

## **CHAPTER 4**

### **Factor analysis of urban planning and urbanization for Wat Ket specific plan**

#### **4.1 Main principal of specific plan and method of using Hybrid Urban Planning**

From the conclusion in Chapter 3, to achieve the common vision on abstract as ‘The only Living Lanna in the City’ and concrete as ‘Living Museum’ has to (1) reintroduce the values of social and cultural assets, such as museum, four-religion unity, important tradition and dominant food, and (2) manage land use to support activities leading to establish living museum.

Management of land use plan has to be operated by (1) using for specific plan and (2) using Hybrid Urban Planning as concept and regulation. The main point of Hybrid Urban Planning is reviewed and constructs the conceptual framework in Chapter 2 that consists of (1) participation mechanism, (2) integration of domain and factors of urban planning and urbanization that require qualitative and quantitative data form primary and secondary sources, (3) analysis the data to achieve area development following community need, area potential and common vision, and (4) communication and coordination for common acceptance resulting support on resource, law and project plan. Concept and regulation of Hybrid Urban Planning in the 1<sup>st</sup> part of Wat Ket area include improvement of Chareonrat Road and Ping riverside that the main point is showed as follow

## **4.2 Creating participation mechanism of Wat Ket specific plan by using Hybrid Urban Planning**

### **4.2.1 Participation mechanism for Wa Ket specific plan**

Specific plan has to have 3 main mechanisms:

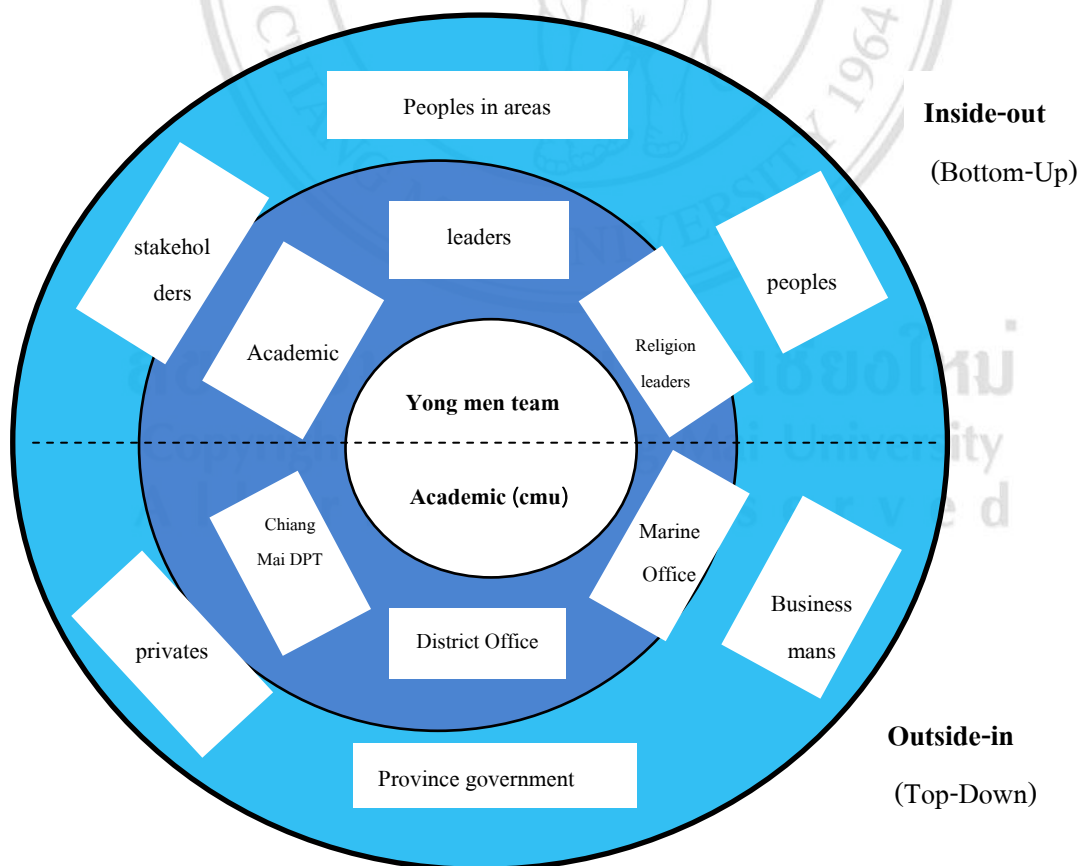
**1) Internal movement mechanism** consists of new generation in the area. Continuous processing of the project causes participation of new generation as working team on land use planning of Wat Ket area. The team has common vision on ‘The Only Living Lanna in the City’ and ‘Living Museum’ as the key of operation. Internal movement mechanism includes six new generations who have ability on architecture (1 person), civil engineering (2 persons) and activity organization (3 persons). The performers of the mechanism collect data, coordinate community leader and cooperate with scientific mechanism. Beside six new generations, community leader, religion leader and Wat Ket technocrat should control and advice specific plan that has to communicate the public, be clarified and has the commitment on public participation and stakeholders.

**2) External support mechanism** fulfills the plan by supporting data, knowledge and academic principle including essence of law, regulation, budget, framework of the project (the performers are mainly from internal movement mechanism). External support mechanism includes:

2.1) Academic support mechanism consists of technocrats from Chiang Mai University (CMU) because the project is continued from integrated livable society project that is operated since 2011. In addition, CMU technocrats have a good relationship with local people, i.e. community leader, new generation and community technocrat. Thus, coordination and finding an operating team are well-managed. ‘The Only Living Lanna in the City’ and ‘Living Museum’ concepts are used as a tool to control the direction and goal for working. CMU technocrats study and collect data from research and landscape design of Maejo University and CMU. The data is corrected and added by architect and engineer from local people and Faculty of Civil

Engineering, CMU accompanying with coordinating and supporting of data and equipment by technocrats.

2.2) Support mechanism on resource, law, policy and framework includes central, regional and related local administrations, which consist of Chiang Mai DPT, Kawila District Office, Chiang Mai Marine Office and Chiang Mai Provincial Land Office. Chiang Mai DPT is ready to appoint many projects in Development Plan of fiscal year in 2017-2018, which the projects include ecological development on Ping Riverside, development of Wat Ket old pier, Chansom Bridge development, landscape management of public area on Ping Riverside and Chareonrat Road improvement. Kawila District Office by the mayor is informed the operational procedure of Wat Ket land use management project. Chiang Mai Marine Office and Provincial Land Office is requested the supporting data, such as land title deed of project area and suggestion on law from 6<sup>th</sup> Marine Office (Figure 4.1).



**Figure 4.1** Mechanism of specific plan

In summation, the successful specific plan has to include:

1) New generation team intends to accomplish the project and devotes themselves to join project activities. Knowledgeable people on civil engineer and architecture and technocrat that know the area should attend the project meeting as team members.

2) Collaborators have good relationship with related government sector. For this study, collaborator is a special case because he is the director of database management, Lamphun Provincial Treasury Office and is PhD student on Sustainable Land Use and Natural Resource Management, Chiang Mai University. Thus, the collaborator of the study has good knowledge on land use that enhances coordination, support and assistance. As a result, project operation is reliable and has good data support that convinces local people and government sector including private sector that increasingly cooperate and accept the project.

3) Government sectors support and actualize the bottom-up project that comes from public participation and public hearing, which originate from area fact and academic data accompanying with local operation and supporting by unbiased and reliable technocrats. The result of this kind of project that actually benefits local people is worth for government support that can give an effective and successful outcome to the government sectors.

For the conclusion, operation on Wat Ket land use plan project with public participation to reach common vision causes cooperation of new generations and technocrats to use common vision as operational direction for achieving the goal.

The main factor of operation is that team members have to trust one another and work seriously. Emerging conflict has to be solved with data and trust without hidden interests using team cooperation and law at last. Outside technocrats have a responsibility to support data and coordinate team member for better relationship including liaise with related outside sectors, which are Chiang Mai DPT, Kawila District Office, Chiang Mai City Municipal, Marine Department and Chiang Mai Land Provincial Office. The technocrats create new attitude in area based approach to related

government sector that used to work with function based approach. Area based approach creates cooperation of both local people and outsider with win-win situation.

Process of three mechanisms begins with establishing common vision by the 1<sup>st</sup> mechanism (operating team). Common vision that is local requirement about the city future and development on way of life can be created by only local people or accompanying with the 2<sup>nd</sup> mechanism (academic support). Common vision may come from existent trouble of the area or common crisis. Then, both mechanisms join creating domain from urban design concept (physiographic method) and urbanization concept (focus on landscape and social factors), which their collected data is analyzed for land use planning as a regulation in detail of specific plan. Land use plan consists of pattern, layout, regulation, local requirement and development direction that are firstly accepted by public hearing to create effective land use plan for urban management. Finally, the 3<sup>rd</sup> mechanism is government support on policy and budget to give an opportunity for using common vision for further development and achievement. All processes lead to win-win situation that decreases a conflict between local people and government sectors, which the result differs from current comprehensive plan. New method may introduce city development approach that is suitable for historic city or specific city to produce balance and sustainability.

#### **4.3 Determining domain and main factor for specific plan**

Hybrid Urban Planning concept has to determine domain and factors to analyze two data aspects that are urban design and urbanization, which their main points are below:

##### **4.3.1 Urban design**

##### **1<sup>st</sup> domain: Physical landscape**

Primary and secondary data from collecting of 1<sup>st</sup> and 2<sup>nd</sup> mechanisms under supporting of 3<sup>rd</sup> mechanism are summarized in physical landscape factor as follow:

1) Wat Ket area is a part of Chiang Mai city with altitude of 290-310 m a.s.l, locates in Chiang Mai – Lamphun basin that is floodplain surrounding with mountain, and situates at the East of Ping River that is the main river of Wat Ket area.

2) Area landscape is a slope of 3-20% from outside (around The Prince Royal's College) to Ping Riverside that is well drain. Chareonrat Road is 2-meter higher than Ping Riverside. Ping River has 3m in depth.

3) Drainage system of Wat Ket area use Ping River as a pathway to drain water from the East and use Payaphet Canal as minor path to drain water out from the community. However, area aside Payaphet Canal is currently trespassed leading to minimizing and shall owing of the canal that introduce flooding of some area because of heavy rainfall.

4) Flooding is mainly a result of Ping River quantity, which the critical water level for warning at P.1 station (Nawarat Bridge) is 3.7 m. Water level at P.1 station on January, 2016 is 0.71m Wat Ket area is rarely flooded because the land slope decline to Ping Riverside.

5) Annual water quality of Ping River is in good to fair criteria and is categorized in surface water type II and III that can use for any purpose following Announcement of the National Environment Committee Issue 8 (B.E. 2537).

6) Soil texture of Chiang Mai city and Wat Ket area is classified in 44<sup>th</sup> soil type that has gray or light brown sandy soil. Soil fertility is low with pH 5.5-7.0 that is suitable for field crops.

7) Climate condition of Chiang Mai is Tropical savanna climate (Aw) that has moderate rainfall with long dry season and short wet season. The weather is very hot in hot season dominating by southwest monsoon and quite cool in cool season dominating by northeast monsoon.

During 2004-2014, average rainfall is 0.16-8.5 inches, while average maximum and minimum temperature are 32.1°C and 20.6°C respectively. For monthly

temperature, average minimum temperature in January is 14.5°C, while average maximum in April is 36.3°C. (Northern Meteorological Center, 2011).

**Table 4.1** Temperature (°C) at Muang District, Chiang Mai during 1971-2014  
(Northern Meteorological Center )

Month	Average Temperature (°C)			Maximum and Minimum Temperature (°C)	
	Max	Min	Monthly	Max	Min
January	29.6	14.5	21.2	35.2	3.7
February	32.4	15.9	23.6	37.7	7.3
March	35.1	19.3	26.9	40.9	12.2
April	36.3	22.6	29.1	41.4	15.8
May	34.2	23.7	28.2	42.4	19.2
June	32.7	24.0	27.6	39.3	20.0
July	31.8	23.8	27.2	39.0	20.5
August	31.4	23.6	26.8	36.5	20.7
September	31.6	23.2	26.7	36.1	16.8
October	31.3	22.1	26.0	37.9	13.3
November	30.0	19.2	23.9	34.7	6.0
December	28.5	15.5	21.3	33.4	3.8
Throughout the year	32.1	20.6	25.7		

## 2<sup>nd</sup> domain: Land use and building including land use change for ten years

From the data, land use type and function of each zone in Wat Ket area is concluded as follow:

2.1 Brief history of land use change in Wat Ket area: the area was classified as urban land use, which the commercial and service zone covered area around Chareonrat Road that is from Nawarat Bridge to Nakhonping Bridge.

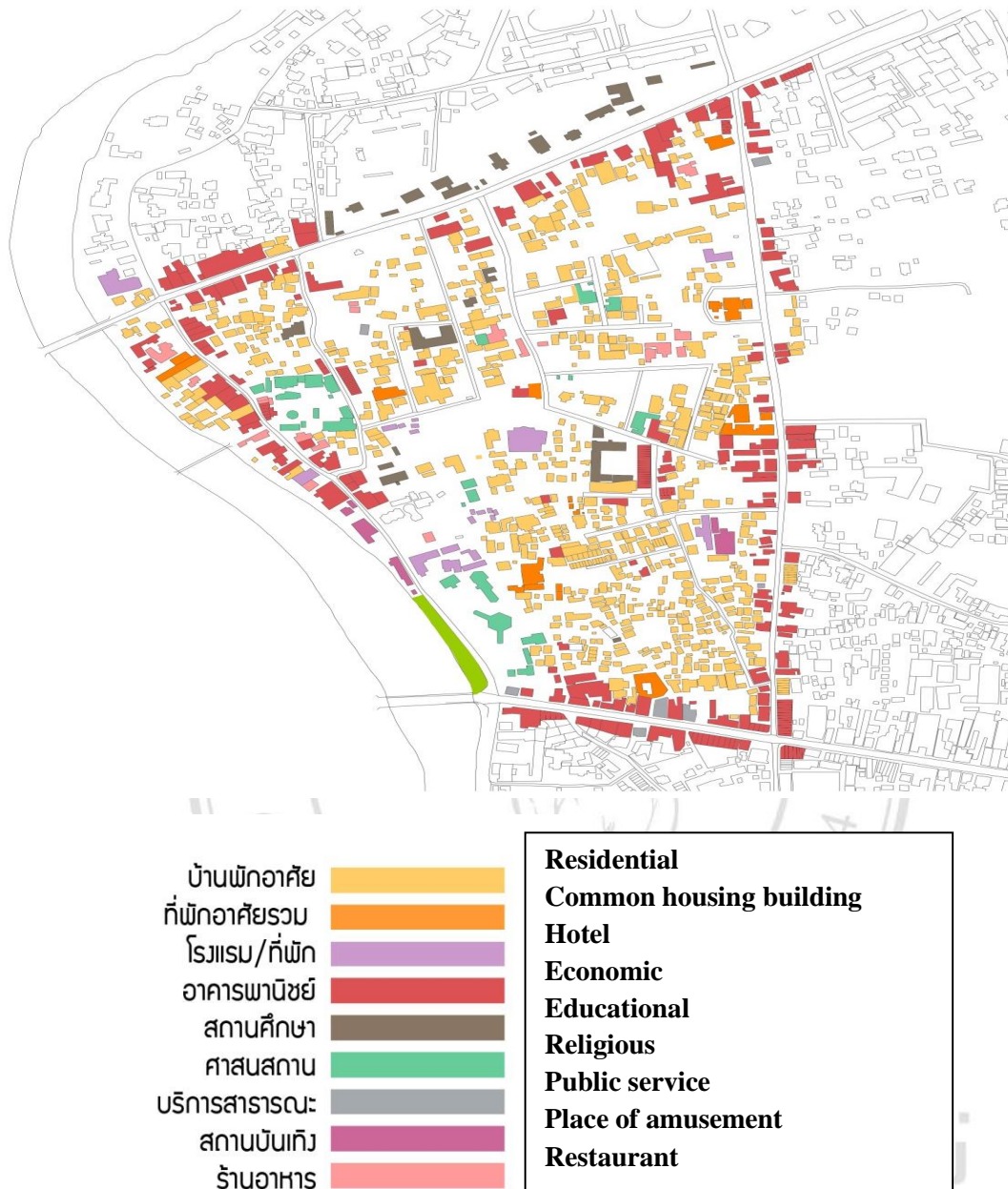
Current land use of Wat Ket area is integration of commercial, residential and service zones. Area from Nakhonping Bridge to crossroad of Chareonrat Road is mostly commercial zone that has shops of home decoration, souvenir and handicraft including restaurant and hotel. The center of area is residential zone that has high quality and expensive condominium. Chareonmuang Road has bank, economic building and famous

food shops aside the road. Land use of Wat Ket area has to more emphasize the integrated activities according to existing potential of the area. Former land use and building had small lot for residence and small business, whereas new land use is changed to larger lot, more high building, higher diversity of business, less open space and less public area for common activity.

**Table 4.2** Proportion of land use at Wat Ket area in 1980 and 2015

	1980		2015		Change		Notes
Land use type	area (km <sup>2</sup> )	%	area (km <sup>2</sup> )	%	area (km <sup>2</sup> )	%	
1. Housing	1.2	55.21	1.23	55.9	+0.03	+0.69	housing increase (condominium increase)
2. Education	0.31	13.69	0.19	8.96	-0.12	-4.73	moving out of educational institutions
3. Commerce including restaurant, hotel and entertainment venue	0.096	4.32	0.48	22.64	+0.384	+18.32	increase of commercial area
4. Agriculture	0.5	2.32	0	0	-0.5	-2.32	change of agricultural area to others
5. Public area (open area, water resource, religious place)	0.35	15.75	0.05	2.36	-0.30	-13.39	decrease of community activities on public area





**Figure 4.2** Wat Ket land use map in 2015

2.2 Current land use of Wat Ket area is integrated use because Wat Ket area has 10 land use zone as follow (according to land use map of Wat Ket area in 2015):

Land use for economic building: 5% of area

Land use for public area: 2.32% of area

Land use for educational institution: 8.96% of area

Land use for public service: 2.51% of area

Land use for restaurant: 7% of area

Land use for residential area: 50.20% of area

Land use for common housing building: 5% of area

Land use for place of amusement: 5.01% of area

Land use for hotel: 5% of area

Land use for religious place: 9% of area

From current land use map in Figure 4.2, it can be concluded that comparison between land use in 1980 and 2015 shows increase of common housing building (or residential building) with higher number of condominium and resident and increase of economic and business area, whereas public area for common use is decreased. Increasing diversity of land use is a result of Wat Ket area potential that located near city center and opposite to Waroros Market, which is traditional market and the biggest local product shop and fresh-food market. In addition, Wat ket area is next to Chiang Mai railway station that can easily contact Lamphun Province. Many significant public services also situate in WatKet area, such as McCormick Hospital, Prince Royal's College, Regina Coeli College and Kawila Military Camp. Moreover, Wat Ket area has significant religious places of four religions and many famous restaurants at Ping Riverside. Potential of Wat Ket area tends to increase the importance after construction of high-speed rail that has Wat Ket area as the last station. (Department of Public Works and Town Planning, 2006.)

### **3<sup>rd</sup> domain: Transportation system**

#### **3.1 Road system**

Sufficient transport route help rapid area access attracting the material, social and cultural growth. Physical and social change is affected by area-access capability or convenient transport route that imports traditions. Increase of access raises area change. In the past, inconvenience on area access caused lower change than the present. A lot of houses, shops, service places, economic buildings and high buildings are constructed to support increase of immigrant. Suitability of building pattern is ignored. For example, construction under municipal law lacks of strict control and monitoring of related officers. In addition, residence pattern is developed by new immigrant to modern style that differs from traditional style, which is gradually replaced. Moreover, overcrowding in the area may introduce many problems as same as other slums.

External transport system can connect Wat Ket area by the 11<sup>th</sup> super highway road and road along the railway (there will be high-speed rail and BRT public transportation in the future).

Transport connection in Wat Ket area includes pathway from Rattanakosin Road to Chiang Mai Bus Station and Tunghotel Road. WatKet area has four main roads: Chareonrat Road, Kaewnawarat Road, Chareonmuang Road and Bumroongrasd Road, which connect to commercial zone and near center of city economic growth.

### 3.2 Traffic system

Wat Ket traffic system is arranged in order of the congestion level as below:

- 1) South: Road from Nawarat Bridge to Chareonmuang Road has the highest congestion because it is the main route to Chiang Mai railway station, private offices and three banks and can connect to 2<sup>nd</sup> bus station.
- 2) North: Nakhonping Bridge and along Kaewnawarat Road
- 3) West: From Ping River to Chareonrat Road
- 4) East: Bamroongrasd Road has the lowest congestion.

Chiang Mai public transport route that pass through Wat Ket area currently has three routes.

- 1) The 1<sup>st</sup> route: From 2<sup>nd</sup> Bus Station to Chiang Mai Airport, through Nakhonping Bridge and Kaewnawarat Road
- 2) The 2<sup>nd</sup> route: From 2<sup>nd</sup> Bus Station to Chiang Mai Zoo, through Nawarat Bridge and Chareonmuang Road
- 3) Bus line 8: through Nakhonping Bridge and Kaewnawarat Road to 2<sup>nd</sup> Bus Station

Traffic congestion always occurs in WatKet area especially during the rush hour, because Wat Ket area is surrounded by 12m-wide main road and 8m-wide minor road without parking place, sidewalk and bike lane and with rough road surface. In addition, Wat Ket area has many landmarks and buildings aside road, which road widening is impossible. Therefore, traffic system is a significant problem for local people that really need to resolve.

#### **4<sup>th</sup> domain: Public utility**

Chiang Mai electricity service is a responsibility of Provincial Electricity Authority Area 1 that buys electricity from Electricity Generating Authority of Thailand at Mae Moh power plant, Lampang Province, which is used for 95% of electric use in Chiang Mai with 22.1 kilovolts. All sub-district and village in Chiang Mai reach electricity.

Water production plant of Chiang Mai situates in six districts: Mae Rim, San Kamphaeng, Hod, Mae Taeng and Fang. Chiang Mai plans to use raw water from Maekuang Dam, Doi Saket District, Chiang Mai, to produce sufficient water supply.

#### **5<sup>th</sup> domain: Pollution**

Data from Pollution Control Department shows that the main cause of air pollution in Wat Ket area is traffic problem, which is a result of three factors:

1) More than 5 large famous schools in Wat Ket area introduce a lot of car number especially during before and after study period.

2) Chareonrat Road connects to Sarapee District and Lamphun Province. Thus, continuous road use during day time produces fine particulate matter and toxic gas from the engine.

3) A lot of stores, restaurants, entertainment spots and other business places that attract many tourists and people during day and night time generate noise pollution, which destroys local people health.

4) Station for air quality measurement in Yupparaj Wittayalai School as the representative of Chiang Mai air situation show increase of average respirable particulate matter (PM10) during 2006-2015 and increase of number of day exceed as in Table 4.3.(Pollution Control Department, 2011).

**Table 4.3** Level of measured respirable particulate matter  
(PM10; Pollution Control Department)

year	year-round average ( $\mu\text{g}/\text{m}^3$ )	number of day exceed /number of sample
2006	55.7	17/353
2007	57.0	30/331
2008	45.9	8/359
2009	49.0	22/365
2015	50.8	25/361

#### **6<sup>th</sup> domain: Chiang Mai economic system**

Economic system of Chiang Mai is under the government policy that needs to create Chiang Mai to be a center or hub of ecotourism, medication, education, transportation and creative business for economic income because potential of Chiang Mai land can support many development fields. Thus, economic system of Wat Ket area is also developed by increasing business diversity, such as cultural tourism, spa, food, and restaurant including general and specific business, such as gallery. The economic growth of Wat Ket area is a result of the economic potential of the area that can connect between commercial zone and historical zone, which also support each other.

#### **7<sup>th</sup> domain: Demography**

Population factor is needed to be condition of specific plan for conforming to population change and preparing for future problems, such as overcrowded slum. Data from civil registration of Kawila District in December 2015 shows 35,676 persons in Wat Ket area that includes 17,231 men and 18,445 women with 30 immigrants and 394 emigrants, while hidden population mostly immigrated from rural area and upland for working in Chiang Mai city.

Table 4.4 shows population increase of 38 percent in Wat Ket area for last five years because the area inside the moan is restricted by regulation of Chiang Mai comprehensive plan and Building Control Act. Thus, residence near the city center is more needed, which Wat Ket area is suitable because there are high quality condominium. In addition, Wat Ket area has many businesses on Ping Riverside that tend to growth continuously following demand of outsiders. Thus, Wat Ket area that has high economic potential is suitable for working, running a business and residence.

Population dynamic is highly changed because increase on immigration for residence and business and increase on diversity of economic status, social status and ethnic. The 1<sup>st</sup> and 2<sup>nd</sup> generations as traditional people still adhere to the area and maintain traditional culture, while the 3<sup>rd</sup> generation is different and overlook a value of area identity. Participation of new immigrant with common activities is absent. Land possession and land use for private benefit (business) that disregard area identity should be concerned. (Ministry of Interior, 2011).

**Table 4.4** Population number in Wat Ket community during 1999-2015  
(Ministry of Interior, 2011).

	Population number			annual		
year	Male	Female	Total	population growth ratio	housing number	annual housing increase ratio
1990	12,948	13,239	26,187	3.14	10,444	2.85
2000	12,783	12,569	25,352	-3.19	10,370	-0.71
2001	12,880	12,640	25,520	0.66	10,259	-1.07
2002	12,150	12,648	24,798	-2.83	10,520	2.54
2003	12,346	12,731	25,077	1.13	10,656	1.29
2004	11,830	12,360	24,190	-3.54	10,881	2.11
2005	11,760	12,334	24,094	-0.40	10,985	0.96
2006	11,690	12,204	23,894	-0.83	11,079	0.86
2007	11,496	12,030	23,526	-1.54	11,147	0.61
2008	11,301	11,847	23,148	-1.61	11,229	0.74
2009	11,194	11,634	22,828	-1.38	11,279	0.45
2010	10,967	11,271	22,238	-2.58	11,356	0.68
2015	17,231	18,445	35,676	+7.57	12,006	0.72

#### 4.3.2 Urbanization

Specific planning by Hybrid Urban Planning method has to use data that indicates urbanization, which includes history and dynamic of city area including problem and requirement of local people that affect the specific plan to resolve and respond the demand of most people leading to balance and sustainability of physical

geography, ecology, economic and livelihood. The data that is required according to urbanization concept includes below:

**1<sup>st</sup> domain: History of Wat Ket area, population dynamic and social relationship**

Wat Ket area has long history for more than 500 years since 1774 that Chiang Mai was combined with Siam by King Taksin. Later, Chiang Mai was repopulated with people from many cities and then also Chaozhou that sailed from central region of China for commerce. During Rama V, colonialism by France and England introduced teak trade by British Borneo Co., Ltd, East Asiatic Co., Ltd and Bombay Burma Co., Ltd. American missionary came to Chiang Mai in term of education and healthcare that can be seen in establishment of Dara Academy, McCormick Hospital, the Prince Royal's College, the Chiang Mai Christian School and Payap University. Wat Ket area has church, Sikhs from Punjab (India), Islamite from Bangladesh, Pakistan and Malaya including Attaqwa mosque and school (Duangchan, 2006). Establishment of railway station in Wat Ket area promoted importance of the area and attracted investment and business into the area. In addition, Wat Ket area is a significant transit that connects with other railway station in other provinces, which it is a main route to Lamphun and Bangkok.

Wat Ket area is a traditional commercial zone of Chiang Mai that had piers for shipment along Ping River to Chao Phraya River in Bangkok in the past. Chansom Bridge was used to walk across the river. Chareonrat Road has been the significant center of Wat Ket commerce. In the present, social and cultural characteristics of Wat Ket area is identity because there are beautiful buildings with valuable architecture aside the road that are used for residence, shop, restaurant and souvenir shop including famous nightspots. Thus, existence of urban lifestyle with historical architecture in Wat Ket community is unique of Chiang Mai. Various religions can live together peacefully. Social harmony of Wat Ket area on nationality, religion and language has occurred for 8-9 generations. Equality and dependence of Wat Ket people are presented in cooperation among religious leaders and between religious leaders and people. However, Wat Ket area is currently disturbed by urban expansion because it closes to center of economic growth and is in Chiang Mai comprehensive plan area.

For population aspect, dynamic and social relationship is urbanization not population number. Wat Ket area consists of many nationalities: local people (Tai Yuan), Thai from Central Regions, Chaozhou, Kha Mu, Indian, Yunnan Chinese and other minorities that immigrates nowadays. Settlement of immigrants relates to their ability and occupation, such as Chinese trades in the East of Ping River coexisting with wood company of English to contact with cargo ships from Central Region. Social relationship of Wat Ket community is relative system as extended family that lives together in the same area or close area among the kinfolk, whereas new immigrants (Kha Mu, Thai from Central Region, Muslim and hill tribe) is nuclear family that has lower relation but tend to increase the connection. (Urban and Environmental Studies Group Institute for Social Research, 2010).

Wat Ket area from past to present has high population dynamic. Immigrants from various nationalities and religions could live together correspondingly in the past, whereas increase on urbanization and capitalism in the present enlarges the gap of economic, social, nationality status. Capitalists own land for business and rural persons move in to work, while new generations of traditional people move out for education and occupation. Thus, social relationship in Wat Ket area tends to increase estrangement and separation.

## **2<sup>nd</sup> domain: Change of land ownership in Chiang Mai municipal area**

Physical factor that closely relates to specific plan is land use that is emphasized by urbanization concept, which also focuses on land and real estate transfer. Data in 2013 from Chiang Mai Provincial Land Office, Ministry of Interior concludes that 46.15% of land belongs to local people and 53.85% of land is transferred to outsiders, which consist of Chiang Mai people 35.9% and people from other provinces 17.95%. This sub-district has the moderate or quite low proportion of land ownership by local people, while the highest proportion of land ownership by local people is in Haiya Sub-district (81.56%) and the lowest proportion is in Patan Sub-districts (31.34%). Land owning by outsiders may introduce many problems, such as conflict and ignorance on development following the plan and responsibility to area. In addition, outsiders may not understand and appreciate the importance of Wat Ket history and identity leading to



direction of development and land use is different and depends on their business, such as modern style of restaurant aside Ping River, spa business, hotel, shop and gallery.

**Table 4.5** Data on land ownership in Chiang Mai city municipal

ตำบล	ร้อยละภูมิลำเนาของผู้มีกรรมสิทธิ์ที่ดินในเขตเทศบาลนครเชียงใหม่				รวม
	ตำบลเดียวกัน	นอกตำบลแต่ จังหวัดเดียวกัน	นอกจังหวัดเชียงใหม่		
			กรุงเทพฯ	อื่น ๆ	
วัดเกต	48	42	7	6	103
	46.15%	35.90%	5.97%	8.97%	
ศรีภูมิ	24	8	2	1	35
	68.57%	22.86%	5.71%	2.85%	
หายยา	31	4	1	2	38
	81.56%	10.53%	2.63%	5.26%	
ช้างม่อย	10	5	2	1	18
	55.56%	13.16%	5.26%	26.3%	
พระสิงห์	30	5	2	1	38
	78.95%	27.78%	11.12%	5.55%	
ท่าศาลา	56	44	3	8	111
	50.45%	39.64%	2.70%	7.20%	
ช้างเผือก	101	62	15	15	193
	52.33%	32.12%	7.77%	7.77%	
ฟ้าฮ่าม	21	29	8	5	63
	33.33%	46.03%	5.04%	3.15%	
ป่าตัน	21	33	9	4	67
	31.34%	49.25%	13.43%	5.96%	
หนองหอย	31	16	-	-	48
	38.27%	33.33%			

Land ownership is mostly received from trading (48.89%) following by other activities (30.62%), gift (10.2%) and heritage (10.2%). Combination of trading and others shows high proportion (79.51%) that presents power of investment form outsiders, which have power on business management that may incorporate with Wat Ket identity, culture and traditional lifestyle. (Ministry of Interior, 2011).

**Table 4.6** Acquisition of land ownership  
(Ministry of Interior, 2011)

District	Acquisition of land ownership							
	Trading		Gift		Heritage		Others	
	Number	%	Number	%	Number	%	Number	%
WatKet	48	48.89	10	10.20	10	10.20	30	30.62

District	Land size							
	< 1 ngan (100 wa <sup>2</sup> )		1-2 ngan		2-4 ngan		> 1 rai	
	Number	%	Number	%	Number	%	Number	%
WatKet	30	29.7	34	33.66	16	15.84	21	20.80

Beside data on land owning and receiving, data on size of land plot is also important. The proportions of land size in Wat Ket area of 100 wa<sup>2</sup> and smaller than 100 wa<sup>2</sup> are 33.66% and 29.7% respectively, which both land sizes are used for residence. The land size of 200-400 wa<sup>2</sup> (15.84%) and larger than 1 rai (20.8%) are the large land that is used for medium and large businesses, which the land owners is outsiders.

### 3<sup>rd</sup> domain: Social conflict from land use

Location and landscape of Wat Ket area that give an opportunity for land using by outsider for residence and business is concerned about land use in urbanization concept. Study and survey in 2014 show trespass to public area aside Ping River and traditional pier, such as Tha Chang, Tha Satharn, Tha Wat Ket and Tha Naikhong including Payaphet Canal, which are emphasized by local people (Table 4.7). Encroaching public area aside Ping River by many shops decreases public area for common use. Building construction and land possessing that exceed land title deed, including land title deed that is issued over public area are also the problem of the area. In addition, narrow and inconvenient roads, i.e. Chareonrat Road, Kaewnawarat Road and Nakhonping Road, including many famous food shops aside the roads cause traffic congestion in the morning and evening (Duangchan, 2006).

**Table 4.7** Land and public area use in Wat Ket area

Land and public area use in WatKet area	S.D.	average	summary
Encroaching public area on Ping Riverside and old pier, e.g. Tha Chang, Tha Satharn, Tha WatKet, Tha Naikhong	0.8847	3.82	high
Encroaching public area at Payaphet canal	0.7928	3.66	high
Houses and buildings that close to pedestal disturbing transportation	1.001	3.65	high
Absent of park and green area in WatKet area	0.9983	3.65	high
Narrow road leading to uncomfortable transportation	0.9615	4.04	high
Absent of open space for recreations and sport of WatKet local people	1.1324	3.80	high

Land use change produces many social conflicts, which problem analysis with leaders shows community concern on land grabbing by capitalists with high power of funding that uses land for their business without concerning community requirement and problem. Change on building and business introduces increase on immigration, while measure of local government is obscure leading to random development (with no direction) and conflict because new capitalist rarely participates with local community and does not understand culture, society and identity of Wat Ket area. Dissent and conflict occur only in specific situation, while existing dissatisfaction is hidden in normal situation.

#### **4<sup>th</sup> domain: Economic system and business in Wat Ket area**

Wat Ket area was the important commercial zone and transportation of Chiang Mai and was the center of economic growth of the city. In the present, commercial zone is changed to the West of Ping River as new center of economic growth, which then economic growth is expanded around Chiang Mai city according to modern tread with modern lifestyle.

Importance of commerce for Wat Ket area is decreased, while some traditional area is conserved and diversity of tourism and service business is increased. Deep analyzing data in Table 4.8 found weak and strong points of business diversity in Wat Ket area. Unable developing to specific business (unlike Wualai area that is specific for silverware) and undesired business on real estate and large shopping mall of local people are the weak points. The strong points are diversity and harmony of small and

medium businesses including land use and lifestyle of local people that is suitable for nature tourism and attracts tourists with Wat Ket identity, which benefits various businesses. It can be seen that this domain shows high potential of the area for being living museum.

**Table 4.8** Proportion of commercial land use at Wat Ket area in 2015  
(Data from survey in 2015)

Commerce	Number	%
Bank	3	2.22
Large hotel	2	1.48
Homestay	3	2.22
Small hotel	5	3.70
Place of amusement	5	3.70
Healthcare business and Spa	4	2.96
Restaurant	9	6.67
Food shop	18	13.33
General shop	38	28.15
Retail shop	30	22.22
Convenience store	5	3.70
Specific store	5	3.70
Wholesale shop	3	2.22
Treat business	2	1.48
Private school	1	0.74
Transportation business	2	1.48
Total	135	100

However, in the opinion of local people, diversity of investor and outsider may create the most serious problem about irresponsible outsiders (Table 4.9). In addition, survey in 2006 found the same problem about threatening local people by alien, discord problem and misunderstanding with outsider on Wat Ket identity (Duangchan, 2006).

**Table 4.9** Economic factors

Economic Factors	S.D.	average	weight
Company in the area may cause dangers, e.g. nuisance, trouble, impact on wellness and health of WatKet residents	0.8723	3.19	medium
Irresponsible outsider businessman	1.012	3.47	high
Grabbing customer by outsider businessman	1.1673	2.97	medium
Outsider tourists annoy and disturb residence	1.0842	3.13	medium
Main occupation that related to WatKet identity is under operation of irresponsible outsider	1.0429	3.40	medium

### **5<sup>th</sup> domain: Potential of Wat Ket area**

Data on community forum, research summary, and community survey shows that Wat Ket area has history, cultural heritage, good relationship among traditional people, strong leader and local technocrat as the potential of Wat Ket area that can be concluded as follow:

#### **1. Diversity of nationality and religion**

People from various faiths settle down and live together in the same area although they have a different path of each faith that inherits from ancestor. Thus, WatKet community is noticeable especially on the faith of four religions: Buddhism, Islam, Christianity and Sikhism, which each religion plays a role as spiritual anchor that preaches relationship for the unity. For the factual example, all activities of each religion receive cooperation of community even in different religion, which the people separate when performing each religious ceremony. In addition, a place for local meeting is circulated along places of each religion, such as church, mosque and temple. Unity and coexistence of various nationalities and religions has occurred for a long time that is the pride of Wat Ket community. The most importance and pride for Wat Ket people is peaceful coexistence of various nationalities and religions as the prominent point of the community. In addition, the unity of community without religious conflict but respects for religion of others and able to learn or participate activities of other religions is also another local pride.

**Table 4.10** Importance and pride on diversity of nationality and religion

Importance and pride on diversity of nationality and religion	Frequency
Peaceful coexistence of various nationalities and religions are admirable and prominent point of WatKet community that can be mentioned	12
Community unity without religious conflict and respect for religion of each person	10
Being a model to other community is a good point	10
Pride on strong point that is generousness of local people	10
Able to study and learn other religions from discussion with other people and participating activities	10

## **2. Architectural heritage and ancient remain**

WatKet architecture is combination of Lanna and other patterns. Old building aside Chareonrat Road has various patterns, such as Lanna-Chinese, Lanna-Colonial and Lanna-Western styles. Economic buildings that are called ‘Haen Pae’ include Baan Kaew Maroon, Baan Khunaraksh (Comedara) and Baan Orapin. The 2-floor teak houses that receive the Architectural Conservation Award from the Association of Siamese Architects include gallery restaurant (Liao Yong Nguan) and Baan Hok Sao (Oriental Style Products). The Prince Royal’s Collage also has buildings that got the Architectural Conservation Award in 1996. The architecture is the pride of Wat Ket community (tanit, 2011).

Most buildings are 50-100 years old with 1-2 floors and have various styles depending on construction period. Architecture of older building that was constructed from wood or brick is combination of foreign pattern and Lanna style, such as Lanna-Chinese, Lanna-Colonial and Lanna-Western. The buildings that less than 50 years old is constructed with modern technology, more strengthen and modern style. Most buildings in Wat Ket area have been used as economic building. Most of Wat Ket people are proud of their beautiful architecture that can attract a lot of tourists, present area identity and produce conservation tourism (Table 4.11).

**Table 4.11** Importance and pride on Wat Ket architecture

Importance and pride on Wat Ket architecture	Frequency
New generations consider old buildings in the area that should be conserved to remind them of former generations	15
Pride on beautiful architecture that can attract a lot of tourists and present the importance of Wat Ket area in term of conservation tourism	27
Architecture along the road is beautiful and show difference of nationality and religion that become the prominent identity of the area	10

### 3. Artistic work and painting heritage

Outstanding heritage of artistic work and painting includes Chinese statue in front of Wat Ket Karam's ubosot (statue of fish spraying water, sea bubble and kylin), artistic work from earthenware at Gallery restaurant, pattern on pole and Chinese powder paint on mural (painting of pheasant, lotus, peony, pine and Chinese view) at Wat Ket Karam's bowl pavilion. Renovation of bowl pavilion in Wat Ket Karam in 1999 used traditional method but cannot equal the former pattern (worawimon, 2006). In the opinion of most local people in Wat ket area, outstanding heritage of artistic work and painting that create a pride for Wat ket community increases interestedness for tourism and can attract tourists from various nationalities, religions and cultures. In addition, the artistic work and painting present the influence of the producer that enhances learning and stimulating value of architectural and cultural conservation.

**Table 4.12** Importance and pride on remarkable environment of artistic work, painting

Importance and pride on remarkable environment of artistic work and painting	Frequency
Cultural diversity and influence of the producer stimulate architectural and cultural conservation of local people to maintain and continue this further	10
Increasing interestedness of Watket tourism and attracting tourists from various nationalities and religions	12
Learning the hometown of new traders and immigrants / Temple is unique, respectable and be worthy of conservation	10
Artistic work is outstanding and unique that support who wants to learn	10
Be proud of antique object and capability of Lanna professionals that create this beautifully	10

#### 4. Tradition and culture

Because Wat ket area is historical area that various nationalities live together, Wat ket area stores important heritage of tradition and culture of Chiang Mai, such as Big Drum and Victory Drum Festival, Floating Sa Pao Parade in Loy Krathong Day, Kathin Ceremony, Bathing Buddha Relic Ceremony, Songkran Festival and tradition on making Lanna flag, lantern, betel nut products and Lanna candle. Those cultures and traditions reflect general Lanna identity, but Watket area has specific Lanna identity that traditional cultures have been inherited for a long time. Loy Krathong Festival of Watket community is arranged by cooperation of local people to be the model of Lanna tradition that combines the great things of tradition, such as beating victory and big drums in Temple, making Sa Pao for floating and eliminating bad luck, warrior dance, making betel nut products, making Lanna candle, decorating Lanna flag. The Sa pao (floating lantern) that is made by local people is showed in parade around the area, then dedicate the merit to deceased person and float to the river. The tradition creates the ecstasy to local people, tourists and other people because the other places cannot do the same. The most importance and pride for local people on traditional culture is that they can conserve good culture and inherit the valuable art to the interested youth through existing teachers to pass along further generation. In addition, the traditional culture creates the group unity, makes people know each other and create the religious value that enhances reputation of the area and create impression for visitors.

**Table 4.13** Importance and pride on Wat Ket traditional culture

Importance and pride on Wat ket traditional culture	Frequency
Creating the unity, making people know each other and being religious value	10
Cooperating on conservation of traditional culture that is already absent in other places	10
Conserving good culture and tradition by teaching the youth who are interested to inherit these to next generation further	10
Introducing Wat ket area to tourists and impressing visitors to pass along the impression to next generation	8
Tradition has been performed for a long time to eliminate bad luck, life prolonging for peace	6



## 5. Famous food of Wat Ket area

Another pride of Wat Ket area is various foods that include Yunnan Chinese food, Bangladeshis food, Yuan food, Burmese food and European food. Each food type is important, has its own history and touches Lanna identity. Immigration of various nationalities (i.e. Yunnan Chinese, Local people, Mon, Burmese, Pakistani and Bangladeshis) and four religions (Buddhism, Islam, Christianity and Sikhism) cause diversity of traditional food according to nationality and religion. The most importance and pride of local people on Wat Ket famous food is a pride on having delicious food for visitors that benefit community by being a selling point for tourism and promoting combination of various nationalities in the area.

**Table 4.14** Importance and pride on Wat Ket famous food

Importance and pride on Wat Ket famous food	Frequency
Knowing lifestyle of Wat Ket people that is combination of various nationalities	12
Pride on having delicious food for visitors that benefit the community by attracting tourists	20
Should be inherited by next generation because it is the local wisdom that has been inherited for a long time and deserve for conservation and being family income.	10
Combination of various regions is another identity of WatKet area	10

## 6. Strength of Wat Ket leader

Because most of Wat Ket leaders are the descendant of local ancestors, they are bonded and love the area. The leader group has good vision and can cooperate although has various religions and occupations. They devote their time for public work because they are local people and have high responsibility. Many leaders are technocrats that are well educated, have knowledge and need to balance development by integrating conservation, culture, lifestyle, building and housing with new economic development of outsider. Leader group tries to mediate the conflict between local people and new immigrant by using activities on cultures and traditions of community to connect two groups and create understanding among them.

## 6<sup>th</sup> domain: Important problems of Wat Ket area

Although Wat Ket area has potential on history, society and culture that are area identity and specific Lanna distinctly, change on economy, modernity and land use causes many problems that is studied from research, community forum and interviewing representative sample. The important problems include below.

### 1. Environmental problem of Wat Ket area

Balance of physical environment of Wat Ket area is disturbed by urban expansion that causes problems and violence to physical environment. For example, obstructing, covering and possessing some part of Payaphet canal (traditional main drainage channel) minimize drainage area that introduces flood in Wat Ket area. From the survey in 2006, the moderate problems that threaten local people are flood and public area encroaching. Both problems are still not resolved by related government sector leading to rapid flooding during heavy rain (Duangchan, 2006). Wat Ket area has increase of condominium and high building that is high intensity of land use by vertical construction. High buildings overshadow respectable religious places and are modern style that is inappropriate with Wat Ket pride and identity on landscape architecture and culture, which local people would like to conserve. In addition, Most of residence in the condominium is outsiders that lack participation on Wat Ket activities and cause overcrowding problem (Table 4.15)

**Table 4.15** Urban environment

Urban environment	S.D.	average	Interpretation
Flood during rainy season is a result of obstruction and encroaching on Payaphet canal	0.8660	4.00	High
Condominium and high building cause overcrowding	1.0219	3.38	Medium
Increase of slum	1.0508	3.11	Medium

## 2. Transportation, public utility and assistance systems

Adequate transport route and rapid access of Wat Ket area introduce material, social, cultural growth from all around. Physical and social change is partly a result of access capability or convenient transport route that leads import of several cultures. Increase on access raises the change. High and highest level of problems on transportation, public utility and public assistance in community opinion are traffic jam during rush hour and festivals because Wat Ket area includes important places, i.e. religious places, schools and famous food shops (Table 4.16). The survey in 2006 also found that the most threatening problems for Wat Ket people are traffic jam in the morning and evening that has not been resolved by related government sector yet (Duangchan, 2006). In fact, the 2-lane road in Wat Ket area is narrow and unsuitable in current situation. In addition, customers of the roadside shops that park a car in front of the shops decrease road surface and aggravate traffic jam especially during rush hour.

**Table 4.16** Transportation, public utility and assistance systems

Transportation, public utility and assistance systems	S.D.	average	Interpretation
Lacking of public transport system in Wat Ket area	1.0416	3.46	High
Inadequate parking place for car and motorbike, which narrowing the road by parking on road (public area) is not appropriate	0.8056	4.04	High
Managing traffic system may affect security and health of WatKet resident.	0.9227	3.87	High
Problems on service of electricity, water supply, telephone and communication systems	1.1966	1.55	Low
Traffic jam during rush hour and festivals	0.8526	4.26	Highest

## 3. Pollution

Wat Ket area faces almost all pollutions, such as air pollution, water pollution, noise pollution and waste problem, which the intensity of pollution tends to increase because of area development, urban expansion, economic growth, population increase and unsuitable land use. The survey in 2016 shows the highest level of pollution problem that is air pollution, noise pollution and business waste. In the same way, the

survey in 2006 found that the 3<sup>rd</sup> and 4<sup>th</sup> ranks in threatening problems are noise pollution from place of amusement during night time and air pollution from car's exhaust during traffic jam (Duangchan, 2006).

**Table 4.17** Pollution factors

Pollution factors	S.D.	Average	Interpretation
Air pollution, dust and smock from traffic and environment	0.7693	3.69	High
Noise pollution from business and shop in WatKet area	0.9379	3.65	High
Landscape pollution from overshadowing of high building and new building that has different style from WatKet identity	0.9211	3.44	High
Waste from business and shop in WatKet area	0.9054	3.52	High
Polluted water from business and shop in WatKet area	1.0305	3.12	Medium

#### 4. Identity and landscape loss

Government policy on enhancing urban expansion to surrounding area influences the change. From the survey in 2016, the most important problem on identity loss for Wat Ket community is the demand on conserving Wat Ket area for learning by next generations and attracting tourists among the conflict of coexistence between local people and new immigrants. In addition, there is the important problem on preserving traditional building aside Chareonrat Road, Chareonmuang Road, Bamroongrat Road, Kaewnawarat Road and area in front of Wat Ket Karam because road widening will narrow the area in front of the buildings and may destroy old building that is valuable artistic work. The same problems were also found in survey in 2006 that show the most threatening problems, i.e. identity loss, landscape loss, new building construction without concerning by outsiders (Duangchan, 2006).

**Table 4.18** Problems of Wat Ket area

Problems of Wat Ket area	S.D.	Average	Interpretation
Decadence of ancient remains, buildings and old houses in Wat Ket area	0.8992	3.36	Medium
Local people depreciate the deccdence of ancient remains, buildings and old houses in Wat Ket area	1.0682	3.43	High
Problem on business and living coexistence between local people	0.9671	3.18	Medium

Problems of Wat Ket area	S.D.	Average	Interpretation
and new immigrants			
Problem on distributing modern lifestyle from outside to Wat Ket youth (game and internet addiction)	0.9000	4.08	High
Problem on preserving Wat Ket area for learning by next generations and attracting tourists	0.9005	3.19	Medium

## 5. Problems on health and crime

Problems on health and crime in Wat Ket area about robbing, larceny, snatch, narcotic and drug are few, while there is a problem on alien labour that works in Wat Ket business and shop and stays in slum that encroaches Payaphet canal, dumps waste into canal, makes trouble to community and is ignored by related government sector.

**Table 4.19** Problems on health and crime in Wat Ket area

Wat Ket Problems	S.D.	Average	Interpretation
Crime: robbing, larceny, snatch in WatKet area	1.0237	2.29	Low
Health problem of WatKet people	1.0622	2.50	Low
Problem on narcotic and drug in WatKet area	1.0621	2.50	Low
Problem on alien labour in WatKet area	1.1805	2.85	Medium

## 7<sup>th</sup> domain: Demand and method on future development of Wat Ket area

### 1. Physical condition of Ping riverside area and importance and pride on capability of seeing Doi Suthep view for Wat Ket community

Area in the East of Ping River is green area along the river with more than 6m width and has combination of residential building and house (narrower residential building) from Nawarat Bridge to Nakhonping Bridge. The area slope of 5-10% on Ping Riverside has drainage canal to Ping River and is used for public recreation. Problem on area aside Ping River is ignored without maintenance and always flooded every year. The area is slightly used for various benefits comparing with the area potential that is the largest riverside area of Chiang Mai and can see Doi Suthep view. The area should be developed and supported to benefits local people. The most importance and pride on

the riverside area for Wat Ket community is that the area provides recreational area, creates pleasantness, doing exercise and can be historical learning place.

**Table 4.20** Physical condition of Ping Riverside area that is important and create pride for Wat Ket community

Physical condition of Ping Riverside area that is important and create pride for WatKet community	Frequency
Local people and tourists can see beautiful scenery	5
Should be developed and protected from flooding	5
Having recreational and beautiful area for resting, walking, fishing	7
Be recreational area and create pleasantness for local people that can bring children to sit and listen to Ping River history	10
Local people can rest, exercise and do other activities in the area	10
WatKet pier has famous history	5
Should be managed physical ecosystem orderly for conservation tourism	5
Should be developed to support traditional lifestyle of local people aside Ping River	5

## 2. Demand on Wat Ket development direction that suits for actual condition of Wat Ket area

Most people need to direct development to appropriate integrating pattern between old and new pattern without swaying to any side. Integrated development may be better than others because it support daily life. Preserving traditional pattern is impossible because of high change from development. The best development direction for Wat Ket area should base on conserving old and new things to remind descendant about the ancestor and history of the area and to learn new thing by applying, integrating and developing with old thing evenly.

**Table 4.21** Demand on Wat Ket development direction

Demand on Wat Ket development direction	Frequency
Traditional style as it is in the past	5
Modern style as the center of modernity like big city	-
Integrated style that has balance of traditional and modern styles	47
Opinion on integrating traditional and modern styles	Frequency
Selecting the advantages of change while preserving the advantage of ancient then allocating and integrating both evenly	12

**Table 4.21 (Continued)**

Opinion on integrating traditional and modern styles	Frequency
Integrated development is better than others because it supports daily life	20
Descendant does not forget ancestor and history of the area and learns new thing to apply and integrate both traditional and modern ways for appropriate development	
Preserving traditional pattern is impossible because high change from development that creates modern pattern. Development should base on both patterns.	20
Total	52

### 3. Demand on development of Chareonrat Road and Ping Riverside ecology

Opinion of most people in Wat Ket area about development direction of Chareonrat Road and Ping Riverside ecology including ‘Project of Wat Ket land use planning by public participation’ accepts 1) improving Chareonrat Road by Horizontal Directional Drilling (HDD) method, and 2) designing Ping Riverside ecology and improving old piers around Wat Ket Karam and Chansom Bridge including landscape rearrangement. Beside the acceptance on the operations, local people give the suggestion for completeness of the project because they believe that both operations can resolve the urgent and most important problems, which are traffic jam on Chareonrat Road and land use problem on Ping Riverside area. Both problems have been ignored by government sector for a long time. Chareonrat Road is narrow and obstructed by electricity and telephone poles on sidewalk that is the problem and obstacle for using. Area aside Ping River (public area) has been overlooked and lacked of maintenance form government sector and local people although the area can greatly benefit community and support many activities because of adequate space and beautiful landscape.

Projects on Chareonrat Road and Ping Riverside development is a part of primary specific plan for Wat Ket area, which most of local people accept the projects. After finishing both projects, project on other areas is operated for completing guideline of integrated urban management in specific area that is called ‘Collaboration for Specific Land Use Planning in Wat Ket Area, Chiang Mai City’ or specific plan. The guideline resolves random urban management and balances urban development by cooperating with stakeholders and focusing on community participation.

**Table 4.22** Demand on Chareonrat Road development and ecological development on Ping Riverside

Development on Chareonrat Road and Ping Riverside ecology	Frequency	%
Disagreement	-	-
Agreement	38	73.1
Should be developed	14	26.9
Total	52	100.0

#### 4. Demand on Wat Ket community participation

From interview of local people on development direction of Chareonrat Road and Ping Riverside ecology, most people accept the operations and give suggestion as follow.

1) Hotels, restaurants and shops should have their own parking place for their customers. The roadside around Chansom Bridge should be paved. Slope of the road should be leaned to Ping River. Pier next to Camedara restaurant should be solved.

2) One-way traffic system should be applied for flexible traffic. Climber should be planted covering pedestal.

3) Ping Riverside management and Ping River widening should be accelerated by moving eight houses aside Ping River because they encroach riverside area for personal benefit that makes trouble to their neighbor.

4) Billboard for inviting visitors to Wat Ket festival should be placed to show reliability and interest other people to participate the festival.

5) Meeting of local people should be arranged to explain the project and listen to acceptable direction for community participation. Monitoring a result of project should be done to keep benefit for local people.

6) Wat Ket area should be developed to be livable and clean.

7) Because Wat Ket community has various ideas, public hearing should be arranged to know opinion and requirement of community for reducing the conflict.

8) High growth of Wat Ket area always increases immigration for doing business and commerce, living in condominium and hotel, establishing restaurant that open all day long. Thus, safety on life and asset of local people and tourists should be firstly considered.



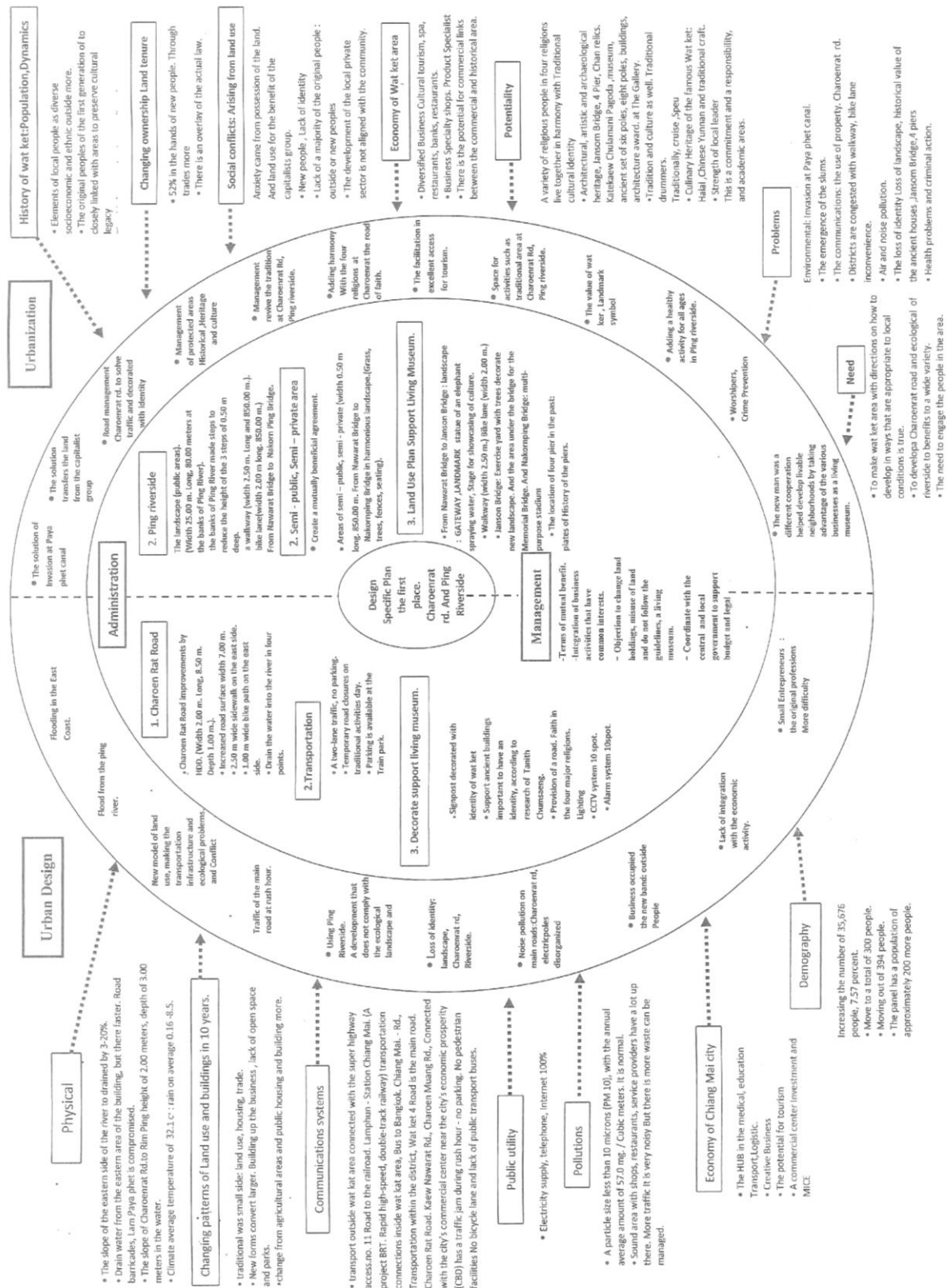
9) People are proud of participating and sharing opinion for the project for teaching next generation to conserve Lanna identity and history of Wat Ket area for education and tourist attraction. They are ready to cooperate for better development.

#### **4.4 Analysis for land use design and detail of specific plan**

Data from several sources according to urban design method and urbanization concept as shown in 4.3 is empirical fact that is needed for analyzing connection and uses the analysis result as a guideline for specific plan.

Data analysis can be done by many methods, such as SWOT analysis that is effective for few and obscure data, which are estimated weak and strong points, chance and threat by professionals and stakeholders. The result of SWOT analysis is moderately effective, but, in case of Wat Ket specific plan, moderate correction of Wat Ket data is unsuitable for SWOT analysis. Another method is Smart Growth Score that specifies and estimate aspects or factors by weighting from 1 to 5 and then the weight score of each factor is placed on map to show influence of factors that affect one another. The method may have conflict about acquirement of factors and data for estimation.

For the 1<sup>st</sup> part of Wat Ket specific plan (Chareonrat Road and Ping Riverside), another method is used because 1) Hybrid Urban Planning defines main aspects base on theoretical framework, and 2) every main aspect and factor has quantitative and qualitative data from reliable source and is collected by correct method especially for main aspect about urbanization, which the data come from local people. With both conditions, the most complete analysis method is relationship connection analysis that analyze by connecting the variables because variables in actual situation are not reasonable directly or simply but they connect one another as a cycle. Therefore, relationship connection analysis may be reasonable logic although it is difficult to specify factor relationship and clarify the analysis result. The result has to interpret with two or three-dimensional model for controlling specific plan. The analysis method is better than SWOT analysis and Smart Growth Score. Main aspects and factors are analyzed and presented in two-dimensional relationship chart as follow.



**Figure 4.3** Shows empirical conclusion of main aspect and factors under urban design and urbanization methods.

Detail in 4.3 is shown outside the circle. The chart only places the important conclusion, but the result of relationship connection analysis concludes reasonableness among factors in each main aspect and among main aspects of urban design and urbanization as shown in a ring of the circle. Connection analysis on data in the ring provides framework or regulation that has to be managed or gained for resolving the problems or getting development that benefits in the present and future. The framework and regulation in the ring are used to design primary specific plan or conceptual design that includes spatial management and spatial administration that are done in the circle.

From analyzing data to design primary specific plan, the result shows that location, physical condition, transport system, economic system and public utility have higher potential than area limitation leading to change on utilization of large land plot, increase of vertical land use and increase of immigrants for working and using public area, which create pollution and aggravate flooding. For analysis with urban design concept, vertical land use has to be controlled and future pollution problems have to be managed. In addition, transport system and traffic have to be managed by increasing road surface and public transport. Green area and landscape management of the area aside Ping River have to be arranged also.

After connecting data with urbanization concept, the result shows more relationship that using urban design. In addition, Hybrid Urban Planning method is proved that it can create more suitable city. For example, in case of change on land ownership and tenure, Wat Ket area has change on land feature and size and vertical increase of building. Land ownership is transferred to outsider capitalists that possess potential area, which increases immigrants and hidden population (population dynamic). Moreover, most of outsider capitalists that have more power on investment than local people have less relationship with local people and conflict with them. Immigration of hill tribe for working increases social separation. All results are important for spatial design to balance between aspects of public and private areas.

For another example in Hybrid Urban Planning, specific area has to use main aspect on history, potential, problem and requirement of the area for analysis to reintroduce good stuffs and create good relationship of local people and then share benefit to other people through living museum, which can partly resolve area problem

and achieve community demand on development following common vision. Results of analysis that is multidimensional development guideline are concluded that:

1) Land use management can decrease the conflict by enhancing respect of local people and new immigrants for land value that is arranged to be living museum by managing public utility and transportation of Chareonrat Road and managing Ping Riverside ecosystem, which the detail will be mentioned further.

Chareonrat Road has to be improved for various utility that is increasing road surface, pedestrian and bicycle lane, and burying electricity and communication system. In addition, decorating building and house and arranging landscape along the roadside is done to show Wat Ket identity. The road is managed traffic during rush hour and created safety including decreased noise pollution and visual pollution. Moreover, the road can be used to support important festival that has to use Chareonrat Road and area aside Ping River for facilitating tourists and supporting good stuff access for tourism.

For Ping Riverside, conflict and land ownership transfer have to be managed by finding agreement that benefit owner, community, government sector and public, such as changing the conflict area to semi-public area (in the same landscape) that is accessible by owner and stakeholder. Ping Riverside area is developed to have general utility by managing flooding area, supporting living museum and making large and small business sharing benefit from the same area. Economic development that directs to be living museum and develops landscape introduces area management for activity space, exercise, festivals, being landmark and benefits on health and recreation of WatKet people.

2) Management Chareonrat Road and Ping Riverside area has to be multi-dimension or general utility. Both areas are the center of living museum that locates and shows activities to conserve history, culture and unity of four religions.

All of those are the results of connection analysis according to Hybrid Urban Planning method, which are cooperated with three mechanisms for designing the 1<sup>st</sup> part of primary specific plan that has the main point as follow.

**Management** is working guideline, such as Chareonrat road is improved by HDD method for increasing road surface to 7m width, creating 2.5m-wide sidewalk on the East, making 1m-wide bicycle lane on the West and constructing four drainage channels to Ping River under the road at four old piers.

The operation follows demand on resolving traffic jam problem, obstruction on roadside, inconvenient and unsafety on using road, and flooding of East area.

For two-lane transport, parking on road is restricted and the road is temporarily closed when there are festivals and faithful road in significant day of four religions. When the road is closed, car parking lot is available at Railway Park and electric cars are used to transport from the park to 8-12 transit points in Wat Ket area.

The operation follows demand on making Chareonrat Road to be faithful road and can solve roadblock problem from car parking.

For decorating to support living museum, guideposts are decorated following Wat Ket identity and significant ancient buildings are conserved following a study of Tanit Choomsang. In addition, security system has electricity system, light, CCTV system at ten points and ten alarm points.

Landscape development of Ping Riverside (public area, with 25m height and 80m long from Nawarat Bridge to Wawee Coffee) is done by constructing three steps of ladder with 0.5m depth for each. The area from Nawarat Bridge to Wawee Coffee is constructed gateway to be a landmark by using sculpture of elephant spraying water (Pu Leoy elephant is a model) and has cultural show space. The public area is used for constructing pedestrian (2.5m width and 850m long from Nawarat Bridge to Nakhonping Bridge), bicycle lane (2m width and 850m long from Nawarat Bridge to Nakhonping Bridge). Semi-public area (0.5m width and 850m long from Nawarat Bridge to Nakhonping Bridge) is constructed as tree fence that is harmonious with landscape. Four traditional piers, i.e. Tha Satharn, Tha Chang, Tha Chansom and Tha Naikhong, is renovated and recorded their history. Landscape of bridge-neck of Chansom Bridge is developed to be exercise field with training equipment and playground by using former trees for decoration. Area under the bridge has small exhibition to remind of Dr. Cheek that built the bridge in memory to his wife. Area around bridge-neck of Nakhonping Bridge will construct multi-purpose stadium (for petanque, takraw, basketball and indoor soccer) and use former trees for decoration.

Spatial management is done by 1) improving Chareonrat Road by HDD method, and 2) arranging Ping Riverside ecosystem, which all operations follow community demand on resolving problems, such as identity loss, new landscape management of

Chareonrat Road for convenient and increasing noise pollution, lacking common area for festival, culture show, exercise, sport field and recreation.

In conclusion, spatial management is operating direction that needs administrative mechanism who applies the direction.

**Administration** is management by three mechanisms that include 1) internal moving mechanism by new generation as driver and worker, 2) external supporting mechanism with 2.1) academic supporting mechanism by technocrat and university, and 2.2) supporting mechanism on resource, law, policy and framework that includes central, regional and related local government sectors. Area administration has to have common regulation by integrating business activities that can share benefits. Change on land ownership and land misapplication is objected, whereas land use is shared to return economic benefits to everyone. If outsiders do not follow living museum direction, community has to object and coordinate with central and local government sectors to support budget and matters of law.

#### **4.5 Analysis result following chart in Figure 4.3**

Three mechanisms create specific plan by working together on drafting details of specific plan that consist of chart, map, land use regulation and notification of Wat Ket specific plan on specifying rule for using asset to benefit specific planning in each sub zone. Complete detail of pattern development and primary regulation comes from cooperation on interview about opinion on draft of specific plan with adding of stakeholders. The data are collected by using conversation about detail on draft of specific plan, which the stakeholders (interviewee) consist of 30 persons in 5 sampling groups: business leader, religious leader, government leader, community leader and knowledgeable people of community. The results of adding stakeholders that are shown in Table 4.23 complete the draft of specific plan and provide land use regulation and notification of Wat Ket specific plan, which the result of using Hybrid Urban Planning method will be mentioned in 4.3

**Table 4.23** Opinion on draft of specific plan with adding of stakeholders on Chareonrat Road development (land management)

**1. Chareonrat Road development by burying electric and telephone lines (HDD system with 2m width and 1m depth).**

	Average	Interpretation
Improving Chareonrat Road by widening road surface to 7m	5	Highest
Improving Chareonrat Road by adding 2.5m-wide pedestrian in the East	5	Highest
Improving Chareonrat Road by adding 1m-wide bicycle lane in the West	5	Highest
Improving Chareonrat Road by adding four points of drainage channel to Ping River	5	Highest

**2. Chareonrat Road development on transportation**

	Average	Interpretation
Improving Chareonrat Road from two-lane road to increase traffic area and prohibit parking on roadside	5	Highest
Temporary close the road during festival and religious activities	5	Highest
Arrange parking lot at Railway park and increase transport system by using electric car from the park to 8-12 transit points in WatKet area	5	Highest

**3. Decoration for supporting living museum**

	Average	Interpretation
Increase and decorate guidepost as WatKet identity	5	Highest
Support houses and ancient building on Chareonrat Road to have WatKet identity following the study of Tanit Choomsaeng	5	Highest
Manage faithful road in significant day of four religions	5	Highest

**4. Development for safety management**

	Average	Interpretation
To increase electricity system and light	5	Highest
To increase five places of CCTV for safety	5	Highest
To increase five alarm points for safety	5	Highest

## 2<sup>nd</sup> part: Ecological development of Ping Riverside (spatial management)

**Table 4.24** Opinion on draft of specific plan with adding of stakeholders on ecological development of Ping Riverside (land management)

### 1. Landscape improvement (public area of 25m width and 80m length)

	Average	Interpretation
Improving Ping Riverside ecosystem by making three steps of ladder with 0.5m depth for each	5	Highest
Improving Ping Riverside ecosystem by changing public area to pedestrian (with 2.5m width and 850m long) and bicycle lane (with 2m width and 850m long) from Nawarat Bridge to Nakhonping Bridge	5	Highest

### 2. Semi-public area method for ecological development of Ping Riverside

	Average	Interpretation
Improving Ping Riverside ecosystem by creating regulation on sharing benefit on semi-public area	5	Highest
Improving Ping Riverside ecosystem by managing semi-public area (with 0.5m width and 850m long from Nawarat Bridge to Nakhonping Bridge) to have landscape concordance with tree fence, grass field, sitting area and large tree	5	Highest

### 3. Ecological development of Ping Riverside by managing land use plan for supporting living museum

	Average	Interpretation
Improving Ping Riverside ecosystem around Nawarat Bridge by creating gateway and arch	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Wawee Coffee by creating landmark with elephant spraying water that has Pu Leoy Elephant as a model	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Wawee Coffee by providing show space for traditional show of local people	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Wawee Coffee by creating information center and office	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Wawee Coffee by having historical hall to tell story of WatKet area	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Wawee Coffee by providing shops, beverage and food (use income for area management)	5	Highest



	Average	Interpretation
Improving Ping Riverside ecosystem by developing four traditional piers: Tha Sathan, Tha Chang, Tha Chansom and Tha Naikhong and having historical memorial board of the piers	5	Highest
Using former trees for landscape decoration	5	Highest
Improving Ping Riverside ecosystem at Chansom Bridge by using area under the bridge to arrange small exhibition to remind of Dr. Cheek, which then proprietor Kheak merit the bridge in memory to his wife (WatKet Taj Mahal)	5	Highest
Improving Ping Riverside ecosystem by using area around Nakhonping Bridge as multi-purpose sport stadium (petanque, takraw, basKetball, indoor soccer) for exercise	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Nakhonping Bridge by increasing 5 places of CCTV for safety	5	Highest
Improving Ping Riverside ecosystem from Nawarat Bridge to Nakhonping Bridge by increasing 5 alarm point for safety	5	Highest

### 3<sup>rd</sup> part: Area administration on Chareonrat Road and Ping Riverside ecosystem

**Table 4.25** Area administration on Chareonrat Road and Ping Riverside ecosystem

	Average	Interpretation
Having common regulation on developing Chareonrat Road and Ping Riverside ecosystem	5	Highest
Integrating business activities that share benefit in Chareonrat Road and Ping Riverside ecosystem	5	Highest
Having measure for objection of land ownership transfer and land misapplication on Chareonrat Road and Ping Riverside ecosystem	5	Highest
Cooperating with central and local government sectors for supporting budget and matters of law	5	Highest

### Suggestion of 30 interviewees from 5 sampling groups on participation of Wat Ket people

#### 1. Chareonrat Road development by burying electricity and telephone systems (HDD system with 2m width, 850m long and 1m depth)

- Besides widening Chareonrat Road, road surface is needed to improve to be smooth because the road is old and has deep hole.

- Should add more wastewater management system in Chareonrat Road
- Sidewalk along Chareonrat Road and project on using electric car for decreasing parking on the road are good point
- Auction on HDD construction in Chiang Mai use very high cost
- Should have drainage channel at four traditional piers and increase clarifiers both sides of Chareonrat Road
- Elevating of pedestrian and bicycle lane should not too higher than road level
- For using Wat Ket electric car for visiting festivals in the area, local people should cooperate in management
- Use yellow color for bicycle lane and blue for pedestrian
- Having the signs at transit points of public electric car
- Bicycle lane should be colored and have bicycle sign on the road
- Coloring white-red stripe throughout roadside and cooperate with traffic police to prohibit parking along Chareonrat Road permanently
- Increase CCTV more than ten points at each junction
- Moving parking lot to Railway park is managed by who and how
- Should design projects on other roads around Wat Ket area and extend the project from Chareonrat Road to soi
- Use electric car like in Chiang Mai University
- Entrance of gateway should have signs of four religions following the religious color, such as green color for Islam
- Entrance of gateway should be decorate by signs of four religions in Wat Ket area

## **2. Ecological development of Ping Riverside**

- Should install large LED monitor for promoting show schedule to inform outsiders and local people with data and news of Wat Ket community
- Comedara Restaurant pleases to support and maintain the developing area with group of shop and restaurant aside Ping River
- Concern about management (working group after project finished) but rely on current community leader (Ting)

- Need rapid construction of Ping Riverside project to bring children for walk and ride a bike
- Gateway should have moving sign display to show news information of Wat Ket and festival of Kawila Municipal District
- Would like to see rapid operation of Ping Riverside project in this year
- Should have public waste disposal points in other places
- Following the plan can decrease wastewater release by hidden pipe from restaurant (The Good View) to the river
- Be a very good Ping Riverside project and please to help everything about civil engineer
- Would like to see finishing of Ping Riverside project rapidly / Would like to have this project in the East side
- Marine Department is operating inquiry on land with 20km long aside Ping River, which will provide more correction of data about land border aside Ping River
- Ping Riverside project is not semi-public area but is owned by government according to Land Law under responsibility of Marine Department
- If the project succeeds, the project will be a model for Ping Riverside management for area along 20km aside Ping River
- Marine Department should offer the project to administrator to consider and support. But for provincial sector, there is no supporting administrator
- Be careful of assemble of teenager during night time around Gateway
- At sport field or show space, student of Wat Ket Karam should participate in the show or activities according to scheduled time or significant festivals
- Painting bicycle sign and use yellow color on road surface
- Soldiers and polices should stay in station (guardhouse) at Gateway
- CCTV number is very few and should have every 50m
- Should have cooperation of community to request ivory of Pu Leoy Elephant from National Museum Bangkok for showing in Wat Ket museum
- Attaching history board of Pu Leoy Elephant at sculpture of elephant spraying water
- Constructing center of Wat Ket goods that have shops and offices
- Light system should use photovoltaic system aside Ping River

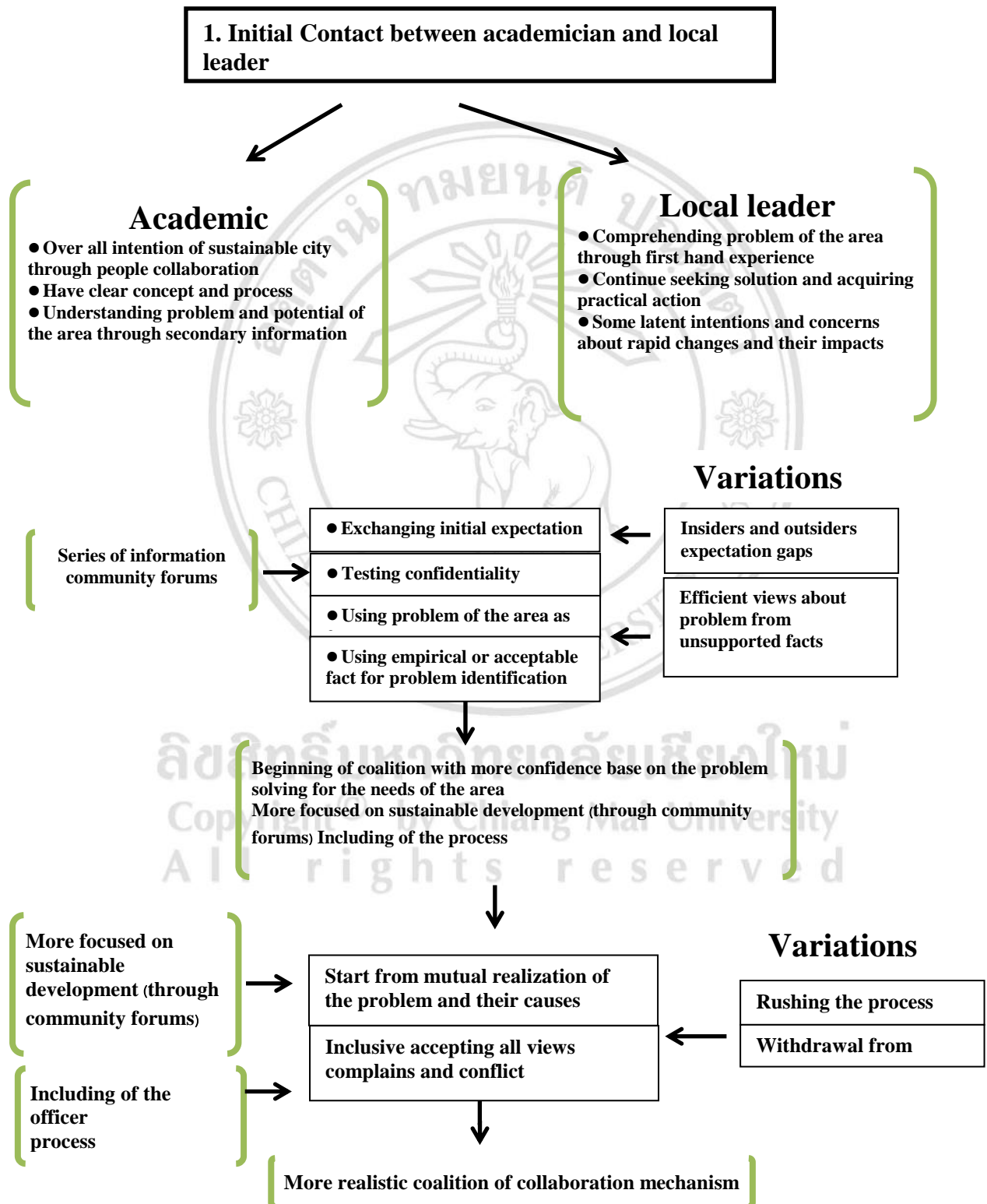
- Try to participate in every part of work as much as I can
- Should use previous research as database for operation
- Administrator of the project should be new generation and have representative from business sector for 50%
- Every Sunday should have walking street to emphasize art at Ping Riverside from Chansom Bridge to Nakhonping Bridge
- New generation team of Wat Ket community takes care of sport stadium and exercise field
- Use Pu Leoy Elephant as a model and has history of him at the base of the sculpture
- Consider budget to maintain tree after project finished
- Move sport stadium from bridge-neck of Nakhonping Bridge to Chansom Bridge
- Want success of the project
- Bicycle lane should be colored
- Increase CCTV in Wat Ket area
- Accelerate operation to success quickly
- Have to maintain previous trees because Christian planted them together
- Chansom Bridge can design and construct with triangle wood that can made of real wood
- Project management is very important and is took and interest otherwise it will become new rotten place
- Try to not remove previous trees that Christian planted them around gateway
- Have to emphasize who manage the area

The 1<sup>st</sup> part of Wat Ket specific plan can preliminarily respond problems and requirements in all aspects of the area, which has to originate from complete data collection. In addition, the question cannot be answered without directing analysis to common vision that is ‘The Only Living Lanna in the City’.

#### **4.6 Flexible and adaptive process of Hybrid Urban Planning**

Successful process of Hybrid Urban Planning has to be dynamic and adaptive throughout the processing because of complicate factors of society, politic and

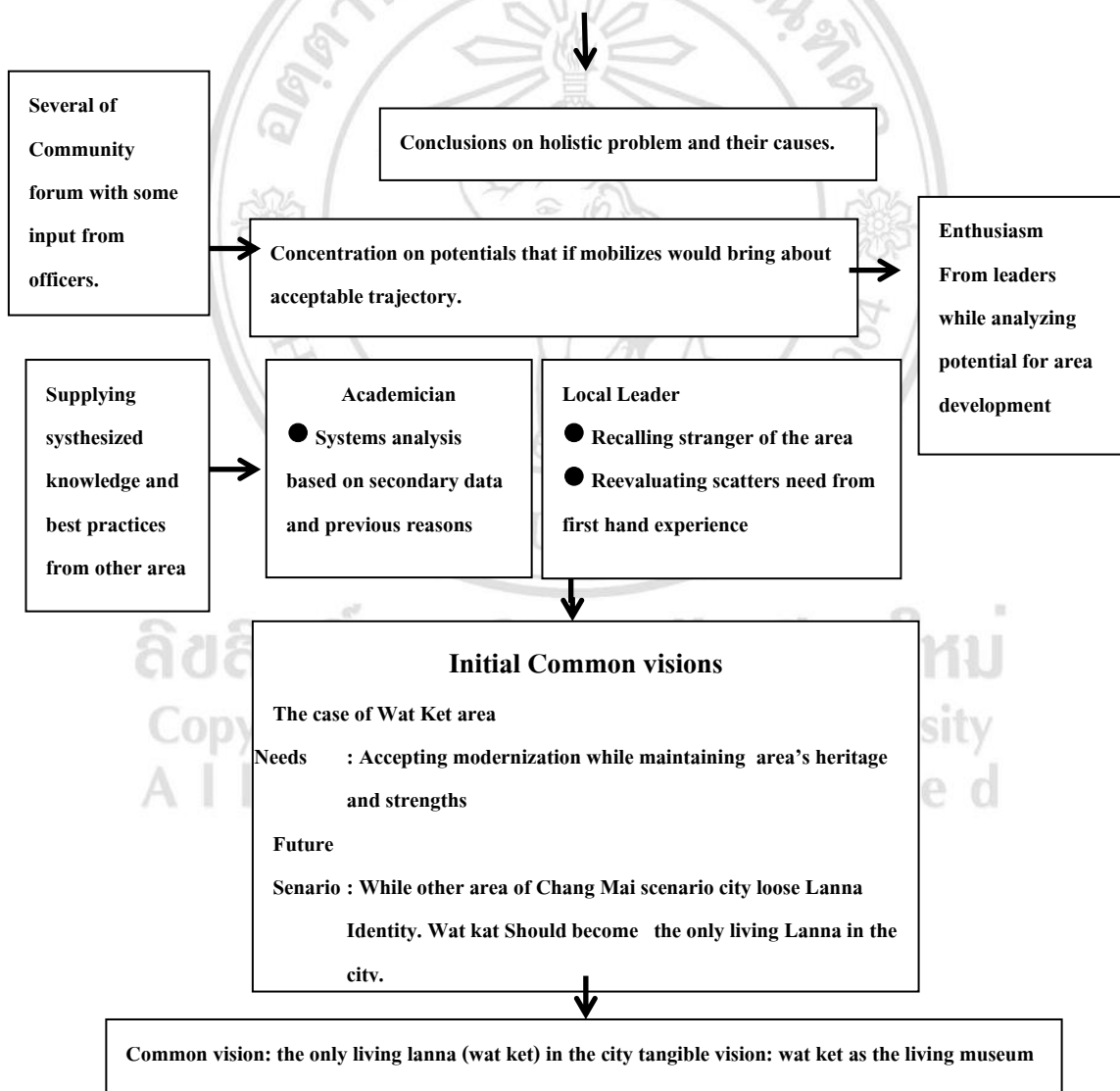
cooperation mechanism including interaction with stakeholders. The following figure shows the main point of process in all steps of Hybrid Urban Planning experiment that illustrate actual movement and adaptation, as follow 1<sup>st</sup> - 6<sup>th</sup> diagrams.



## B. Identification and acquiring mutual acceptance of Area development common vision.

### Logic/Assumption

1. Problems are diversified complex.
2. Adequate not comprehensive and self-degeneration problems identification should be more, practical
3. Analysis based on holistic a Understanding of problem and into potential of the area bring about more enthusiastic imagination about future of the area.



## 2. Mobilization of collaboration effort to plan wat ket area as specific plan using hybrid urban planning

### Inclusion of stakeholders as collaborative mechanism

the project physical development and planning to support other activities leading to living museum was (a) recognized by the leader and other stakeholders in the area (b) supported by the university and TRF (c) committed by officer concerning with city planning and development

Extension members in the collaboration team



- 8-9 members from active wat ket area joined the team (They are interted in renovating housing building conflict, solving of land use and developing sport and recreation, etc) there members were and coordinating
- Committed to actual data collection and linking with business openion community leaders in order to recieve ideas needs and innovations necessary for specific plan wat ket
- Academic partners prepare necessary expertises, sush as historical Land use change civil engineering for infrastructure architectural renovation of building, transportation river bank protection etc.
- Team from goverment official such as the Public Works and Town and country Planning of Chiangmai Province, Kawila district, Tourism Authority of Chiangmai Province, Traffic police and Marine Department Region in Chiang Mai are ready to (a) support data for planning (b) prepare to support the process by helping obstacles involving with law and regulation (c) prepare to adopt planned activity into annual budgets



### 3. Informal on understanding: How to think about the practice and the target

Conclusion: to do the problems and what to do in concrete

The team's work opinion is not clear (academic/ leader in the area)

The target :

1. Chareonrat Road development
2. ecological improvement of Ping riverside

The team's work an academic/ leader in the area:

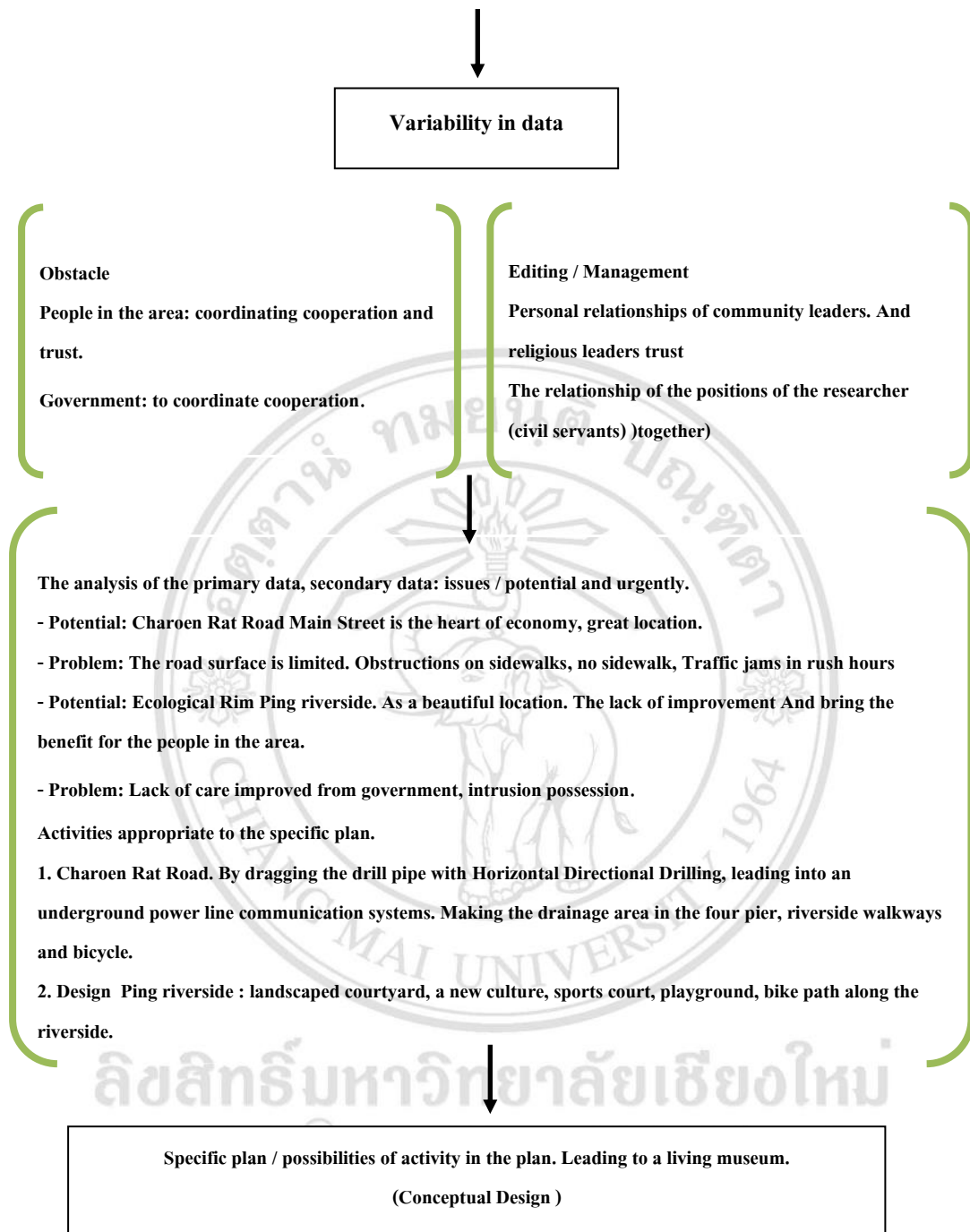
Agree with some solutions. Some people want a lot of activities like sporting culture

The goal is to clear up the implementation for the team's work to learn

### 4. Data collection and sharing of information by the team (Academic/ Community)

Academic	Teamworks / leader in the area
<u>Data collection: primary and secondary:</u>	<u>Data collection: primary and secondary: urbanization</u>
<u>physical landscape</u>	
Landscape character	History of the Wat ket area
Drainage	Population dynamics and social relationships.
weather And rainfall	Changing the ownership of land in Chiang Mai Municipality.
Land use and buildings	The social conflicts arising from land use.
changing patterns of land use in 10 years	The economy and the operation of the business of the Wat ket area
Transportation systems, traffic	The potential of the Wat ket area
Public utility	Racial and religious diversity
pollution	Architectural and archaeological heritage
City economy	Heritage Arts and Painting Tradition and culture
Population (Demography)	Famous food of the Wat ket area
	The strength of a leader and mainstay of the Wat ket area
	The issue of the Wat ket area : Environmental, transportation and utilities infrastructure, pollution and loss of identity.
	Loss of landscape and criminal action.





### Charoen Rat Road development by drilling tube towed by HDD.

#### Charoen Rat Road tube towed by drilling by HDD.

- Survey and mapping
- Designed by the drill pipe by dragging HDD.
- Design a drainage system into the existing pier.

- Walkway, bike lane along the riverside
- Decorative poles
- The planting of the tree
- drainage system into the existing pier

The renovation of the building, according to research of Tanith Chumsaeng

#### Traffic system to parking at the train park

- Lighting system, security cameras, CCTV system
- Lighting system, security cameras, CCTV

#### Coordinate with

- Municipal Kawila and the Public Works and Town country Planning
- HDD design company
- Community Leaders, team associates Survey and Design

Concluded are agreed with the development.

#### Coordinate with

- Community Leaders
- stakeholder 30 people

Concluded are agreed with the development.

#### Coordinate with

- Community Leaders, team
- stakeholder 30 people

Concluded are agreed with the development

But wait for the public hearing.

### Ecological improvement of Ping Riverside

Design, Land Mark Plaza ,Cultural Center , tourist center ,tree planting, walkway, bicycle lane along the Ping riverside.

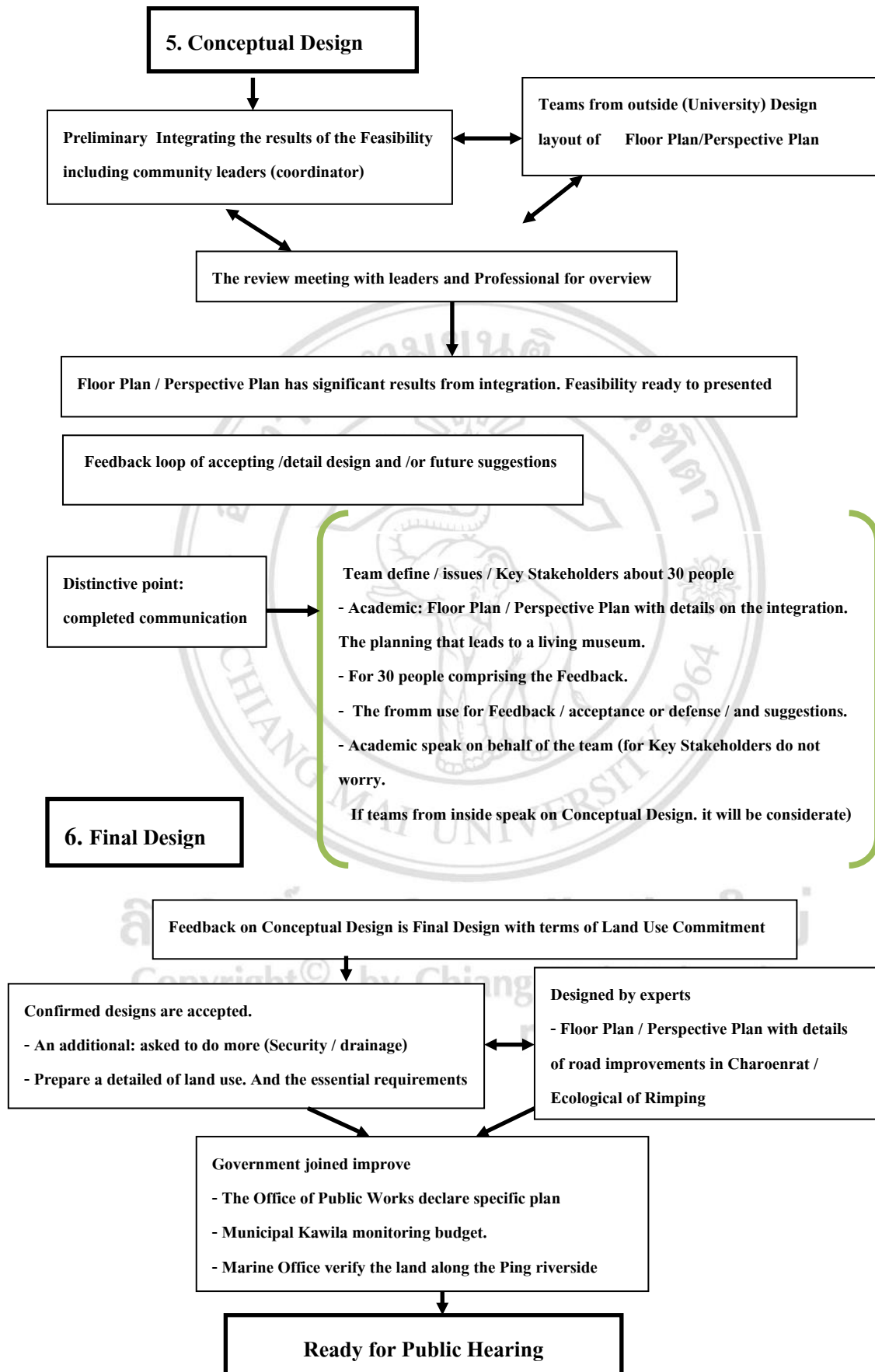
- Sport playground, multi-purpose stadium.
- Lighting systems, security cameras, CCTV.
- The planting of the tree along the Ping riverside.
- conflict resolution over ownership of land along the Ping Riverside.
- The result is a design disputed area by a fence, trees.

#### Coordinate with

- Municipal Kawila and the Public Works and Town country Planning ,Marine Office
- HDD design company
- Community Leaders, team associates Survey and Design

Concluded are agreed with the development.

New way of talking to present new thinking about semi-public and semi-private method while awaiting review by the court.



From the 1<sup>st</sup> - 6<sup>th</sup> diagrams hold the principle of Hybrid Urban Planning that lead to the result of specific plan as mentioned in topic 4.1. Practicality of the principle is not completely fluent that is the nature of problem. Because the principle of Hybrid Urban Planning focuses on clear common vision, intention and expectation may initially be unbalanced. However, learning and adaptation are emerged during the process leading to substantial operation that increases clarity of mechanisms and processes. All processes have to use many complicate concepts to manage conflict on land ownership at Ping Riverside about semi-public area that has already got satisfy primary agreement. Win-win situation method is also used to share benefits for every group properly. For example, HDD at Chareonrat Road directly benefits community and entrepreneurs and provides the plan with details for the supported government agencies to use in their missions that avoid the use of resource to propose and design the project from the beginning for only one agency.

The details of the 1<sup>st</sup> part of specific plan on Chareonrat Road and ecological development on Ping Riverside that relate to control designing of specific plan in spatial management and area administration is presented in Chapter 5.