlighted "Art and Culture" to promote tourism inside the Tessaban area. Department of Culture has selected Tessaban Mueang Krabi to organize the upcoming Art Olympic, which is held every four years.

Centrality of Tessaban Mueang Krabi is generated not only from its prosperous economy, but also its role as an administrative and service center in the province. In terms of agriculture, there is a plan to construct a large pond as a fish farm to control illegal fishing in the southern area in accordance with governmental regulations. As the largest center of fishery for Phuket, Phung Nga, Surat Thani, Nakhon Si Thammarat and Trang, the fishery industry has historically generated more income and occupation for citizens.

2) Society

Population of Tessaban Mueang Krabi increases by 2% every year, wherein 1.5% is the social increase. The population of Krabi urban area increases by around 2% annually, while that of the entire Krabi province increases by 1.3% annually.





Ratio of a youth segment in the total population has decreased while its older population increases, thereby rapidly increasing the ageing rate.



Figure 7.1.3 Population Pyramid in Krabi Urban Area and Tessaban Mueang Krabi

There are many types of kindergartens, nursery schools, primary schools, and junior high schools that are either managed by the Tessaban, province, or the private sector. High schools in Tessaban Mueang Krabi have the highest academic level in Krabi Province. Although there is no college or university, Tessaban Mueang Krabi has vocational schools. School children, from kindergarten to high school, come from both inside and outside the Tessaban. For medical services, the Tessaban has up to secondary medical care that is available in the Tessaban (or province). People in the province have to go to Hat Yai, Trang and Phuket for tertiary medical care.

Many employment opportunities are available. Since employment opportunities for the young are sufficient in some local industries such as tourism, the ageing rate in these areas is not high, around 9.8% in 2015. Surprisingly, the ageing rate is either low in Southern Thailand and Krabi Province, which seems to be due to the high birth rate in these regions.

Furthermore, only a few students who leave to go to college or to universities in the big cities return to Tessaban Mueang Krabi. Half of the graduates of vocational schools remain in Tessaban Mueang Krabi and, consequently, about 40% of the young generation remains in Tessaban Mueang Krabi, although there has been a slight note of more students recently starting to come back to Tessaban Mueang Krabi to open new businesses. The increasing population of out-migration by the young generation implies

a high birth rate and sufficient employment opportunities in tourism and its related industries in Krabi's urban area.

Tessaban Mueang Krabi has a unique arts and culture that distinguish it from other tourism destinations. It has also a remarkable potential to educate its citizens and provide opportunities for them to integrate its arts and culture with sustainable development of Tessaban Mueang Krabi.

3) Environment

Air and water quality currently meet the environmental standards because of its sufficient forest coverage and water resources. From the mountain ranging about 12 km to the north of Tessaban Mueang Krabi area with watershed of five rivers Phung Nga, Surat Thani, Nakhon Si Thammarat and Krabi, large stream flows into Tessaban Mueang Krabi ensuring good water quality. The southwest monsoon and tides also contribute to its relatively good air quality. No pollution is currently reported. Thus, there is no apparent environmental issue. Tessaban Mueang Krabi is blessed with beautiful landscape including rivers, the sea and its mountain range. However, there is a risk on air pollution from toxic materials such as dioxin from a waste incineration site located outside of Tessaban Mueang Krabi, which should be taken into consideration. Not to mention that the monsoon sometimes causes flooding in the Tessaban Mueang Krabi area destroying properties and endangering lives.

Also, an old coal power plant, which was constructed in 1961 and was shut down in 1995, might have caused environmental degradation in Tessaban Mueang Krabi. Its surrounding communities are upset about the current conditions and have requested appropriate environmental controls. Recently, Electricity Generating Authority of Thailand (EGAT) has proposed a plan to renovate the coal power plant with clean technology in Krabi province in order to generate cheaper electricity for the southern region. The application of clean technology in the conventional power plant could allow EGAT to efficiently control environmental degradation.

Tessaban Mueang Krabi has laid down three pre-conditions relative to allowing the operationalization of the plant:

- (1) The government should provide a university in Krabi to promote education.
- (2) The government has to guarantee palm oil prices of about 5 THB/kg per farmer. Hence, EGAT have already installed palm oil generator in the existing power plant to equalize the electricity prices between coal and palm oil, which can help stabilize the agricultural market.
- (3) The government should provide privileges for province in exchange of the impact of power plant. For instance, communities around the power plant can get free electricity while citizens in the city center can get power discounts of about 10-20% of the electricity price.

There is a plan to reduce the volume of organic waste by making fertilizers at home. Tessaban Mueang Krabi will sell the necessary equipment and provide capacity and knowhow for residents for about THB 500. Residents in turn can produce the fertilizers then sell it back to Tessaban Mueang Krabi, and Tessaban sells the fertilizers to famers and use the revenues to buy new equipment for more community.

Tessaban Mueang Krabi has outsourced garbage collection and disposal operation to the private sector but its performance doesn't correspond to the high cost of the services. In addition, the practice of open dumping has resulted in unpleasant environment. Therefore, Tessaban Mueang Krabi plans to provide proper facilities and the necessary manpower that would operate a municipal disposal site.

There is a plan to urge communities to plant vegetables at home, which can enhance agricultural production and help create additional income for households through the selling of agricultural products to restaurants and hotels.

The city's wastewater treatment site also needs to be expanded since the existing site treats only half of the area of Tessaban Mueang Krabi. Tessaban Mueang Krabi already requested the necessary budget from the Department of Public Works and Town & County Planning for its expansion.

4) Urban Development and Infrastructure

The area between NR 4 and the old town is currently urbanized (North side of Tessaban Mueang Krabi bordered by the main access road to the airport). The large traffic volume on NR 4 and 4034 has caused a number of traffic accidents. As for public transportation, there are buses that operates among the districts. Songtaew or "red-car" is a common public transportation mode while taxis and motorcycles also provide services in Tessaban Mueang Krabi.

Tessaban Mueang Krabi has the highest living conditions compared with its neighboring areas in terms of education and economy. It has a number of elementary and junior high schools and excellent shops as well as a thriving urban environment in general. Many of its citizens are engaged in the tourism industry.

5) Urban Management

There are several points for urban management of Tessaban Mueang Krabi that should be addressed. First, the city seems to be managed well with good leadership and vision led by the mayor. Second, Tessaban Mueang Krabi has a dynamic relationship with its communities. It has various projects, including many that have gained recognition that it carried out with communities and adjacent tessabans. Also, of note is that the local communities have established a conservation network to protect its environmental resources such as its mangroves and marine resources ensuring the compatibility of these resources with its thriving tourism industry thereby guaranteeing sustain incomes for its residents.

7.1.3 Future Perspective under Current Trend

1) Economy and society

Krabi urban area has a sound and promising economic foundation based on its tourism industry. Sufficient job opportunities are expected due to its strong tourism growth. Since the Krabi Airport will be expanded within two years, the number of tourists visiting Krabi are expected to increase accordingly.

While the agricultural sector can also contribute to the increase in income for residents, it is likewise dependent on a fluctuating market forces.



Figure 7.1.4 Population Forecast in Tessaban Mueang Krabi

The risk of a declining population is relatively low since its population will continually increase in the future (Figure 7.1.4). Although its population of elderlies will gradually increase, the growth rate is moderate compared with that of other cities. It is interesting to note that mayor has been actively working to invite universities to Tessaban Mueang Krabi including potential faculties for aviation and marketing, which are not available in the southern region

2) Environment and Urbanization

The urbanization situation will continuously expand in accordance with the increase in population. This will be followed by an increasing demand for utilities including water supply, wastewater treatment and waste management, so that the development of additional facilities are required to attain sustainability and stable service provision.



Figure 7.1.5 Mapping Analysis of Tessaban Mueang Krabi

- 7.1.4 Assessment of Sustainability
- 1) Economic Sustainability
The economic basis for Krabi's urban area looks sound and promising with the increase of tourist inflows in the future. Although there is no large-scale company or factory in Tessaban Mueang Krabi, its tourism industry offers a lot of job opportunities including those in the tourism-supporting businesses. However, there are few job opportunities for returnees, who grew up in Tessaban Mueang Krabi and left for higher education opportunities due to the limited number of highly skilled positions in the city.

2) Social Sustainability

Primary and junior-high education are well provided in the area attracting children's enrollment and students coming from surrounding areas. However, students graduating from middle-level schools have to leave Tessaban Mueang Krabi to enroll in higher education courses in other places.

There are many employment opportunities in tourism and tourism-related industries thereby enhancing future sustainability. However, since there are few white-collar opportunities, many of the young who graduate from higher education do not return to Tessaban Mueang Krabi. Interestingly, risk of aging society is not so serious compared to other cities owing to the Tessaban's higher birth rate.

3) Environmental Sustainability

To sustain its economic growth based on its tourism industry, the conservation of its natural environment is essential for Tessaban Mueang Krabi and its neighboring areas. Therefore, close coordination between Tessaban Mueang Krabi and surrounding areas on environmental protection is needed. Another point is land use and urbanization should be properly controlled in accordance with the increase in population.

The search for a final and ideal disposal site has become an issue due to the increasing volume of garbage that is generated with the increasing population. Waste reduction and recycling including Waste to Energy (WtE) are essential matters in addition to the search and development of a final disposal site. Tessaban Mueang Krabi currently has been collaborating with GIZ¹ to attain better waste management through waste reduction. Tessaban Mueang Krabi also needs to expand its wastewater treatment facilities to meet the demands of its increasing population.

7.1.5 Review of Existing Plans

The LSDP and the Comprehensive Plan for Tessaban Mueang Krabi were reviewed in light of the above assessment. The following were the major findings:

1) Local Strategic Development Plan

Tessaban Mueang Krabi's vision comprises three elements: "A Happy People in a Livable City", "Center of service, and Gateway to Ecological, Historical, Art and Cultural Tourism", and "Ready to be a Q-City by 2026." All the three visions aim for a sound balance among

¹ Deutsche Gesellschaft für Internationale Zusammenarbeit, a German International Cooperation to support sustainable development

education, urban centrality and environment, and a tourism-oriented economy.

To implement the visions, Tessaban Mueang Krabi lists the following strategies: 6 Q's; 1) Clean City, 2) Green City, 3) Safety City, 4) Healthy City, 5) Wealthy City, 6) Quality Tourist Destination City.

Taken from a sustainability viewpoint, these strategies are appropriate and reasonable for Tessaban Mueang Krabi. However, there is a need for Krabi's urban area to enhance environmental coordination with Changwat and its surrounding areas to implement these strategies especially through the conservation of environmental resources. While economic sustainability largely depends on the beach resorts that are outside Tessaban Mueang Krabi, conservation efforts should be implemented in the entire region, especially between the resorts and Tessaban, due to the environmental correlation among them.

2) Comprehensive Plan

Urban development occurs along NR 4 and the area between the old town and the new urban area. The built-up areas are illustrated in the existing comprehensive plan (Figure 7.1.6).

Since the Provincial Comprehensive Plan was prepared to cover the inland and coastal areas, the regional urban development and environmental management plans should cover both Tessaban Mueang Krabi and the beach resorts.

3) Provincial Strategic Development Plan

The vision of the provincial strategic plan is "A Tourism City with International Quality Standards, Sustainable Agricultural Industry and a Likable Society" under the over-arching goal of "A Sustainable and Livable Krabi City".

The following three strategies are the strategic principles and flagship projects:

- (1) Improvement on marine tourism in terms of the conservation of the art, culture, history and health to meet the international standard;
- (2) Securing the agricultural industry including the manufacture of food from fishing and livestock; and
- (3) Improvement of the quality of life leading toward a livable society.

As summarized in the strategies above, the economic focus of the Provincial Strategic Development Plan is on the tourism and agriculture industries while its social aspects underscore the improvement of the quality of life, security, safety, as well as administration. From the environmental viewpoint, waste management and conservation/restoration of natural resources are highlighted.



Figure 7.1.6 Krabi City Comprehensive Plan

7.1.6 Sustainable Future City Plan

1) Future Vision

Mayor's principle: "Art-Cultural City with Tourism"

On the other hand, PT meetings lays down the following three points as future vision of Tessaban Muang Krabi:

- City with sufficient income based on tourism;
- City with high education and livability; and
- City with sustaining good environment.

These vision from the PT meetings are considered as concrete elements of the mayor's theme of an "Cultural City with Tourism".

2) Issues to be Addressed

The "Art-Cultural City with Tourism" vision, which, in itself, entails sufficient income, high education, livability, good environment as important elements, requires the need to tackle and address the following issues to realize the said vision:

- How to keep the young generation in Tessaban Muang Krabi?
- How to sustain the resorts-oriented tourism?
- How to promote Andaman Culture (culture of diversity and coexistence) through education and the development of human resources?
- How to achieve a stable waste sewerage management regime in the whole region?

3) SWOT Analysis of the Future Vision

able 7.1.1 SWOT Ana	ysis for Sustainable	Future City Plan
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Strength	Opportunity
Well known beach resorts	 Increase of tourists under AEC
 Accumulation of tourism industry and tourism 	Joint tourism project among "Andaman Cluster"
supporting industry	• Art Olympic in tessaban every 4 years by the
Livability of Tessaban Krabi	Department of Culture
Andaman Culture (i.e. culture of diversity and	Collaboration in term of tourism in Andaman
coexistence)	group.
• A variety of natural resources, including beaches,	• Airport will be expanded within 2 years.
waterfalls, hot springs and mountains.	
• Uniqueness of the art (i.e. sculpture, museum and art	
festivals)	
Beautiful landscape	
Weakness	Threat
Disparity of income assessment	Deterioration of the beach environment
Imited job opportunities for white-color young job	Competition among beach resorts
seekers	Mass-media broadcasting incorrect information
Limited tourism products	providing negative/ inappropriate image of the
Language skills especially English and Chinese to	city)
communicate with tourists	Lack of local product promotion, including
Lack of specialists for art-building design to promote	traditional food, product and attraction. (i.e.
tourism in the city.	packaging design)
• Relatively high price of products and services in the city.	Risk of flooding and traffic accidents

4) Basic Direction

Tourism products in Krabi should be more valued and diversified to add to the sustainability of Krabi's economy. For this purpose, its environmental and tourism resources should be carefully conserved and wisely utilized, particularly in the beach resort areas. The city tour (based on Andaman Culture) is one of the additional tourism products in the beach resorts. On the other hand, Andaman Culture is a sort of "identity" of inherent tag even in the Tessaban's aspirations on urban development together with human resource development under the overarching concept of a unique "Andaman Culture" that will make Krabi more livable and function as viable basis of the unique "city tours".

Target:

- Increase the number of tourists in the beach and Tessaban areas.
- Keep the water quality in the beach resorts within the Thai standard.

5) SFC Strategy

Strategy 1: Conservation and promotion of environmental and tourism resources.

Strategy 2: Conservation and promotion of cultural and tourism resources.

Strategy 3: Promotion of Integrated CBT.

Strategy 1: Conservation and promotion of environmental and tourism resources

Target: To sustain the beach tourism industry by preserving the environment and sustaining the economy

Program:

- Awareness campaign on conserving natural and environmental resources.
- Environmental restoration.

Strategy 2: Conservation and promotion of cultural and tourism resources

Target: To sustain cultural tourism through conservation and promotion of cultural resources.

Program:

- Enhancement on the dissemination of Andaman Culture.
- Human resource development on the Andaman Culture

Strategy 3: Promotion of integrated CBT

Target: To promote the city tour and diversify tourism in Krabi and increase job opportunities for the youth in the sightseeing program.

Program:

- Development of tour program/package.
- Establishment of access routes through necessary transportation.
- Establishment of an operation and management system.

6) SFC Framework

In accordance with these basic principles, the generation of sufficient income from tourism and improvements on education and livability to sustain its high-quality urban environment were identified as the focal areas of the SFC Plan during the PT meetings. The mayor set the "Art-Cultural City with Tourism" as future vision in the SFC Plan with consent from the PT members since the integration of conservation and the promotion of the environmental and cultural resources with CBT makes Krabi City more livable in terms of culture, environment and economy.

The following strategies have been proposed to implement the objective of the SFC Plan as well as its future vision. The framework and components of the SFC Plan are described in Figure 7.1.7 and Table 7.1.2.



Figure 7.1.7 Framework of SFC Plan

Strategy	Program	Project	Budget	Organization
1. Conservation	1-1	1. Training environmental		
& promotion of	Awareness	volunteer		
environmental	campaign for	-Organize the community	14,490	Krabi Town
and tourism	conserving	leaders workshop in		Municipality
resources in	natural and	Tessaban Krabi area and		
Krabi urban	environmenta	found the environmental		
area and	l resources	voluntary groups in 14		
surrounding	(ongoing).	communities (with 80		
beaches/islands.		members in total).		
		Offering training course -		
		for people	20.000	Krabi Town
		-Office materials	20,000	Municipality
		-Lunch spack and	-	widincipality
		refreshments		
		2. Campaign for environmental		
		conservation and education		
		institution sustainably.		
		-Organize the community	69 999 40	Krabi Town
		leaders workshop in	03/333110	Municipality
		Tessaban Krabi area and		
		found the environmental		
		volunteer groups in 14		
		communities (with 80	50,000	Krabi Town
		members in total).		Municipality
		-Launch environmental		
		conservation campaigns in		
		communities and academia		
		under Tessaban (1 activity		
		per 1 institute).		
		3. Campaign for creating a	50.000	
		Kwang	50,000	Krabi Town
		-Organize a referentation		wunicipality
		project The participants		
		were children youth and		
		adults. 500 trees will be		
		planted including sago trees		
		and cork trees.		
	1-2	1. Green area development	50,000	Krabi Town
	Conservation	(Pa-Nu-Rat community, Pa-	/	Municipality
	of natural and	Wat-Panurat) The project		_
	environmenta	implemented in 2017.		
	l resources	(1) The 1 st public participation		
	(ongoing).	(2) Buddhist proverbs on		
		boards		
		(3) Tree tags		
		(4) Activities to maintain trees		
		2. Development of 5		

Table 7.1.2	Components of	Sustainable	Future City	/ Plan
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Strategy	Program	Project	Budget	Organization
		subprograms about		
		sustainable urban		
		environment.		
		(1) Conservation tourism		
		(2) Waste management		
		(3) Cultural and traditional		
		maintenance of public		
		spaces		
		(4) Sufficiency economy		
		3. Learning and administrative		
		city		
2. Conservation	2-1	1. Improvement on facilities in		
& promotion of	Enhancement	Andaman Cultural center.		
cultural and	on	(1) Improvement on entrance		JICA Pilot
resources in	of Andaman	Museum		Project
Krabi urban	Culture (SFC	(2) Improvement on roof of the	2 700 000 -	
area and	Program).	arcade.	2,700,000	Krabi Town
surrounding		(3) Improvement on souvenir	1,800,000	— Municipality
beaches/islands.		shop and packaging design.		
		(4) Improvements on circulation	J	
		of art exhibition.		
		2. Local Community Products	21,000,000	Community
		and Andaman OTOP Shop		Development
		(1) Construction of Andaman		and Krabi
		OTOP Shop.		Town
		(2) Interior design which is		Municipality
		divided provinces into 5 zones		1 5
		such as; Phuket, Phang Nga,		
		Krabi, Ranong, and Trang.		
		(3) Products and goods storage		
		rooms.		
		Shon) located at Andaman		Project
		OTOP Shop area.		ejeet
		3. Marketing and public		JICA Pilot
		relation promotion based		Project
		on the coordination with		
		relevant stakeholders.		
		4. Promotion of art activities and	100,000	Krabi Iown
		cultural learning and leaching		iviuriicipality
		5. Establishment of local		
		supporter/volunteer groups		Krabi Town
		and their activities.	50,000	Municipality
		6. Thailand Biennale Krabi 2018		
		(International Contemporary		Krabi Cultural
		Art Show).	50,000,000	Office and
		Art Show).	50,000,000	Office and Krabi Town

Strategy	Program	Project	Budget	Organization
		7. National Artists Exhibition		Municipality
		8. International Art Workshop	1,000,000	Municipality
		9. International Art Hall – Phase 2 (FY 2019)	2,000,000	
		10. The Historical Tracing Ship (FY 2019)	90,000,000	
		(5) The Andaman Community Tourism	32,000,000	
			32,000,000	
	2-2 Development of human resources based on the "acceptance of diversity and coexistence" of Andaman arts and culture (under planning).	 Local arts and culture curriculum. Signed MOU with education institution to develop quality of education and Andaman cultural center. Encourage local scholars into children and student learning based on the signed MOU. Promoting arts and culture activities by national and local artist focusing on student's participation. 		Krabi Town Municipality
3. Promotion of integrated community- based tourism (CBT).	3-1 Development of tour program/ packages.	 Feasibility Study on the price and contents of the package. Determination of number of trips/day and the suitability of each cycle time based on the coordination with relevant stakeholders (e.g. Tourism Council of Thailand). Marketing promotion and public relations based on coordination with relevant stakeholders (e.g. TAT, Tourism Business Association). 		Krabi Town Municipality

Strategy	Program		Project	Budget	Organization
	3-2	1.	Selection of transport modes		
	Establishment		and routes.		
	of access	2.	Planning and development	3,950,000	
	routes with		of the necessary facilities for		
	necessary		CBT.		
	transportatio	3.	Procurement of necessary	3,040,000	
	n and		vehicle such as Tourism		
	facilities.		Buses and Boats.		
		4.	Construction of a Food	2,055,000	
			Safety Center, the		
		_	Community Souvenir Shop.		
		5.	Local Community Souvenir		
			Shop and the construction of	1.955.000	
			embankment to prevent	.,,	
		6	Floating Market in front of		
		0.	Floating Market in front of		
		7	Footpath Improvement		
		7.	Footpath improvement		
				<u>11,000,000</u>	
	3-3	1	Recruitment for project		Krabi Town
	Establishment		operation and management.		Municipality
	of an				
	operation and	2.	Capacity enhancement for		Krabi Town
	management		operation and management.		Municipality
	system.				
	-	3.	Environmental development	243,504.62	IGES
			for ecotourism.		
		(1)	Creating the knowledge		
			about ecological diversity.		
		(2)	Farm model for sustainable		
			nature.		
		(3)	Ways of life and		
			environmentally friendly		
			consumption for sustainable		
		.	environment.		
		4.	Arts create humans and		
			humans create cities		

7.2 Project Implementation Support



Figure 7.2.1 Master Plan Process for the Pilot Project

In order to prepare the action plan for the pilot project, the whole master plan process for the pilot project (Figure 7.2.1) was conducted to formulate the details of the implementation plan and its execution. At the beginning, the SFC Framework was reviewed to identify the scope of the selected projects. After that, the primary and secondary data were collected in order to understand actual situations. The primary data was collected through interviews and questionnaires and including those from the secondary data collection. And then a public participatory process was operated through stakeholder engagement and a co-creation workshop by using the result of data collection. This process supported the formulation of the criteria for the pilot project including making an action plan for the pilot project.

7.2.1 SFC Framework



Figure 7.2.2 SFC Program Framework

Notwithstanding its significant potential, the functions of Andaman Cultural Center and Andaman OTOP Shop cannot be fully utilized in disseminating Andaman Culture toward sustainable tourism promotion.

With these reasons, Strategy 2: Conservation and Promotion of Cultural and Tourism Resources in Krabi Urban Area and Surrounding beaches/island was prioritized to promote both the local Andaman culture and tourism. Meanwhile, Program 2-1: Enhancement on Dissemination of Andaman Culture was selected to implement and prepare details. It can be seen in Table 7.1.2 that the program can be divided into 11 main projects. The three main projects were detailed in the sub-projects and selected for financial support and implementation by JICA, as shown in Figure 7.1.7. Meanwhile, the rest is expected to be implemented by the relevant agencies.

7.2.2 Data Collection

Secondary Data

In 2012, the TAT launched a "creative tourism" campaign, which was promoted to implement the policy objective of developing a creative economy. Then in 2015 Thailand launched "Thailand 4.0" as a national policy to drive creativity and innovation through agriculture, tourism and community development. Creative tourism embraces local wisdom and searches for ways to express local identities, and if they are co-created well with multi-stakeholders, they could be used as an innovative tool to develop intergenerational exchanges on arts, history and the story of places. The national policy is now to promote tourism within the community as a means of supporting sustainable community development. Many tourist activities associated with agro-tourism (such as farm visits and Thai cuisine) are embedded within the creative tourism approach.

Table 7.2.1 provides information about the number of visitor arrivals in Krabi. It was also found that there are more than 900 registered tour companies in Krabi which clearly indicates an opportunity that may not have been well-captured by the Andaman Cultural Center. However, marketing partnerships between the Center and these intermediaries are limited and the relationship between related tourism sectors should be re-evaluated as well.

Andaman Cultural Center is the learning resource for arts and culture along with histories of Krabi Provinces and other southern provinces in the Andaman coast. This center conveys the rich part of Krabi as the port city that could date back to 2,000 years ago to the present days. It also serves as the place of creation that showcases arts and culture-related works from all sorts of artists from the provinces along the Andaman coastline including those living abroad.

The Andaman Cultural Center has been gathering a number of visitors. Majority of the recorded visitors were pre-booked groups of students who were visiting the center as a part of school field trip. It was evident during the site observation that data-collecting process, in order to compile statistics for visitor arrivals, has not been well executed. So, a better system is needed to profile visitors and monitor any changing trends.

ltems	2009	2010	2011	2012	2013	2014	2015
Visitors	2,212,241	2,386,266	2,665,530	3,160,738	3,761,234	4,735,217	5,575,541
Thai	1,082,515	1,238,058	1,324,679	1,570,560	1,765,243	1,952,598	2,087,433
Foreigners	1,129,726	1,148,208	1,340,851	1,590,178	1,995,991	2,782,619	3,488,108
Tourists	2,026,636	2,145,047	2,439,711	2,845,518	3,275,495	3,392,747	3,557,409
Thai	967,762	1,085,135	1,150,185	1,324,529	1,503,279	1,572,045	1,650,174
Foreigners	1,058,874	1,059,912	1,289,526	1,520,989	1,772,216	1,820,702	1,907,235
Excursionist	185,605	241,219	225,819	315,220	485,739	1,342,470	2,018,132
Thai	114,753	152,923	174,494	246,031	261,964	380,553	437,259
Foreigners	70,852	88,296	51,325	69,189	223,775	961,917	1,580,873
Average Length of	3.17	4.25	4.61	4.71	4.95	4.70	4.46
Stay (Day)							
Thai	2.48	3.62	4.40	4.58	4.72	4.46	4.25
Foreigners	3.81	4.89	4.80	4.82	5.15	4.91	4.64
Average							
Expenditure							
(Baht/Person/Day)	3,031	3,248	3,280	3,521	3,889	4,235	4,381
Visitors	2,532	2,668	2,919	3,159	3,543	3,812	3,992
Thai	3,336	3,698	3,582	3,830	4,161	4,484	4,633
Foreigners	3,074	3,279	3,307	3,559	3,945	4,259	4,458
Tourists	2,565	2,699	2,955	3,212	3,605	3,913	4,109
Thai	3,376	3,719	3,596	3,847	4,208	4,596	4,821
Foreigners	1,548	2,084	1,896	1,902	2,037	2,303	2,384
Excursionist	1,835	1,856	1,872	1,854	1,876	1,957	2,107
Thai	1,083	2,478	1,977	2,071	2,225	2,440	2,461
Foreigners							
Revenue (Million							
Baht)							
Visitors	20,142	30,389	37,646	48,271	67,979	73,239	78,336
Thai	6,361	10,892	15,278	19,939	26,071	28,180	29,742
Foreigners	13,782	19,496	22,369	28,332	36,908	45,058	48,594
Accommodation							
Establishments							
Rooms	12,446	10,808	15,529	18,692	18,122	18,607	19,020
Occupancy Rate (%)	52.84	41.35	41.83	44.41	56.67	59.51	62.81
Number of guests	1,662,321	1,370,397	1,982,639	2,540,879	3,194,669	3,314,403	3,482,186
arrivals							
Thai	827,821	553,400	738,767	1,168,836	1,437,891	1,500,391	1,582,335
Foreigners	834,500	816,997	1,243,872	1,372,043	1,756,778	1,814,012	1,899,851

Table 7.2.1	Number	of Visitor	Arrivals	in	Krabi
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Source: Department of Tourism, Ministry of Tourism and Sports

Group (Person)	2014 (Nov-Dec)	2015	2016	2017 (Jan-May)
Study Tour/ Field Trip	2,422	31,798	32,750	14,674
General Public	682	4,911	6,469	4,533
Total	3,241	37,801	39,801	21,256

The focus should be on how the Center can take advantage of the increasing number of visitors to Krabi as well as developing and encouraging tour companies to add the Center as a city tour activity thereby helping promote more local cultural experiences. At the

same time, the Center could try to meet travelers' needs for a local authentic and quality experience.

Tessaban Muang Krabi has less number of tourists inside the Tessaban area because majority of the tourists travel to the resorts outside the Tessaban area. Thus, the Tessaban had formulated a plan to enhance the dissemination of Andaman Culture and increasing the number of tourists in the city in order to achieve the vision of an "Art-Cultural City with Tourism". So, The Andaman Cultural Center was selected as a core representative of the Andaman Cluster so as to promote tourism as well as disseminate Andaman Culture.

Primary Data

1) Telephone Interviews

Understanding existing political climate was also noted as a key to success. Telephone interviews were conducted with stakeholders from the three sectors; tourism authority, tourism private entity and Krabi local resident. The phone interviews were conducted informally to permit a free expression of views on the current situation. Confidentiality was emphasized.

Pros	Diversity of the implementation team. Access to sufficient budget. Visionary leader Well-supported by all related governmental bodies, hence level of cohesiveness is high.
Cons	Large size of the group of implementation team; voice may not be well-heard. Limited opportunities to gain wider public involvement in decision-making processes. Tangible elements could be emphasized. Budget management and return on investment is questionable by public at large.
Recommended Actions	Carefully designed for more co-creation and engagement; ease the hierarchical structure for better idea expressions. Create some quick wins to gain momentum in the implementation through real sense of ownership.

Table 7.2.3 Summary of the Existing Political Climate

2) Questionnaire Design

A survey instrument is a structured questionnaire. The paper-based questionnaires were disseminated to visitors at the exit area of bead museum for data collection. The questionnaires were designed to assess visitors' (local and tourist) perceptions using five elements: namely Entrance Design, Exhibition Design, Interactivities, Referral Marketing in the dissemination of culture, and visitors' Perception on "Thinking Green." Respondents were classified into two groups: 1) internal visitors: PT and PCC members, and 2) external visitors: Tourists who visited bead museum.

As a result, most respondents were "Asians" and these included 100% internal visitors and 97.52% external visitors. The rest mostly came from the United State and Australia. In terms of gender, they were divided into three groups: Male, Female and LGBT, which accounted for 82%, 71% and 3%, respectively. The age of internal visitors was between 35-44 years old (31.43%), 45-54 years old (25.71%) and up to 65 years old (17.14%), respectively. Meanwhile, for external visitors, the age brackets ranged between 25-34-years old (30.58%), 15-24 years old (23.14%) and 35-44 years old (22.31%) respectively. As for "purpose of visit", internal visitors mostly came for field trip (40%) while external visitors mostly came for leisure and travel (80.99). On frequency, the internal visits mostly ranged from a few times a year (45.71%) to more than one month (25.71%) at most. On the other hand, the external visitors knew the Center and the local people/culture with a high rate of 91.43 while external visitors knew the same factors through friends and relatives (44.63%).

According to the information of visitors, the quantitative analysis was also taken with the 5 Likert Scale related to the four above elements. First, in the entrance area, it was revealed that there was no significant difference between Internal and External factors with a 95% confidence interval.

In Figure 7.2.3, internal visitors concentrated in the well-designed entrance which provided the first impression while external visitors acknowledged the well design. In terms of information, both internal and external visitors agreed that they found the necessary information expected in such set up. However, internal visitors didn't to be too satisfied regarding the direction of the arrival information even as external visitors considered them to be fine.



Figure 7.2.3 Entrance Design

As shown in Figure 7.2.4, parts of the exhibition design revealed that although the results showed what visitors could learn about the Andaman culture from the design of the exhibition (layouts/ decorations/ architectures) got a high score, while the multimedia interpretation and all-senses exhibits (visually/musically/kinesthetically) which interacted with the interpretation in the exhibition could still be improved to help visitors appreciate the local culture.



Figure 7.2.4 Exhibition Design

In the interaction, as shown in Figure 7.2.5, the opportunities to have an interaction with locals got the lowest score. The items that rated the lowest were "the Center provides spaces or facilities to talk with friends", followed by "there are many interactive workshops for me to enjoy and learn local culture" and "I was able to connect with local community" respectively.

In terms of Referral Marketing, as shown in Figure 7.2.6, the Center could be used for tourist information and there is a potential channel to promote CBT and the promotion of local products. This is not yet the case as shown in the survey; visitors indicated that they were expecting more from what the Center currently offered. The following item was rated lowest "I thinkL the content in the exhibition is sufficient to my expectation". As the result of this, visitors are not willing to recommend the Center to their friends and families thereby indicating a low score when asked whether "I will recommend the Center to my friends and family".

The last, the visitor perceptions on Thinking Green, garnered a low rank in the eco-friendly factor. A climate friendly management could be better implemented as shown in Table 7.2.4.



ข้าทเจ้าจะแนะนำเพื่อนและญาติให้มาเยี่ยม ขมคูนย์ฯ-I will recommend the centre to my friends and family.

นิทรรศการและการจัดแสดงทำให้ข้าพเจ้ามี ความอยากรู้อยากเห็นเพิ่มเติมเกี่ยวกับวิถีชีวิต ต้องถิ่น-The exhibition makes me want to see more about local ways of life.



(Internal)

ผู้มาเยี่ยมชม

(External:Visitors)

ข้าพเจ้าจะกลับมาเอี่ยมรมศูนย์ฯ นี้อีกใน อนาคต-I will revisit Andaman Cultural Center.

3.00

2:50

2.00

1.50

1.00

Figure 7.2.6 Referral Marketing

	ทีมคณะทำงาน (Internal)		ผู้มาเยี่ยมขม (External:Visitors)		รวมทั้งหมด (Total)	
ระดับความเป็นมิตรต่อสิ่งแวดล้อมของ ศูนย์ฯ Visitors' Perception on Think Green	ต่าเฉลี่ย- Mean	ความหมาย- Interpretation	ค่าเฉลี่ย- Mean	ความหมาย- Interpretation	ค่าเฉลี่ย- Mean	ความหมาย- Interpretation
ระดับความเป็นมีตรต่อสิ่งแวดล้อมของศูนย์ฯ- From your visit, how much do you rate the centre as being eco-friendly?	3.09	รู้สึกเป็นกลาง Neutral	3.99	มีความเป็นมิตรต่อ สิ่งแวดล้อมมาก : Very eco- friendly	3.79	มีความเป็นมีตรต่อ สิ่งแวดด้อมมาก Very eco- friendly

Table 7.2.4 Visitor's Perception on Think Green

Lastly, the part of comment and suggestion showed that most of the people concerned on the atmosphere and facilities in exhibition room (35.19%) and the improvement of frontage area of Andaman Cultural Center (Figure 7.2.7).



Figure 7.2.7 Comments and Suggestions

3) Public Participation

- Stakeholders' Engagement

After questionnaire, the public participation process was conducted through a process of stakeholder engagement and co-creation workshops. The following are the objective of stakeholder engagement:

- 1) Introduction, data collection and analysis of current conditions;
- 2) Clarification of current conditions and sharing of study results;
- 3) Brainstorming and finalization of the scope of the JICA pilot project; and

4) Top Management meeting: Consensus building for the implementation process of the selected pilot projects.

Results of these engagements led to a clearer scope of the JICA pilot project which was implemented in a participatory manner.

Table 7.2.5	Summary of	Participatory	Process: Meetings	with Relevant Stakeholders
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Meeting	Objectives	Attendees	
Pre-workshop	Preparation for the Workshop with	Krabi Municipality	
weeting	and Project Coordinating Committee (PCC)	JICA Project Team	
		Perfect Link Consulting Group (Local	
Stakeholder	Identify Krabi's Tourism Situation	Consultant) Tourism Authority of Thailand (Krabi Office)	
Interviews	Discuss collaboration between TAT and JICA's	JICA Project Team	
	Pilot Project in Krabi	Perfect Link Consulting Group (Local	
	Suggestions for Improvement for Andaman	Consultant)	
Wrap Up	Update on Workshop and Pre-test Results	Krabi Municipality	
Meeting	Next steps for the next PT/PCC Meeting	JICA Project Team	
	Reconfirmation of tourism statistics and DATA	Perfect Link Consulting Group (Local	
ard	gathered	Consultant)	
3 ^{ra} Implementation	Presentation of Pilot Project Progress	Krabi Municipality	
Team Meeting	Recommendations on Criteria and Components of Andaman Cultural Center Improvement	Tourism Authority of Thailand (Krabi Office)	
and 5 th PT Meeting		Krabi Noi Sub-District Municipality	
	Recommendations on Activities from Local Communities	Krabi Technical College	
		Thung Long Community	
	Collect more information and suggestions on criteria and components of Andaman Cultural	Baan Thung Long Community	
	Center Improvement	Mueang Gao Patthana Community	
	Opinions on Activities from Local	Koo Mueang Community	
	Communities	Baan Tha Klong Community	
		Pak Nam Community	
		Baan Tha Daeng Community	
		Krabi Media	
		Local Artists	
		JICA Project Team	
		Perfect Link Consulting Group (Local Consultant)	
		RDM Design Group	
Post-inspection	Summarize key points from the PT and PCC	Krabi Municipality	
Meeting with Architects	meeting	JICA Project Team	
	Reflection on the site visit with expert team	Perfect Link Consulting Group (Local	

Meeting	Objectives	Attendees
	Discuss necessary information for criteria development and conceptual design/construction works with experts	Consultant) RDM Design Group
Summary of 3 rd Implementation Team Meeting and 5 th PT Meeting	Summary of 3rd Implementation Team and 5th Planning Team Meeting Next steps of JICA Pilot Project	Krabi Municipality (with the Mayor) JICA Project Team Perfect Link Consulting Group (Local Consultant) RDM Design Group
Master Plan Presentation and Hearings with Architects	 To evaluate the architect's recommended overall improvements on Andaman Cultural Center and extract applicable elements to JICA Pilot Project To finalize specific areas of work for JICA Pilot Project; decision to be made upon the following points: Overall criteria for the enhancement/design and construction works Specific location and implementation plan of the JICA pilot project (entrance area enhancement, local beverage and PR components) Preliminary estimated budget, timeframe and responsible key stakeholders 	Deputy Mayor chaired the meeting with 44 PT/PCC members, representing PT/PCC JICA Project Team Perfect Link Consulting Group (Local Consultant) RDM Design Group
Top Management Meeting for consensus building	To gain consensus for the implementation of the pilot project To clarify the implementation and management process for the pilot project	Management Committee Krabi Town Municipality JICA Project Team

Interviews and the updating of the project with the key team from the Tessaban came to an agreement that the three components of the pilot project should be conceptualized in conjunction with two key Tessaban's SFC projects: Andaman OTOP center and the integrated CBT program which will be managed by communities.

In addition, the results of the discussion with stakeholders strongly indicated that better partnerships should be developed with tourism intermediaries in Krabi. An additional survey of registered tour companies in Krabi was then designed and conducted. The list of 450 registered tour companies was obtained from the department of tourism. An online survey was then launched. However, it was found that the list of all 450 registered tour companies details. This was assumed that one owner or manager registered more than one company.

This set of surveys was done to assess the level of interest and initial feedback from potential marketing bodies. Four hundred fifty e-mails were sent to registered tour

companies in Krabi through an online survey; only 17 out of 450 (3.78%) responded. Only two out of 17 companies answered. It showed that only two out of 17 companies set tour programs or brought tourists to visit Andaman Cultural Center. The reason why they did not set a tour program to Andaman Cultural Center was because two out of 15 companies answered that they "did not know" the Andaman Cultural Center, while six out of 15 companies answered that "they knew but they don't have information about what is interesting there." Seven out of 15 companies answered that "they knew but there was no activity nor interesting thing for our customers in the Center". The conclusion drawn from this was clear that there is an urgent need to communicate better about the presence of the Center and to design a more viable/marketable activities for prospective visitors.

- Co-Creation Workshop

The co-creation workshop was designed to generate ideas and gain consensus with the relevant stakeholders. The mayor of Krabi presided over the opening of the workshop and encouraged the implementation team to strive for the best. The following were the objectives of the workshop:

- To review the components of pilot project and explain the next steps;
- To create shared vision and formulate an integrated detail of each component (social, environmental, economic); and
- To prioritizes projects (from proposed 3 components) that would fit into the limited time and budget for the pilot implementation.

The facilitators explained the objectives of the meeting and the workshop. A group of five to six people was formed and divided into five teams. Each team brainstormed ideas to address the following questions:

- How would you like to see Andaman Cultural Center? The question was intended to create Shared Visions and Expectations thus helping identify key functions of the Center which are expected by the stakeholders.
- What can you (your organization or your community) do to MAKE the dream come true? This is to create a list of action plans which were collaborative.
- Draw your vision and how you would like to see the Center improved?

To sum up, stakeholders were able to generate a number of "wish-lists." The "wish lists" were content-analyzed and clustered into five key components:

- Creative space for cultural activities to be showcased;
- Increase green space;
- Areas/ opportunities for local products to be displayed;
- Open space for recreation for locals, for everyone to enjoy; and
- Sustainable and local design/make the Center a unique "city landmark."



Figure 7.2.8 Co-Creation Workshop



Figure 7.2.9 Criteria of the Pilot Project

Results from the workshop were presented to the PCC. They agreed and strongly supported the creative open space idea that could be made available for locals to gain access to the Center and to provide opportunities for local performances to be showcased. Specific areas to be improved were agreed that the entrance should be eco-friendly (green). Local identities should be incorporated into the design.

The components of the SFC plan and the pilot project were reviewed to ensure that the five necessary elements generated from the stakeholders' engagement were included in the thinking and design processes. Results from the interviews, survey and SFC framework were consistent, forming a basis for the foregoing recommendations to be formulated and then presented to the Tessaban.

It should focus on the do-able area to achieve a "quick win" and build from the initial successful small step – Improve the entrance to be more "inviting" – Make the operating time clear (open-closing periods). The foyer upon arrival could be designed to incorporate the criteria generated from the workshop, which were: 1) waiting area showing local beverages and local showcases, 2) a community tour display area, 3) calendar of local communities "arts and craft and the local culture." The workshop for this included organizing a family trip and targeting intermediary groups, once the improvements are in place.



Figure 7.2.10 Preliminarily Outlined Action Plan

7.2.3 Selection of Pilot Project

In order to maximize the benefits of existing and planned facilities for the dissemination of Andaman Culture, various projects have been proposed for Andaman Cultural Center and Andaman OTOP Shop as previously described. Since the contending issues, as shown in Figure 7.2.11, were identified as the major obstacles in the dissemination of Andaman Culture toward sustainable tourism in Krabi, the JICA Pilot Projects have been selected to eliminate these obstacles to ensure the sustainability.



Figure 7.2.11 Framework of the JICA Pilot Project

The three important elements of the pilot project were integrated as it was deemed important to demonstrate holistic thinking and achieve sustainable management and development. In addition, it was designed and planned as a case example on how to incorporate environmental issues into the management of a local beverage shop where communities could share their local culture, heritage, and pride.

In order to ensure that the provisional budget could be used as effectively as possible, the list of complete master plan for the improvement was formulated. A user-centric analysis was used to identify the flow of the visitor's experience that could result in a clear list of issues and solutions for the master plan to be developed. The following illustrations and tables provide the master plan for the improvement; issues and solutions were listed for best selection. The picture and table below depict these issues into five categories:

- Entrance area (outside)
- Entrance area (inside)
- Space between the buildings
- Circulation and building layout
- PR/Marketing



Figure 7.2.12 Problem Identification: User-centric Approach

Area	lssue	Solution
Entrance Area (Outside)	Visibility from the main road is quite poor.	 Installing a visible signage. Planting trees along main road to mitigate the negative impact of the fence.
	Parking and green spaces are not sufficient. Parking circulation is not convenient/ efficient.	 Expanding the parking area through planting and designated new entrance and exit.
	No designated walkway with shade from parking to building.	 Providing a direct pedestrian access and planting from main road/ parking to the building.
	No space to interact and rest.	 Providing open space with planting. Developing a Local Beverage Shop.
	The main plaza is not well designed to support multi-functional activities	 Providing open space with planting for social interaction.
Entrance Area (Inside)	Main entrance is not visible well.	 Providing direct access from the south-west side.
	Design of space is not efficient.	 Renovating the under-utilized facilities and spaces.
	Lack of information on the entire circulation/ building layout and tourism in Krabi.	 Installing a facility layout/ circulation map. Providing tourist information by constructing a tourist information area.
Space	Not well designed to support the function	- Installing the planting, seating,

Table 7.2.6 Issues and Solutions for the Andaman Cultural Center Improvement

between building	of the facility. Green space is not sufficient.	open space, and signage between buildings to enhance linkage and
Circulation and Building	Relationship and access among the buildings are not clear.	efficiency of their functionality.
Layout	Art museum is located too far from the main entrance.	 Installing a facility layout/ circulation map at the entrance of the Beads Museum. Installing a visible signage in front of the Art Museum.
PR/Marketing	Existence of Andaman Cultural Center is not well known.	 Invite tour operators and guides for the completion ceremony of the JICA Pilot Project. Establishing/updating a platform to disseminate information.
	Involvement of local community is limited.	 Hire local staff in the Local Beverage Shop. Secure the space (e.g. Local Beverage Shop, Outdoor open space) and organize the events to introduce local culture, arts products and CBT.

After indicating all issues and solution for the improvement of the Andaman Cultural Center, the plan was carefully considered and reviewed. The decision needs to be based on a sustainable future citiy framework.

It was clear that the committee foresaw a more urgent need to improve the visibility and the identity of the Center by creating better awareness among the bypass visitors and inviting them to visit the center instantly. The list of improvements and the proposed master plan are shown below.



Figure 7.2.13 Proposed Master Plan

Relationship between all the selected elements of JICA Pilot Project:

- Design & Build is based on sustainable principles, using Local Beverage Shop as a platform to promote local heritage;
- A proposed improvement plan for the Center is to attract both residents and visitors as well as to enhance the overall experiences of visitors in sharing and learning about their culture;
- PR & Marketing components should be built based upon the local assets and formulated with the participation of stakeholders to create an identity that can used as a pilot example at the Local Beverage Shop.
- Management system should be established through this pilot project and should later be expanded by communities or related stakeholders.

No	Contents	Level of Implementation	Preliminary Estimated Cost (THB)*
1	Parking Expansion for vehicular circulation improvement and different types of vehicles which are car, motorcycle, bike and tourist bus. Also planting along parking areas and project frontside boundary.	Detailed Design	99,750
2	Construction of pedestrian access from main road and parking areas to the buildings with trees along it.	Design and Construction	205,200
3	Renovation of the existing plaza to create more green open space for social events and rest.	Design and Construction	410,400
4	Installation of main project sign at drop-off area and flag signs along main road and the building facade.	Design and Construction	80,000
5	Construction of One Local Beverage Shop with outdoor seatings (approximate 50 Sq m.)	Design and Construction	1,082,240
6	Addition of the direct access from south-west side and sub-entrance both sides to connect with space between the buildings.	Design and Construction	205,200
7	Renovation of the existing information centre in the entrance area of Beads Museum, (including the installation of facility layout map, tourist information and rest area) approximate 120 Sq m.	Design and Construction	492,210
8	Installation of kiosk, planting, seating, open space and signage in the space between the buildings to enhance the linkage and efficiency of their functionality. (Solar roof is excluded)	Detailed Design	5,000
9	Hosting events to introduce the centre as well as local culture, arts products and CBT.	Design and Implementation	170,000
10	Establish unique selling point (USP) based on an inventory of community activities and design CBT logo to be used in a leaflet.	Design and Implementation	50,000
	TOTAL ESTIMATED COST		2,800,000

Table 7.2.7 List of Proposed Projects

The operation system of the implementation was set to include key identities with their responsibilities and roles. This system includes five key stakeholder groups that could be involved during different stages of the pilot project. The five key stakeholder groups are following:

- 1. Tessaban as a Key Convener;
- 2. PT/PCC who represent the planning-implementing-monitoring team, the review of detailed works/approve of the work and consensus building;
- 3. Local Consultant facilitators who are taking the facilitating roles and ensure that the operation of the pilot project is a learning project. Also, assisting in the reflection and identification on how to overcome all challenges in a sustainable manner;
- 4. Tourism related entities as users and local businesses are disseminating information and helping promote the CBT initiative; and
- 5. Communities including the general public, is providing recommendations/ feedbacks when necessary.

7.3 Pilot Project under JICA's Financial Support

7.3.1 Design and Build Project

The design and build project includes two main projects: 1) the improvement of Andaman Cultural Center and 2) Local Beverage Shop. The objectives of design and build project are to improve visibility of the Center, improve the dissemination of Andaman Culture, improve communities/ stakeholders' engagement, and improve visitor experience.

An architect team was invited to do site inspection and provide necessary elements for the possible building and landscaping improvement using the results of the stakeholder engagements. Experts in the field of landscaping and architecture formulated the proposed plan.

To ensure that the provisional budget could be used as effectively as possible, the list of complete master plan for the improvement was formulated. A user-centric analysis was used to identify the flow of the visitor's experience that result in a clear list of issues and solutions for the development of the master plan. The following illustrations and tables show the issues, solutions and the best selection.

		Level of Implementation	
No.	Content	Detailed Design	Construction
1	Parking Expansion for vehicular circulation improvement and		
	different types of vehicles (cars, motorcycles, bikes and tourist		
	buses. Also, planting along parking areas and the project frontside		
	boundary.		
2	Construction of pedestrian access from main road and parking		
	areas to the buildings with trees along it.		
3	Renovation of the existing plaza to create a greener open space		
	for social events and resting.		
4	Installation of main project sign at the drop-off area and flag signs		
	along main road and building facade.		
5	Construction of One Local Beverage Shop with outdoor seating		
	(approximate 50 Sq. m.)		
6	Addition of the direct access from the southwest side and sub-		
	entrance both sides to connect with space between the buildings.		
7	Renovation of the existing information center in the entrance area		
	of Beads Museum, (including the installation of facility layout map)		
8	Installation of kiosk, planting, seating, open space and signage in		
	the spaces between the buildings to enhance the linkage and		
	efficiency of their functionality. (Solar roof is excluded)		

Table 7.3.1 Design and Build Projects

The contents of the construction elements were revised following consultations and discussions with the Tessaban and the key stakeholders. The agreement was to make these available in four separate sets:

1. Detailed design for full phases;

- 2. Detailed design for construction;
- 3. Detailed design only; and
- 4. Detailed design only for the artificial stone cave concept.

The following figures show the computer graphics of the pilot project construction.



Figure 7.3.1 Overall Perspective



Figure 7.3.2 Front Elevation



Figure 7.3.3 Main Elevation



Figure 7.3.4 Local Beverage Shop



Figure 7.3.5 Local Beverage Shop



Figure 7.3.6 Plaza



Figure 7.3.7 Side Entrance



Figure 7.3.8 Entrance Gate 1

(Before)



(After)



Figure 7.3.9 Construction (Before & After)

After the completion of the construction, the opening ceremony was arranged to introduce and promote the Center. The participants included stakeholders from the relevant sectors, such as the Tessaban, provincial office, community, and private companies.

7.3.2 PR and Marketing

1) Objectives of PR & Marketing

- Establishing unique selling point (USP) based on an inventory of community activities and the design of the CBT logo to be used in a leaflet.
- Hosting events to introduce the Center as well as the local culture, art products, and CBT.

2) Establishing USP and Designing Logo for CBT

Figure 7.3.2 shows the tasks to be completed through a participatory approach. An integrated and systematic thinking should be stimulated in order to ensure that marketing communication strategies were well thought through. So, the 14 communities in the tessaban district were the key stakeholders to help promoting the CBT in Krabi City.

Table 7.3.2 Tasks, Outputs, and Outcomes for the USP establishment and Logo Design

	Task	Output	Outcome
1.	Identifying potential CBT activities and highlighting one unique marketable activity for each community, a total of 14 activities should be selected.	14 unique CBT activities which could be promoted at the Andaman Cultural Center.	Learning process for an inventory of community activities for future development or to develop an annual calendar for CBT activities.
2.	Identifying one integrated unique selling point and establishing one brand character which could be used to capture the diversity of CBT activities.	 One thematic marketable message which is established as USP. A marketing tagline. Key visuals. 	Brand architecture is established and can be expanded in the future.
3.	Designing a logo which could represent the USP concept.	Logo as brand identity in an .ai file.	One succinct message could be used to establish a CBT brand and communicate CBT for Krabi City.

3) Co-creation of Brand Identity and Identification of Community Assets

It was found that all communities were still in the early stages of CBT, especially those that do not have any visitors. Main assets of the community are food, local ingredients, and local handicraft that could be used as a form of brand ambassadors to attract visitors to visit communities during the later stages. Also, the Local Beverage Shop could be a PR platform for communities to learn about the tourism management system and product development in the future. In the co-creation of the potential products, chefs and young entrepreneurs were invited to identify new potential businesses and offer brand identities that could be incorporated into the Local Beverage Shop; such as the grilled sweet corn which has been designed and could be offered as a part of unique food experience at the Local Beverage Shop.



Figure 7.3.10 Grilled Sweet Corn, Newly Developed Product for Local Beverage Shop

4) Identification of Brand Identity

According to the co-creation, it was agreed that one character to capture CBT product in Krabi should be clear and stated that all products are locally owned. Therefore, the *K Link* or *Krabi Link* has been designed (the logo is shown in Figure 7.3.11). The concept of the *K Link* began with the combination of the unique and popular products of each tambon in Krabi by using K to represent Krabi. All four colors in the logo represent nature, mountain, and the beautiful sea.



Figure 7.3.11 Logo of K Link or Krabi Link

5) Collection of Products under Choices of Brand Identities

• **Flotic** is a brand that combines flower and batik. This brand could be used for all handicrafts under the categories of accessories; such as handbags.



Figure 7.3.12 Logo of Flotic

• **KRABIHEARTMADE** (Krabi-Heart-Made) is a concept well-made authentic local product created "from the heart". This brand could be used as a trademark for all handmade products.



Figure 7.3.13 Logo of KRABIHEARTMADE

• **Chance** (Chan-Ce) is the combination of delicious and unique food in Krabi and its southern area. This brand could be used as a representation of the rich local cuisine and food collection. Chan in Thai means thumbed. When it comes to English (chance), it means that the opportunity given to communities which is the main objective for developing and changing all food designs in Krabi.


Figure 7.3.14 Logo of Chance

• Other product collections could be developed later. For example, CBT Tourism activities and pineapple related products (e.g. paper made from pineapple)



Figure 7.3.15 Logos of Other Product Collections

7.3.3 Operation and Management System

Interviews with stakeholders were conducted to identify current situations and the different levels of the CBT management system was correspondingly reviewed in order to put the operation and management system in place. The following is the current situations of the CBT:

- The 14 communities located in the Tessaban are now operating a Tessaban CBT Network without a formal management structure.
- Management remains centralized under Tessaban initiative.
- Communities have limited experiences in managing CBT as they have limited visitors.
- The current support for self-management of CBT has not been set up. Hence, it will be challenges for communities to take that in places. However, it should aim to achieve genuine management as the communities eventually take control of the planning, execution and the actual benefits from tourism.

According to the interview, the Local Beverage Shop will provide a good platform for learning. Moreover, a code of conduct should be developed to ensure that all

stakeholders could authorize CBT management so that they can be sustainable. So, this code could be used to identify suitable local operators who need to have a shared value for community-based approaches.



Figure 7.3.16 Criteria for Local Operator Selection

1) Code of Conduct

The local operator of Local Beverage Shop should meet all basic legal requirements under the Thai Law. Moreover, there are three additional requirements for local operators to comply under the code of conduct:

- 1. The local operator must support local employment;
- 2. The local operator must source ingredients that are locally grown or are unique to the locality; and
- 3. Local operators must be locally owned which means that the local operator should be a local resident.

These three basic codes of conduct have been discussed together with potential operators who could fit into these requirements. Therefore, the operator of "POO DAM", a local beverage shop has been in operation for many years. In addition, many creative ideas were proposed; such as local coffee brewery that is mixed with a special Thai rice called "Khao Sang Yot".

Moreover, the brain bank team is needed in order to be able to establish the operation and management system. The brain bank team could help sustain the initiative and act as a management and monitoring team as well. The component of this team includes the following representatives from the three general stakeholder groups: private, public, and the people.



Figure 7.3.17 Components of the Monitoring and Management Team:

Sustainable Brain Bank Krabi Team

The sustainable brain bank was established under a list of potential organizations that would take key roles and responsibilities in the working group. These roles include the following:

- 1. Managing product inventory;
- 2. Searching for new local products;
- 3. Evaluating quality and select qualified products that would be made available at the shop;
- 4. Recruiting suitable operators for the shop;
- 5. Establishing and monitoring the distribution of benefits; and
- 6. Evaluating the progress of the shop every six months.

2) Organizational Structure

It is very important that operator's give their consent to the code of conduct and work collaboratively with the brain bank team. However, the working team needs at least six functional allocations, which led to the formulation of the structure and necessary elements for the operation and management system.



Figure 7.3.18 Operation and Management System

7.4 Lessons Learned

7.4.1 The Participation Process

Sustainable development has gradually been accepted as a fundamental objective and guiding point for public policymaking especially on tourism initiatives. The pilot project embraced the participatory approach to achieve sustainable development for the city. As a leading case, enhancement on dissemination of Andaman Culture through tourism in Tessaban Mueang Krabi was utilized as a mechanism to demonstrate the process.

It was not easy to create a better balance in the integration of the economic, environmental and social dimensions into the development processes. Because the pilot project was relatively small scale, the holistic working principles could only be appreciated gradually. A sharp learning curve was needed for all the involved stakeholders in the consideration of the project timeframe. Nevertheless, the pilot project reflected that a "better" sustainable tourism planning approach must significantly consist a shift in people's mindsets. This point should continue to be emphasized in the creation of a better understanding that the goal for a sustainable city should focus on all beneficial aspects of community livelihood: such as sociological (e.g., promotion of community wellbeing, stability, family solidarity, cultural identity), economic (e.g., employment, income), and environmental (e.g., conservation/preservation) aspects.

It could be arguable that a community can benefit more when its members genuinely participate in the making of decisions that affects their welfare and in the implementation of the desired actions/solutions. The multi-stakeholder participatory approach demonstrated that it was a better form of planning process starting from its democratic orientation. The main principle of this approach was to incorporate community inputs through active participation in tourism development processes. However, the project implementation has not yet manifested as a significant shift in sustainable planning from a top-down approach to a bottom-up approach. Such an integrative and inclusive planning approach puts an emphasis on the importance of understanding the whole tourism system based on a rigorous evaluative research through an extensive dialogue among all involved stakeholders. Goals for sustainable development should therefore be derived from, and integrated into, an overall shared community vision and aspiration. Again, as in this case, the long-term shared vision and sense of people's ownership of the project was better served when it was embedded in the whole process. To date, achieving such an ambitious goal remains a challenging task, particularly on the resolution of conflicting interests within an internal organization of the key conveners (e.g. Tessaban).

Three linking components of the pilot project should be clearly realized by all stakeholders, to wit:

- A tangible and physical built center (Place);
- Intangible features that include culture, heritage, local mores and practices and lives of the local people (People); and
- A management system that can lead to the effectiveness and efficient use of

resources (Prosperity).

However, it was clear that the tangible value of the project was emphasized too much by the local authorities. Investors and governments, particularly in developing countries, have often focused the bulk of their investment on the promotion of physical sites/elements, while overlooking the need to make adequate preparations for local communities to take control of the management process. This was also the challenge in this project. Once a local community decides to get involved in sustainable development, they must be able to map out impacts and benefits from END to END across the entire value chain. A comprehensive understanding of sustainable principles remains inadequate in this case and has room for better self-development.

The connection between sustainable development and well-being is worth emphasizing. As the overall objective of the pilot project states, sustainable development should help increase a community's well-being over a very long time. For communities, sustainability hinges on the ability to be resilient, meaning they could adapt to the following factors: deal with changes, timely reconfigure available resources, and recombine financial capital, local skills, and natural resources in ways that create sustainable livelihoods. Communities seeking to monitor their sustainability progress will typically need to understand complex interrelated issues and should be able to take control of their desired future. The starting point of any change is to take stock of the current available economic, environmental and social resources, then together develop a shared vision regarding the use of these resources and develop a means to evaluate progress toward the identified goals. However, this systematic thinking and planning for changes through self-development remains inadequate in this case.

There is a tremendous gap in science-based evidence; facts and figures about several situational baseline could be established. Information needed could include statistics on tourist arrivals/visitors, segmentations, and the characteristics of visitors categorized into day parts or seasons, database on referrals, the amount spend at the souvenir shops, and the distribution of benefits from the revenues generated from the souvenir shops.

7.4.2 Way Forward

To emphasize that tourism is not developed solely for the sake of tourism, a multistakeholder map should be revisited to ensure that the complete ecosystem of stakeholder engagement should continue to achieve genuine participation. This should help identify the landscape of the involved actors across the totality of what comprises the communities' wellbeing. Intergenerational groups ranging from the young generation to senior citizens should be included to broaden the equality and diversity of a sustainable city.

The pilot project model attempts to redefine the form of partnership as a healthy cocreated responsible value chain or public-private-people model. The Tessaban (a key convener) should continue to act as a facilitator to leverage continuous positive dialogue among multi-stakeholders and to sustain the longevity and approach of the sustainable planning and implementation of the city.

Tourism numbers and annual tourism statistics reports should be set up for the Center. With a small investment, this exercise could provide more powerful insights into travel patterns and better market intelligence if visitor surveys could be standardized and the results of an aggregated, citywide analysis could be published annually. More can be done to use customer reviews and the social media as a source of market intelligence to improve visitor experiences.

Despite the recent establishment of multi-stakeholder sustainable team, public-private collaboration for joint efforts could still be strengthened. Greater effort is needed to bring both the public and private actors together so as to increase the effectiveness and efficiency of sustainable planning, destination marketing and improve competitiveness. Strengthening partnerships is also essential in the maximization of the economies of scale, creating demand in secondary destinations, delivering on brand promise, and stimulating innovation.

Key learning points from the implementation of the pilot project are drawn from the participatory approach. Sustainable development guidelines could be mapped out and compiled.