

INTEGRATING LAND USE CONFLICTS

**Resolving conservation and development conflicts through
adaptive approach in Northeast Coast National Scenic Area**

**Nien-Ping Huang
4239857**

**Master Thesis
26 JUNE 2014**

**Delft University of Technology, Faculty of Architecture and the Built Environment
Department of Urbanism**



Contact

Nien-Ping Huang
4239857
bubu16888@msn.com
+31 615 334 886

Mentor team

Dr. Dominic Stead
Associate professor
Section Urban and Regional Studies
Department of OTB
D. Stead@tudelft.nl

Ing. Steffen Nijhuis
Assistant professor
Section Landscape Architecture,
Department of Urbanism
s.nijhuis@tudelft.nl

Prof. Vincent Nadin
Professor
Section Spatial Planning & Strategy,
Department of Urbanism
v.nadin@tudelft.nl

External committee member

Ir. Arie Bergsma
Researcher
Organization of Facade Master Program,
Department of Building Technology
A.C.Bergsma@tudelft.nl

Delft University of Technology, Faculty of Architecture and the Built Environment,
Department of Urbanism
Graduation studio Complex Cities & International Planning and Developing Regions

Preface

This report is my master thesis called "Integrating land use conflicts - Resolving conservation and development conflicts through adaptive approach in Northeast Coast National Scenic Area" The research focus on the territorial management issue that competing interests happened in Taiwan National scenic area. I wish this research would inspire planners and decision makers to be more aware of the complexity of competing interests and actors in a spatial project.

My personal motivation about this topic originated from my working experience with the project "Northeast Coast Area Civilian Economic Improvement Plan" in Metropolitan Engineering Consulting Company. The master plan dispute and Northeast Coast Area Civilian Economic Improvement Plan proposal by Taiwan Construction and Planning Agency resulted in serious protests in Gongliao. It seems the traditional planning system and planning approach cannot deal with conflict issue not only in land use but also the social ecological values. As an urbanist, I wonder is there a possible strategy would facilitate the conflict land use issues between conservation and development? Accordingly, this research sets up the hypothesis that adaptive planning approach would provide applicable theory and strategy to deal with social and spatial changes by integrating land use conflicts.

During the thesis research journey, I learned that the power and interests behind a spatial project is very complex. The conflict relationship between public authorities and decision making process make it difficult to reach agreement between relevant actors. This project is an exploration about the unsolved issues and questions in my mind about the involvement of the Civilian Economic Improvement Plan. First, I would like to know how a spatial strategy could be adaptive to the changing social ecological context. Second, I would like to know if the plan making process could be more supportive and responsive to the changing land use demand Third, I would like to know the relevant actors that we can consult at early stage of planning process. In the end, I demonstrate a set of spatial development strategy to resolve the existing spatial issues combined with a stakeholders collaboration form.

Urbanists may not be a politician or the decision maker, but it would be valuable if we are aware of the competing interests and stakeholder influence relations and help the planning system to act adaptively to the reality.



Terraced farmland in Gongliao

Source: kongliao-water-terrace.blog



Coastal landscape in Bitou

Source: Flickr website

Acknowledgment

I would like to express my deep gratitude to my mentor team : Dominic Stead, Steffen Nijhuis and Vincent Nadin, who guided me through the complex process of research and always gave me positive feedbacks. I also would like to show my appreciation to my colleague Tsai Yi Ju and Chen Wei Jie in Metropolitan Engineering Consulting Company, who showed me the spirits of urban planning in practice. I wish to acknowledge the help provided by Jason Chiang for the case study interview. Also, thank to Alick, Chi Yi, Kuan-Ling, Shumeng, Yi-hsuan without your support my study life in the last few months would be less fun and meaningless. Special thanks to Tomas, who always shared his insights and provided assistance about my project. Finally, I wish to thank my mother and brother for their support and encouragement throughout my study.

CONTENTS

CHAPTER A INTRODUCTION

I. Study area - Northeast Coastal National Scenic Area	10
II. Project context	14
III. Project definition	16
IV. Background information in Northeast coast area	18
V. Project structure	26

CHAPTER B METHODOLOGY

I. Literature review	30
II. Adaptive planning framework	34
III. Research tools	36

Acronyms and Abbreviations

CHAPTER C DIAGNOSIS

I. Institutional analysis	40
II. Stakeholder analysis	48
III. Spatial analysis	54
IV. Summary of analysis	82

CEPD	Taiwan Council for Economic Planning and Development
CPAMI	Taiwan Construction and Planning Agency, Ministry of the Interior
CEIP	Civilian Economic Improvement Plan
ESA	Environmentally sensitive area
EEFT	Environmental Ethics Foundation of Taiwan
FACOA	Taiwan Fisheries Agency, Council of Agriculture
FBCOA	Taiwan Forestry Bureau, Council of Agriculture
FANCRI	Taiwan Forest and Nature Conservation Research Institute
NCNSA	Taiwan Northeast Coast National Scenic Area
NCNSAA	Taiwan Northeast Coast National Scenic Area Administration
NLPL	Taiwan National Land Use Plan Law
SWCB	Taiwan Soil and Water Conservation Bureau, Council of Agriculture
TBMT	Taiwan Tourism Bureau, Ministry of Transport and Communications
WRA	Taiwan Water Resources Agency, Ministry of Economic Affairs
GESP	Generic and specific policy

CHAPTER D IMPLEMENTATION

I. General spatial concept in Northeast coast area	86
II. Demonstration site - Shuangxi River valley area	92
III. Strategies of adaptation plan in Gongliao	97

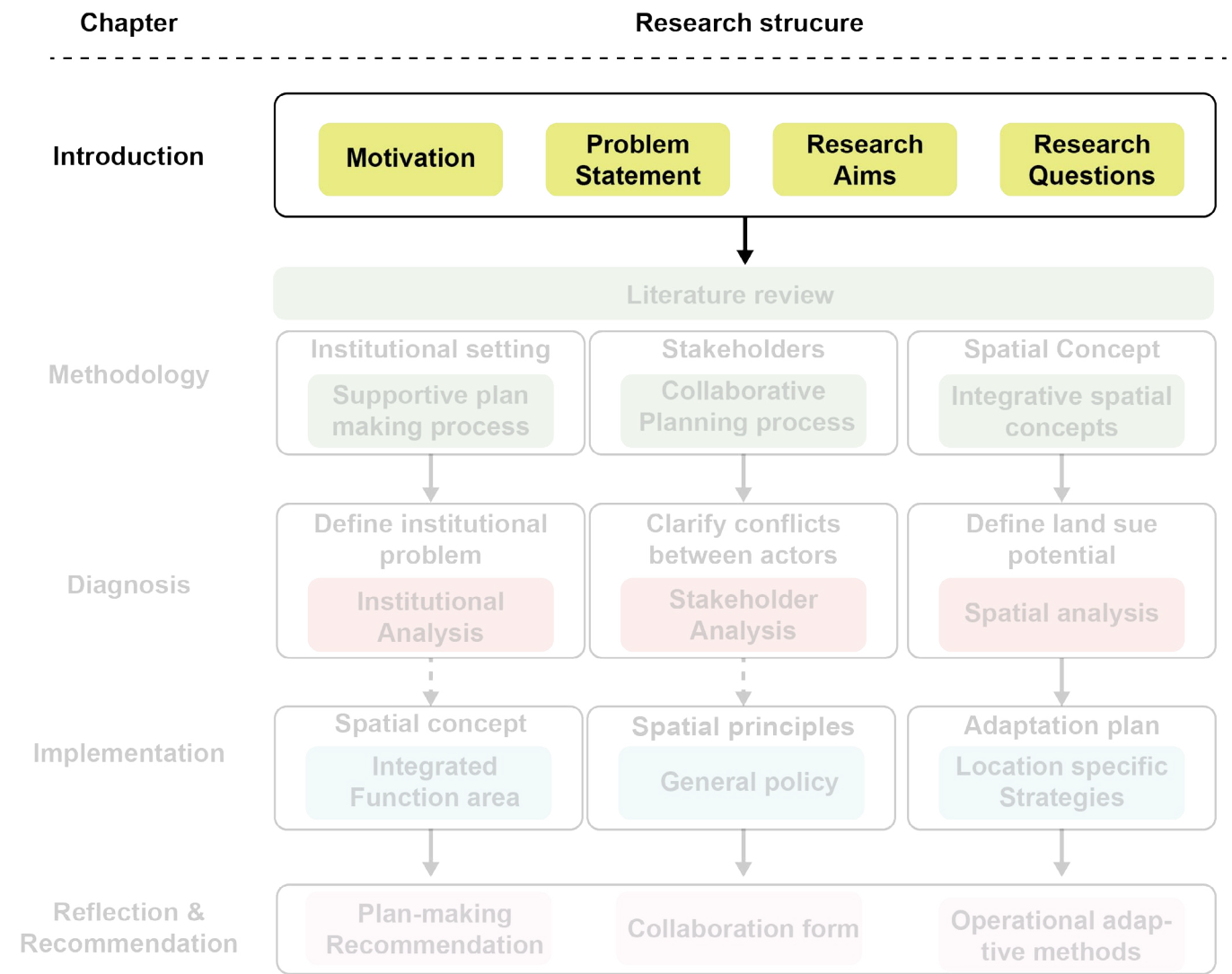
CHAPTER E EVALUATION AND RECOMMENDATION

I. Evaluation	114
II. Recommendations	115
III. The relationship between the project and the wider social context	115

APPENDIX

Appendix I - Reference	116
Appendix II - landscape types	118

Chapter A. Introduction



I. Study area - Northeast Coastal National Scenic Area

1. Location

Northeast Coastal National Scenic Area (NCNSA) is a place with more than 60 kilometres coastline along Pacific Ocean and 15 kilometres waterfronts along Shuangxi River, which locates in the northeast starting point of the Snow Mountain Range in Taiwan. The diversity of geographic landforms makes NCNSA the most unique and diverse combination landscapes of valley, mountain village, and fishery village in Taiwan.

This study focus on Northeast coast area, and take Shuangxi River valley as a test area for the proposed strategy.

Shuangxi River valley



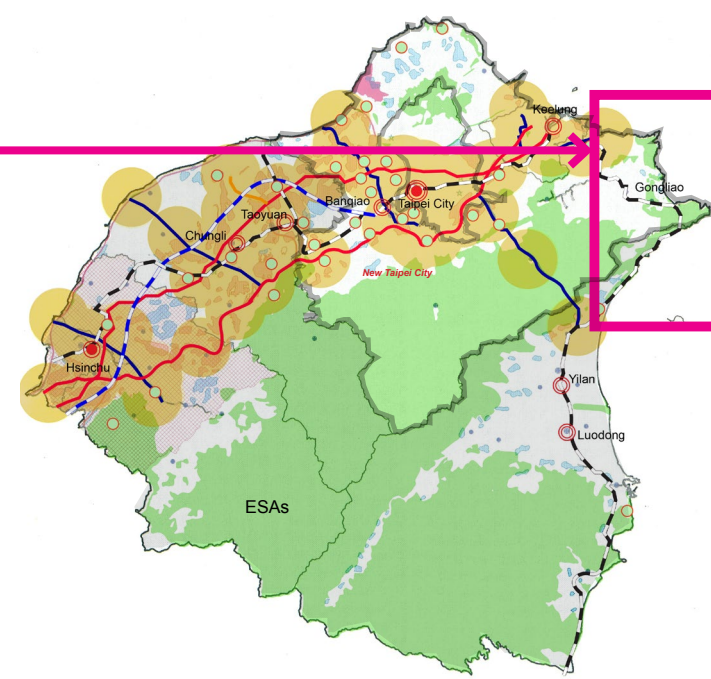
Asia



Taiwan



North region



Northeast coast scenic area

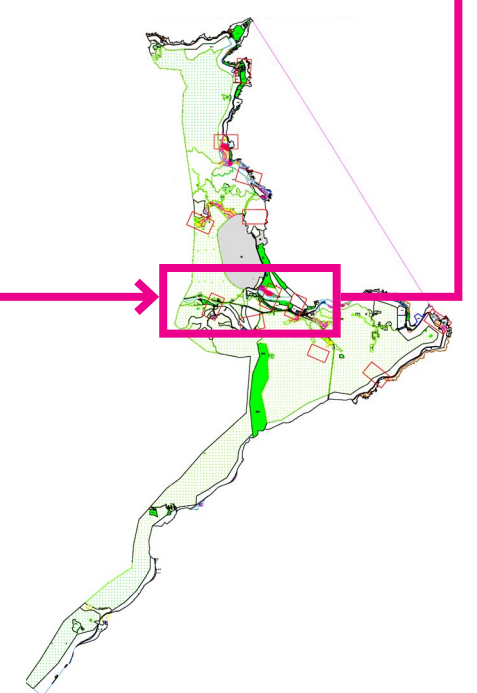


Figure 1.1 Study area location

2. Impression of Northeast Coastal National Scenic Area

1 Sand beach



5 Coastal ridge



9 Wetland



2 Pebble shore



6 Cliff



10 Terraced farmland



3 Marina



7 Windbreak



11 Valley



4 Breeding pond



8 Plain



12 Mountain ridge



Figure 1.2 Impression of Northeast Coastal National Scenic Area

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

II. Project context

1. General information

The context of this graduation project is Northeast Coast National Scenic Area (NCNSA). The total area is 124.85 km² with 15,759 population in 2009. Compare to Taipei City, the population density is less dense because of the natural geographical constraints. The unique natural landscape and scenery attracts more than 4.3 million visitors per year, which has potential to generate 8.5 billion New Taiwan Dollar (204 million euros) tourism income in Taiwan (0.06% GDP)

2. Administrative territory

The Northeast Coast National Scenic Area has cross border territories, which contains Gongliao District and Ruifang District in New Taipei City, and Toucheng Township in Yilan County. This research will focus on the spatial development issue in Gongliao District, where dominate main territory of NCNSA. The natural environment planning in Taiwan are devised into three category: national park, national scenic area, national forest recreation area. NCNSA is the first established national scenic area in 1982.

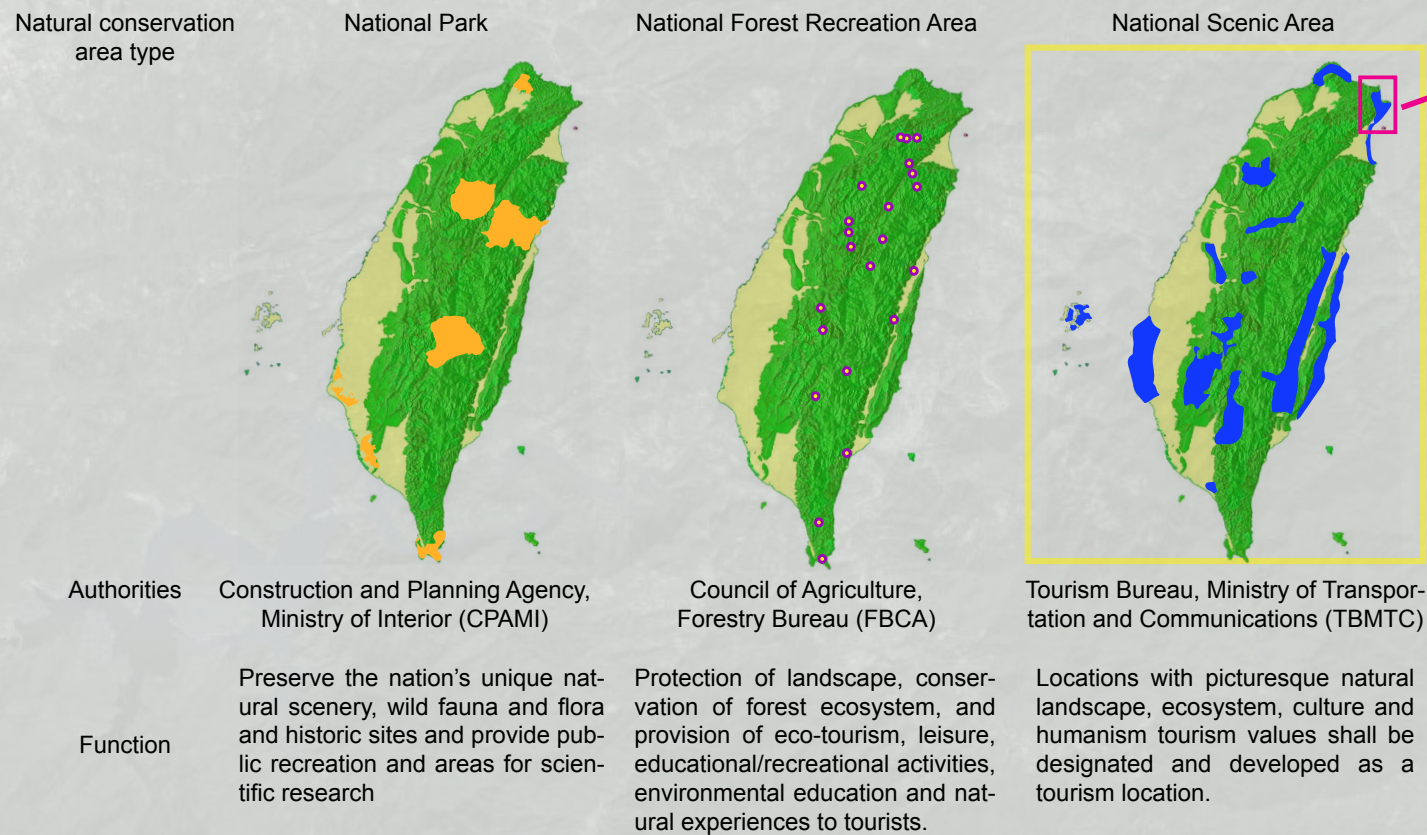
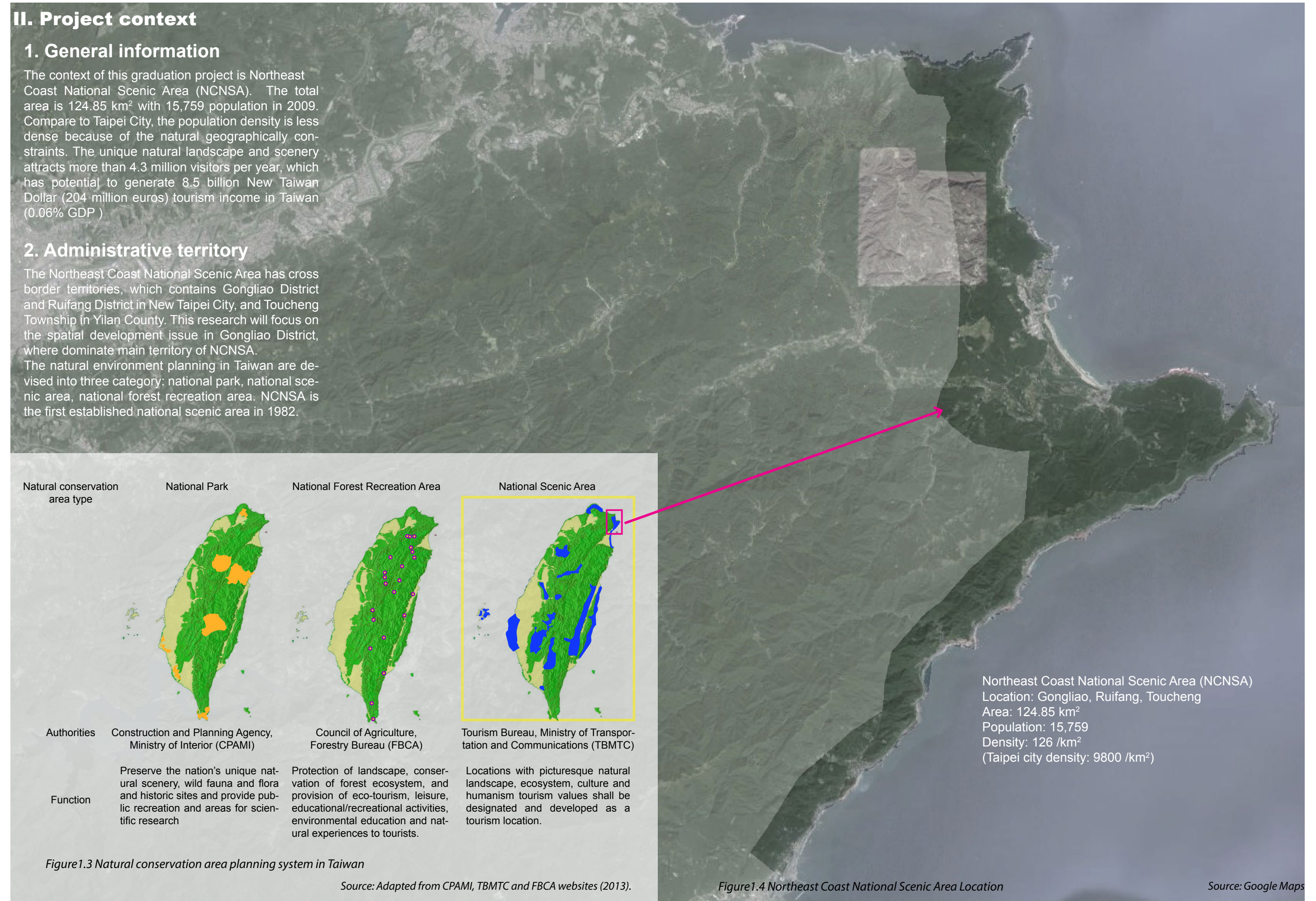


Figure 1.3 Natural conservation area planning system in Taiwan

Source: Adapted from CPAMI, TBMTC and FBCA websites (2013).



Northeast Coast National Scenic Area (NCNSA)
 Location: Gongliao, Ruifang, Toucheng
 Area: 124.85 km²
 Population: 15,759
 Density: 126 /km²
 (Taipei city density: 9800 /km²)

Figure 1.4 Northeast Coast National Scenic Area Location

Source: Google Maps

III. Project definition

1. The outline of land use conflicts

Northeast Coast National Scenic Area is a place with high landscape value, environmentally vulnerability and risk. The complex value of the territory generates pressures between conservation and development.

The nature of Northeast coast area was well preserved because of strict land use regulation. However, the plan regulation and proposed policy lead to unwanted effect to the local development.

The main conflicts are soil and water conservation, tourism development, flood mitigation and the improvement of living environment quality. However, the planning system is not supportive enough to allow integrations of the conflicts values happen.



Figure 1.5 Diagram of conflict interests

2. Research question

What is the strategy to help traditional spatial planning system be capable of dealing with conservation and development land use conflicts?

The research goal is to define the generic and specific spatial strategy to land use conflict between social and spatial changes in Gongliao, the main territory of Northeast Coast National Scenic Area in Taiwan. The research focus on developing spatial concepts through integrating conflicting proposals from multi-actor perspectives into possible projects, which accommodate local initiative and governmental policy for new forms of cooperation.

3. Hypothesis

This research sets up the hypothesis that adaptive planning approach would provide applicable theory and strategy to deal with social and spatial changes by integrating land use conflicts.

4. Sub research questions

In order to defined the spatial development strategy, the planning background, relevant actors, and the spatial quality need to be defined first. Accordingly, the sub research question includes four parts as follows:

- 4.1 What is existing planning tradition and spatial development value in Northeast coast area?
 - A. What is the environmental conservation and spatial development policy?
 - B. What is the development condition and constraints in this area?
 - C. What is the problem and potential of existing spatial policy?
- 4.2 How and where do land use conflicts happen in Northeast coast area?
 - A. What is the spatial quality and characteristics in Northeast coastal area?
 - B. How conservation and development issue lead to land use conflicts?
 - C. What is the problem between spatial development policy and current land use ?
- 4.3 What is the interrelationship between the relevant stakeholders?
 - A. What is the responsible body for spatial regulation, management, and development in the area?
 - B. What is the private sector's role and their influence to the area?
 - C. What are the conflict values and competing interests among the relevant actors?

- 4.4 What is the generic and specific strategy to help traditional spatial planning system to be capable of dealing with the conservation and development conflicts?
 - A. What are the priority spatial development principles?
 - B. What is the strategy to integrate conservation and development land use conflicts?
 - C. What adaptation methods could be the possible solution to reach the new common for future vision?
 - D. How does existing planning framework accommodate conservation and development tasks in Northeast coast area?

IV. Background information in Northeast coast area

1. Planning hierarchy and institutional system in transition period

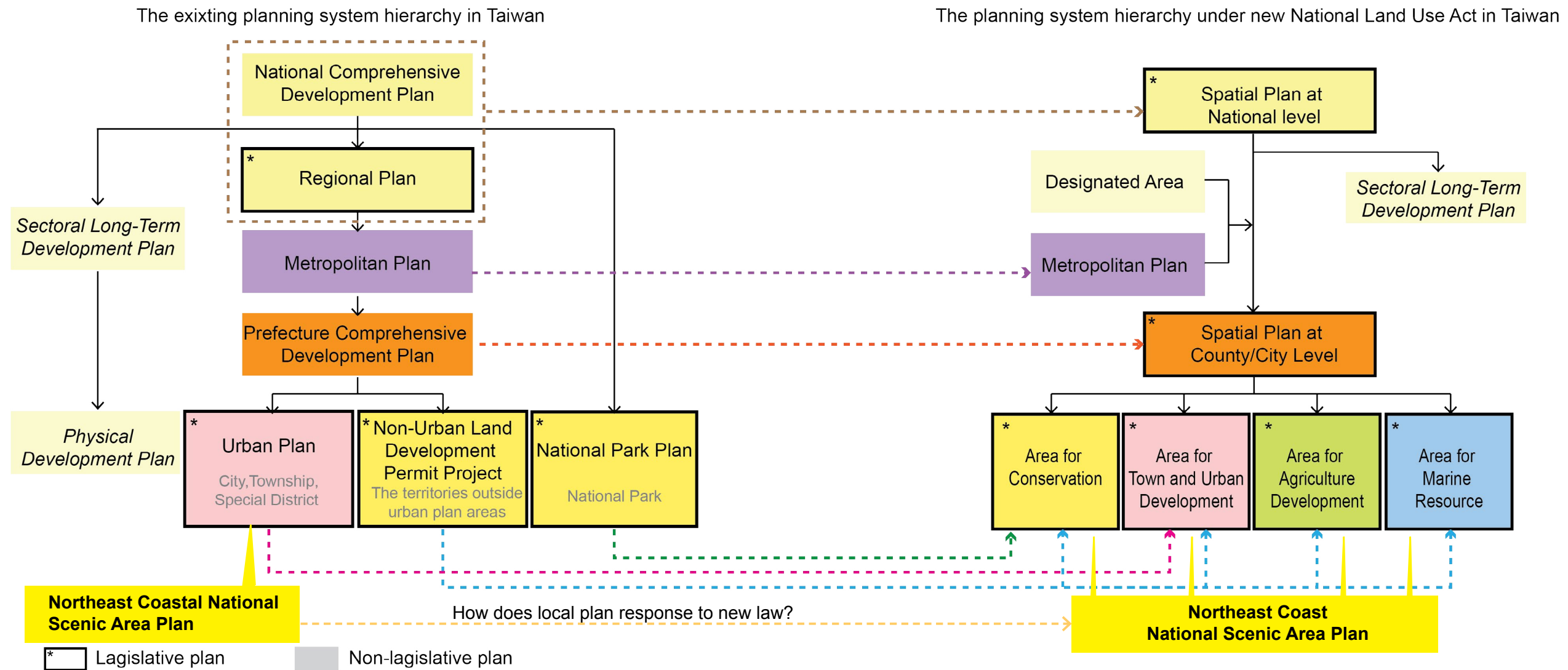


Figure 1.6 Planning regime and system in the transition period.

Source: Current planning mechanisms in Taiwan, Chen et al. (2010)

The planning system in Taiwan is now in the transition period (see the figure above), this research will contribute to the understanding of how conservation area planning can be done under new national land use planning law.

A fundamental conflict in current planning system is that NCNSA master plan is special district plan under urban plan category. The main purpose of special district plan is to delineate certain area for special purpose such as economy and industrial development of resource protection. However, only 5 per cent of the total area is defined as urban settlement in NCNSA, the other areas should be categorized as conservation areas

The new draft National Land Use Planning Law (2010) requires that the whole country be divided into four zones: conservation areas, town and urban devel-

opment areas, agriculture development areas and marine resource areas. According to Huang study on National conservation area planning in Taiwan conservation areas need to be categorized into four types: ecological resources, scenic landscapes, water resources and natural hazards. Each of conservation area is then classified into two classes according to their resources characteristics, which combined into three classes of conservation areas for the entire Taiwan area.

In this case, Northeast coastal national scenic area will be categorized both in 'conservation area' and 'town and urban development area'.

The future development and vision need to be define, especially the development capacity for tourism, industry (agriculture and fishery). The development vision need to response national land protection as well as local vision.

The main problem is the existing national spatial planning system cannot provide sufficient resolution to regulate the conflicting relationship between designated preservation/conservation areas and the local development. Although most stakeholders agree that the landscape and natural resource protection are necessary, the locals and the government take the opposite attitude to landscape and environment development. The strict regulations and complex actors make it more difficult to reach agreement in the decision making process.

Therefore the new draft National Land Use Planning Law (2010) requires that the whole country be divided into four function areas instead of urban areas and non-urban areas. The four function areas include conservation areas, town and urban development areas, agriculture development areas and marine resource areas.

In order to adjust the integration of human activities in protection areas, the research will evaluate the existing environmental policy and strategy of natural protection area in Taiwan.

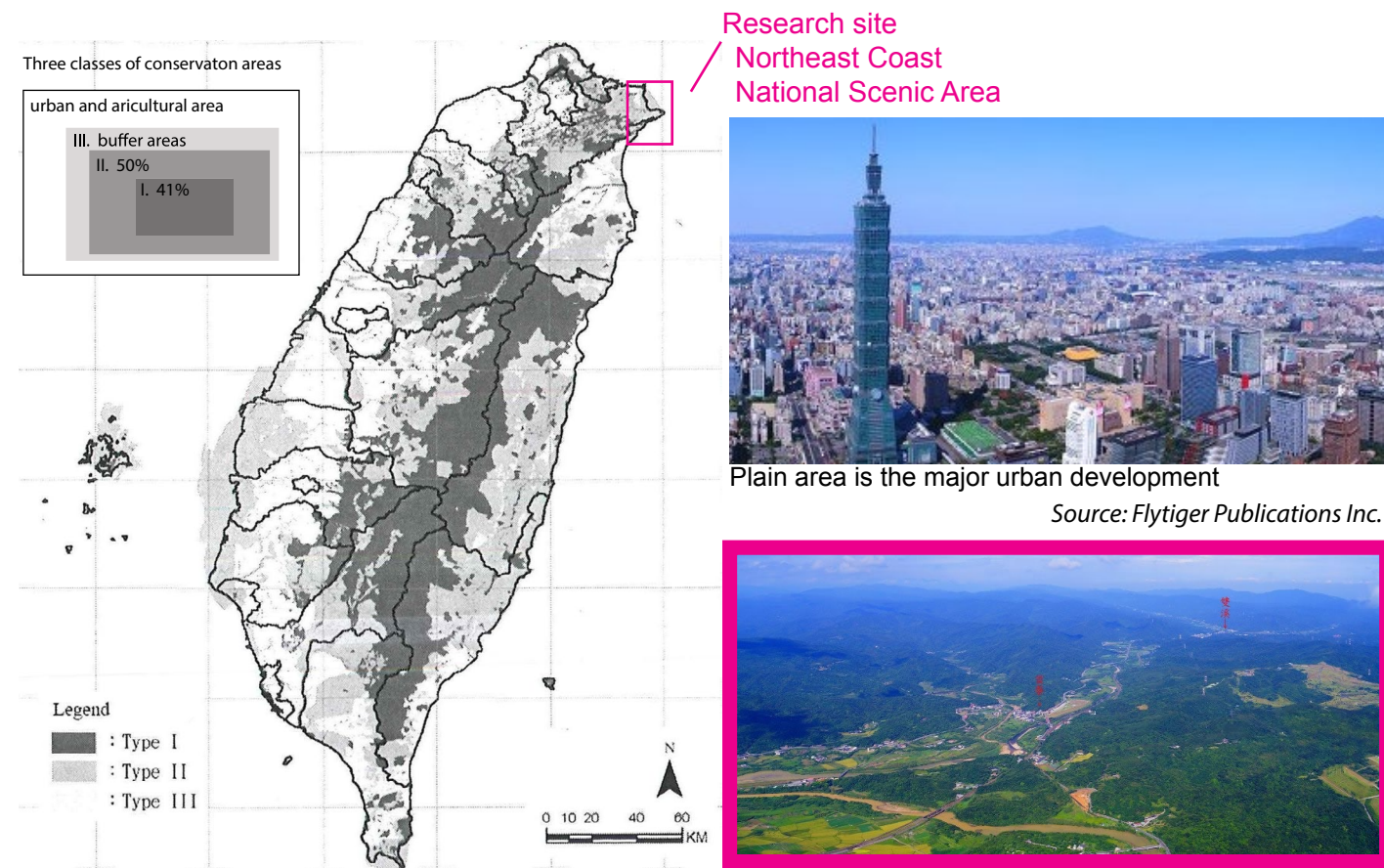
The complexity of landscape in Northeast coast area can be a good case to study how four function areas (the figure above) formulate future spatial concept under National Land Use Act framework.

2. Environmentally sensitive area (ESA)

In Taiwan, mountainous slope land areas, where development is restricted, cover 73 per cent of the entire island (SWCB, 2013). The total environmentally sensitive area (ESA) delineated by the Ministry of Interior to be reserved for natural resource conservation covering 77 per cent of the total area of Taiwan (CPAMI, 1992). The ESAs can be categorized as four classes and various types of natural protection areas (NPAs). Development in these areas is neither prohibited or subject to strict regulation but different types of laws and regulations (Bristow et al., 2010)

According to Northern Regional Plan (1995) development vision, Northeast Coast area, located 40 km away to Taipei city, were designated as a national

scenic area which provides the opportunity to develop and protect the quality of Taipei Metropolitan. The statistics data in 2012 showed that Northeast Coast National Scenic Area (NCNSA) ranked as 4th most visited National Scenic Area in Taiwan (TBMTC, 2012). The competent authority CPAMI is highly convinced tourism development will bring opportunities to develop Northeast Coast area, while the locals are growing awareness of develop and protect the area quality. Social and spatial needs change rapidly, and the traditional planning system in Taiwan is not always capable of dealing with the reality.



Class I : most sensitive part of Taiwan, cover 41 percent of the total Taiwan area.
Class II : mid-level sensitive part of Taiwan, nearly 50 per cent of the entire island.
Class III : serves mainly as buffers between the conservation areas and the man urban and agricultural areas. Gongliao is located at the class II and class III areas, the buffer zone plays critical roles because the trade-off in protection and development activities.

Figure 1.7 Conservation areas distribution in Taiwan

Source: Flytiger Publications Inc.

3. Environmentally sensitive area distribution in NCNSA

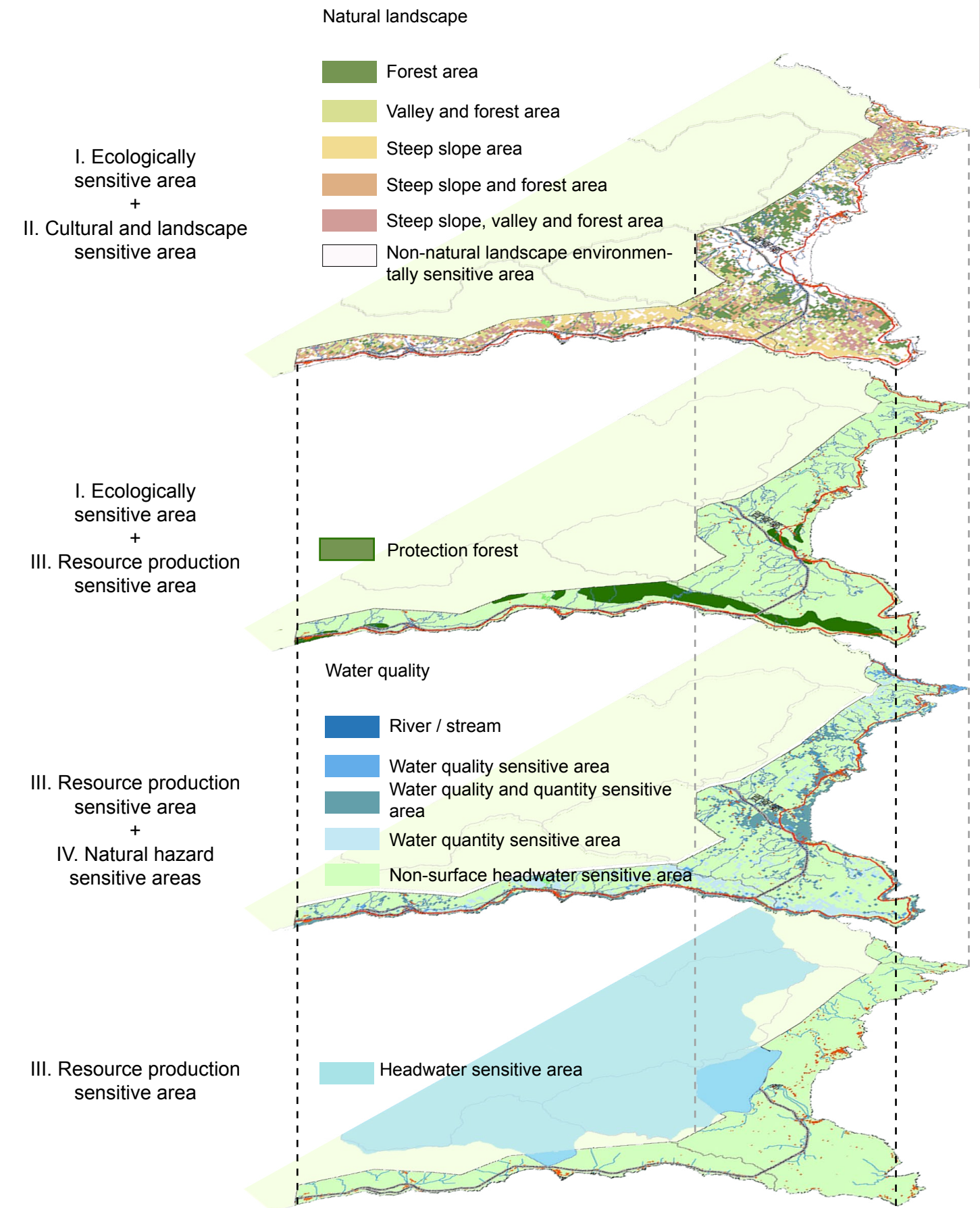


Figure 1.8 Environmentally sensitive areas in Northeast Coast National Scenic Area

Source: Map by author, adapted from CPAMI website, 2006

4. The story in Gongliao - competing interests

The story begins with a beautiful project - GENE 21+ in Gongliao
 2008 The Gene group CEO invited International Architects to design for GENE 21+ Grand Land Architecture International Project. 26 famous architect group's design proposal became the selling point of the dwelling project.



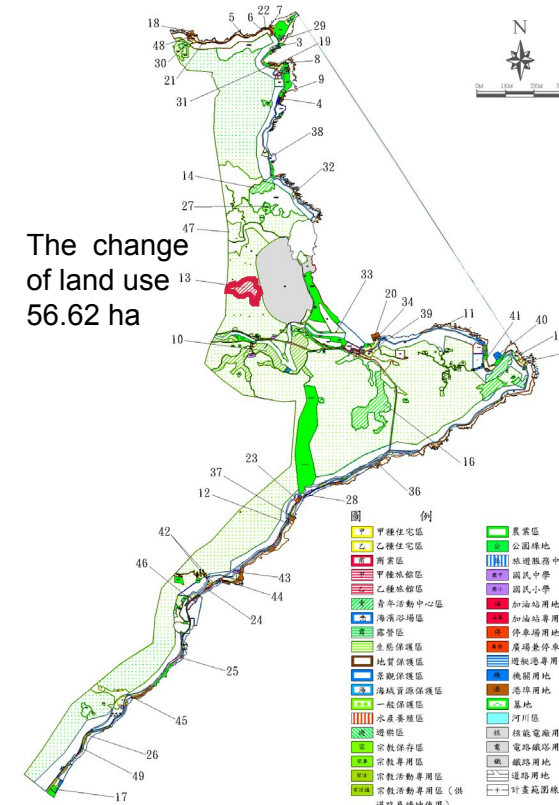
The residents concerned the GENE 21 project will become gated community instead of enhance the quality of neighbourhood environment.
 They against the draft plan of Economic Improvement Plan and accused the plan is the tailor-made proposal for developer.



One year later, Gene group managed to persuade CPAMI accept their proposal and change land use from natural conservation area to hotel zone.

Which means, the local dwellings still do not have right to maintain and extend their house in their farm.

But, the project site locates at natural conservation area in Northeast Coast National Scenic Area, development is highly restricted. CPAMI rejected the proposal at beginning.



The developer will get permit to build villa in natural conservation area.



Figure 1.9 The diagram of the story in Gongliao

Land seizure plans for NE coast anger residents

'WORSE THAN BANDITS': Residents said that despite promises they could keep half their land, they would have to sell at NT\$1,000 a ping and buy it back at NT\$28,000

By Lee I-chia / Staff Reporter



Environmental groups and landowners from the northeast expressed anger at a land expropriation project to make way for hotels.

The project is part of an "action plan for a land amendment to improve the people's living" originated by the Ministry of Transportation and Communications and passed by the Ministry of the Interior's Construction and Planning

Agency last year, which intends to use land in the northeast coastal area for tourism.

Smoothly sloped areas near Hemei Township (和美), Audi Village (澳底) and Fulong Village (福隆), as well as locations in Gongliao District (貢寮) and New Taipei City (新北市), are to be expropriated for development.

The initial plan, outlined in March last year, covered 688.5 hectares of land, including high-quality farmland and wetlands. After provoking strong opposition from local residents, the area was reduced to 102.56 hectares last month, but of that territory, about 88 percent is private land.

5. Problem define

5.1 The natural protection framework and development restrictions in Northeastern coastal area environmentally sensitive areas (ESAs)

Under the supervision of the Council for Economic Planning and Development of the Taiwan government, the Ministry of Interior completed studies of delineation of ESAs completed in the Northern and Southern regions, Central region, and Eastern region in 1992, 1996 and 1997 respectively (Huang, Jen, & Hung, 2006). The primary studies of the delineation of ESAs are seemed as the strategy basis of natural resource protection in national-level, regional level and local level. Moreover, the delineation of ESAs response to the study of natural protection areas defined in the Natural environment conservation plan in Taiwan (1984).

In NCNSA, four categories of ESAs are defined: Ecologically sensitive area (national forests, wetlands, coastal zone conservation areas and natural conservation areas); Cultural and landscape sensitive area (scenic areas); Resource production sensitive area (forest and prime agricultural land); Natural hazard sensitive areas: flood prone areas and geologically hazardous areas (Kuo & Huang, 2010). Development in these areas is either prohibited or subject to strict regulation by different types of laws and regulations. (Huang et al., 2006).

In the existing planning system, the primary purpose of the delineation of ESAs in Taiwan at present is for the incorporation of resource conservation within the revision procedures of the four regional plans as required by the Regional Planning Act (Huang, Jen, & Hung, 2006). Since the new draft National land use planning law (2010) has not passed by Legislative Yuan, regional plan is the highest level of statutory spatial plan in Taiwan. In this case, regional plan is the basic guidance of urban and rural area development, as well as the protection of natural resource and landscape areas. Since the Northern regional plan (1992) emphasized the spatial development in urban areas, the vision and development pattern to urban-rural relationship need to be clarified.

5.2 The restriction for environmental and landscape planning in Northern coastal area

The initiative of Civilian Economic Improvement Strategic Plan- Improving Land Utilization and Landscape Quality of Northeast Coastal National Scenic Area was the national policy in 2010, approved by Executive Yuan and implemented by Construction and Planning Agency of Ministry of Interior (CPAMI). CPAMI, the highest planning agency in Taiwan, plays the leading authority to coordinate other ministries and local municipality. Since Gongliao located in four types of ESAs, development is highly restricted. The local residents need to apply building permit through complicated procedure for housing renovation. The negative effect of the strict regulation result in poorly maintained living environment. Hence, the strategic plan intended to solve the conflicting problem in designated protection area with the locals by integrating hotel area development, change land use in conservation areas, and disaster prevention into a single protect (CPAMI, 2010).

After 30 years of developments restriction, the local expected the strategic plan to solve the spatial problem and enhance local economic development. However, the local were disappointed to CPAMI draft proposal, 102.56 hectare lands were designated as collective development areas. In order to attract tourism investors, 8.58 hectare of the hotel zone were proposed in the project (CPAMI, 2010). Due to the lack of transparent information in the planning process, the benefit for local sustainable economy development and landscape protection is questionable. In addition, as civic awareness increased, the creation of new collective development areas in NCNSA resulted in conflicts of interest with the local community. In general, applying adaptive approach and planning framework to integrate natural resource protection and landscape development for sustainable future need to be clarified and implemented in NCNSA. The effective mechanism and tools that require and facilitate a social context with flexible and open institutions and multi-level governance systems need to be identified.

Figure1.10 The local demonstration of Civilian Economic Improvement Plan

Source: Taipei Times, 2011

V. Project structure

The remainder of this project is divided into five parts

Chapter B explains relevant theories and concept applied in this project. A set of principle in three layers (planning institution, stakeholders, and spatial concepts) are introduced as the proposed planning framework

Chapter C defines the institutional problems, clarify the conflict interests and define the spatial development problem and potential. The Diagnose of the three themes will answer the first three sub research question.

Chapter D demonstrates the process to apply adaptive planning approach in site Shuangxi River valley. An operational adaptive method and strategy is the research result to help traditional spatial planning system be capable of dealing with conservation and development land use conflicts.

Chapter E presents the reflection and recommendation for further research.

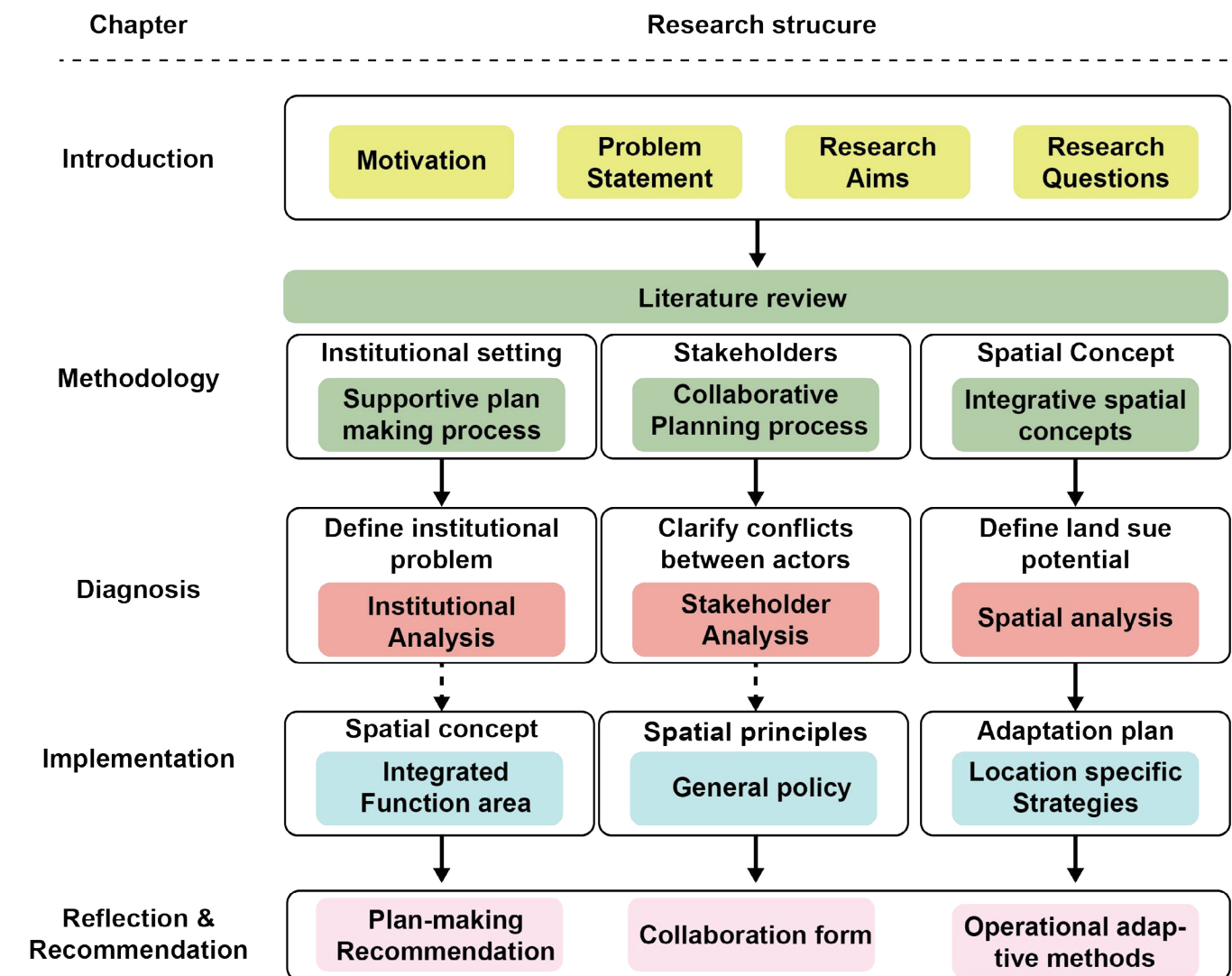
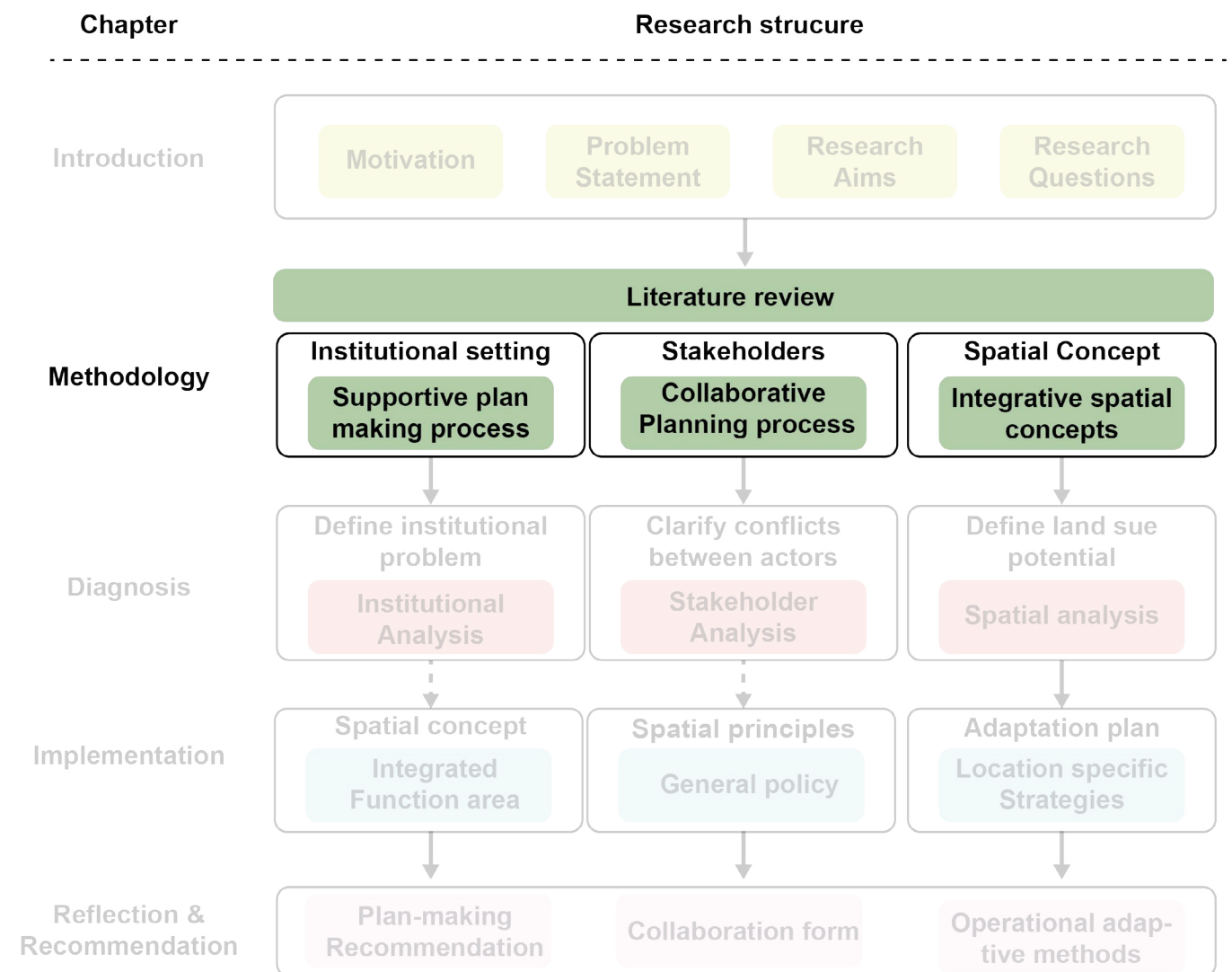


Figure1.11 Project content overview

Source: Draw by author.

Chapter B. Methodology



I. Literature review

This research sets up the hypothesis that adaptive planning approach would provide applicable theory and strategy to deal with social and spatial changes by integrating land use conflicts. The following paragraphs will explain how adaptive planning theory are related to this project.

1.1 The concept of adaptive planning approach

Adaptive approach in environmental planning has been advocated not only by ecologists but also political scientists and land use planner (Briassoulis, 1989). Representing a mentality of prepared responsiveness (Holling, 1978), the adaptive approach consists of a series of successive and continuous **adaptation of human activities** to variable, over space and time, environmental and socioeconomic conditions (Briassoulis, 1989).

Adaptive approach stresses the need for flexibility at each step of planning process to allow for changes in direction necessitated by changes in goals, revised future predictions, and availability of new evidence (Holling, 1978). Environmental planning becomes a continuous process of adaptive learning (Daneke, 1983), starting with plan (or policy) formulation, proceeding to implementation, and progressing with plan evolution into the future (Briassoulis, 1989).

However, Kato and Ahern (2008) argued that the **lack of operational adaptive methods, agreement on clearly stated goals, unsupportive institutional setting, and complex social values and interests** are the reasons for slow adoption of adaptive approach. These may be the similar factors that make existing plan in NCNSA cannot conduct adaptively.

1.2 Does existing plan in NCNSA conduct adaptively?

The planning system in Taiwan is concerned with both planning making and control of development. A constant comprehensive review of master plan is the main mechanism to evaluate the effectiveness of plan implementation. Moreover, the change of land use distribution demonstrates new policy and adaptation action of previous plan. However, the implementation of plans usually takes long period and not always conducted adaptively.

Since social and ecological relations changes, traditional planning method cannot always deal with the change of land use demand. Hence, the change of land use distribution in Northeast Coastal National Scenic Area (NCNSA) master plan third comprehensive review draft report (2010) and civilian economic improvement action plan (2011) resulted in serious against by local residents. While facing the change of

land use, the planning practice has been looking for an adaptive approach that could integrate land use conflicts and facilitate collaboration among multiple actors' demands. Therefore, an operational method for adaptive planning approach need to be addressed in this study.

2.1 Responsive and collaborative framework

Two cases of National Park planning practice showed that the collaborative approach was applied in plan-making process. Wollenberg et al. emphasised that a responsive framework to facilitate local demands and to set up **collaboration among multiple stakeholders** in the buffer zone between forest and village of Indonesia Ranomafana National Park. The Taiwan Taijian National Park remarked that the policy makers started to allow the local government to make independent decisions in the creation process of Taijian National Park. The Stakeholder approach helps the research to **interpret the interests, conflicts** or complementary relationship between stakeholders the creation process of Taijian National Park in Taiwan (Hsu & Lin, 2013).

2.2 Participatory approach

The Japanese Satoyama and Satoumi Assessment (JSSA) remarked the integrated approaches, including citizen participation, have been implemented increasingly over the past 10 years and show potential for reducing biodiversity loss and maintaining sustainable flows of ecosystem services (JSSA, 2010).

The empirical study of Revitalizing a lowland delta area in Taiwan Southwest Coast National Scenic Area (2012) emphasized the importance of the participation of local stakeholders/people in the planning and design process. The research explained that in order to successfully integrate the plan within the hazard-prone region, it is critical to engage with people, public and private sectors in an open communication, which involves exchange of information between a diverse mix of stakeholders, including central government, local governments, counties, bureaus, villages management offices, villagers, enterprises, private sectors, etc.

In order to understand the demand of different actors and facilitate conflict interests, the cases mentioned above all emphasis the necessary to apply a collaborative participatory approach in plan making process. The stakeholder relationship will be illustrated in the second part of this study.

3.1 integrate development and conservation conflicts as strategy

The Dutch case introduced an operational adaptive planning method in book *Regions in Transition-Designing for adaptivity* (Hartman et al, 2011), which explains how three regions in the Netherlands integrate development and conservation conflicts by integrating unresolved issues. Though the diagnosis of spatial quality, the proposed strategy take account of the development opportunity and avert natural disaster as integrated approach and formulated innovative spatial development concept. The study remarked planners should carefully consider what potential local innovations area are desirable, what developments are undesirable, and what are the impediments and unresolved issues.

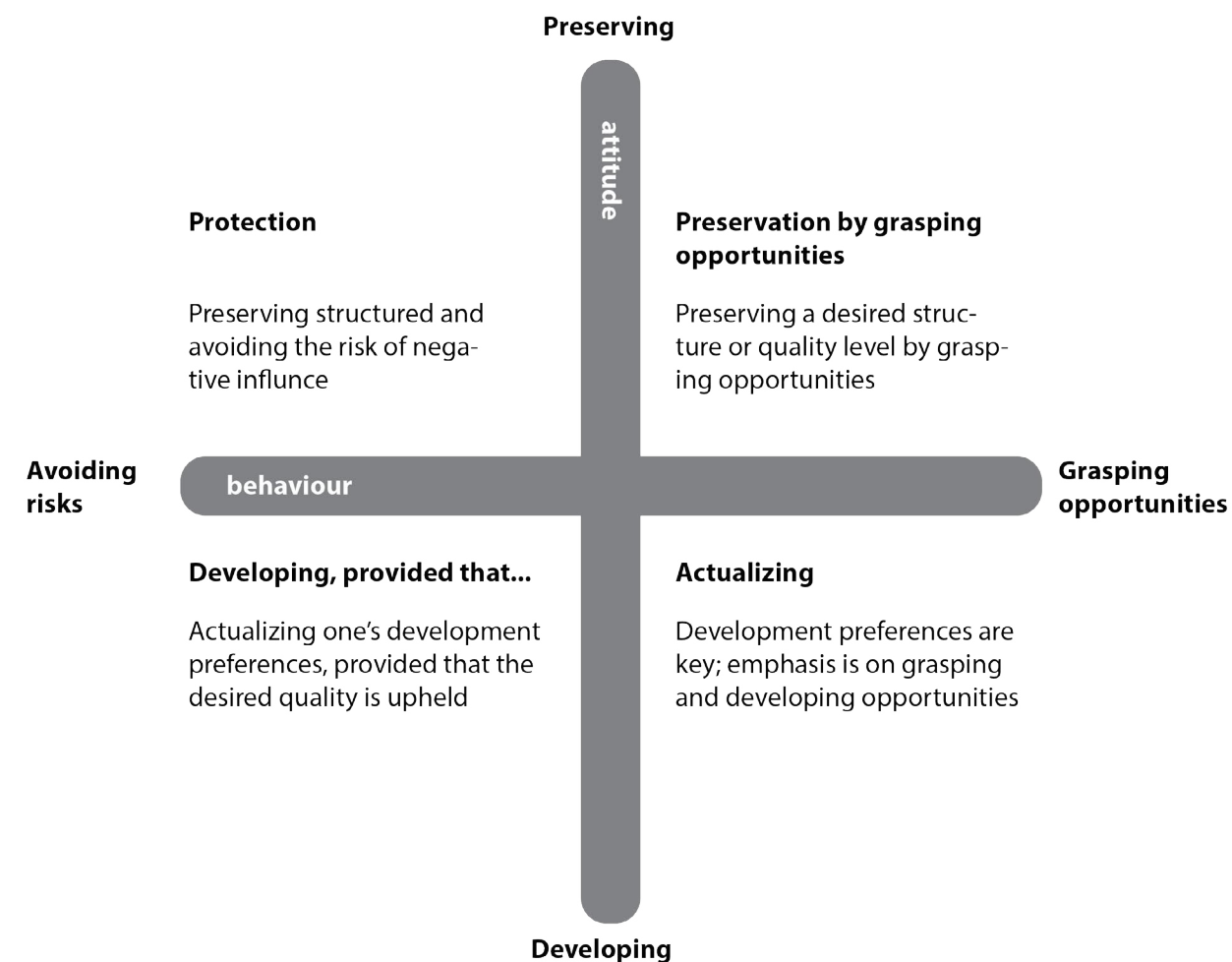


Figure 2.1 Unifying perspective for spatial development and associated conditions

Source: *Regions in transition- Designing for adaptivity, 2011*

3.2 The concept of Satoyama and Satoumi Initiative (JSSA)

The Japan Satoyama Satoumi Assessment (JSSA) is the study of the interaction between humans and terrestrial-aquatic ecosystems (Satoyama), and marine-coastal ecosystems (Satoumi) in Japan (United Nations University, 2010). The spirits of Satoyama and Satoumi landscapes are managed with a mix of traditional knowledge and modern science should be reflective of the socio-ecological contexts.

The Satoyama and Satoumi landscapes have been a rapid decline in both types of landscapes in the last half century. The primary characteristics of Satoyama and Satoumi landscapes are:

A. Satoyama is a mosaic of both terrestrial and aquatic ecosystems comprised of woodlands, plantation, grasslands, farmlands, pasture, irrigation ponds and canals, with an emphasis on the terrestrial ecosystems.

B. Satoumi is a mosaic of both terrestrial and aquatic ecosystems comprised of seashore, rocky shore, tidal flats, coral reefs, and seaweed/grass beds, with an emphasis on the aquatic ecosystems.

Taiwan is one of a region in economic development trends with rapid urbanization areas resulting in a physical loss of natural landscape such as woodlands and farmlands became converted to other uses (e.g. housing, recreational facilities), and in the degradation of the landscape with the decline in a rural population base. With fewer rural dwellers, there are fewer people available to make use of as well as manage Satoyama landscapes.

Northeast coast area has very dynamic of landscapes that could be regarded as Satoyama and Satoumi landscapes. The applicable Satoyama and Satoumi Initiative knowledge in Northeast coast area need to be conducted with local and further research.

4. Summary

The main theory and practice of adaptive planning approach concept are list below. The proposed planning framework will illustrate in the next chapter.

Table 2.1 The emphasis of adaptive planning approach in theory and practice

	RESILIENCE TO CHANGES	RESPONSIVE	ADAPTATION	COLLABORATION	INTEGRION
HOLLING, (1978) Adaptive Environmental Assessment and Management.	●	●	◐	○	○
BRIASSOULIS, (1989) Theoretical Orientations in Environmental Planning: An Inquiry into Alternative Approaches	◐	○	●	○	●
WOLLENBERG et le.,(2000) Using scenarios to make decisions about the future: anticipatory learning for the adaptive co-management of community forests.	◐	●	●	●	●
JAPAN SATOYAMA SATOUMI INITIATIVE (2011)	◐	◐	●	◐	●
DUTCH ADAPTIVE PLANNING PRACTICE (2011)	●	●	●	○	○



Figure 2.2 Concept and characteristics of satoyama (mountain village) Source: Japan Satoyama Satoumi Assessment,2011



Figure 2.3 Concept and characteristics of satoumi (fishery village) Source: Japan Satoyama Satoumi Assessment,2011

II. Adaptive planning framework

In order to make these ideas become operational adaptive planning approach, three main topics are explained below, which includes supportive institutional setting, collaborative planning process, and integrative spatial concept.

1 Supportive institutional setting

1.1 A reflection of four function areas in new National Land Use Law

In order to response the transitional planning system setting in new National Land Use Law, the future institutional system should test and evaluate the possibility to integrate four function areas into current regional / local master plan.

1.2 Generic policy and location specific strategy

The spatial plan should be flexible and robust, therefore policy formulation and strategy implementation in should work in different scale. The formulation of goal and principle represent the general spatial concept for future development direction. Hence, the goal should be stated clearly as generic policy. The implementation of strategy depends on the local issues, the implementation should take environment conditions and relevant stakeholders into consideration. As a result, the strategy should be implemented as location specific policy.

1.3 Responsive plan-making process

The responsive plan-making process is the co-evolution of institutional system and the social-ecosystem. In order to upgrade the existing planning-making process and make the plan be conducted adaptively to reality, a constant evaluation and monitor of changing The responsive plan-making process make it capable of dealing with the changes of socio-economic condition and dynamic landscape.

2 Collaborative planning process

2.1 People-public-private partnership

In order to widely gain local supportive to the action plan, it is critical to engaged multi-stakeholder in the early stage in the planning process. The majority change of collaboration form is to move from P-P-P (public-private partnership) to P-P-P-P (people, public-private partnership). A successful plan is not only rely on technical and financial support from private developer, but also widely support from relevant local stakeholders.

2.2 Constructive dialogue in planning process

A successful plan also relies on a constructive dialogues and consensus making among multi stakeholder. The constructive dialogues is on the basis of open communication involving the exchange of information between relevant stakeholders, including central and local competent authority, councils, agencies, bureaus, civic group, NGOs, and local dwellers.

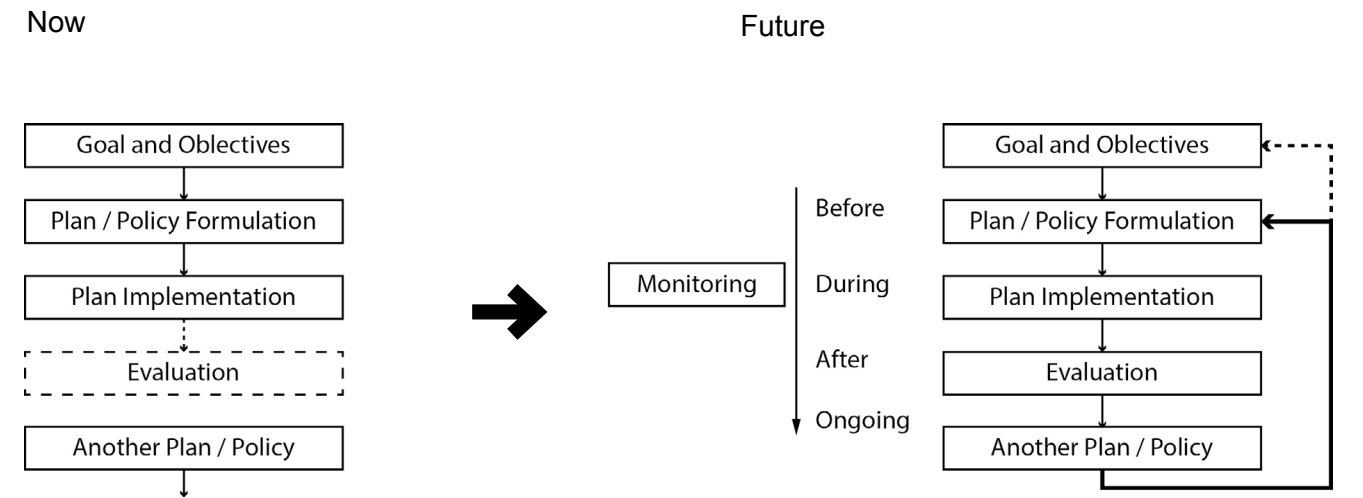


Figure 2.4 Responsive plan making and evaluation process

Source: Draw by author.

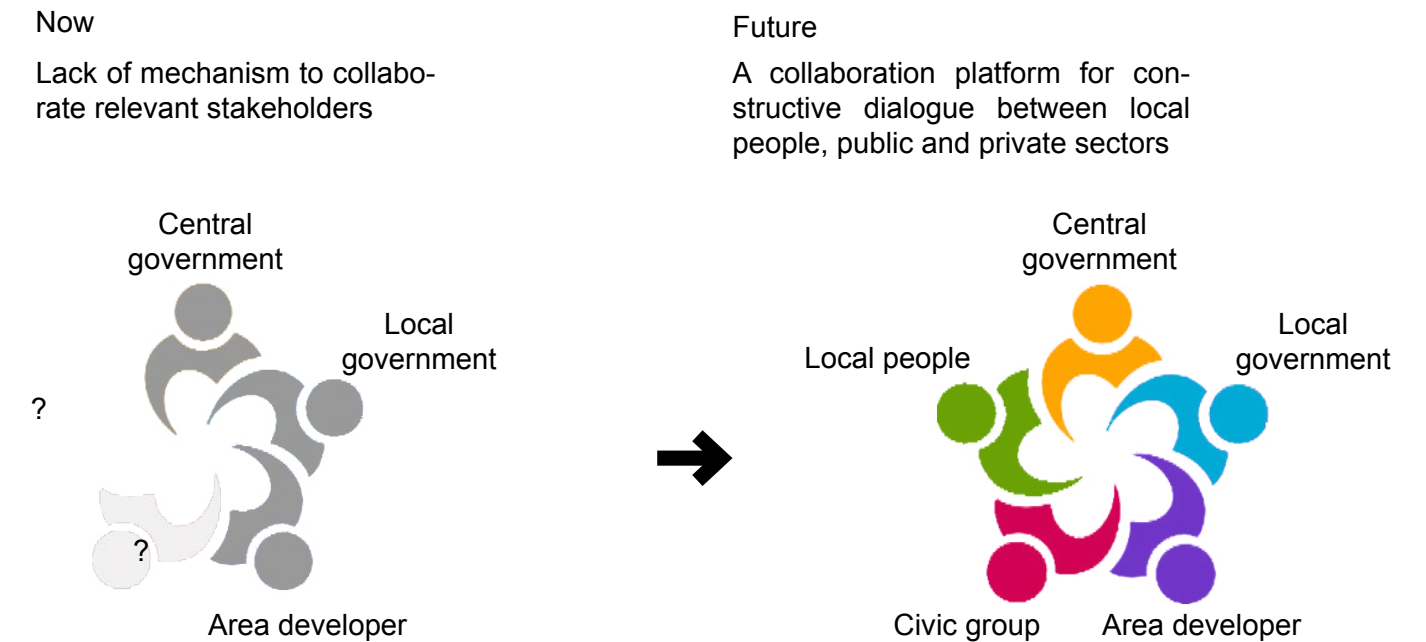


Figure 2.5 Collaborative planning process

Source: Draw by author.

3 Integrative spatial concepts

3.1 Integrate spatial issues and avoid conflicts

The main concept to resolve land use conflicts is to integrate existing spatial concept into new action through different scale and multi actors. Through the spatial analysis conclusion, the limitation of available space and dynamic landscape function/potential natural risks, it is necessary to make the future spatial development with multi-function and compact land uses development.

3.2 Multi-function land use

Integrating the function areas concept which was designated in new Draft National Land Use Law into multi-function land use policy. Multi-function land use means the integration of urban and town development with environment conservation function. Considering agriculture and marine resources area as transitional buffer spaces between urban and nature.

3.3 Compact networks

Compact networks means the revitalization of current village function with living environment improvement. Considering the limited available for development, upgrading existing function instead of expanding the territory.

III. Research tools

Literature review, case study, mapping, modelling, statistic analysis and stakeholder influence analysis are the main tools used in this project.

1. Institutional analysis

Policy analysis will focus on the official report including policy and strategy report, natural conservation strategy and environmentally sensitive area delineation in National level, regional level and local level. The purpose of policy analysis is to understand the restriction and planning tool. The outcome of policy analysis will shows the governance of different territory.

2. Stakeholder analysis

In this research, stakeholder analysis will be divided into public sector analysis and private sector analysis. First, policy and report evaluation will help me understand the relationship (conflicts and opportunities) between public sectors. Second, questionnaire and news interview will help me understand the public preference and response to propose policy. The stakeholder analysis will indicate conflicts and opportunities of value and imagination for future development. In this case, the conclusion of stakeholder analysis will contribute to scenarios creation.

3. Spatial analysis

Mapping and modelling is the main tool to analysis the current . Analysis of geography and topography condition, natural landscape, urban and village development pattern, tourism development, agriculture and fishery industry, and flood prone areas through regional scale to local scale are shown. The 3D modelling illustrates the restriction and potential neglected in existing master plan.



Figure 2.6 Toward "conservation by grasping opportunities" (left) and "development with risk avoidance"(right)
Source: Regions in transition- Design ing for adaptivity,2011

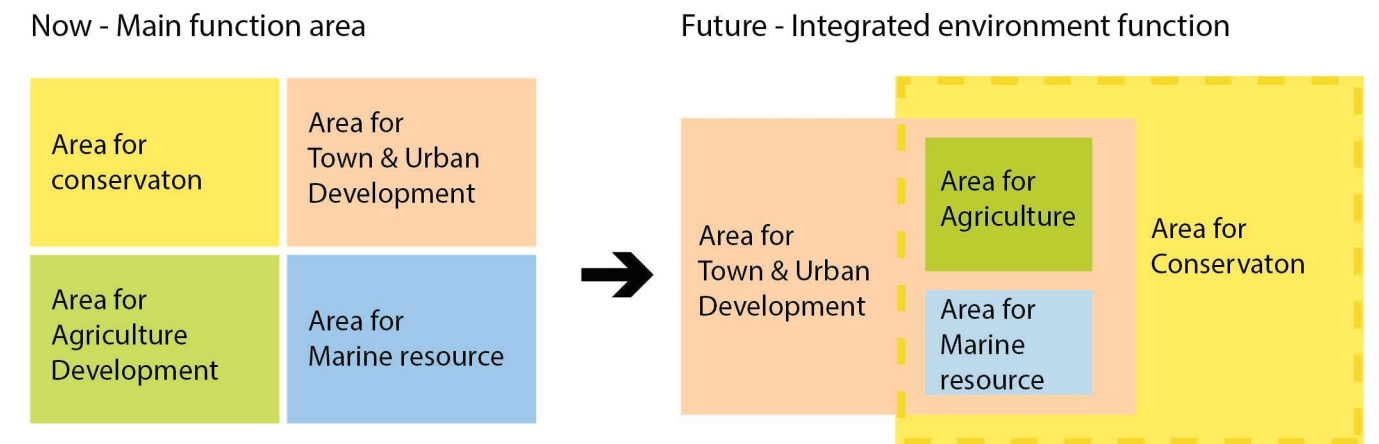


Figure 2.7 Integrate the concept of function area designated in new Draft National Land Use Law

Source: Draw by author.

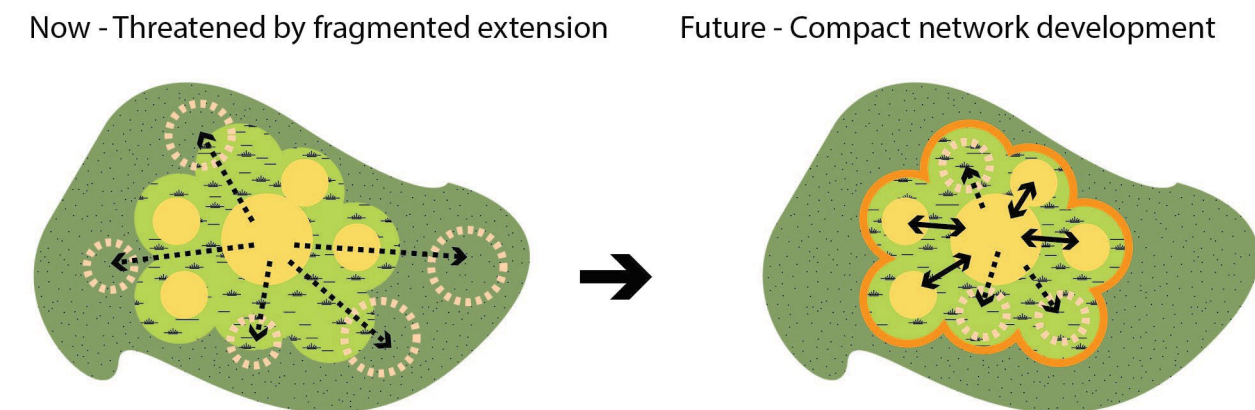
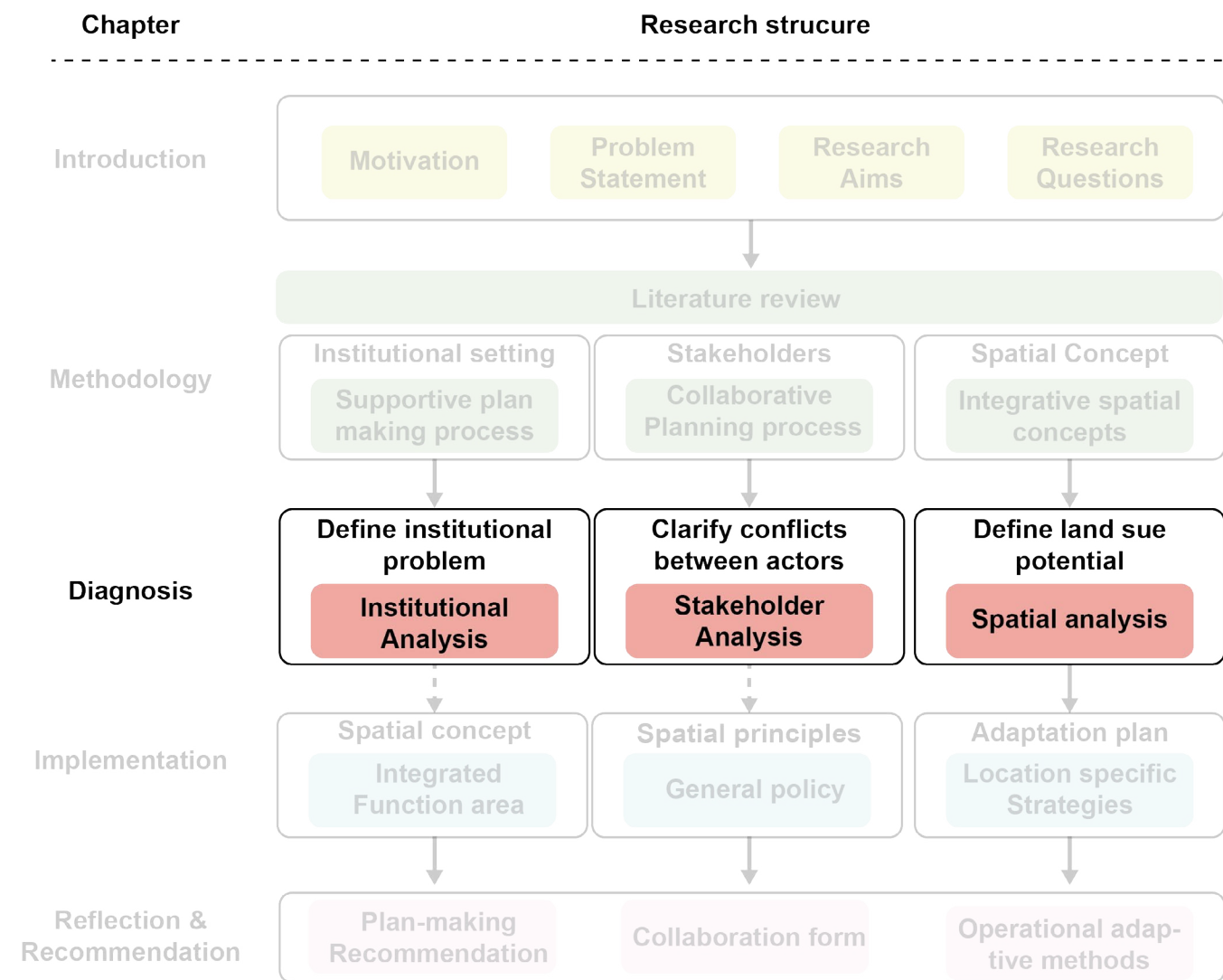


Figure 2.8 Compact networks development

Source: Draw by author.

Chapter C. Diagnosis



In this chapter, three main research questions will be answered.

Analysis theme

Research questions

Institutional analysis

SEE P40 - 47

1. What is existing planning tradition and spatial development value in Northeast coast area?

- A. What is the environmental conservation and spatial development policy?
- B. What is the development condition and constraints in this area?
- C. What is the problem and potential of existing spatial policy?

Stakeholder analysis

SEE P48 - 53

2. What is the interrelationship between the relevant stakeholders?

- A. What is the responsible body for spatial regulation, management, and development in the area?
- B. What is the private sector's role and their influence to the area?
- C. What are the conflict values and competing interests among the relevant actors?

Spatial analysis

SEE P54 - 81

3. How and where do land use conflicts happen in Northeast coast area?

- A. What is the spatial quality and characteristics in Northeast coastal area?
- B. How conservation and development issue lead to land use conflicts?
- C. What is the problem between spatial development policy and current land use ?

I. Institutional analysis

1. Regional proposal and potential

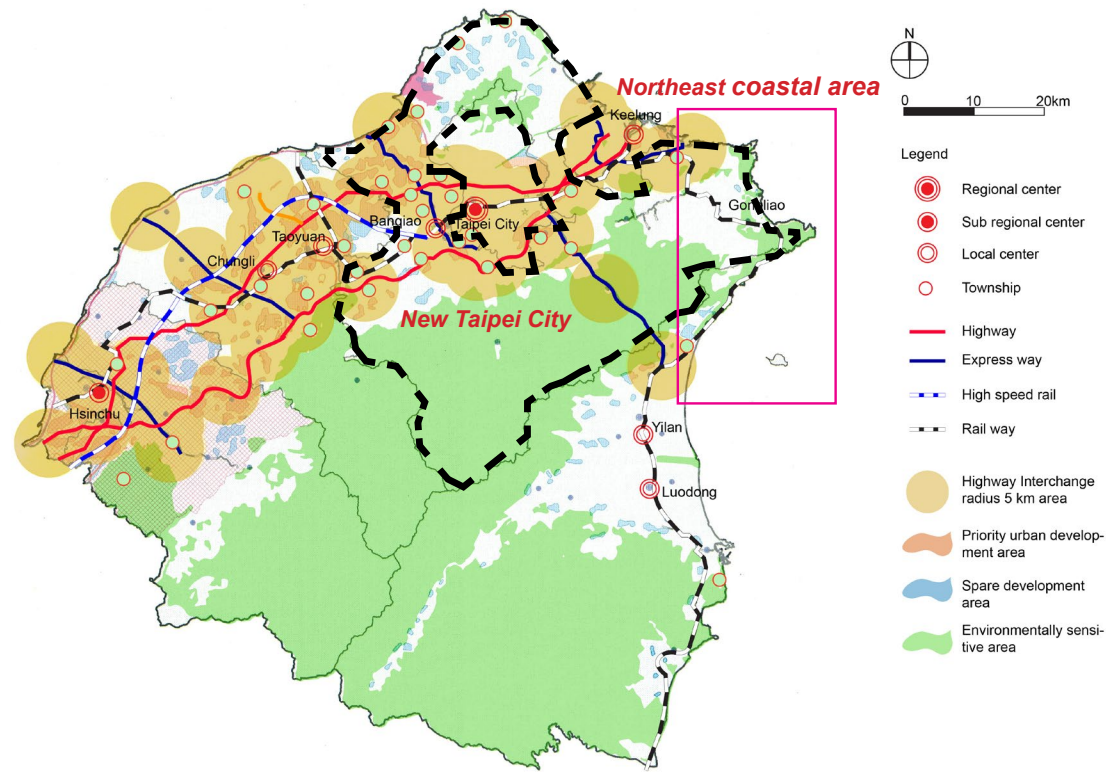


Figure 3.1 Northern Region spatial development vision in 2005
Source: Author's own elaboration based on Taiwan Northern Regional Plan (1995)

1.1 Existing proposals

In order to move toward a sustainable environment of Taipei Metropolitan, the overall object focus on implementing resource conservation and protection, enhancing industrial and economic development, and improving the quality of living environment. Four perspectives are highlighted:

- A. Strengthen balance between natural resources conservation and development.
- B. Maintain coastal landscape through ecological, social, and economic perspective with the combination of tourism and recreation function.
- C. Northeast National Scenic Area will be positioned as international conservation demonstration by the eco-tourism.
- D. Designated environmentally sensitive area and establish the adaptive ecological management standard, prevent natural resources from destroyed.

1.2 Problems and potential

In the existing planning system, the primary purpose of the delineation of ESAs in Taiwan at present is for the incorporation of resource conservation within the revision procedures of the four regional plans as required by the Regional Planning Act (Huang et al., 2006). Since the new draft National land use planning law (2010) has not passed by Legislative Yuan, regional plan is the highest level of statutory spatial

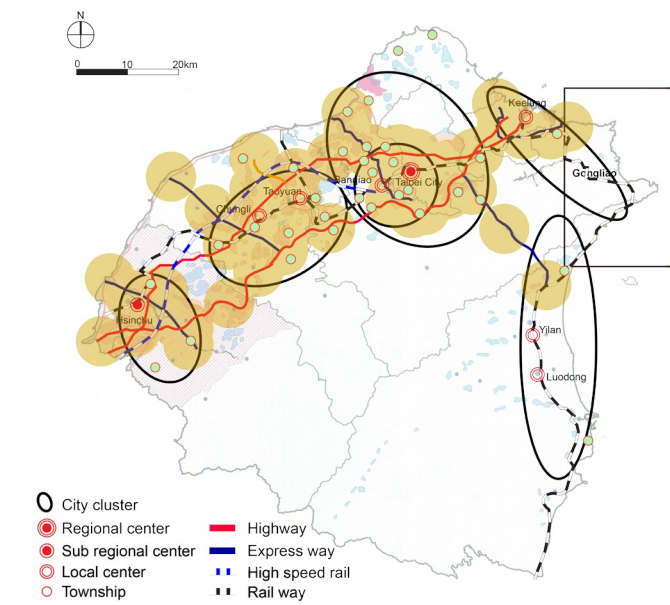
plan in Taiwan. In this case, regional plan is the basic guidance of urban and rural area development, as well as the protection of natural resource and landscape areas. Since the Northern regional plan (1992) emphasized the spatial development in urban areas, the vision and development pattern to urban-rural relationship need to be clarified.

Northeast Coastal National Scenic Area (NCNSA) provides the opportunity to develop and protect the quality of Taipei Metropolitan. NCNSA locates 40 km away to Taipei city, and ranked as 4th popular National Scenic area in Taiwan. National Scenic Area was originally set up for tourism function by Tourism Development Law, therefore, the opportunity to develop and protect the quality of Taipei Metropolitan should be considered in the Northern Regional development.

NCNSA can serve as regional park in Taipei Metropolitan, and can be used as a strategy for spatial development in terms of collaboration, integration, qualification of the landscape, regional action and network (Steffen,2006).In Northern Regional plan (1995) NCNSA is categorized as four types of environmentally sensitive areas (ESAs), and serves as buffer area between natural conservation area and urban areas (Huang et al., 2006).

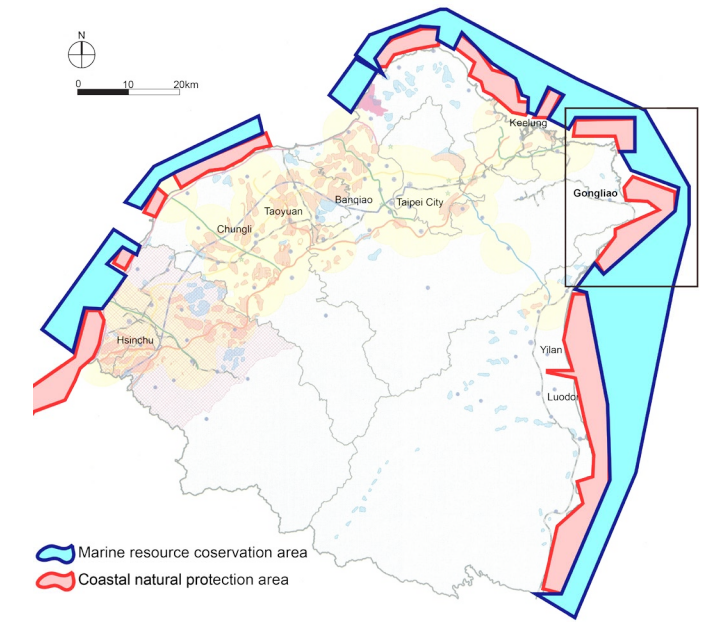
1.3 Diagnosis

A. Urban and town development area



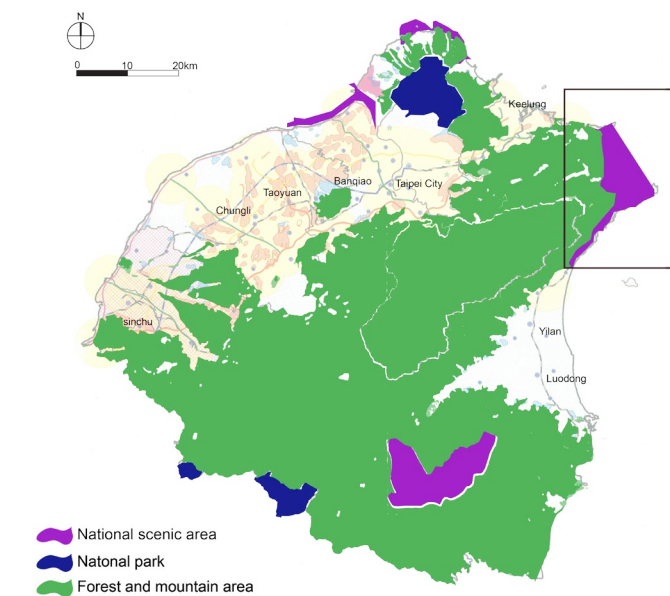
The existing urban development and mobility system are mainly focus on west part of north region. The accessibility to Northeast coast area are relatively low.

B. Coastal natural conservation area



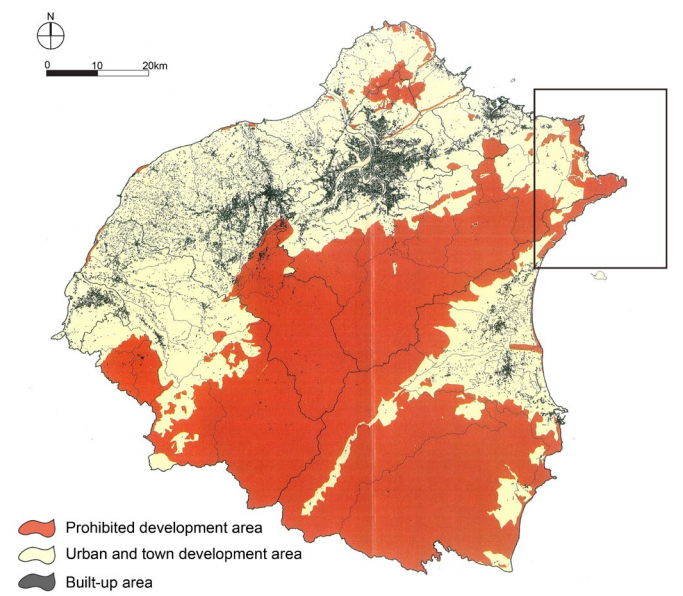
In order to protect the coastal geographic landscape uniqueness and coral reef ecosystem for sustainable development along coastal area, Natural protection area and Marine resources conservation area are designated.

Natural and cultural landscape conservation area



National scenic areas, national parks, and surrounding mountains serve as regional park in Taipei Metropolitan. The natural and cultural landscape can be defined as a strategy for spatial development in terms of collaboration, integration, qualification of the landscape.

Restrict development area



Mountain areas and slope land are restricted for development. In general, these areas are categorized as four types of environmentally sensitive areas (ESAs), and serves as buffer area between natural conservation area and urban areas (Huang et al., 2006).

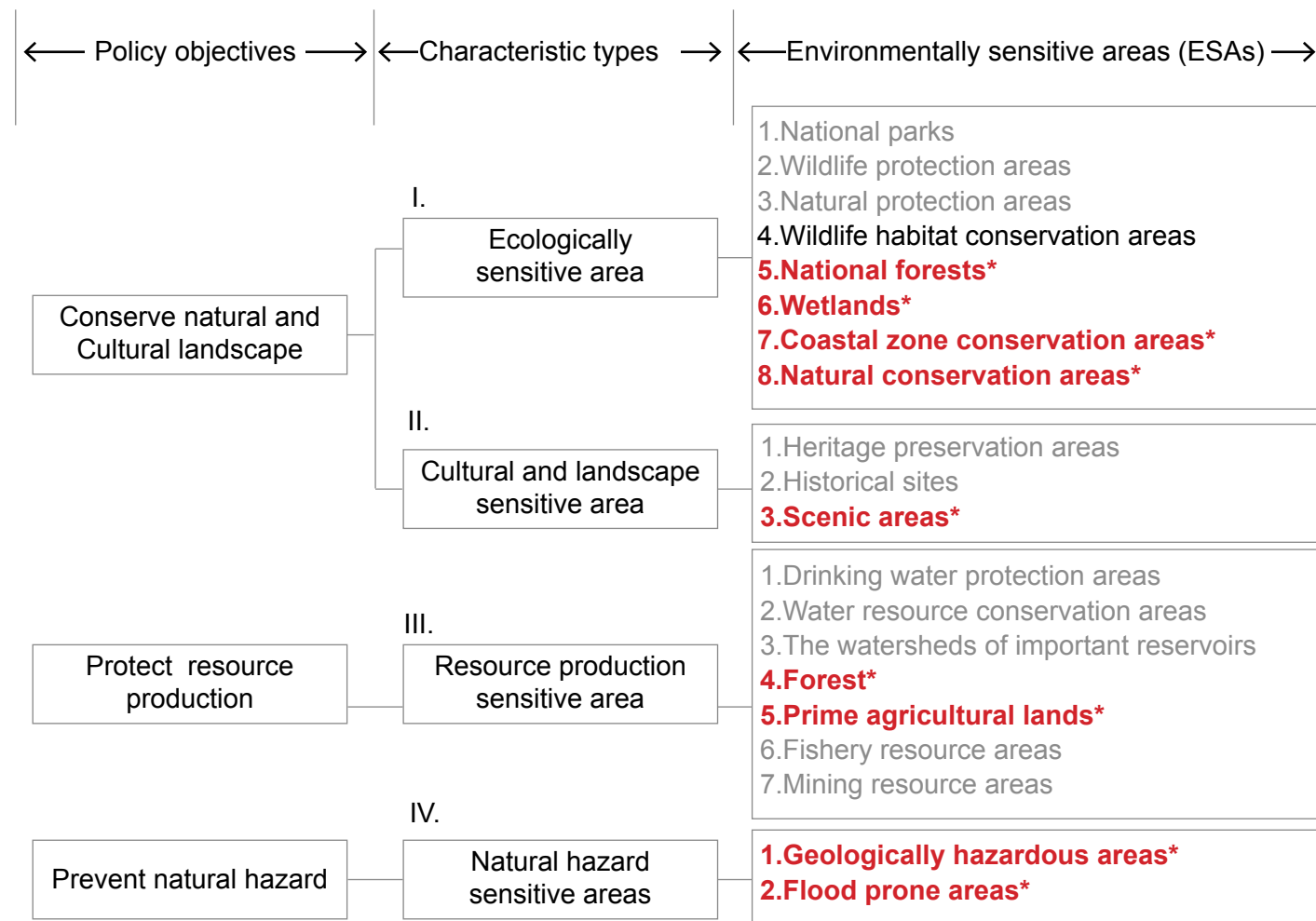
Figure 3.2 Diagnose of regional spatial proposal

Source: All the figures are author's own elaboration based on Taiwan Northern Regional Plan (1995)

3. Municipal proposal, problem and potential

3.1 The designation of environmentally sensitive area (ESA)

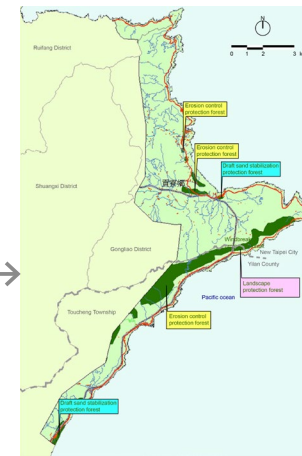
Under the supervision of the Council for Economic Planning and Development of the Taiwan government, the Ministry of Interior completed studies of delineation of ESAs completed in the Northern and Southern regions, Central region, and Eastern region in 1992, 1996 and 1997 respectively (Huang, Jen, & Hung, 2006). The primary studies of the delineation of ESAs are seemed as the strategy basis of natural resource protection in national-level, regional level and local level. Moreover, the delineation of ESAs response to the study of natural protection areas defined in the Natural environment conservation plan in Taiwan (1984). In NCNSA, four categories of ESAs are defined: Ecologically sensitive area (national forests, wetlands, coastal zone conservation areas and natural conservation areas); Cultural and landscape sensitive area (scenic areas); Resource production sensitive area (forest and prime agricultural land); Natural hazard sensitive areas: flood prone areas and geologically hazardous areas (Kuo & Huang, 2010). Development in these areas is either prohibited or subject to strict regulation by different types of laws and regulations. (Huang et al., 2006)



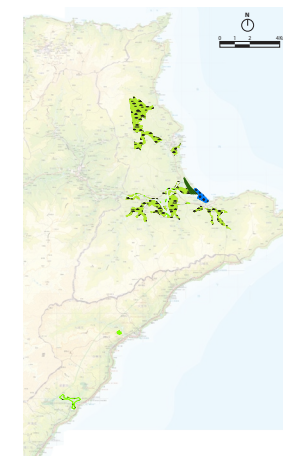
Note: * ESAs located inside the territory of NCNSA

Source: Northern and Southern Regional Plan (CPAMI, 1995)

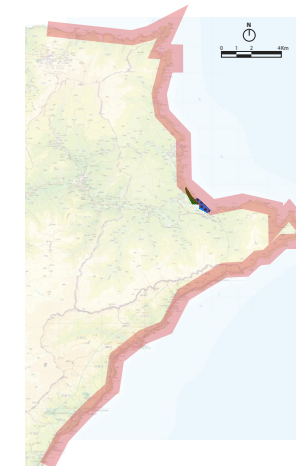
I.5 National forest



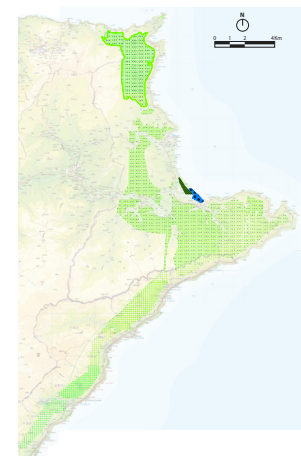
I.6 Wetlands



I.7 Coastal zone



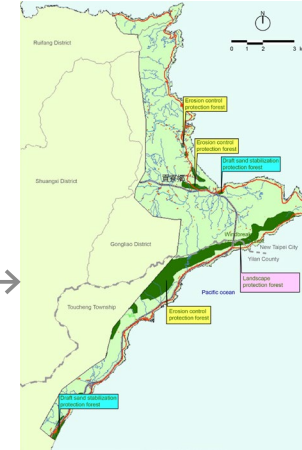
I.8 Natural conservation areas



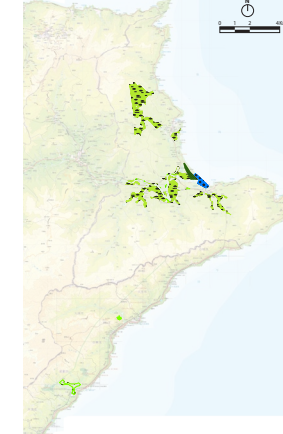
II.3 Scenic areas



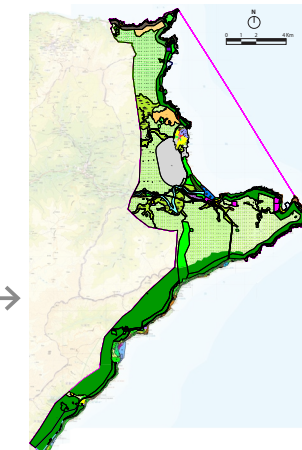
III.4 Forest



III.5 Primary agricultural lands



IV.1 Geologically hazardous areas



IV.2 Flood prone areas

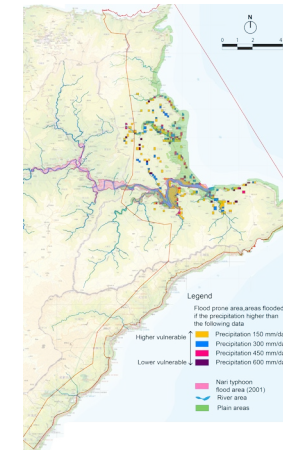


Figure 3.3 Sets of figure represent the environmentally sensitive areas in Northeast Coast National Scenic Area

Source: Draw by author.

3.2 Northeast Coast National Scenic Area Master Plan

Northeast National Scenic Area master plan is the main spatial development plan in Northeast coast area. The master plan published in 1982, and then published two times comprehensive review reports in 1985 and 2000. Zoning and land use control are the primary instruments in environment conservation and development regulation. Since social and ecological relations changes, traditional planning method cannot always deal with land use demand. Therefore, the implementation and land use distribution in NCNSA master plan third comprehensive review draft report (2010) resulted in serious against by local residents.

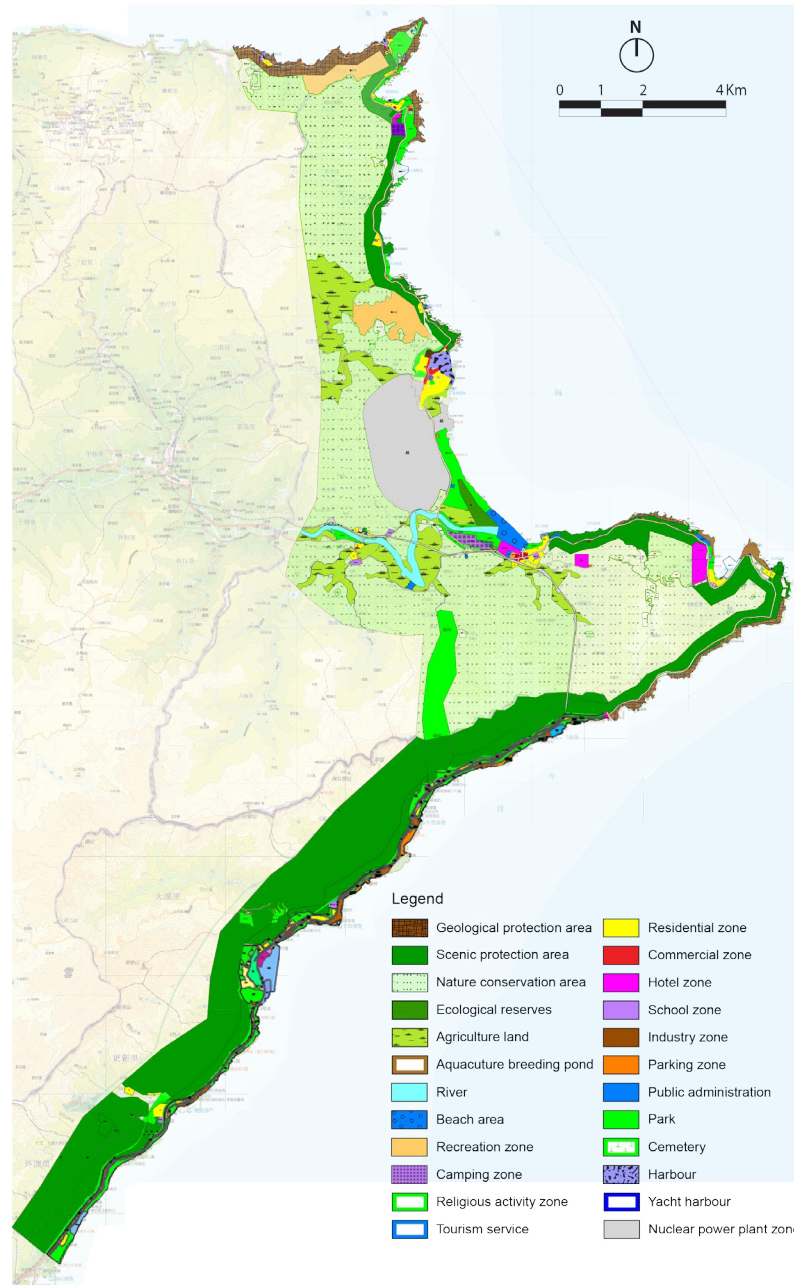
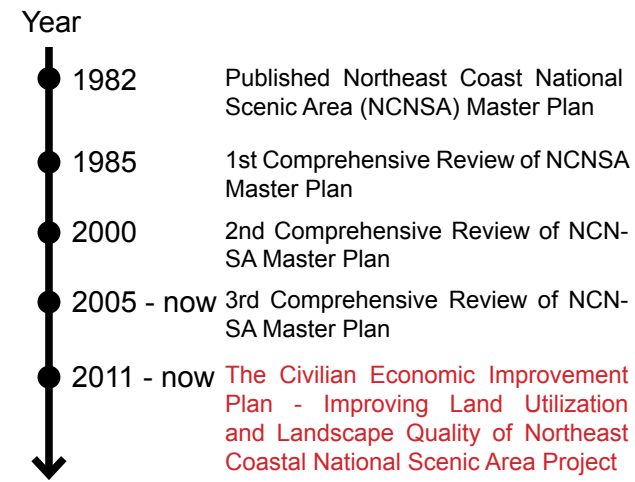


Figure 3.4 Northeastern Coastal Scenic Area Master Plan Land Use map (2010)

Source : Construction and Planning Agency, Ministry of Interior, 2010

3.3 Land use regulation and enforcement

In order to protect natural resource and landscape from development, the master plan uses different regulatory enforcement of land use regulation. As a result, the natural environment and landscape are well maintained in scenic conservation zone, ecological protection zone, geological protection zone,

water resource protection zone, marine resource conservation zone, the land use regulation is robust and lack of flexible for local development. Agriculture and dwelling are main demand of the area. Very few recreational and tourism development project locate at coastal area (Fulong beach).

Table 3.1 Northeast Coast National Scenic Area master plan and land use regulation

Regulatory Intensity	Land use	New construction	Renovation / Reconstruction/ Expansion
Highly restricted Regulation	Ecological Protection Zone, Geological Protection Zone, Water Resource Protection Zone, Marine Resource Protection Zone		X
Middle restricted regulation	Scenic protection zone	X	H<7m Note* BA<125m ²
Normal restricted regulation	Natural conservation zone Slope land	X	H<10.5m Note* BA<165m ²
Low restricted regulation	Residential zone	BCR: 0.5 FAR: 1	
	Commercial zone	BCR: 0.6 FAR: 2.4	
	Hotel zone	BCR: 0.4 FAR: 3.2	

H: Building height
A: Site area
BA: Building area
BCR: Building coverage ratio = Building are / Site area
FAR: Floor area ratio = Gross floor area / Site area

Note:* The constructions need to be reviewed and approved under competent authorities for national defence and security, public facilities purpose.

Source: Third Comprehensive Review Northeast Coast National Scenic Area Master Plan, 2010

3.4 New plan dispute

A. The Draft Third Comprehensive Review of NCNSA Master Plan

In order to deal with social and land use demand and accommodate increasing tourism development, the third comprehensive review of NCNSA master plan intended to change land use layout for hotel and recreational developers. More than 100 hectares natural conservation land was proposed to change land use into Hotel zone and recreational zone (see figure). As a result, the locals concerned the massive change of land use proposed may threaten the landforms and landscape quality.

B. Northeast Coast Area Civilian Economic Improvement Plan

In addition, the Civilian Economic Improvement Plan (2011) proposed to change 200 hectares agricultural land into residential zone, commercial zone and hotel zone. The change of land use has significant meaning for future development, most of the agriculture land plan was not aware of the general vision of Gongliao, the land use change only reflect the developer's demand but not capable to deal with the local needs.

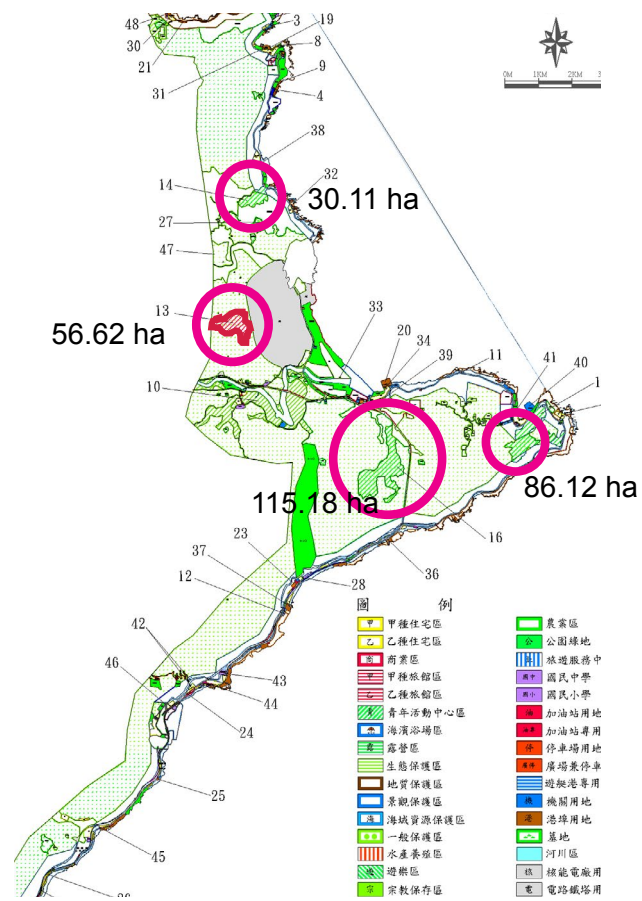


Figure 3.5 Change zoning plan in 3rd comprehensive review of Northeast coast national scenic area master plan
Source: CPAMI, 2010

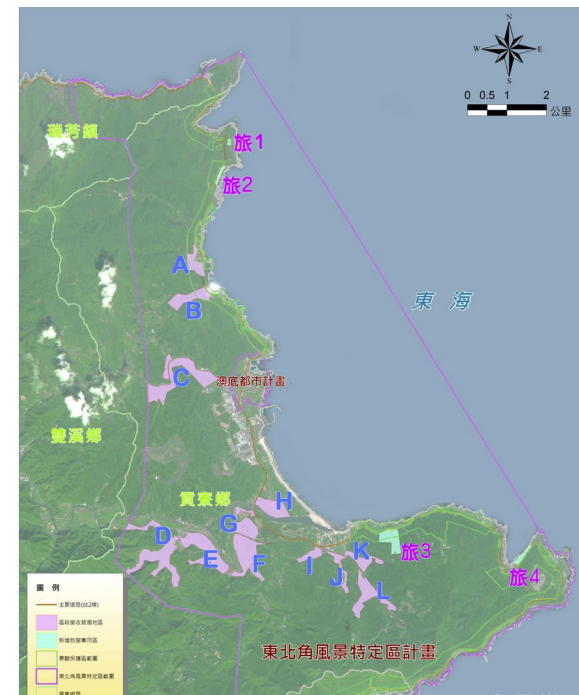


Figure 3.6 Draft expropriation project of Civilian Economic Improvement Plan (2011)
Source: CPAMI, 2011

C. Plan making process and decision making process

The planning making process includes three phases: proposal phase, collaboration phase, and approval phase. In the proposal phase, the local meeting sometimes become policy announcement instead of a real conversation between plan maker and stakeholders. The planning agency plays main leading actor for the spatial planning and development direction. The case in Northeast coast area is that the change of land use, enforcement condition, development instrument has already decided before publish of draft

plan (collaboration phase). As a result, local people got confused about how future development vision was made, and how future development fulfil the local demand. In the other words, the decision making process is not always transparent enough for all stakeholder. The opportunity for stakeholders to choose and decide the future development is missing in current planning framework. This is the common conflicts in other spatial project in Taiwan.

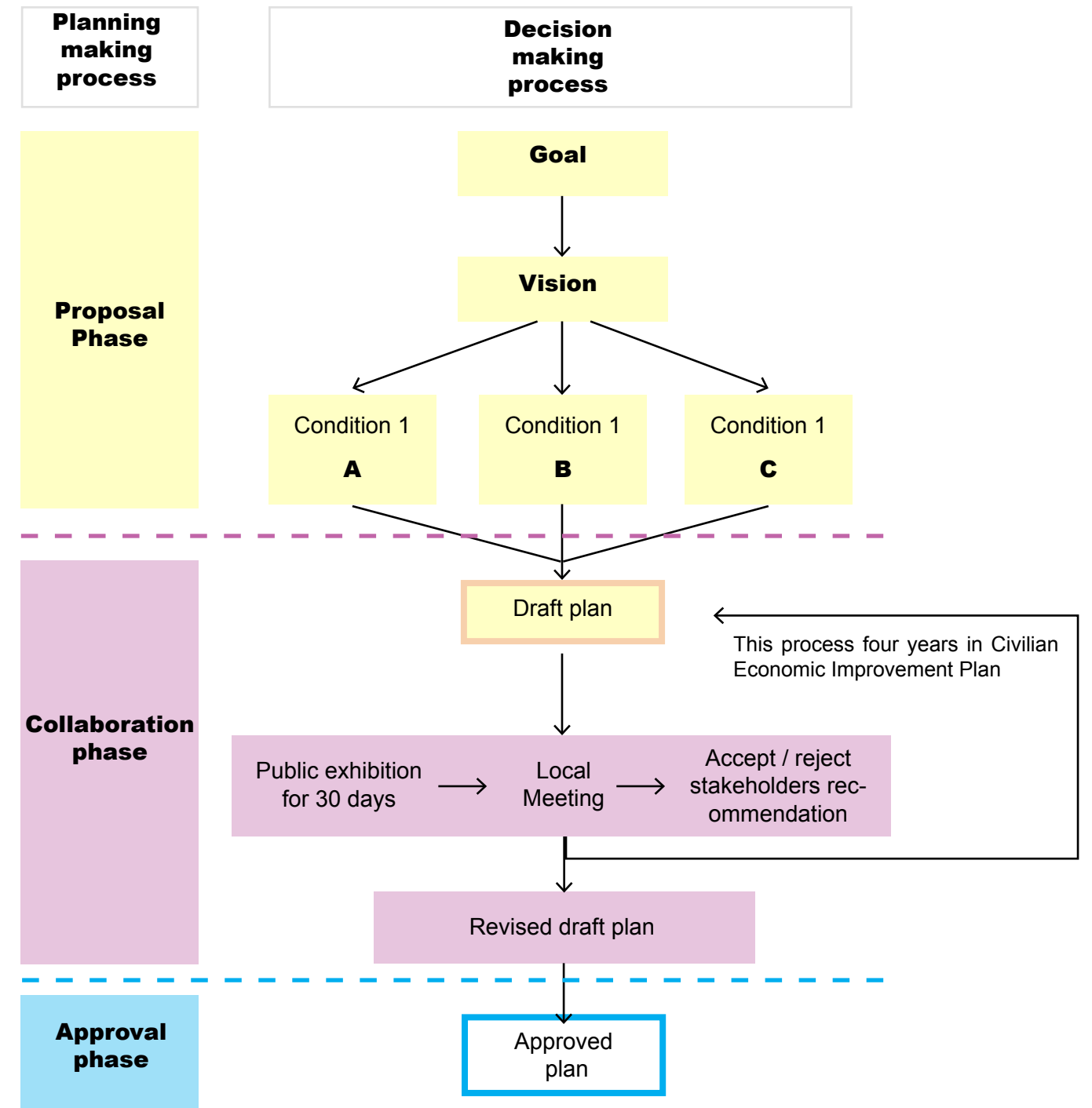


Figure 3.7 Plan making process and decision making process in 3rd Comprehensive Review of NCNSA Master Plan and Civilian Economic Improvement Plan

Source: Author's own elaboration based on the involvement experience of the project

II. Stakeholder analysis

1. Stakeholder analysis in general

In order to moving from single stakeholder to multi-stakeholder frameworks, a stakeholder analysis is an important part of diagnosis of the problem and potential of conflicting value of target group.

This part used analytical matrices of stakeholders to discuss the problem and potential of northeast coastal national scenic area, to understand the competing interests, conflicts, compromises and interactions between those stakeholders. It helps to understand the actual needs of local stakeholders, the possible proposal of private investment. In addition, it allows for recognition of existing spatial organizations, responsibilities and goals of different stakeholder. Over the next few pages, firstly the general information is given on stakeholder analysis, which is applied to the context of this graduation project.

This research, stakeholder analysis will be divided into public government sector, local private sector, and non-local private sector.

There are currently nearly 15,800 residents, 1, 400 landowners around the Northeast national scenic area and additionally there are active community development groups, NGOs, and tourists, etc. (CPA-MI,2010). Consequentially the relationships between stakeholders are complicated.

This study first utilized observation and literature review to understand all systems, and then applied the classifications of "local," "non-local," "public sector" and "private sector" to identify stakeholders in the planning process of Northeast national scenic area and Civilian Economic Improvement Plan. Stakeholders were divided into four dimensions: A - The first stakeholders (Empowerment), B - The secondary stakeholders (Alliance and partnerships), C - The third stakeholders (Properly inform and contact), and D - The fourth stakeholders (Poorly contact).

The study is based on official document review questionnaires and news interview. The stakeholder comments collected in the public display period for Northeast National Scenic Area master plan of third comprehensive review (2010), questionnaires survey from questionnaire of Civilian Economic Improvement Plan(2011) helps this research to understand the conflicts and opportunities between public government sector, local private sector, and non-local private sector. In addition, the analysis helps this research to understand the preference of stakeholders and the response to proposed policy.

Furthermore, the authors examined the combined findings from literature review and analysis, partici-

patory observation, and study of the key stakeholders comments and questionnaires, using two indicators of "Importance" (intensity of impact by the planning process of Civilian Economic Improvement Plan or the degree of influence on its planning process) and "Influence" (power to promote or obstruct the planning process of Civilian Economic Improvement Plan).

Through the cross sector meetings with public sectors, public presentations and discussions with residents, repeated assessment and comparison, the authors completed the stakeholder analysis as summarized in an importance/influence matrix

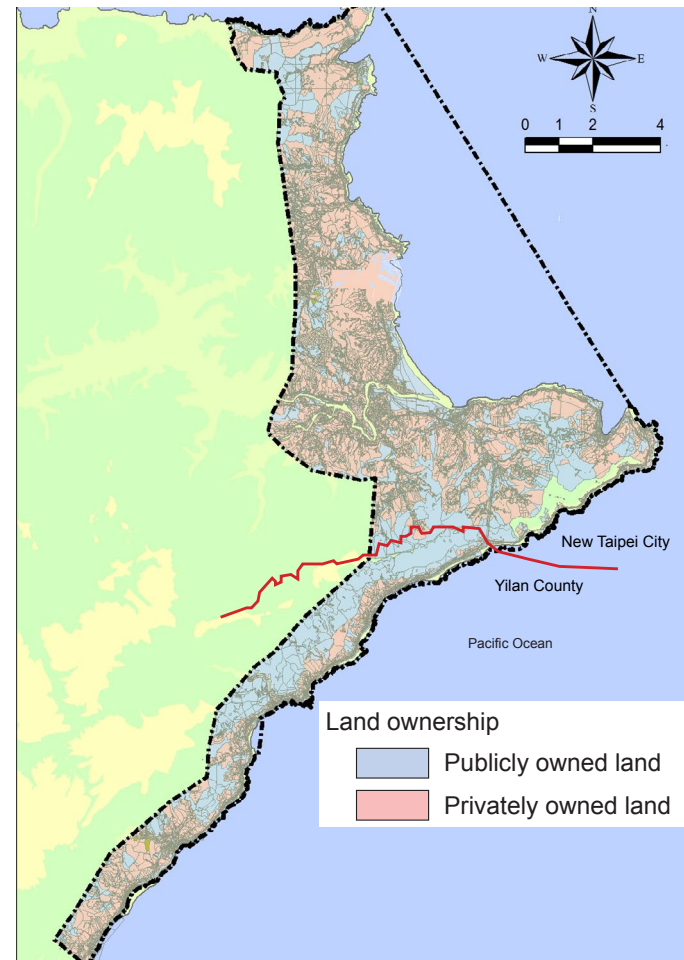
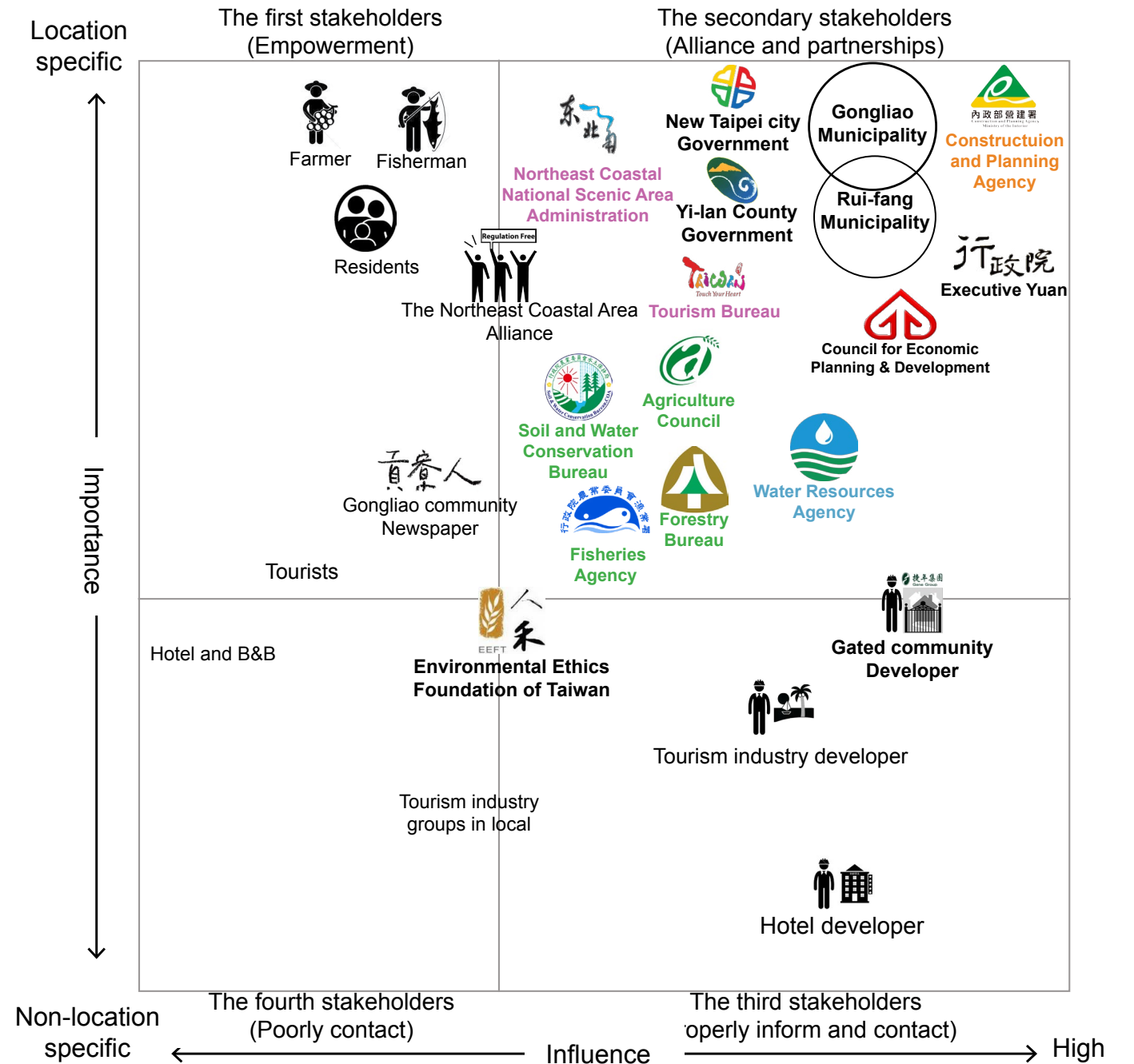


Figure 3.8 Land ownership in Northeast coast area

Source: Civilian Economic Improvement Plan(2011)

2. Stakeholder influence

Trough the stakeholder matrix analysis, this research defines four types of stakeholders. Stakeholders were divided into four dimensions: A - The first stakeholders (Empowerment), B - The secondary stakeholders (Alliance and partnerships), C - The third stakeholders (Properly inform and contact), and D - The fourth stakeholders (Poorly contact). Not all of them are well informed and involved during decision making process.



Note:

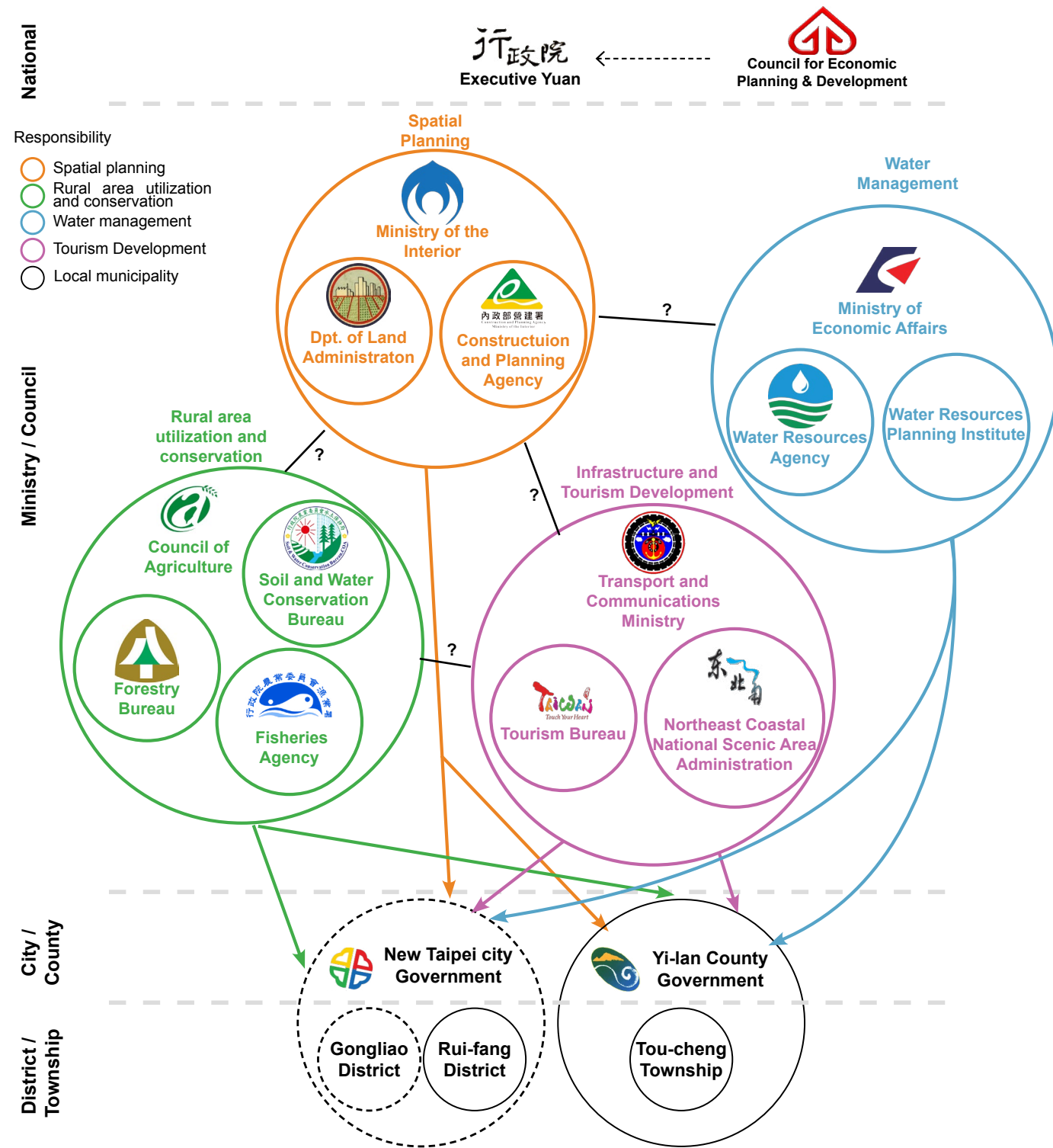
Tourism industry developer including Ginsa Gulf Limited, Ginyu Gulf Recreation Limited, and Koda Recreation Limited.

Hotel and gated community developer including Gene Group.

Local civic group including Gongliao Community Newspaper, The Northeast Coastal Area Alliance and Yanliao Anti Nuclear Power Association.

Non local NGOs include Environmental Ethics Foundation of Taiwan

3. Involving public sectors



3.1 Responsibility of public sectors

The responsibility of public sectors is shown in the diagram. The competent authority in central government level

A. Policy maker

Council for Economic Planning and Development (CEPD) is responsible for drafting overall plans and strategies. It also assessed development projects and proposals and programs submitted to the Executive Yuan.

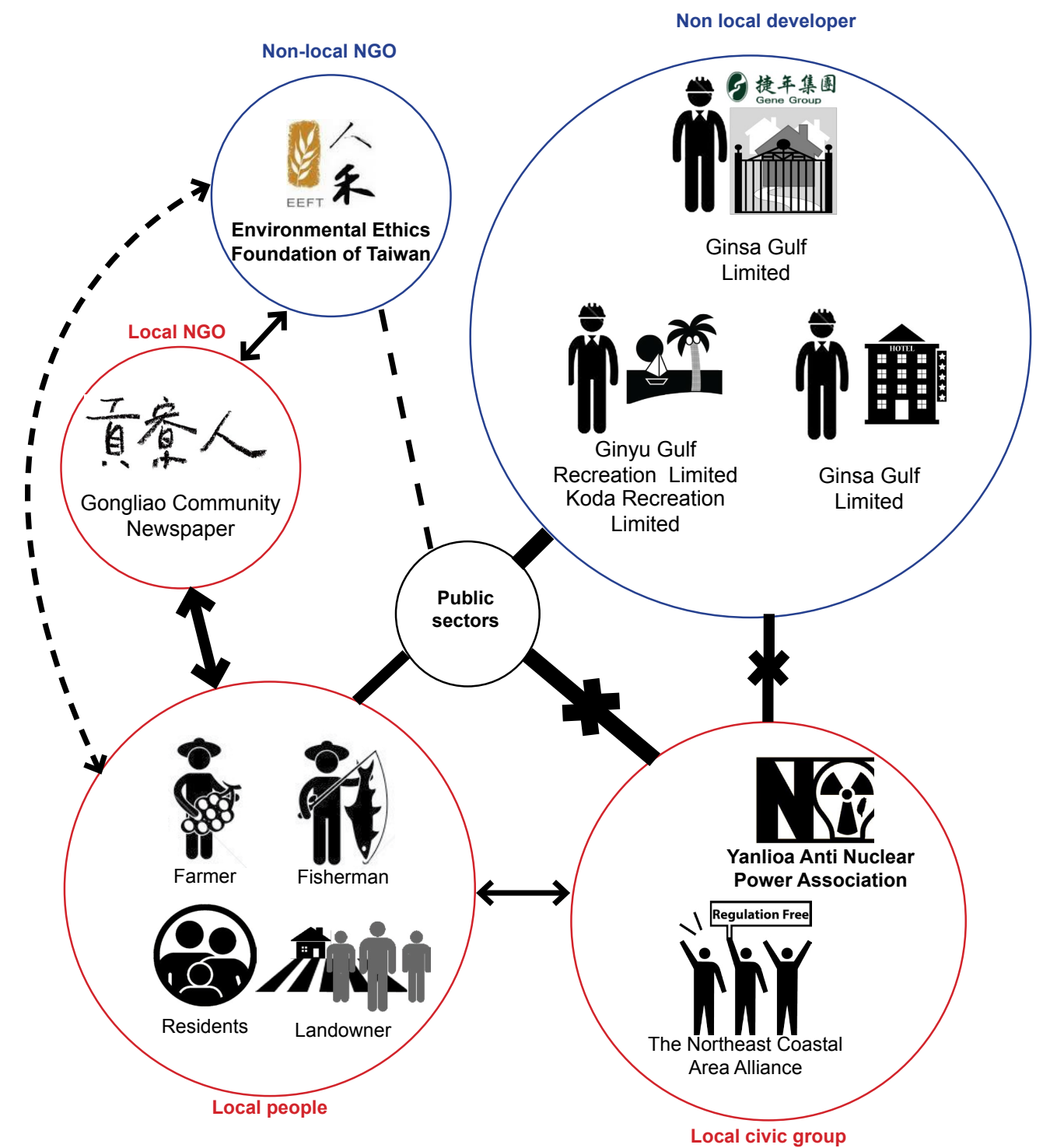
B. Spatial planning

Construction and Planning Agency, Ministry of the Interior (CPAMI) is the competent authority for the approval of regional plan, master plans, master and detailed plans, and special district plans.

C. Rural area utilization and conservation

Council of Agricultural (COA) is charged with overseeing affairs related to agriculture, forestry, fishery, soil and water conservation affairs. The Forestry Bureau, Fishery Agency, and Soil and water conservation Bureau are competent authorities in mountain, coastal and rural area development.

4. Involving private sectors



D. Water management

Water Resources Agency (WRA) is charged with review of administrative plans, the planning, implementation, and management of water resources and water hazard.

E. Tourism Development

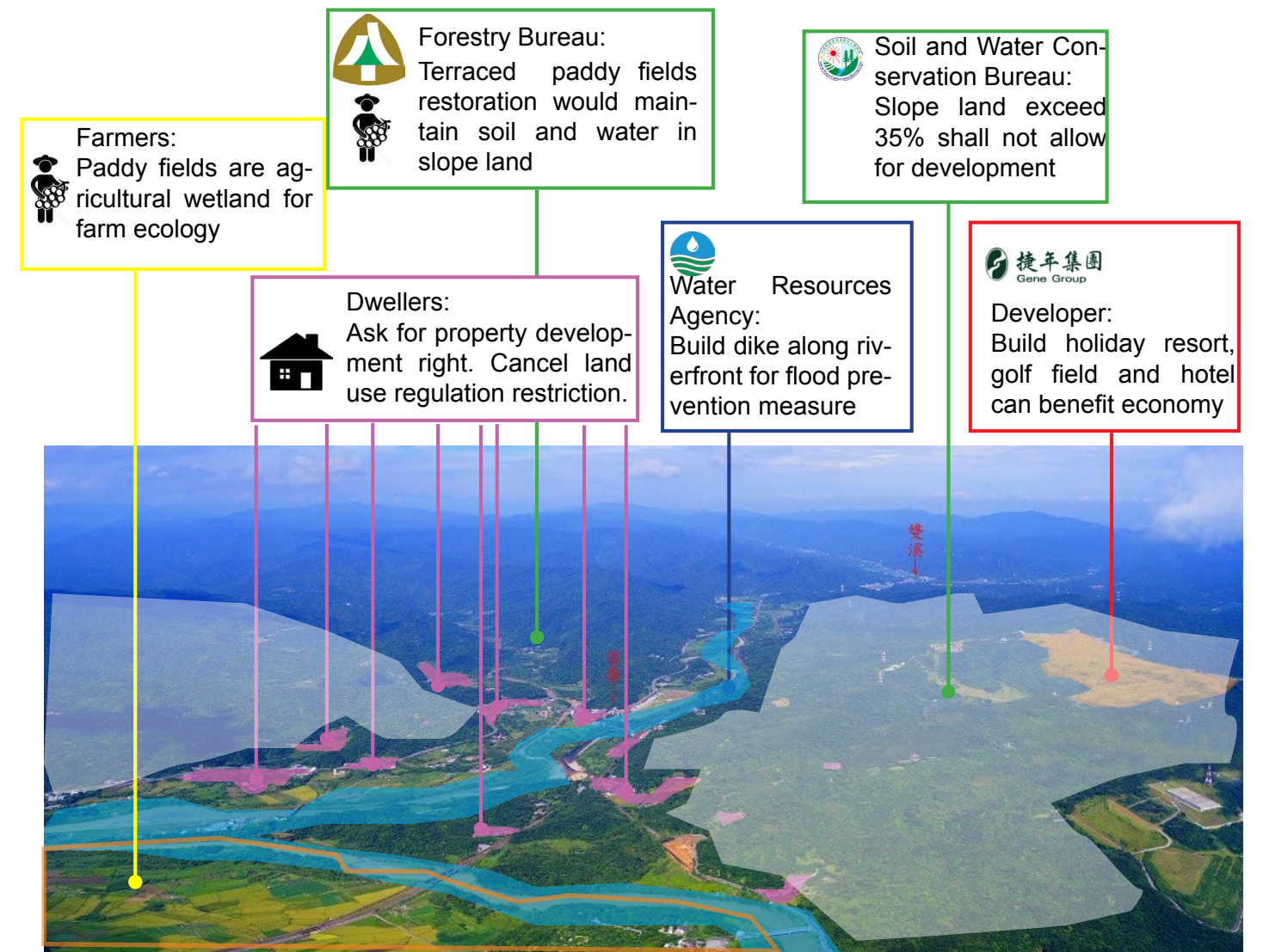
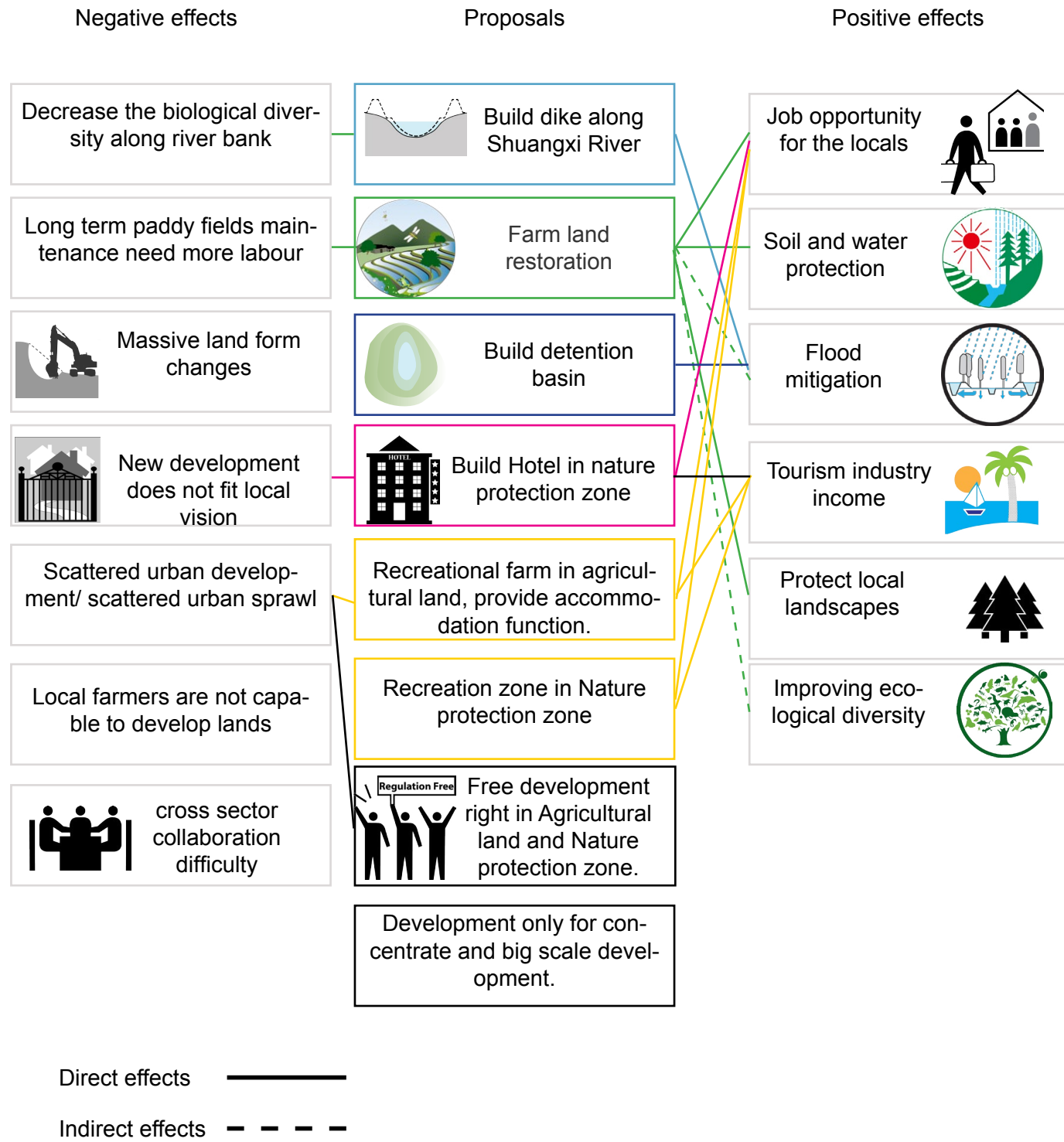
Tourism Bureau, Transport and Communications Ministry (TBMT) is charge with tourism and transportation development planning and management.

3.2 The problems in governance level

CPAMI is the key competent authority to accommodate proposals from national land conservation, water management, agricultural development, marine resource conservation and tourism development into spatial development. It means the implementation and review of spatial development plan should accommodate the contradicting issues among demanding land use and functions.

5. Conflicts matrix and spatial conflicts

How the locals feel about Northeast coast National Scenic Master plan in 2010, Civilian Economic Improvement Plan in 2011, terraced paddy fields restoration project in 2012?



Source: Draw by author.

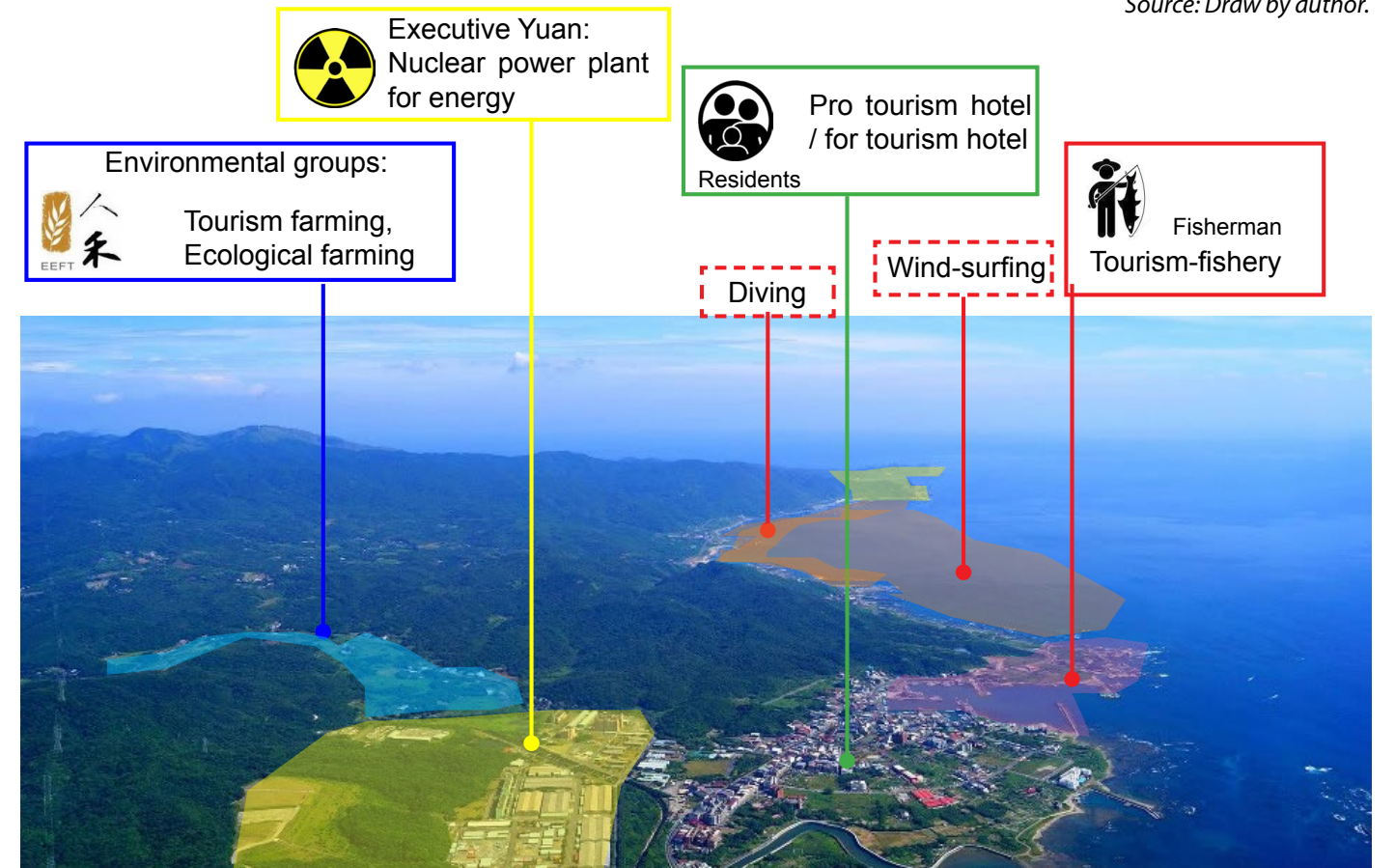


Figure 3.9 Ao'di downtown and surrounding landscape

Source: Draw by author.

III. Spatial analysis

1. Geography and topography

1.1 Unique geographic landscape brings tourism revenue

There are three major types of terrain in Northeast coast area, which are submergence coast, fault coast, and sandy coast.

The unique natural landscape and scenery attracts more than 4.3 million visitors per year, which has potential to generate 8.5 billion New Taiwan Dollar (204 million Euros) tourism income in Taiwan (0.06% GDP). Northeast Coast National Scenic Area is the 4th most visited National Scenic Area in Taiwan.

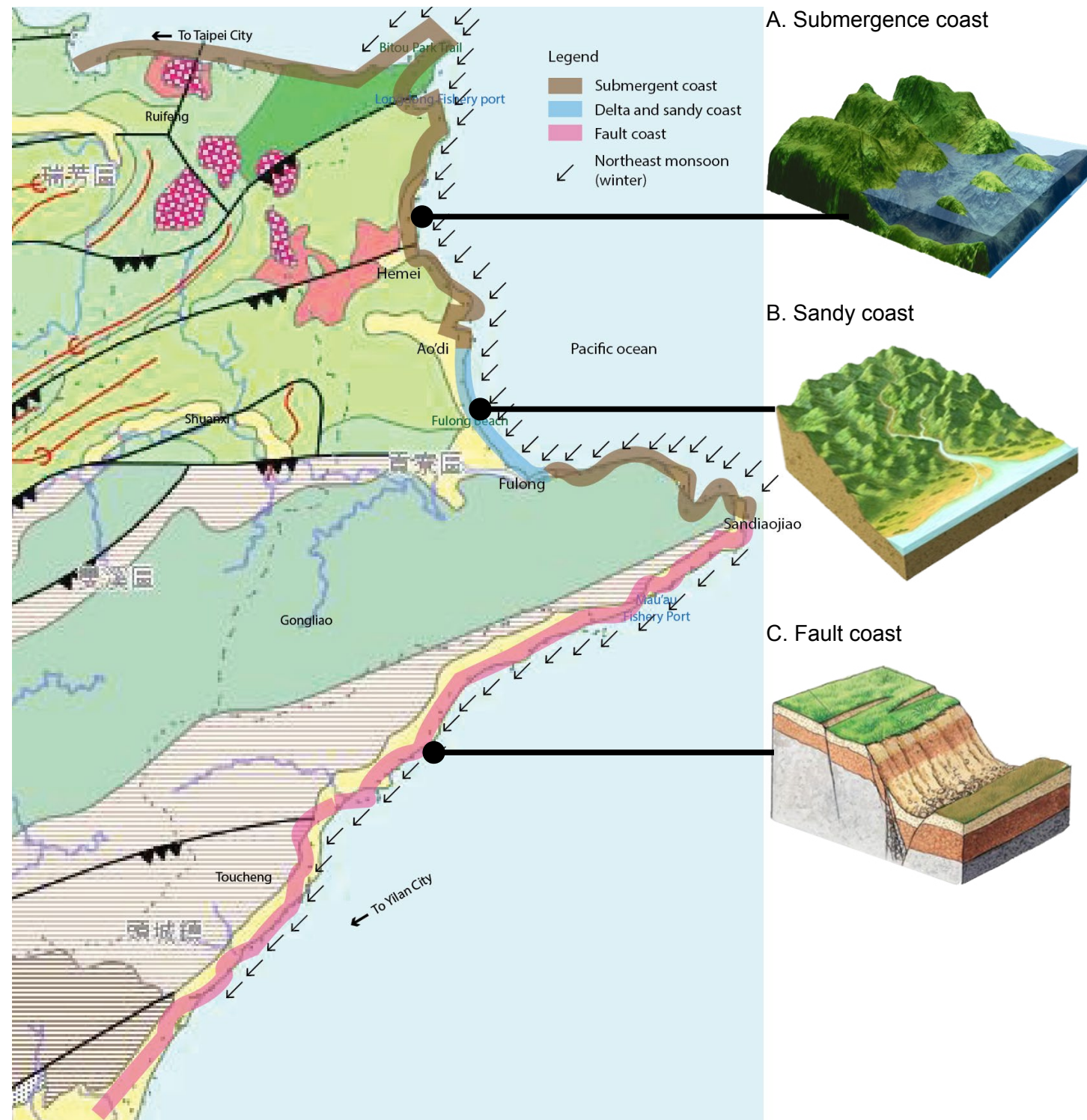


Figure 3.10 Distribution of coastal type

Source: SWCB

Natural landscape brings tourism revenue

€ 204,310,895	Tourism revenue (2011) 0.06% GDP
€ 3,382,204	Fishery production value (2011)
€ 145,475	Industry, commerce and service production value (2011)

Source: Directorate-General of Budget, Accounting and Statistics, Executive Yuan (Taiwan)



Source: Flickr



Source: kongliao-water-terrace.blog



Source: Flickr

A. Submergence coast

The north of Sandiaojiao is mainly submergence coast, which stretches along the coast that have been inundated by the sea due to a relative rise in sea levels. Because the coastline is vertical to the northeast monsoon, winds and waves erosion led to several bays and cliffs.

B. Sandy coast

From Ao'di to Fulong along with Shuangxi river delta, where is the location of major villages settlements, is sand and gravel coast.

C. Fault coast

The south of Sandiaojiao is mainly fault coast, which is a fault scarp separating a higher-standing earth block-which, after faulting, forms the land from a lower-lying block-which, after faulting, is depressed below sea level. The northeast-southwest oriented geological structure parallels the coastline and the northeast monsoon. The coastline is relatively smooth because of less destructive erosion formation. Wave-cut platform and gravel coast are common topography.

Figure 3.11 Coast type in Northeast coast area

1.2 Mountainous topography determine the land use pattern

The mountainous slope land covers 90 per cent of whole territory of Northeast coast area, the rest 10 per cent of plain areas that mainly located along coastline or river-front. The few gentle slopes which allow for human activities are mainly located along Shuangxi River bank and coastal areas are indicated as flood prone area. The landforms determine the land use pattern, which is highly related to soil and water conservation function.

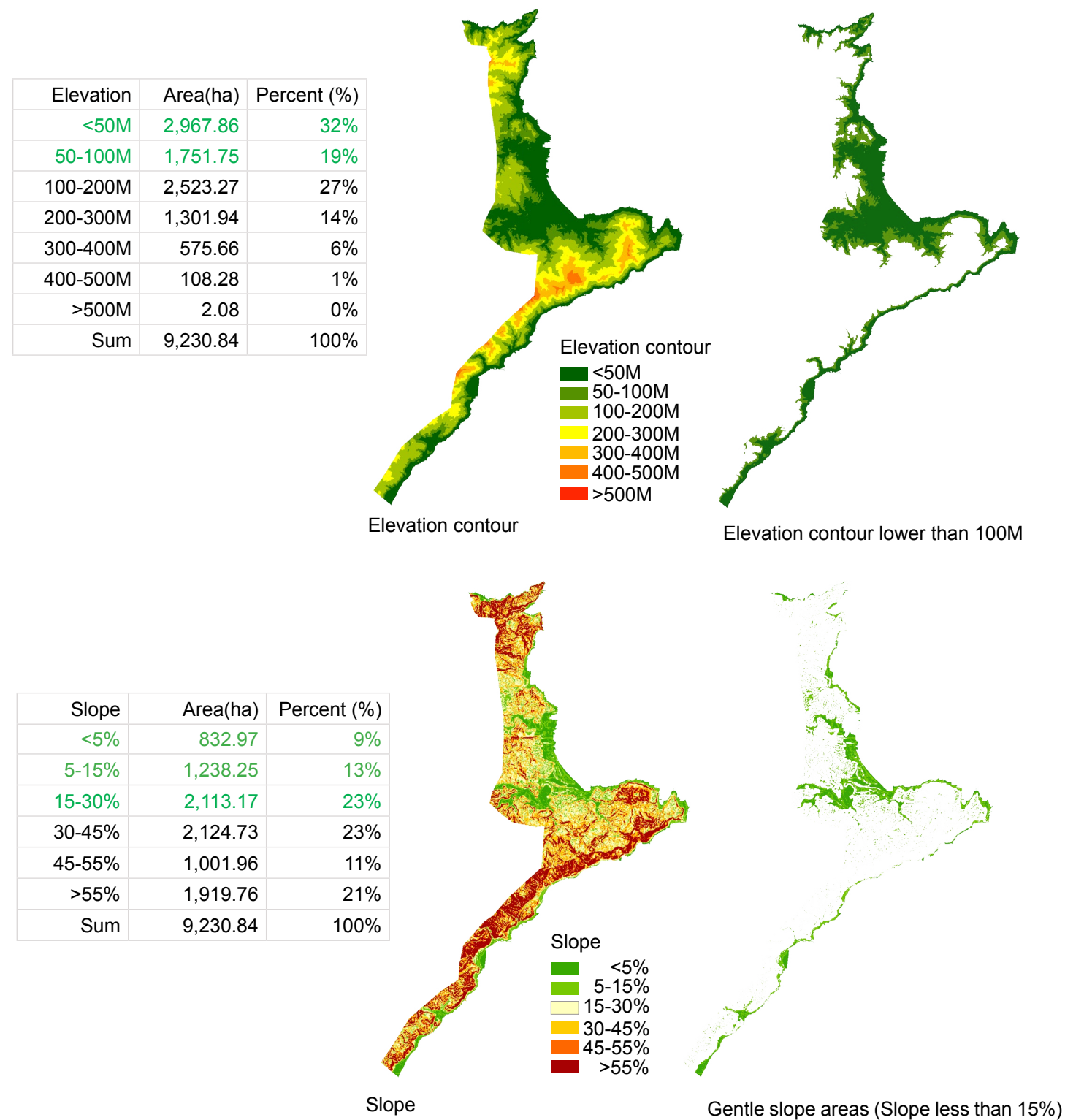


Figure 3.12 Distribution of elevation and slope

Source: Author's own diagram.

1.3 The variety of nature environment provide habitats for wild animals

Northeast coast area is located in bird migration pathway, the diversity of landscapes such as riverfront wetlands, woods, bushes, meadows, farmlands and wetlands provide various habitat for migratory birds and local animals.

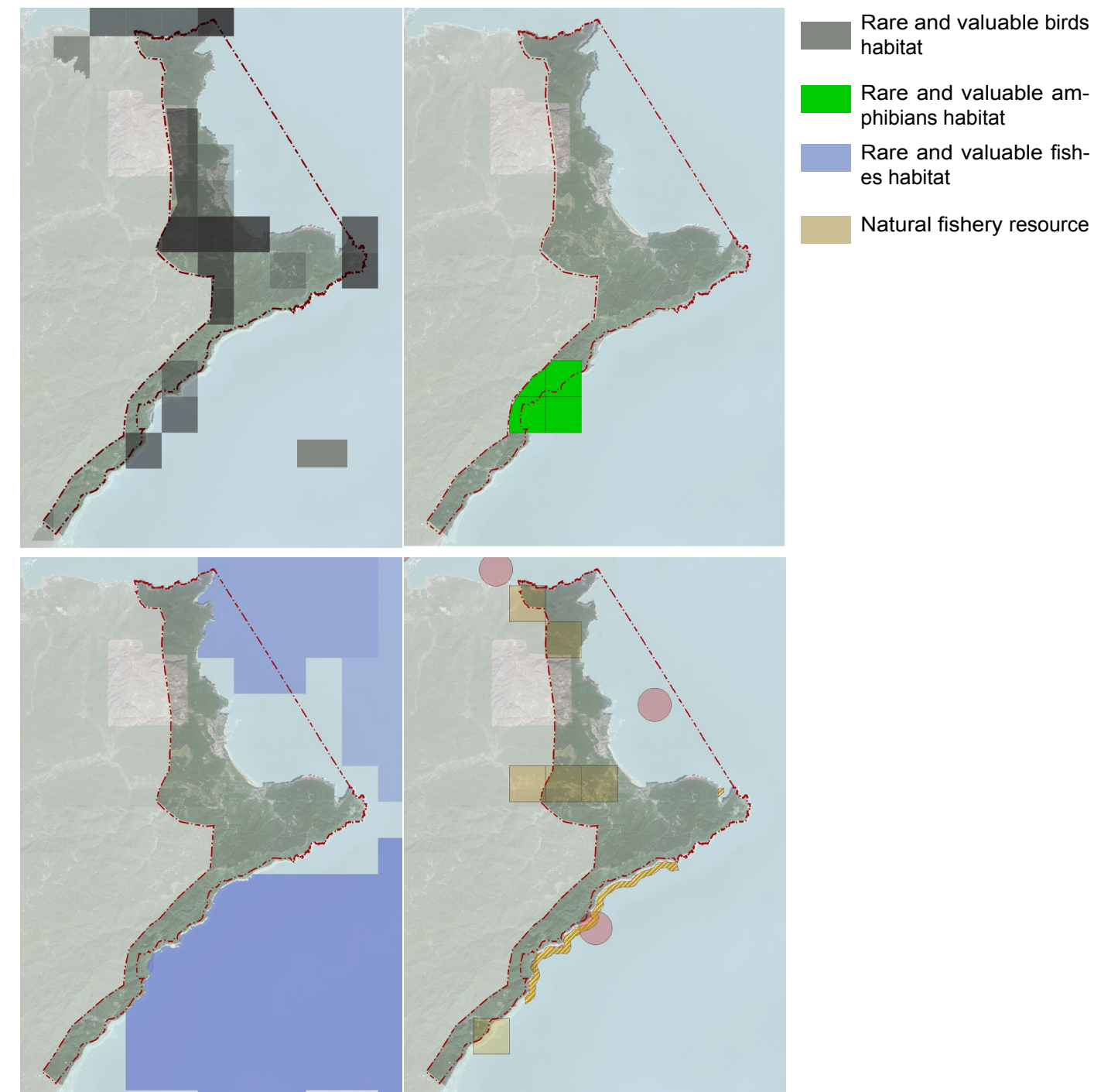


Figure 3.13 Distribution of rare and valuable animal habitats

Source: Author's own diagram.

2. Waterway and flood prone area

2.1 Shuangxi River

The flood prone areas are mainly located along Shuangxi River and Fangliao Stream. There are two river valley and 12 small streams covers Northeast coast area. The main river Shuangxi River with a length of 28.6km originated from mountains with a height of approximately 700m to 500m.

2.2 Flood prone areas

The figure shows flood prone areas are mainly located along Shuangxi River and Fangliao Stream. Tianliaoyang is the main agriculture wetland along Shuangxi River, when daily precipitation excess 150mm/day, Tianliaoyang will flood and help adjust water level of Shuangxi River.

From year 2009 to 2013, there are 11 times the daily precipitation excess 150 mm in one day.

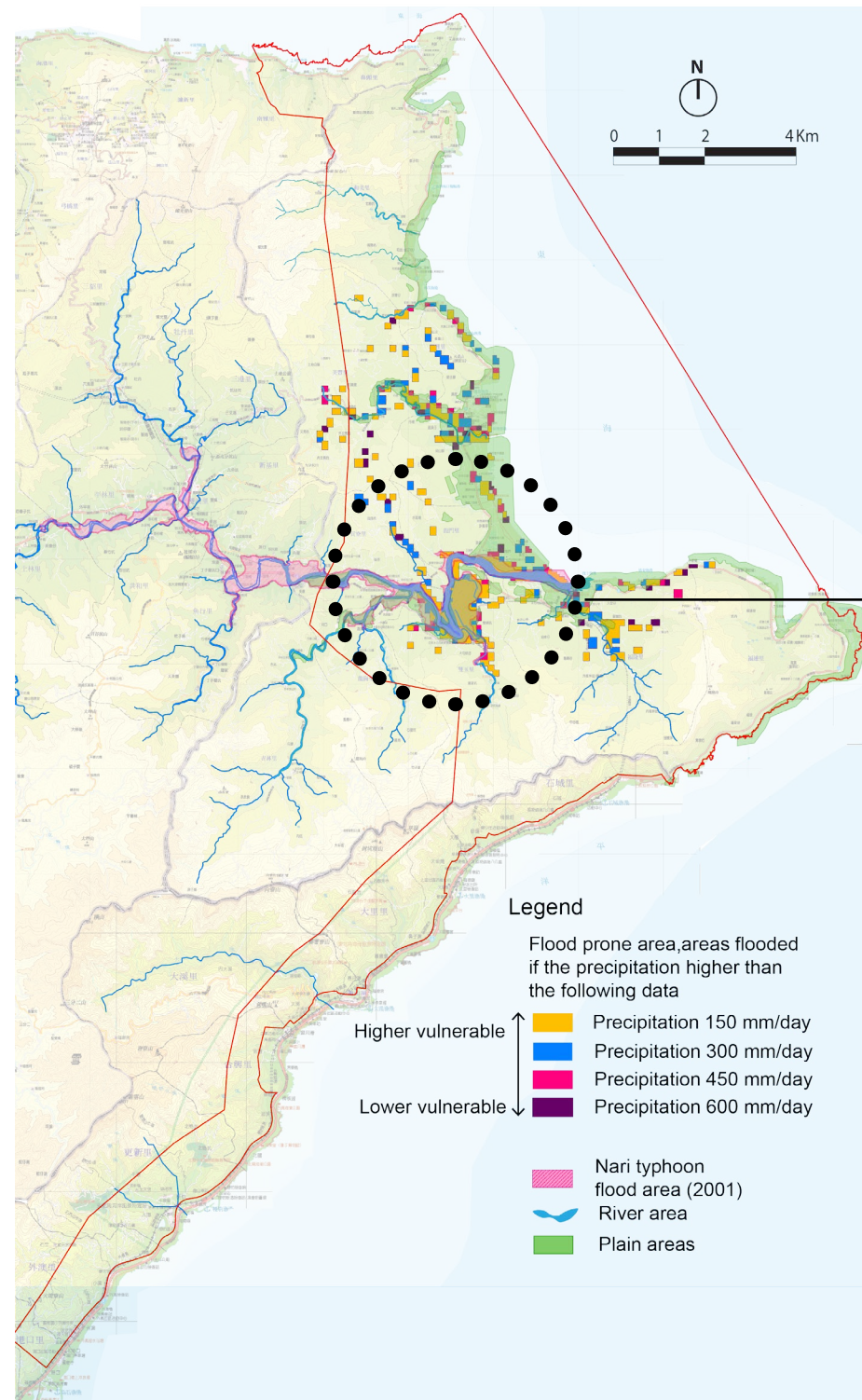


Figure 3.14 Flood prone areas

Source: Author's own diagram.

2.3 Flood plain Tianliaoyang

Due to the short river length and flesh storm rainfall amounts, villages in the Shuangxi River valley and the lower Shuangxi River flood plain Tianliaoyang areas are threatened constant flooding events in the raining season. During the raining and typhoon season, a considerable amount of rainfall from the mountains often times inundates in the lower Shuangxi River flood plain Tianliaoyang. According to the local senior farmers' experiences, flood plains in Tianliaoyang and terraced paddy fields in Fangliao Stream used to serve agriculture wetland with flood mitigation and ecological function in lower Shuangxi River valley. When daily precipitation exceeded 150mm per day, the terraced paddy fields and flood plains could adjust water level of Shuangxi River.

The name means a ocean-like agriculture field which indicates the geography nature of constant flooding low plain. Tianliaoyang not only plays important role to adjust water level of Shuangxi River, but also protect village from flood and severe precipitation.



Tianliaoyang wetland in summer time (dry season).



Tianliaoyang wetland after Nathan typhoon (2004) become flooding.

Figure 3.15 The dry season and flood condition in Tianliaoyang

Source: kongaliao-water-terrace.blog

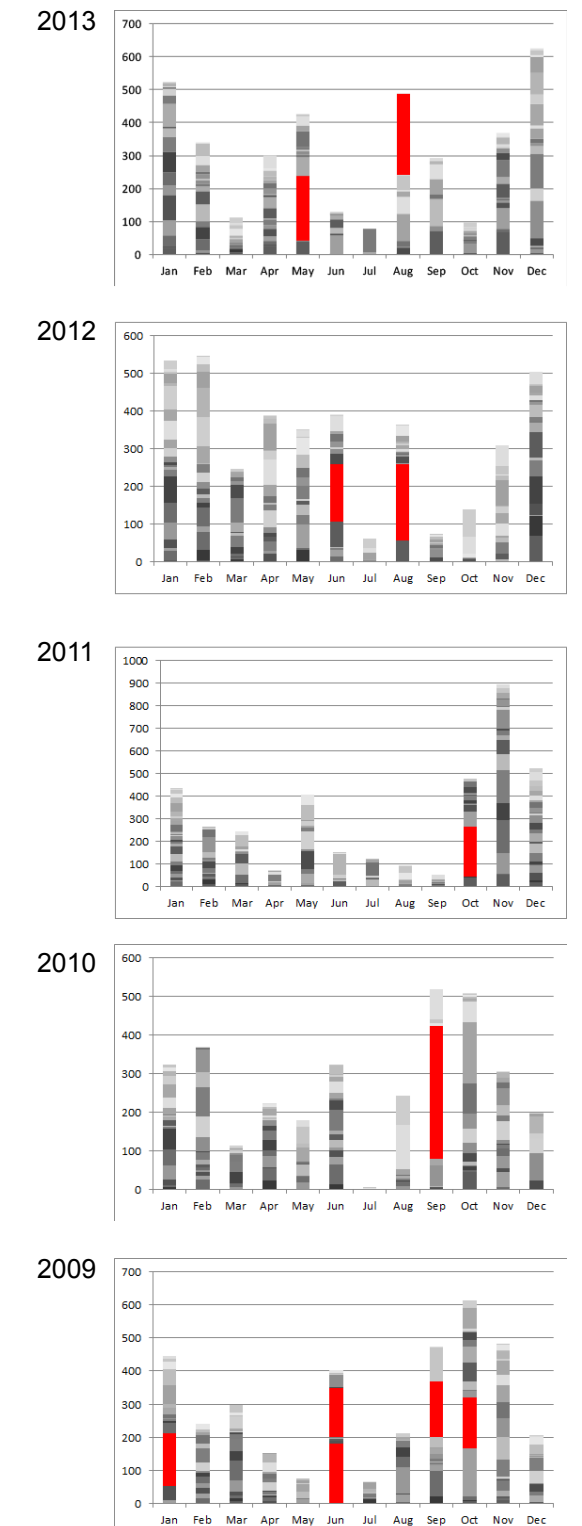


Figure 3.16 2009-2013 single-day rainfall (mm)

Source: TCWB

3. Farmland and agriculture

3.1 Decline of population and farming industry

The population in Gongliao showed negative growth. The average annual growth has declined in the past ten years as the population growth rate is -0.67 % (CPAMI 2010). In one hand, the topography restriction and development constraints decrease local economy investment and job opportunities, which results in young population move to surrounding cities. On the other hand, the terraced farming was the traditional agriculture methods and landscape that support soil and water conservation system.

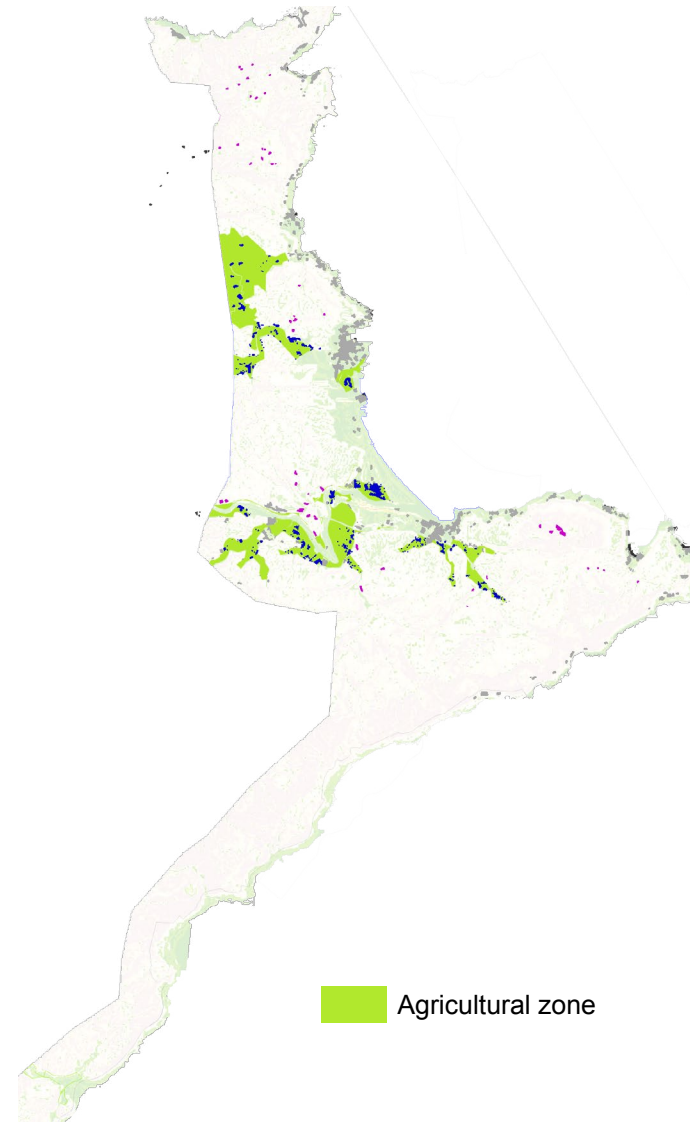


Figure 3.17 Agricultural land distribution
Source: Map by author



Wasted terraced paddy fields
Source: New Taipei City Farmer market website



Wasted farmland in Fangjiao Stream riverfront
Source: Author's own photo

Figure 3.18 Wasted farmland in upstream

3.2 Decline of farming area and flash flood storage capacity

Among 563 hectares agricultural land, 406 hectares agricultural land are abandoned in Gongliao. (Gongliao District Administration Office, 2012) Since traditional terraced farming methods cannot replace labour force with machinery on slope lands, a big amount of the terraced paddy fields has been abandoned due to lack of agriculture labour force and social reasons. The decline of population and abandoned of terraced paddy fields bring make it more difficult to support soil and water conservation without changing existing landscape structure.

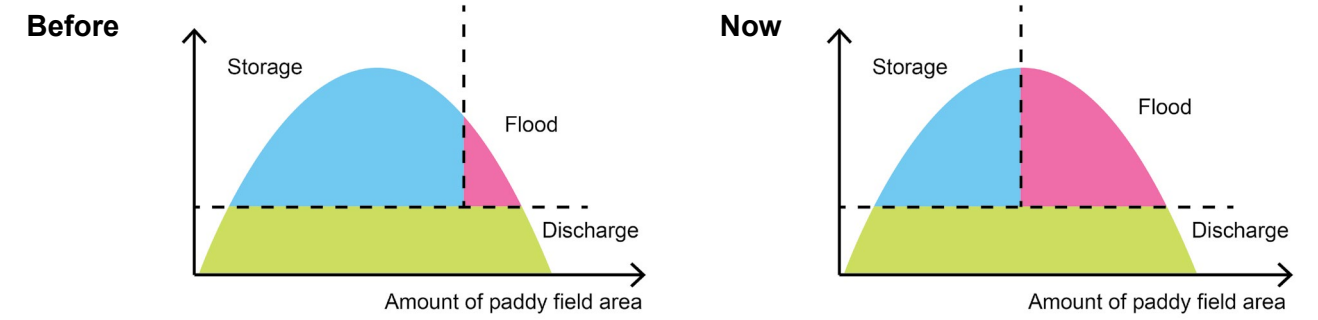


Figure 3.19 Flash flood storage capacity in paddy fields

Source: Draw by author

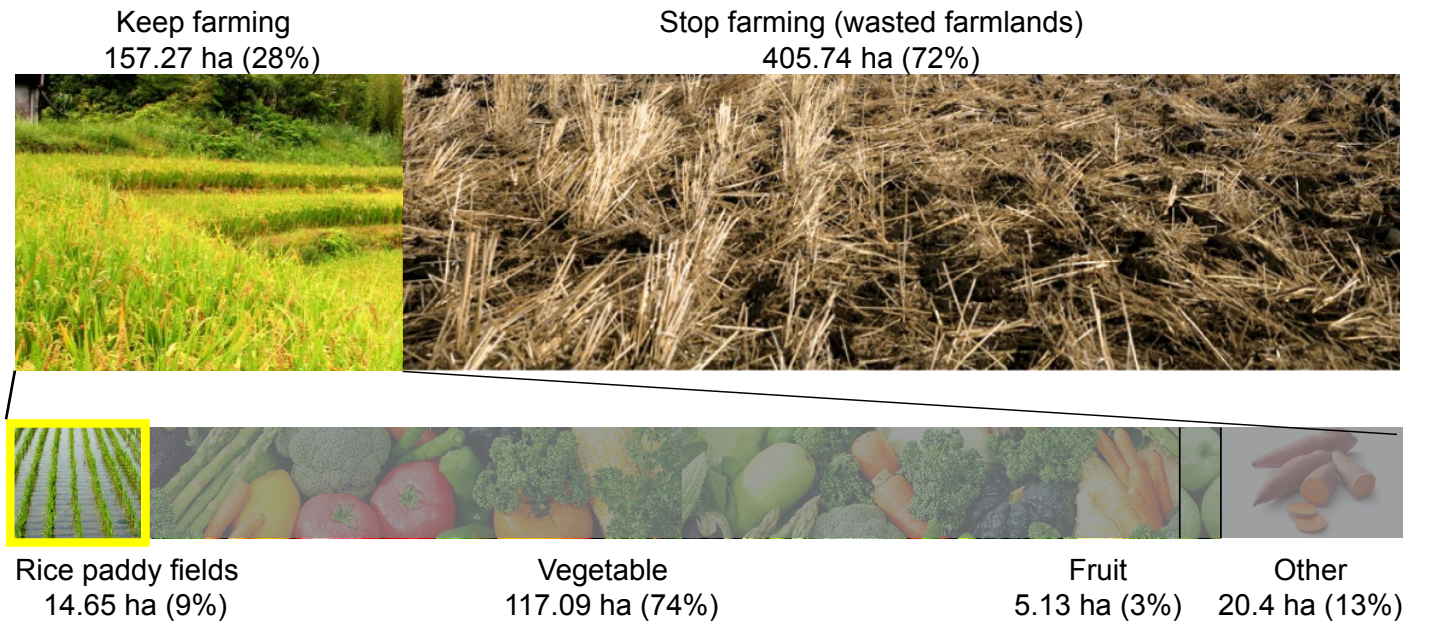


Figure 3.20 Farm lands/ paddy fields in downstream



Source: New Taipei City Farmer market website

4. Town and village development

4.1 Coastal and mountain villages

The town development pattern is determined by the topography, natural environment and waterfronts condition. Coastal village and mountain village are two settlement types represent Northeast coast area.

The mountain villages were built along Shuangxi River valley and surrounding farmlands. Gongliao village is the main cluster mountain village. The others mountain settlements have development into scattered farmlands settlements.

The coastal villages were built along fishery ports and breeding ponds, most villages are located within 1,000 meters diameter to fishery port. Owing to the transport and mobility convenience, the coastal villages have developed into cluster fishery villages or port villages.

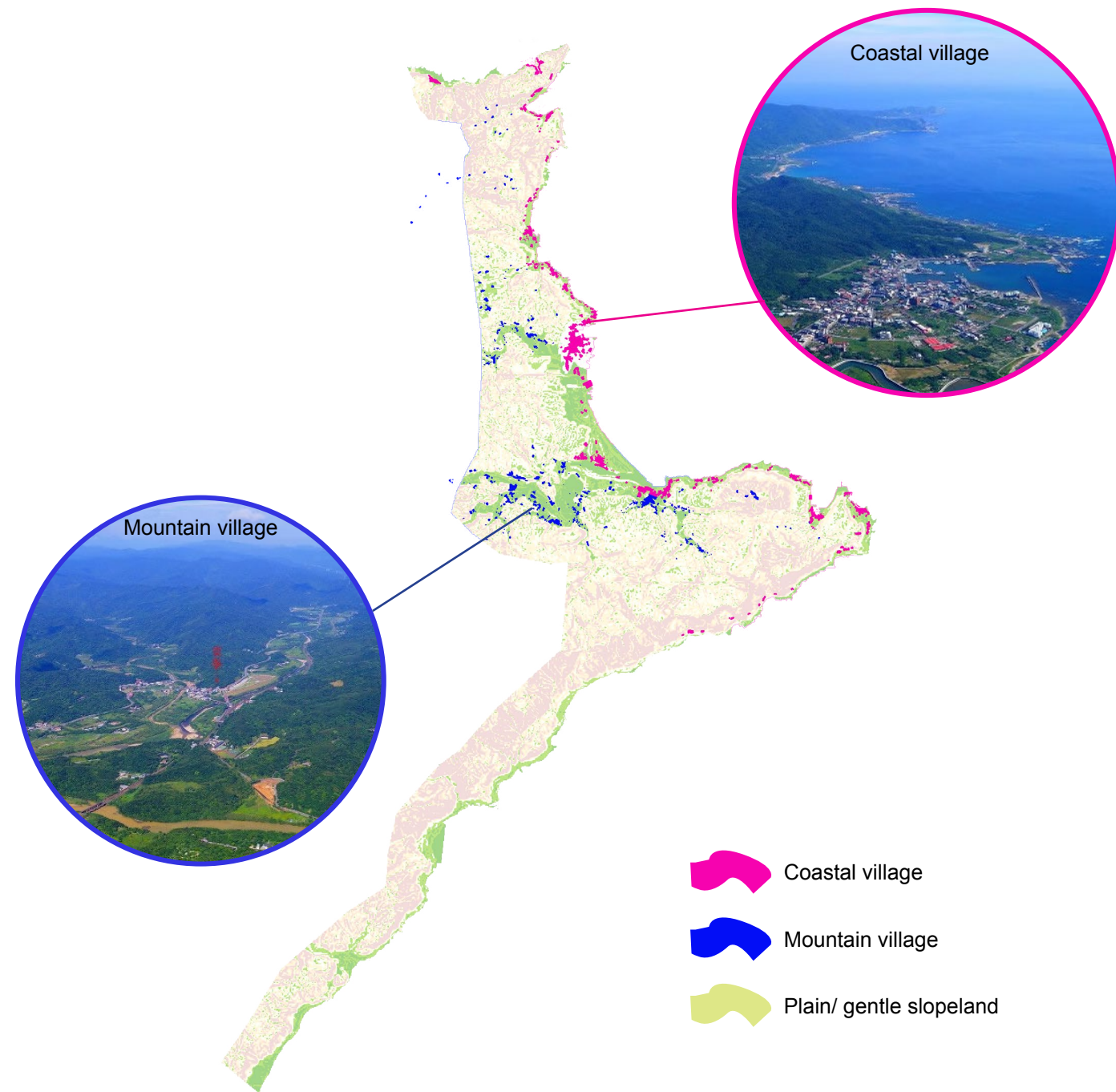


Figure 3.21 Town and village distribution

Source: Map by author

4.2 Town development with tourism

The main tourism attraction are located along coastline areas. The forests and mountain in the south-wing of Northeast coast area is a popular hiking route.



Figure 3.22 Tourism attractions

Source: Map by author



Spring Gongliao Sand Carving Art Festival



Summer Gongliao Rock Music Festival



Fall Hiking Season - Coaling Historic Trail



Winter Harvest celebration - Sanshing Green Onion and Garlic Festival

Figure 3.23 Seasonal recreation activities

4.3 Fishery port and breeding pond

The rich marine resource make Gongliao a prosperous fishery village. Fishery and aquaculture is the primary industry in Gongliao. There area 15 fishery ports and 8 aquaculture breeding companies.

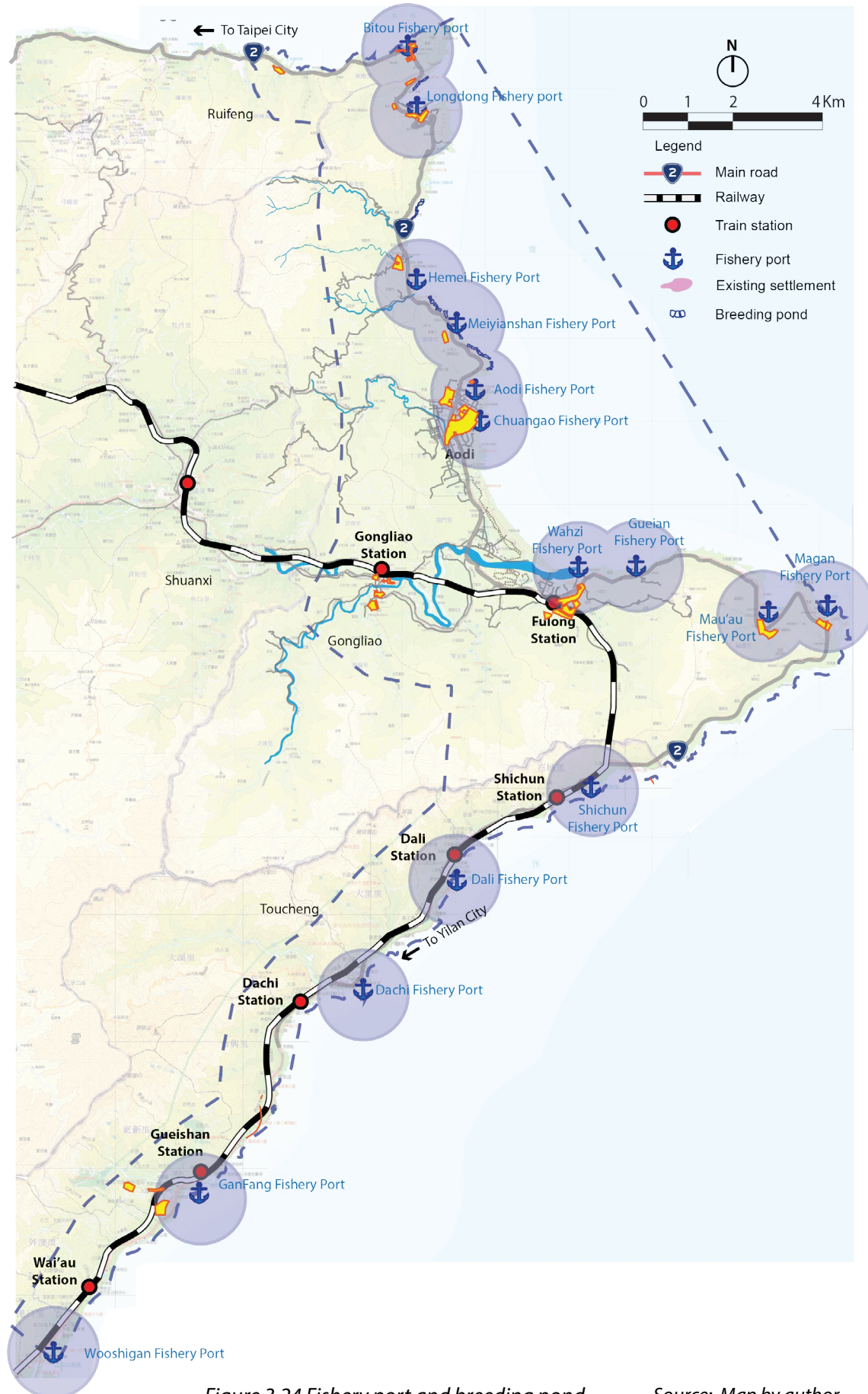
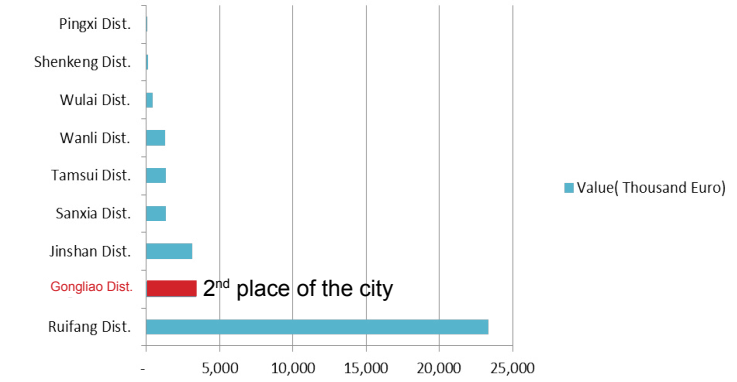


Figure 3.24 Fishery port and breeding pond Source: Map by author

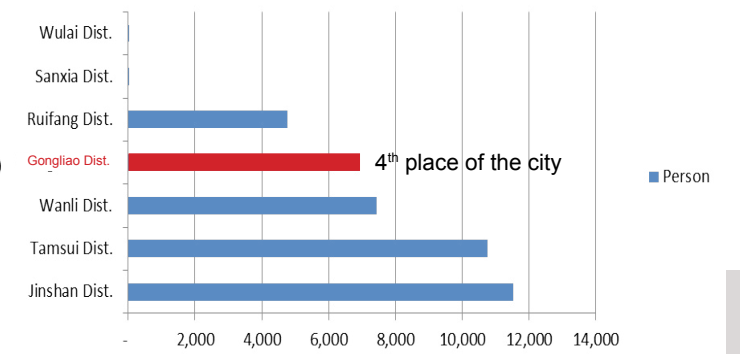
Fishery production value is the 2nd most important industry in New Taipei City

2010 New Taipei City Fishery Production Value



Source: New Taipei City Government (2010)

2010 New Taipei City Fishery Employment



Source: New Taipei City Government (2010)



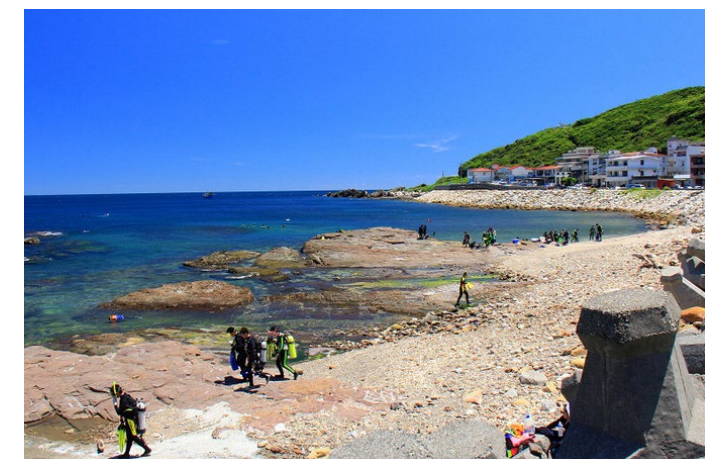
Long dong fishery port



Aquaculture pond in Gongliao coast



Longdong fishery port & village



Long dong diving activity

Source: Xuite blog

Figure 3.25 Fishery port, village and breeding pond landscape

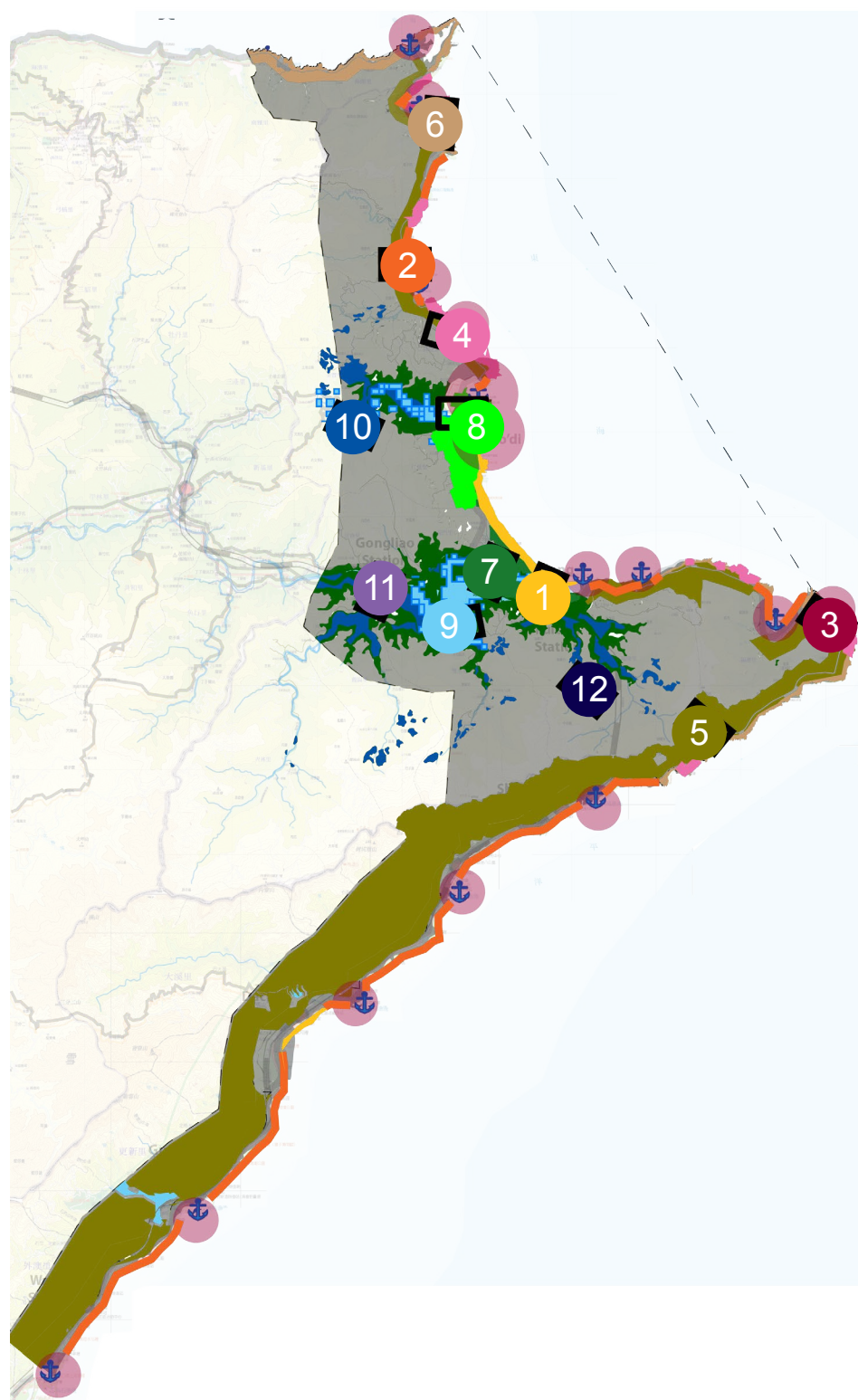
5. Landscape type analysis

In order to understand the relationship with built-up area and the natural landscape, first define 12 landscape types that represent the characteristic in Northeast coast area.

Second, according to the functional areas mentioned in Draft New National Land Use Law, the assessment will illustrate the importance of four factors in each landscape type.

Third, indicate conservation and development issues related to the landscape types, and define the problem and potential. (Shown below)

The analysis shows that terraced valley, farmlands and floodplain are the three landscape types encounter most diverse land use issues. Therefore, the Gongliao Village in Shuangxi River valley will be the test site for further research.



The most conservation and development conflicts in coastal village

The most conservation and development conflicts in mountain village

5.1 Landscape type

● High ◐ Medium ○ Low

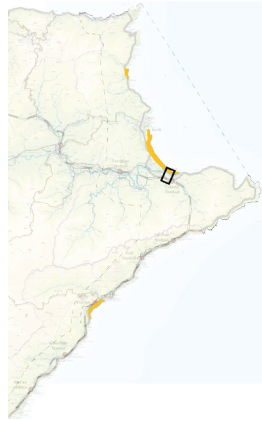
Environment conservation Agriculture development Fishery development Build-up area and settlement Recreation activity

Landscape Type	Environment conservation	Agriculture development	Fishery development	Build-up area and settlement	Recreation activity
5 Coastal ridge	●	○	○	○	◐
6 Cliff	●	○	○	○	●
12 Mountain ridge	●	○	○	○	◐
2 Pebble shore	●	○	◐	◐	◐
4 Breeding pond	●	○	●	◐	○
3 Marina	●	○	●	◐	◐
8 Plain	◐	○	○	●	○
1 Sand beach	●	○	○	◐	●
7 Windbreak	●	○	○	◐	◐
9 Flood plain	●	●	○	◐	◐
11 Valley	●	◐	○	◐	◐
10 Terraced farmlands	●	●	○	◐	○

Figure 3.26 The landscape typology location Source: Draw by author.

5.2 Landscape typology impressions

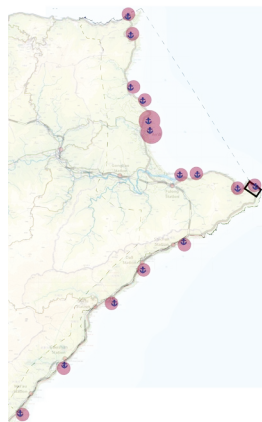
1 Sand beach



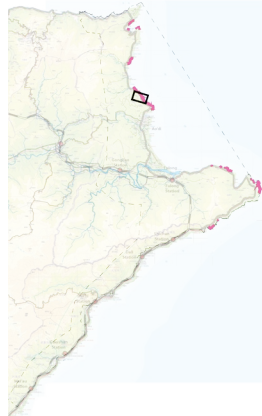
2 Pebble shore



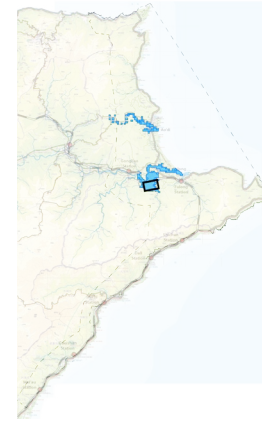
3 Marina



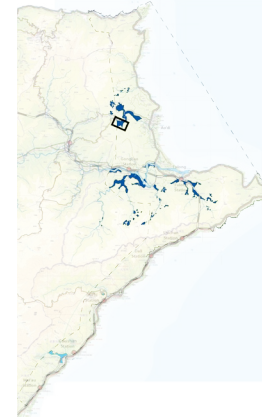
4 Breeding pond



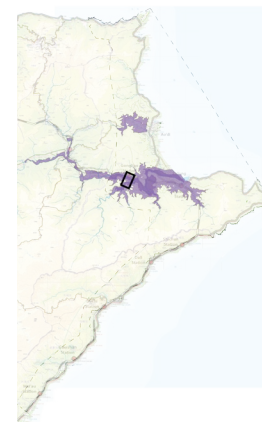
9 Wetland



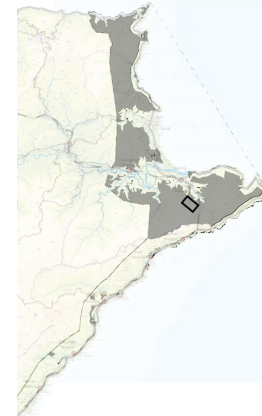
10 Terraced farmland



11 Valley



12 Mountain ridge



5 Coastal ridge



6 Cliff



7 Windbreak



8 Plain



5.3 Landscape typology issues

A. The slope define the general function of the area

Steep slopes 55 % of total area is prohibited to develop
 Gentle slopes 36 % of total area is restricted to develop
 Plain 9% of total area is plain

12 types of landscape conflicts, see Appendix II

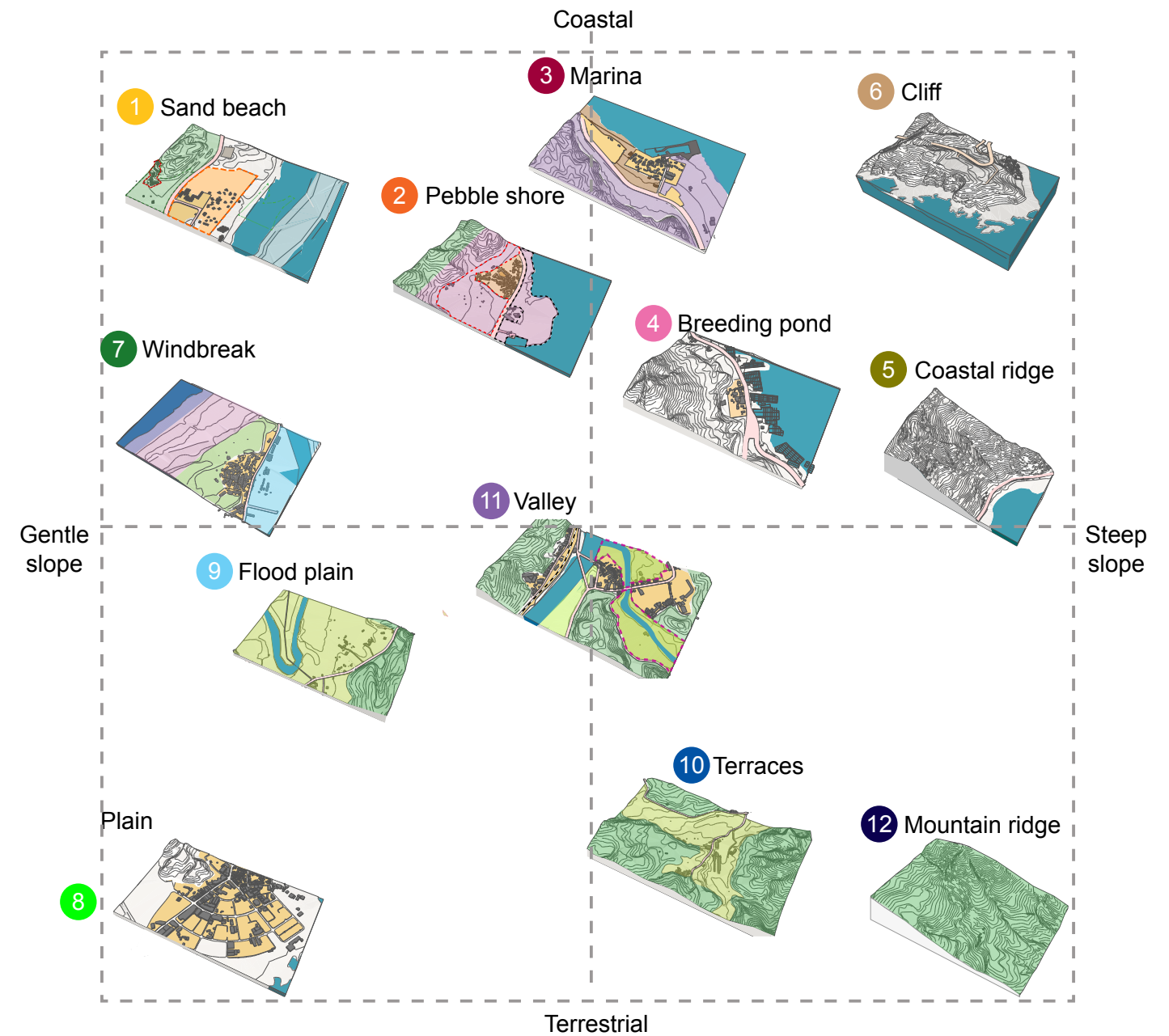
B. Conflicts between scenic protection areas with residential uses.

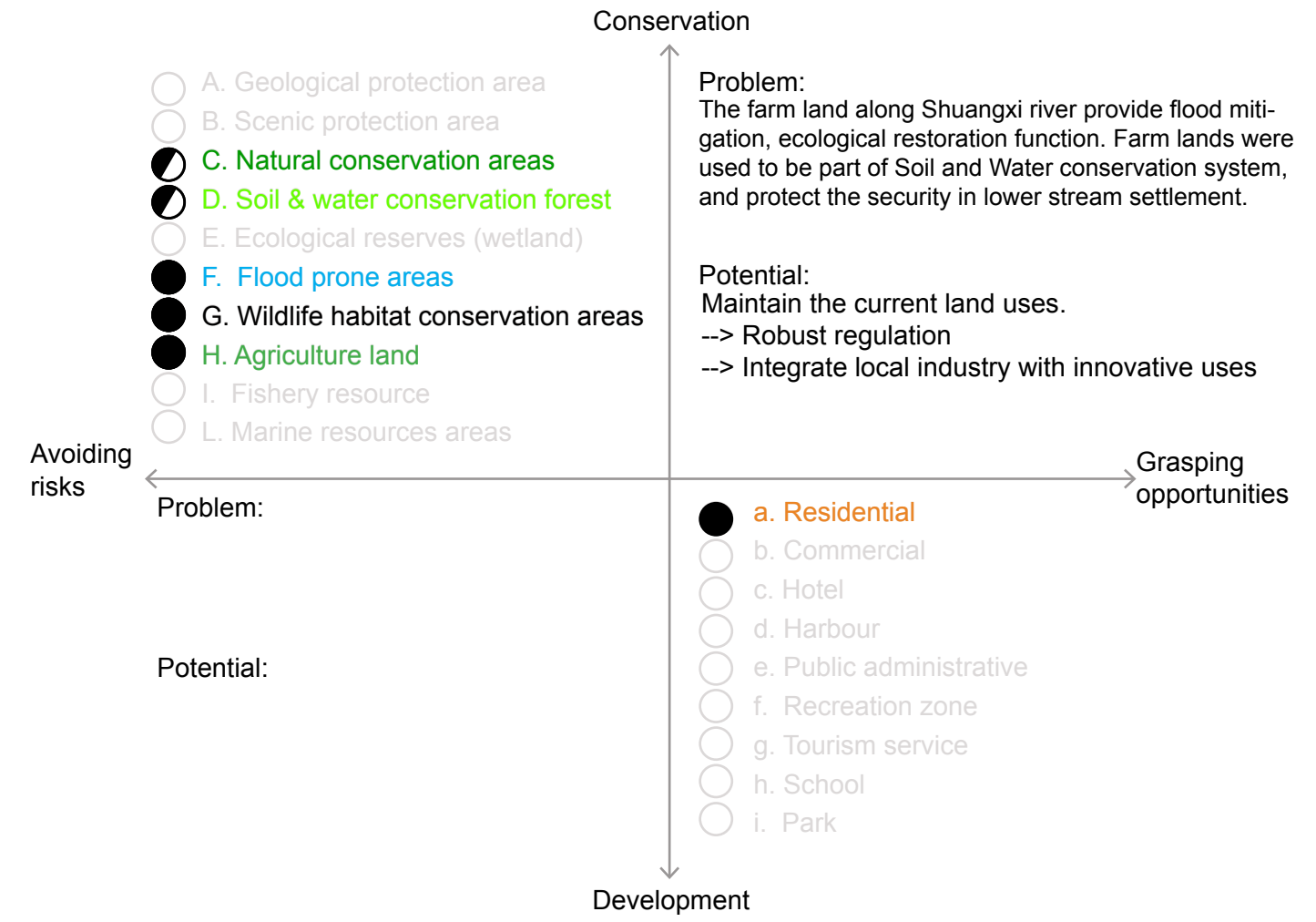
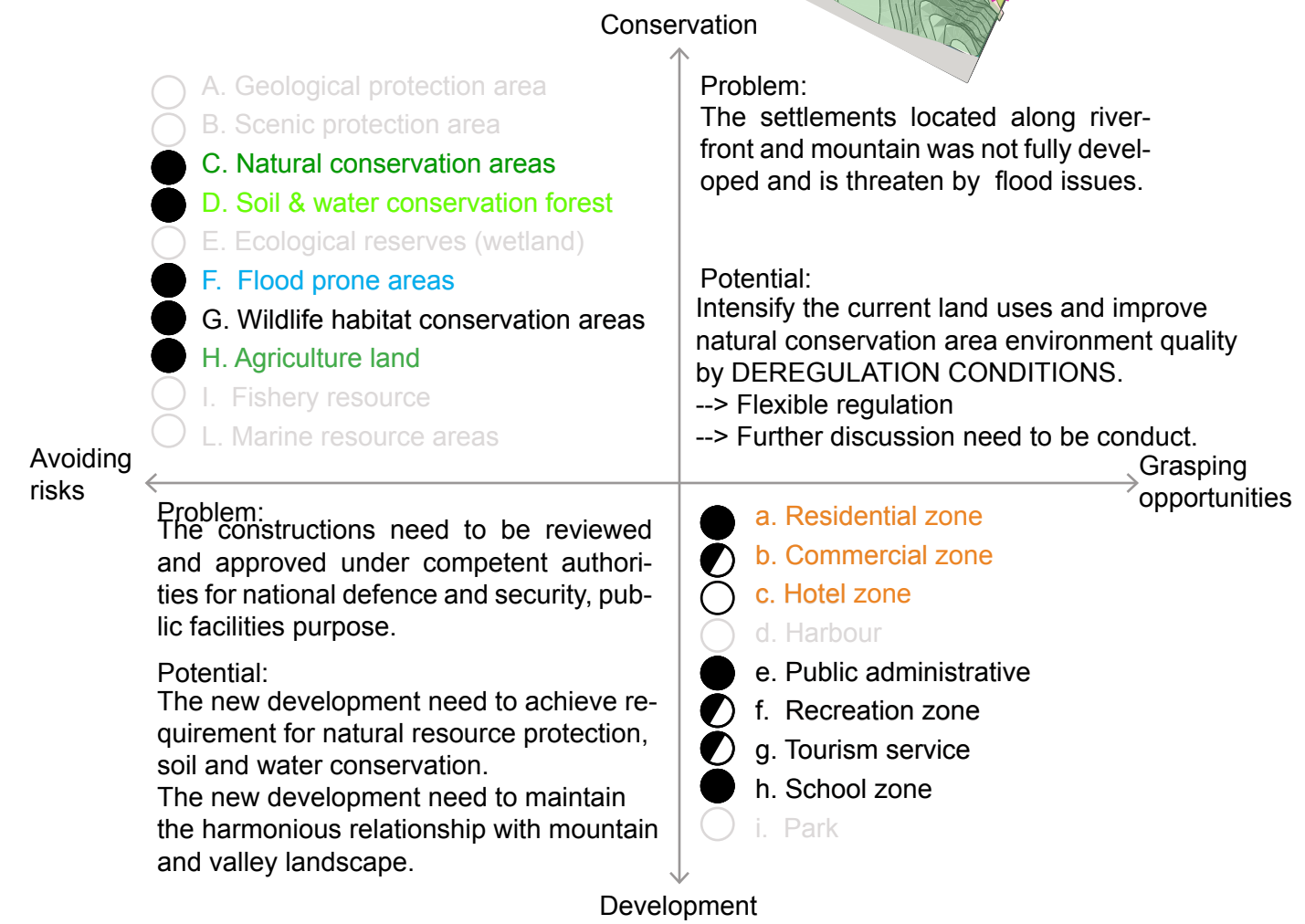
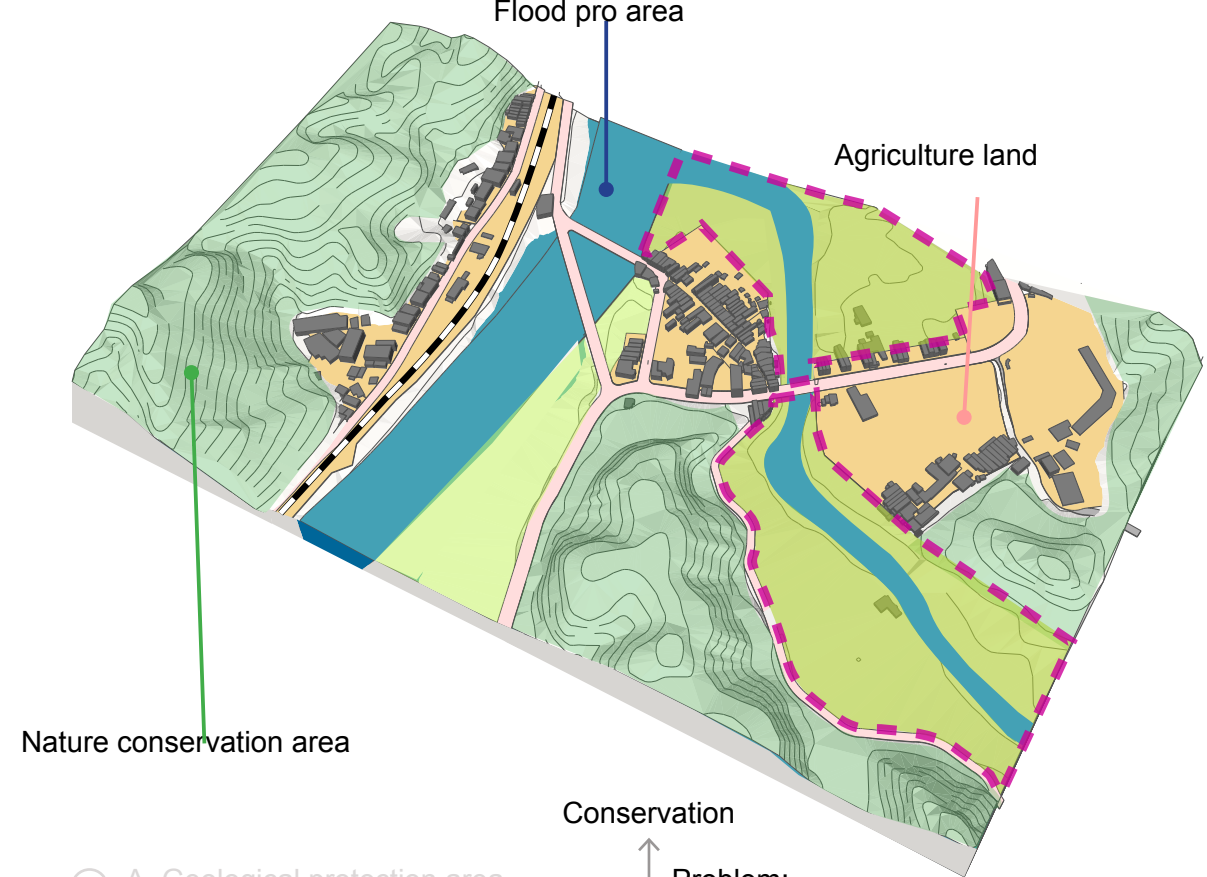
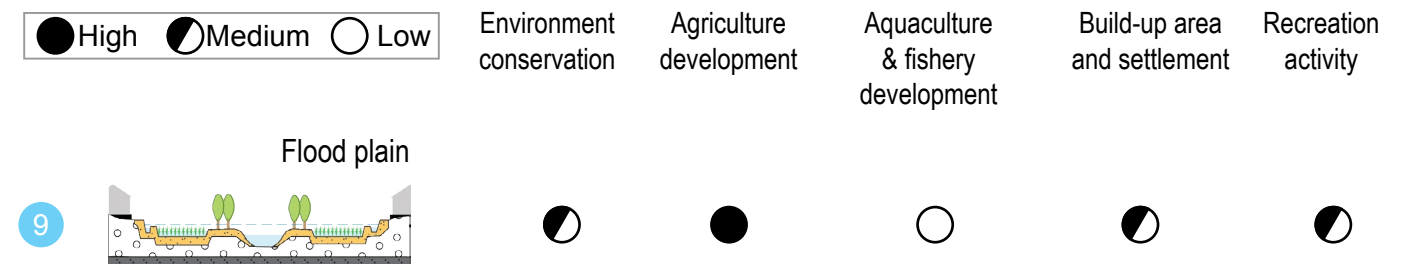
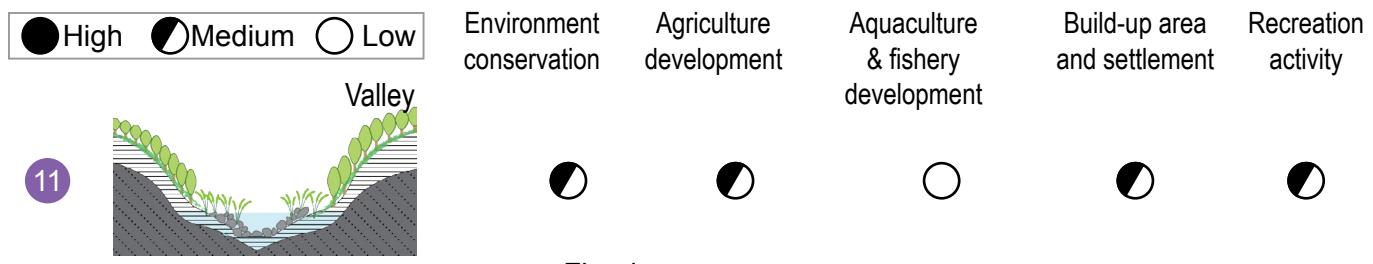
Mountain village

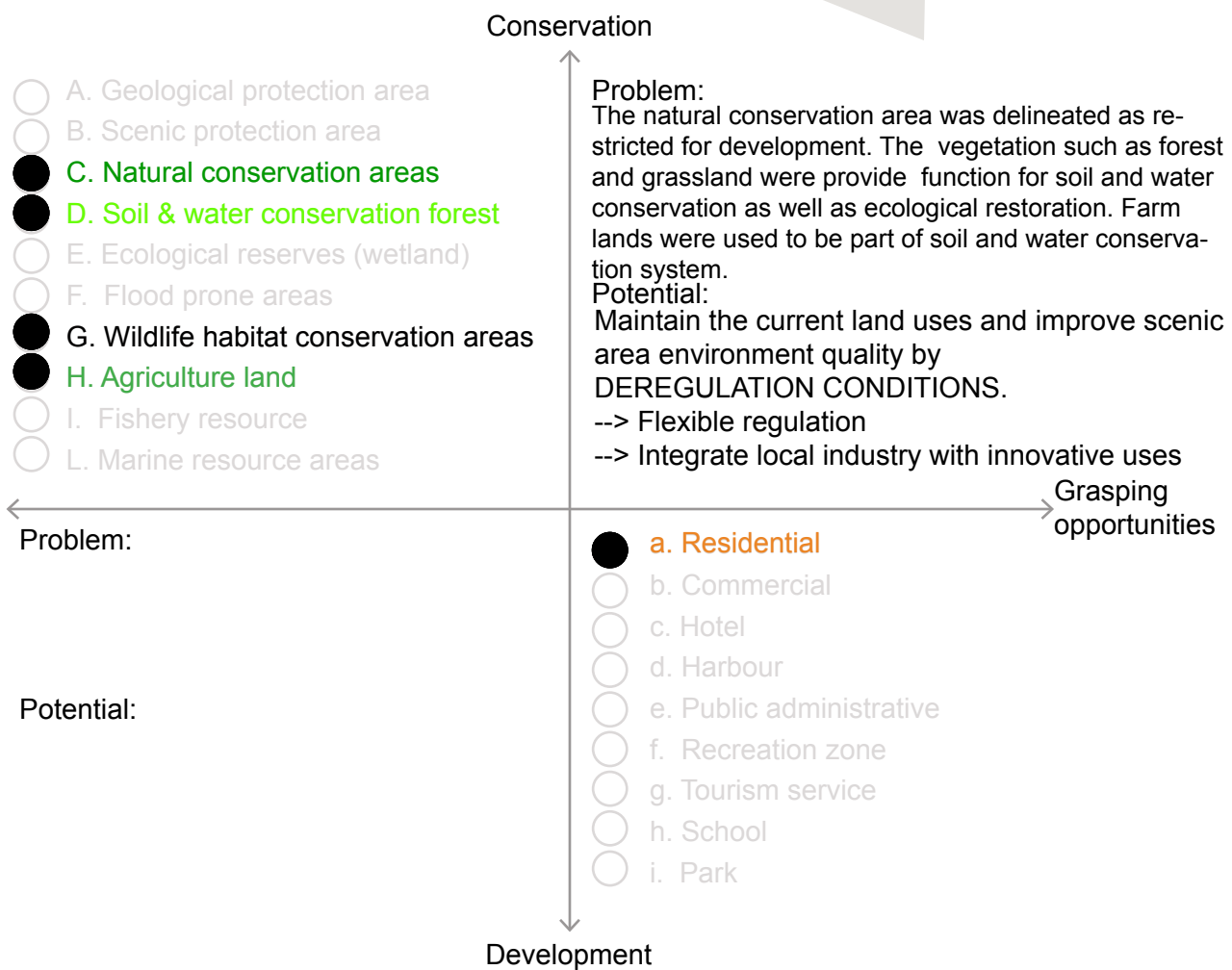
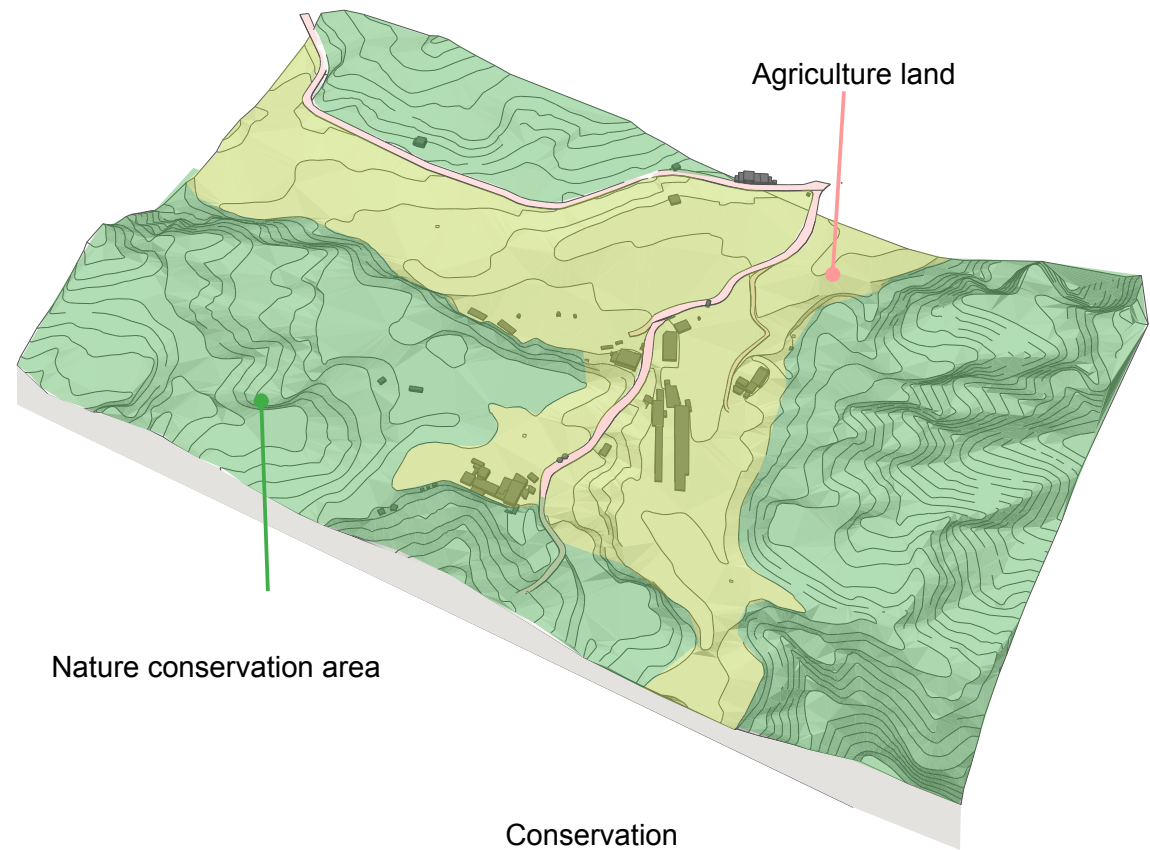
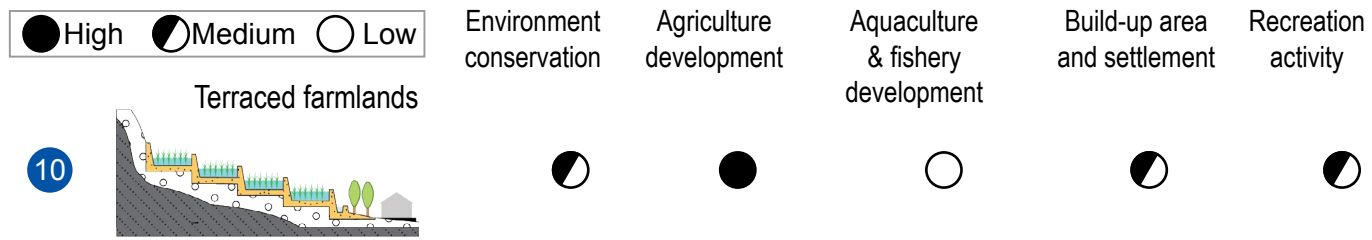
Soil and Water protection
 Flood prone areas
 Decreasing farm land uses

Coastal village

Soil and Water protection
 Privatization of coastal landscape threaten aquaculture industry.
 Conflicts between scenic protection areas with local uses







6. Shuangxi river valley analysis

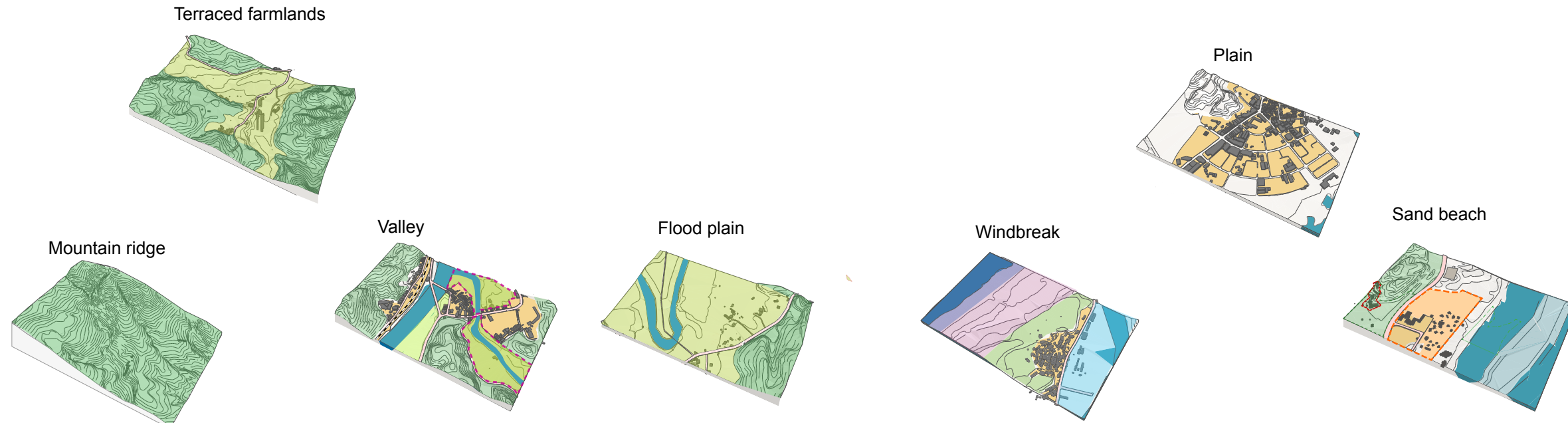


Figure 3.27 Current land use map Source: CPAMI,2010

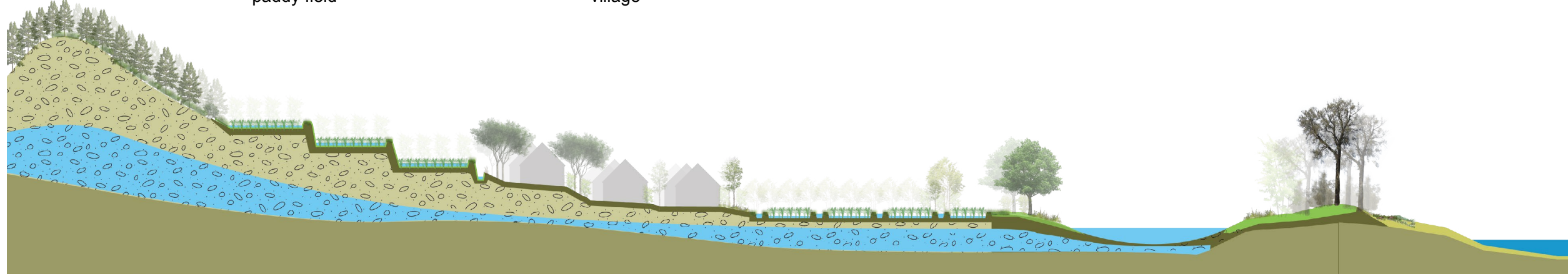
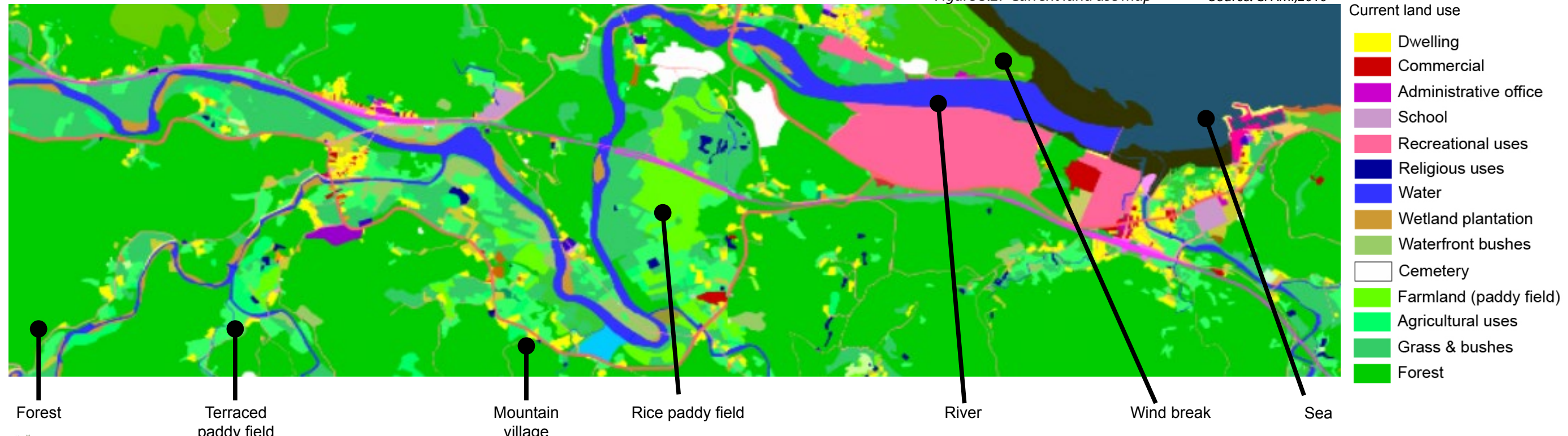


Figure 3.28 The current land use section along Shuangxi river Source: Draw by author.

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

6.1 The differences between zoning plan and existing land use

The following four pages shows the conflicts issues includes

A. The plan residential zone is undeveloped, where still has extra capacity for development.

B. The existence of barns and housing was neglected in agriculture zone

C. Flood risk in existing village, the housing and village are threaten by floods

D. The waterfront quality and accessibility with human activity need to be improved

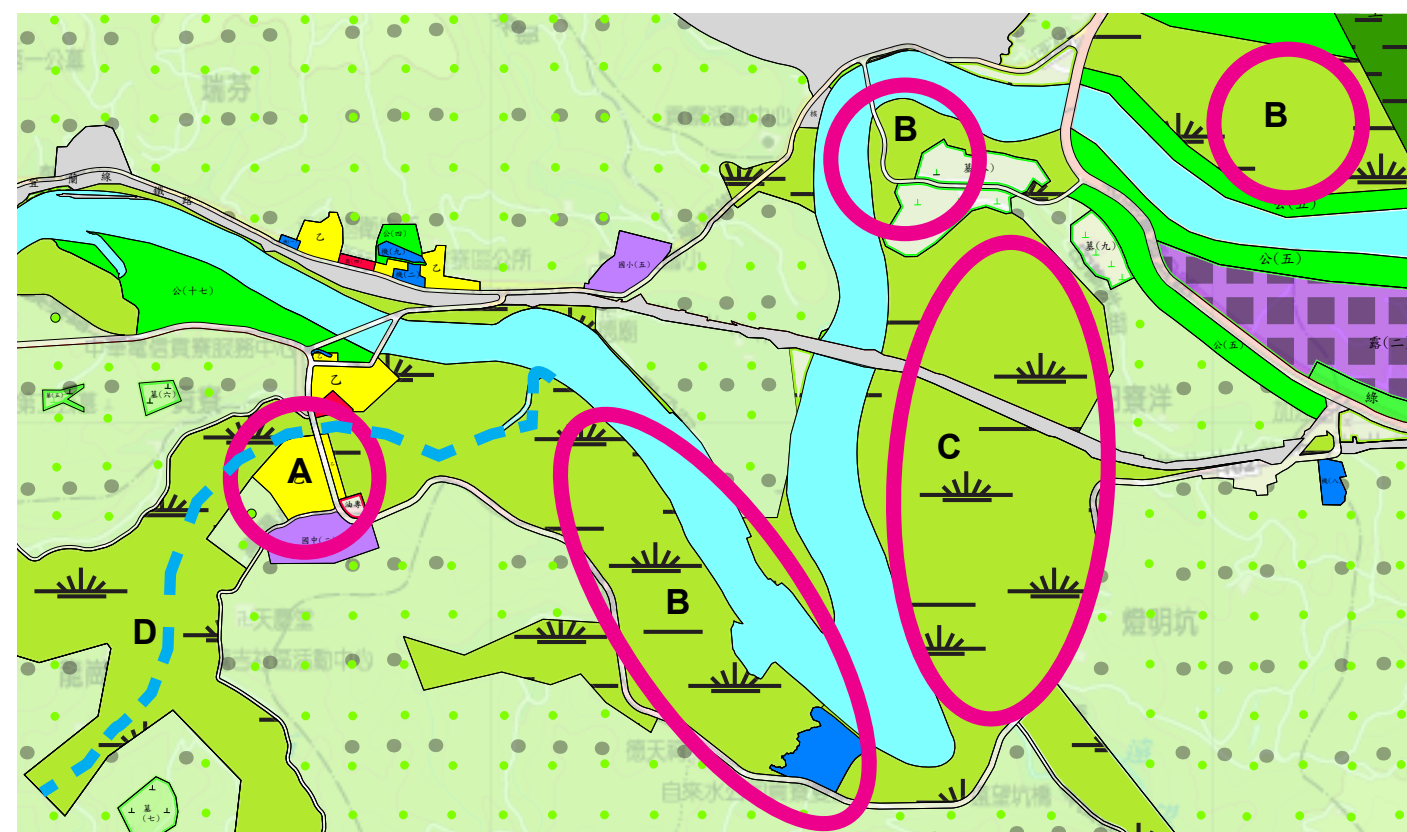
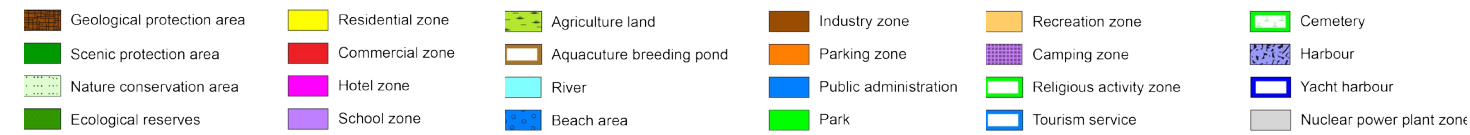


Figure 3.29 Zoning plan map in Shuangxi River

Source: CPAMI,2010

6.2 Road system and villages

The village clusters are mainly located along the main road system. The scattered houses are barns and in the agricultural land. Three types of settlement: a. Compact village b. Linear village c. Scattered village



① Compact village in gongliao ② Linear village along between railway and mountain ③ Scattered village in farmland and mountain



④ Small settlements along main road and farmland ⑤ Village between mountain and farmland ⑥ Mixed

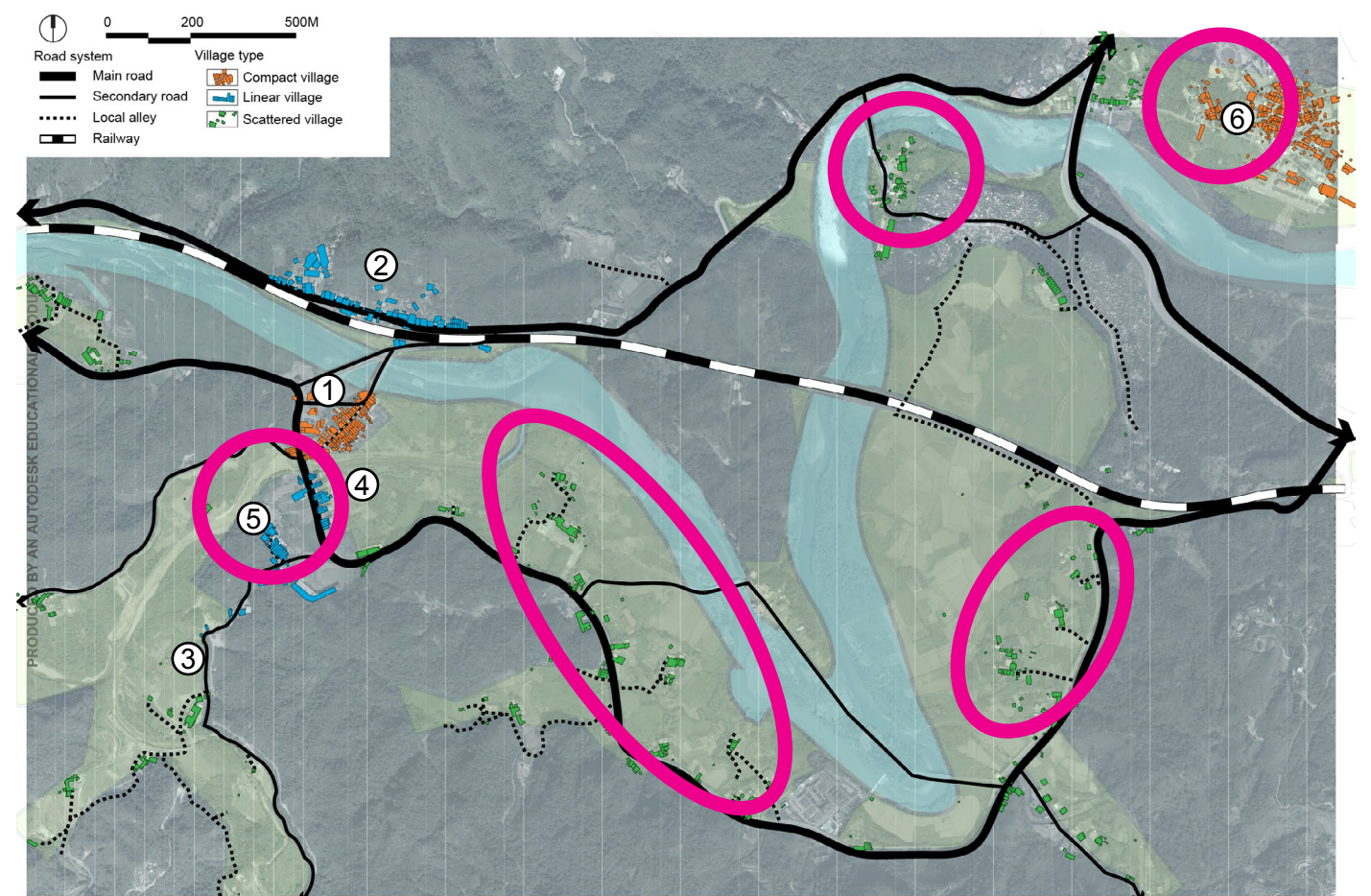


Figure 3.30 Current road system and settlements

Source: Draw by author.

6.3 Flood prone area in lower Shuangxi River flood plain

The lower Shuangxi River flood plain Tianliaoyang areas are threatened constant flooding events in the raining season. During the raining and typhoon season, a considerable amount of rainfall from the mountains often inundate in the lower Shuangxi River flood plain Tianliaoyang. According to the local senior farmers' experiences, flood plains in Tianliaoyang and terraced paddy fields in Fangliao Stream used

to serve agriculture wetland with flood mitigation and ecological function in lower Shuangxi River valley. When daily precipitation exceeded 150mm per day, the terraced paddy fields and flood plains could adjust the water level of Shuangxi River. The abandoned terraced paddy fields and waste farmlands indirectly reduce the flood mitigation function in Shuangxi River valley.



Figure 3.31 The local dwelling has developed few housing types to adapt the living condition with flood. 1) Stilt house in high flood risk area, 2) elevated base house in mid flood risk area, and 3) normal housing type in low flood risk area.

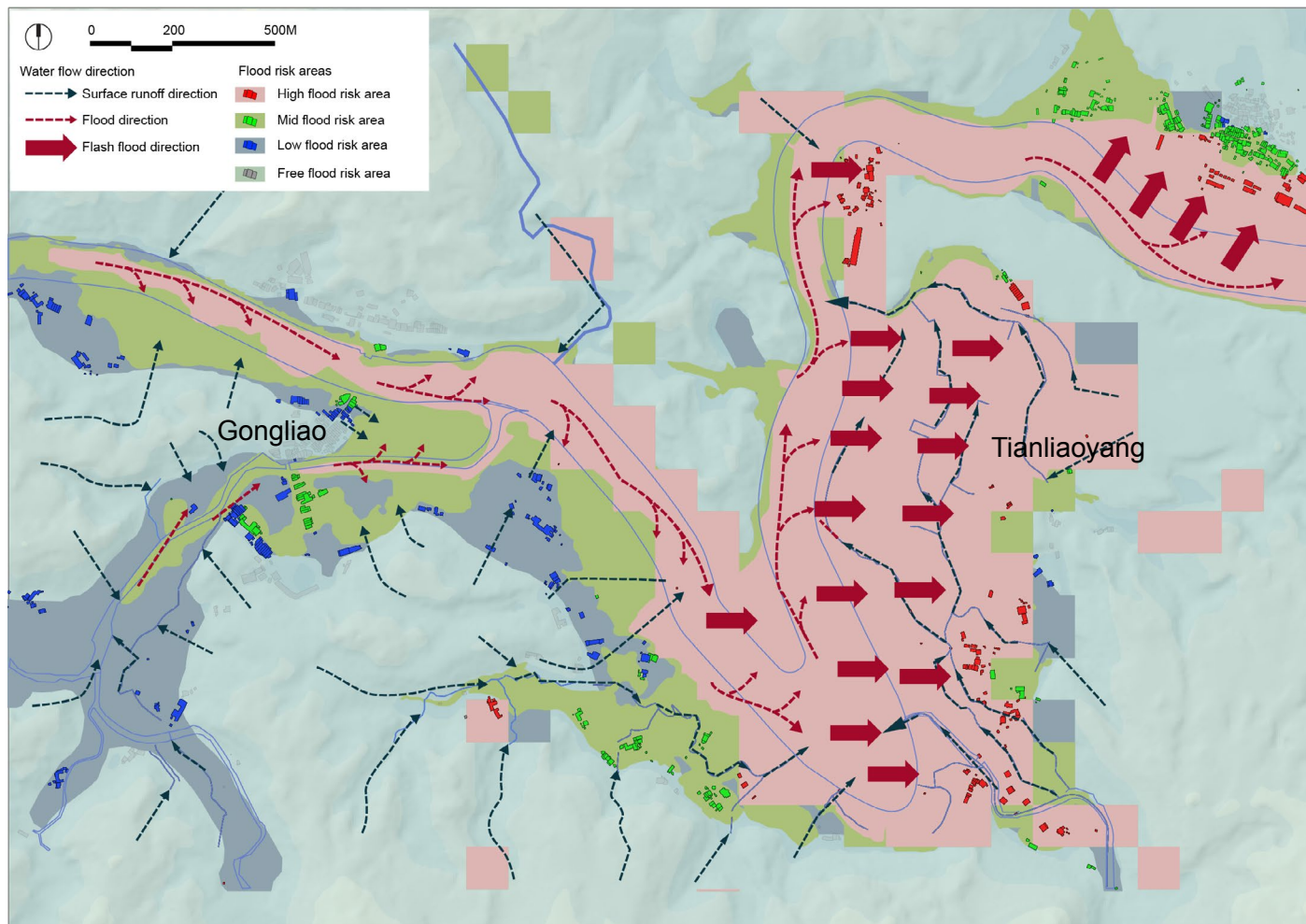


Figure 3.32 Flood prone area

Source: Map by author

6.4 Waterway and ecological system (River, stream, and irrigation)

The riverfront wetlands, farmlands, grasslands and secondary woods has developed into an harmonious ecological system. However, instead of applying ecological engineering flood mitigation method, the new flood mitigation construction in Shuangxi River and Fangjiao Stream intend to replace riverfront aquatic plants by dyke. The future development should consider both water storage capacity, flash flood detention method, and recreational function along riverfront.



① Wasted farmland along Fangliao Stream ② Dyke construction in Fangliao Stream riverfront



③ Floodplain and park between river and village ④ The backside of town house without access to stream ⑤ Riverfront plantation & woods

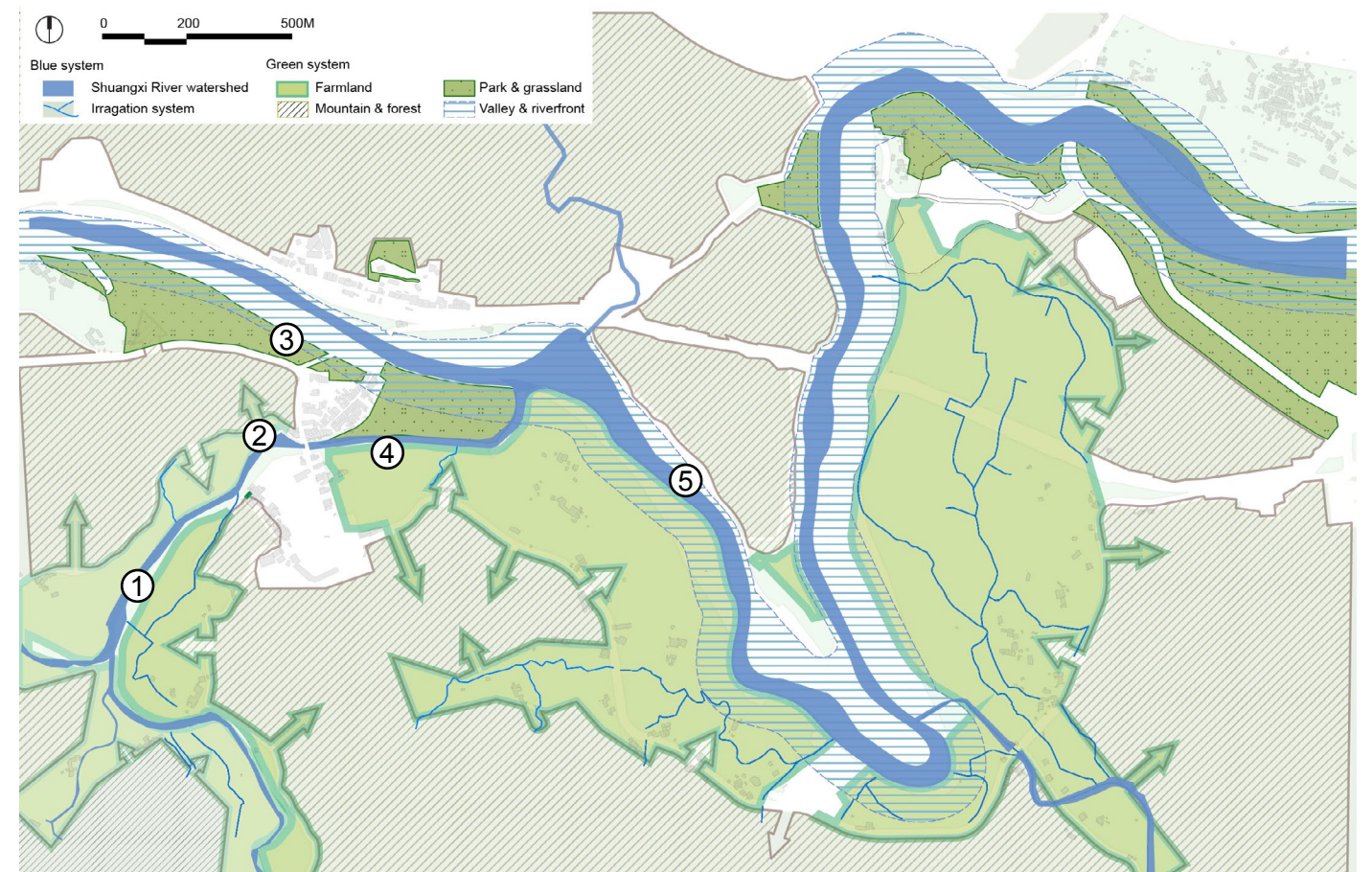


Figure 3.33 Green system and blue system

Source: Map by author

IV. Summary of analysis

1. Institutional analysis

Local development plan dispute

The latest comprehensive review of NCNSA Draft Master Plan (CPAMI 2010) and the Civilian Economic Improvement Draft Plan (CPAMI 2011) proposed the expansion of natural conservation area instead of the improvement of current settlement. In order to attract economy investment in Gongliao, CPAMI proposed to change of land use from conservation zone into hotel zone, recreational zone and residential zone. However, the new proposal had little effect on resolving current spatial problems such as waste farm lands and undeveloped residential zone, the decline of villages living environment quality under development constraints. The locals and environmentalists concerned the new plan would result in exploitation in forests area and destroy its soil and water conservation function. In other words, the extension plan may lead to a more challenging task in the conservation and development issue, which fundamentally against the original purpose of the setup of National scenic area.

2. Stakeholder analysis

Unsupportive institutional setting and complex and competing social values and interests.

The existing institutional structure is based on plan-making and development control instrument, which is unlikely to accommodate competing social values and interests. In addition, the decision makers are likely to have different social values in local planning practice (Kato & Ahern 2008). For instance, the complex values among private sectors (farmers, dwellers, and developers) and public sectors (Soil and Water Conservation Bureau, Forestry Bureau) in limited territory along Shuangxi River results in severe conflicts. Due to many key stakeholders are unlikely to share interests that can yield new knowledge, which make it even more difficult for local plan response to spatial conflict adaptively.

3. Spatial analysis

Topography and dynamic landforms restrictions

The mountainous slope land covers 90 per cent of the territory of Northeast coast area, the rest 10 per cent of plain areas that mainly located along coastline or river fronts. The few gentle slopes which allow for human activities are mainly located along Shuangxi River bank and coastal areas are indicated as flood prone area. The landforms determine

the land use pattern, which is highly related to soil and water conservation function. In this case, the spatial development issues are inevitable to deal with flood mitigation and soil and water conservation tasks.

Waterways and flood prone areas

The flood prone areas are mainly located along Shuangxi River and Fangliao Stream. The main river Shuangxi River with a length of 28.6km originated from mountains with a height of approximately 700m to 500m. Due to the short river length and flesh storm rainfall amounts, villages in the Shuangxi River valley and the lower Shuangxi River flood plain Tianliaoyang areas are threatened constant flooding events in the raining season. During the raining and typhoon season, a considerable amount of rainfall from the mountains often inundate in the lower Shuangxi River flood plain Tianliaoyang. According to the local senior farmers' experiences, flood plains in Tianliaoyang and terraced paddy fields in Fangliao Stream used to serve agriculture wetland with flood mitigation and ecological function in lower Shuangxi River valley. When daily precipitation exceeded 150mm per day, the terraced paddy fields and flood plains could adjust the water level of Shuangxi River. The abandoned terraced paddy fields and waste farmlands indirectly reduce the flood mitigation function in Shuangxi River valley.

Decline of population and farming industry

The population in Gongliao showed negative growth. The average annual growth has declined in the past ten years as the population growth rate is -0.67 % (CPAMI 2010). In one hand, the topography restriction and development constraints decrease local economy investment and job opportunities, which results in young population move to surrounding cities. On the other hand, the terraced farming was the traditional agriculture methods and landscape that support soil and water conservation system.

Among 563 hectares agricultural land, 406 hectares agricultural land are abandoned in Gongliao. (Gongliao District Administration Office, 2012) Since traditional terraced farming methods cannot replace labour force with machinery on slope lands, a big amount of the terraced paddy fields has been abandoned due to lack of agriculture labour force and social reasons. The decline of population and abandoned of terraced paddy fields bring make it more difficult to support soil and water conservation without changing existing landscape structure.

Chapter E. Implementation

In this chapter, the main research questions and demonstrate by a set of spatial development strategy.

Research questions

What is the generic and specific strategy to help traditional spatial planning system to be capable of dealing with the conservation and development conflicts?

A. What are the priority spatial development principles?

SEE P86 - 93

B. What is the strategy to integrate conservation and development land use conflicts?

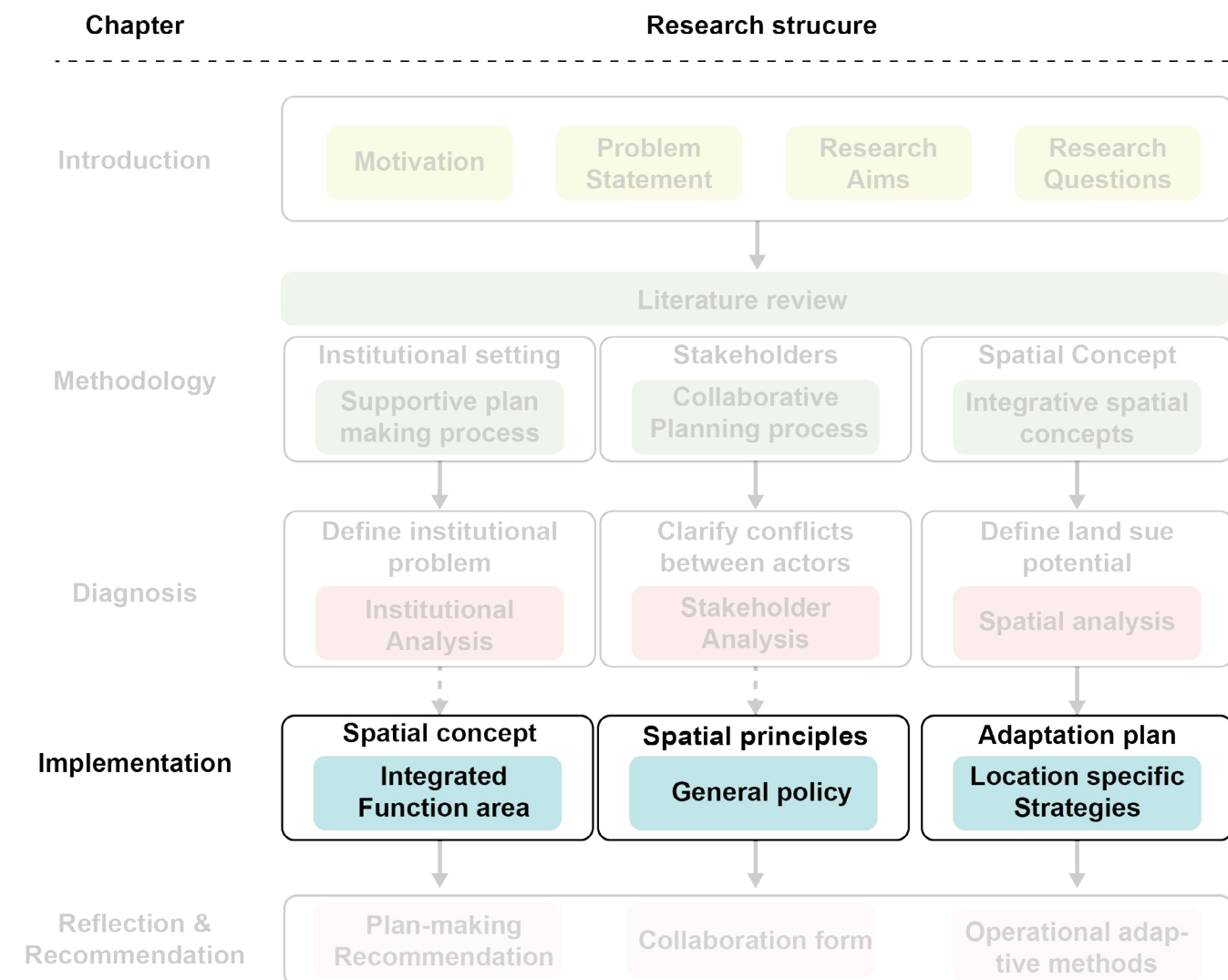
SEE P94 - 95

C. What adaptation methods could be the possible solution to reach the new common for future vision?

SEE P98 - 109

D. How does existing planning framework accommodate conservation and development tasks in Northeast coast area?

SEE P110-111



I. General spatial concept in Northeast coast area

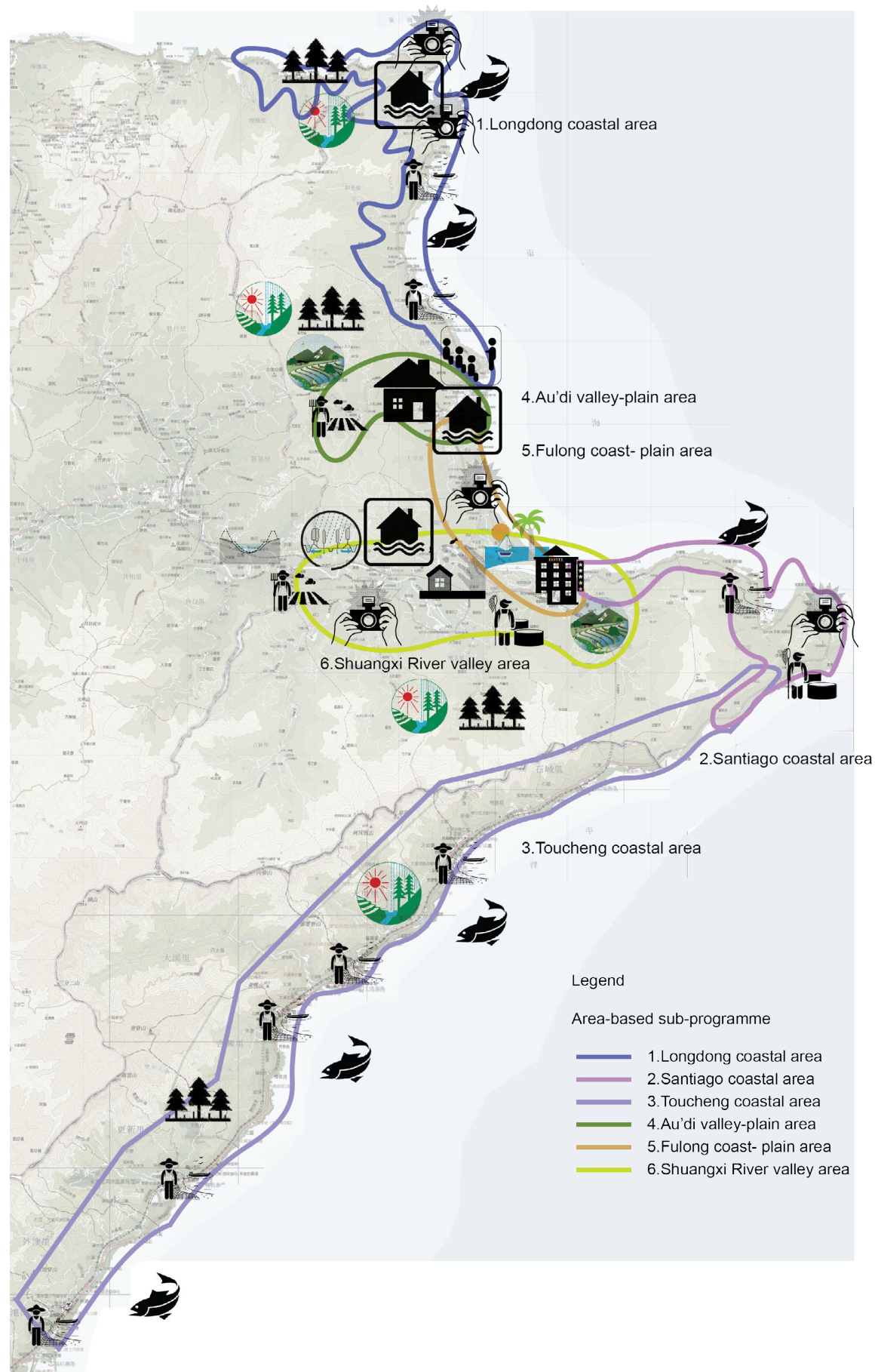


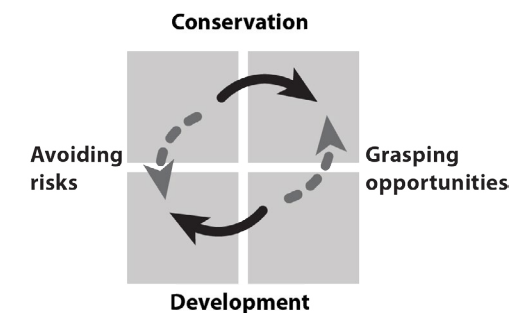
Figure 4.1 Spatial concept in municipal level

Source: Draw by author.

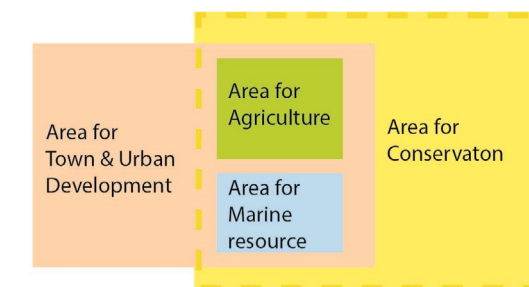
1. Generic policy

The spatial development concepts are based on previous spatial diagnosis. The integrative spatial concept apply in the whole territory are illustrated in figure 4.1. In order to improve the spatial development issue that existing Northeast Coast National Scenic Area Master Plan did not resolved, six area-based sub-programme are defined according to the landscape function of the location. Four function area will present in layers in the following four pages.

Integrate spatial issues and avoid conflicts



Multi-function land use



Compact networks

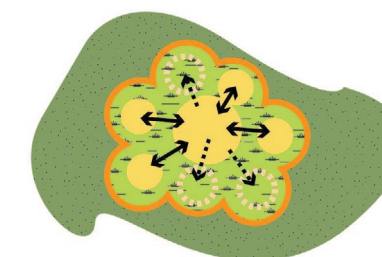


Figure 4.2 General spatial concepts

<p>Area for conservation</p> <ul style="list-style-type: none"> Water & soil conservation Forest protection programme Flood prevention Dike project Detention pond project 	<p>Area for town and urban development</p> <ul style="list-style-type: none"> Training and education programme Living environment renovation programme Tourism development Recreational industry Live with water programme 	<p>Area for agriculture development</p> <ul style="list-style-type: none"> Farmland restoration programme Terraced paddy field research programme <p>Area for marine resource</p> <ul style="list-style-type: none"> Marine resource programme Fishery development programme Aquaculture development programme
---	---	---

2. Principle of four functional areas

The following four pages illustrates the principle of four function areas in Northeast coast area.

2.1 Area for town and urban development

Redevelop existing village living environment and reinforce the network connections in coastal and mountain villages

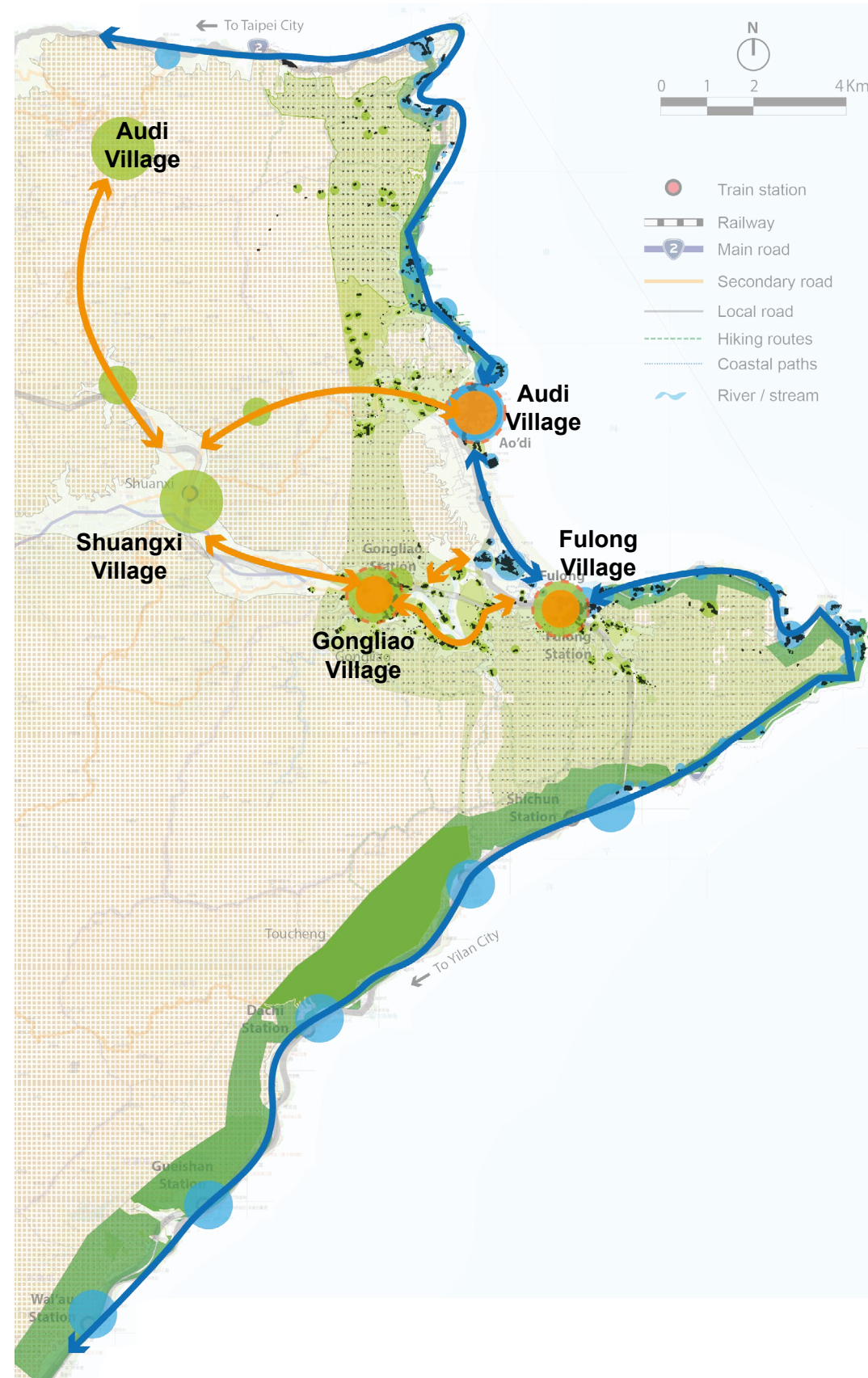


Figure 4.3 Town and village development principle

Source: Draw by author.

2.2 Area for conservation

Reinforcement of disaster prevention, ecosystem, scenic value in conservation area.

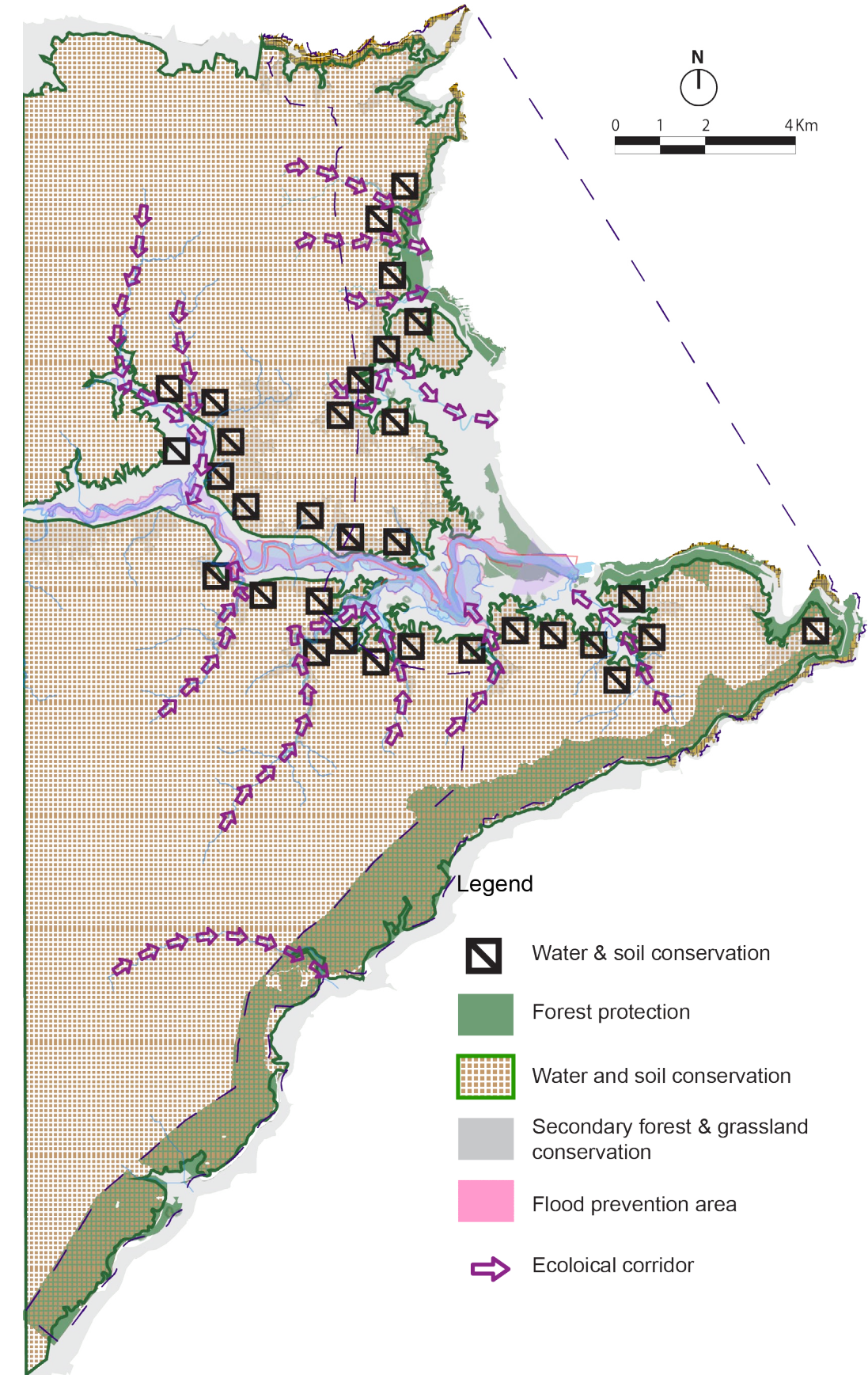


Figure 4.4 Natural environment conservation principle

Source: Draw by author.

2.3 Area for agriculture development

Agriculture industry restoration and Integrate flood mitigation function with agricultural landscape

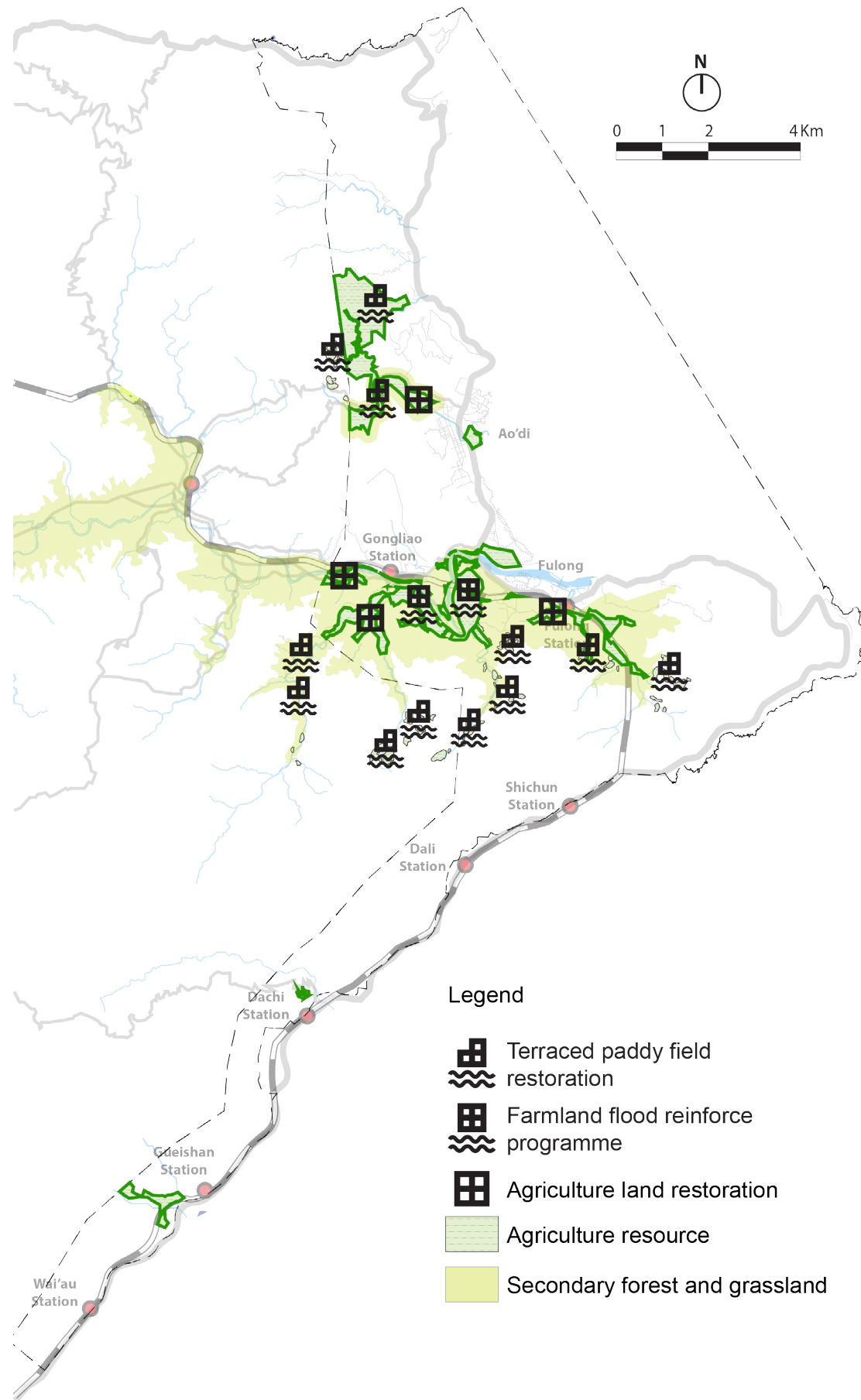


Figure 4.5 Agriculture development principle

Source: Draw by author.

2.4 Area for marine and fishery resource

Conserve coastal landscape and marine resource. Integrate the fishery industry with village development.

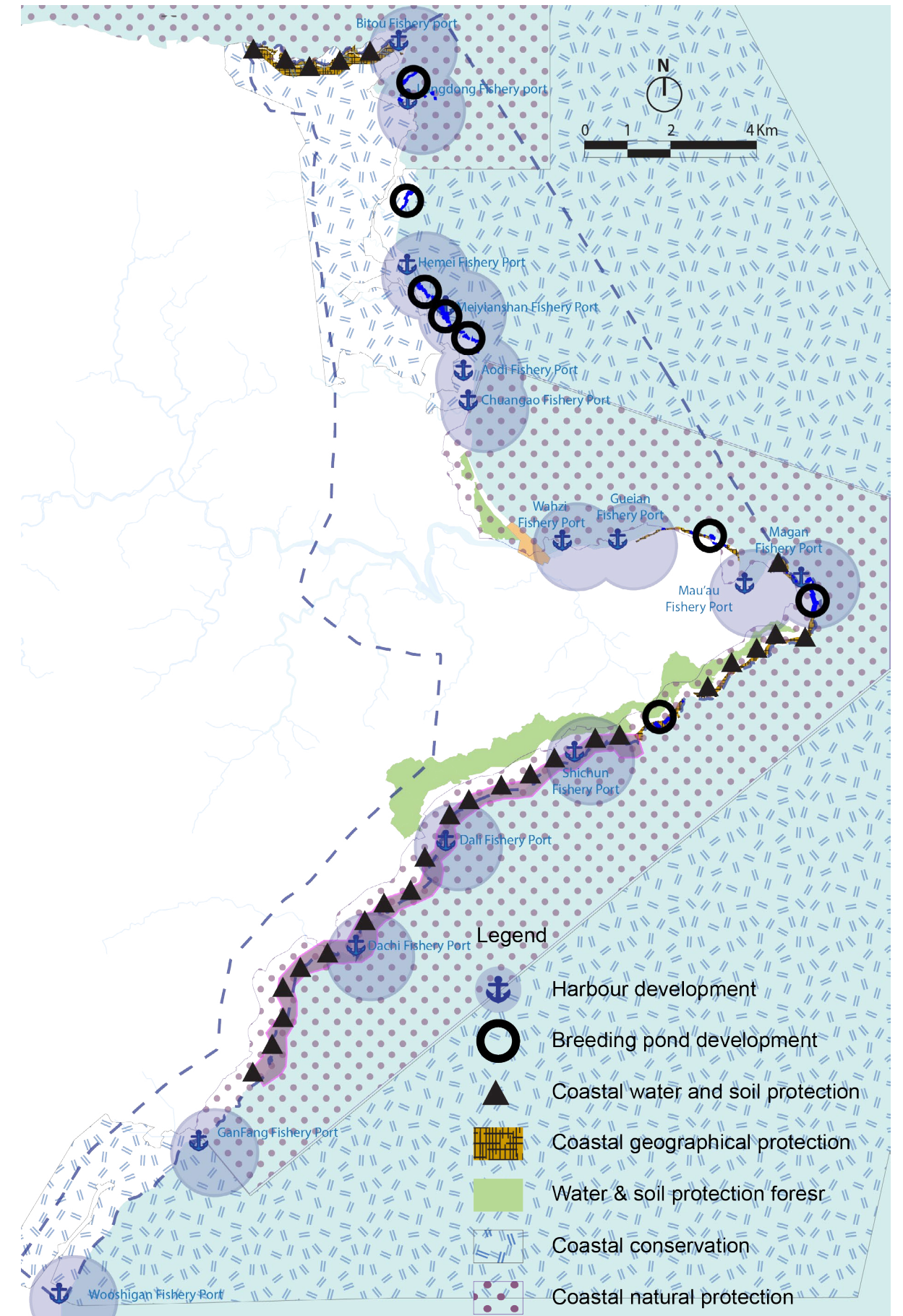


Figure 4.6 Marine resource and fishery industry development principle

Source: Draw by author.

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX

II. Demonstration site - Shuangxi River valley area

In order to make the spatial concept and become operational strategy, this section use Shuangxi River valley area as demonstration site to explain how adaptive planning framework could apply in reality. Based on the general spatial concepts, a set of action as adaptation plan are illustrated in the following sections.

First, the spatial concept in Shuangxi River valley are shown.

Second, three principles to guide development direction are defined.

Third, six local solution with recommend spatial development strategy, collaboration form and the potential benefit are explained.

Case study: Satoyama landscape

Gongliao Village is the typical mountain village typology, here I use the definition of Satoyama (mountain village) landscapes to redefine the territory meaning in Gongliao "a mosaic of both terrestrial and aquatic ecosystems comprised of woodlands, plantation, grasslands, farmlands, pasture, irrigation ponds and canals, with an emphasis on the terrestrial ecosystems." The value of Satoyama landscape in mountain village is the spirit of adaptation plan in demonstration site.

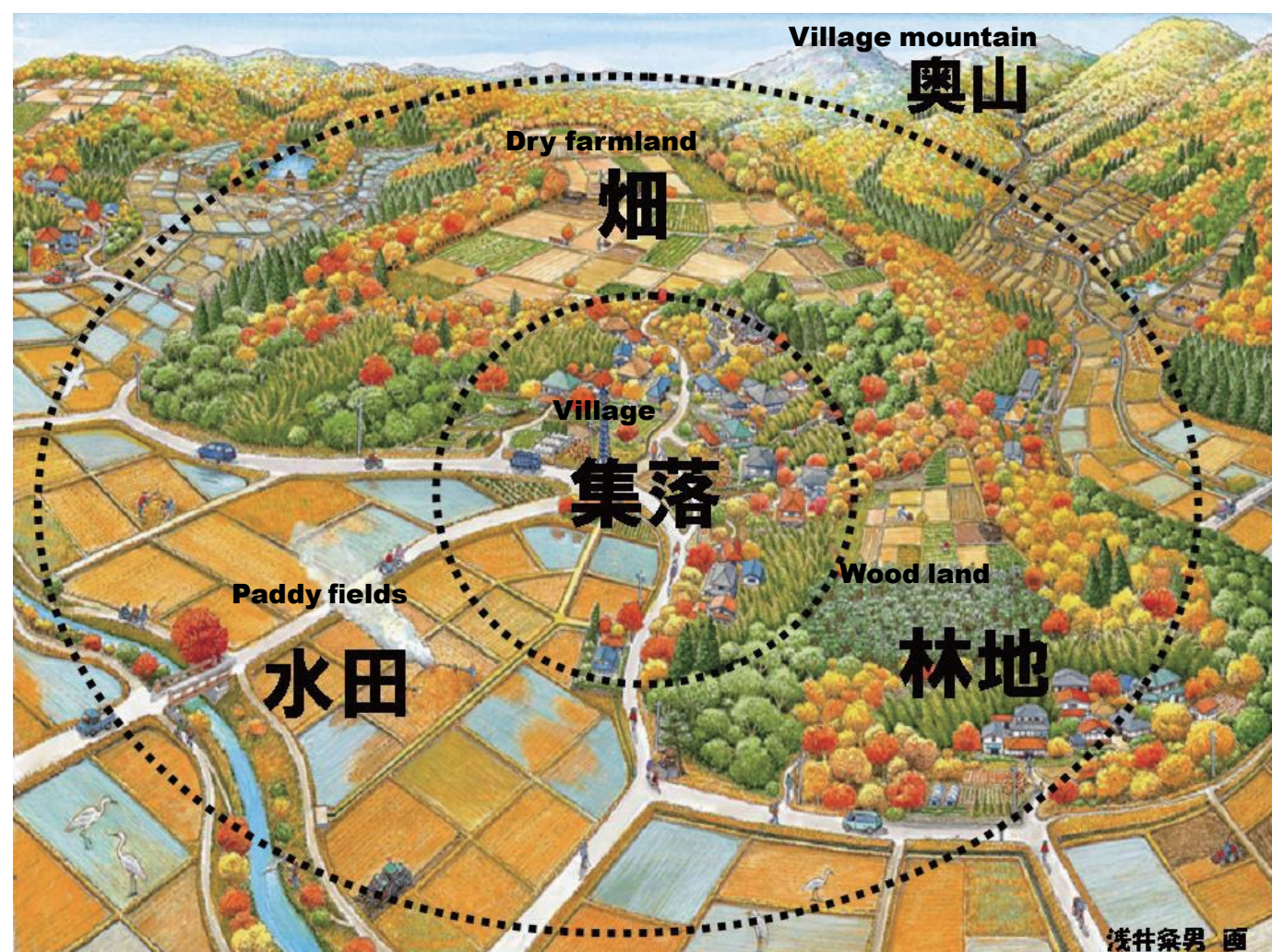


Figure 4.7 The distribution of mountain village and village mountain

Source: United Nations University, 2010

1. General spatial concept in Gongliao

Remarks of four function areas

- Reinforcement of disaster prevention, ecosystem, scenic value in conservation area.
- Redevelop existing village living environment and reinforce the network connections in coastal and mountain villages.
- Agriculture industry restoration and Integrate flood mitigation function with agricultural landscape.

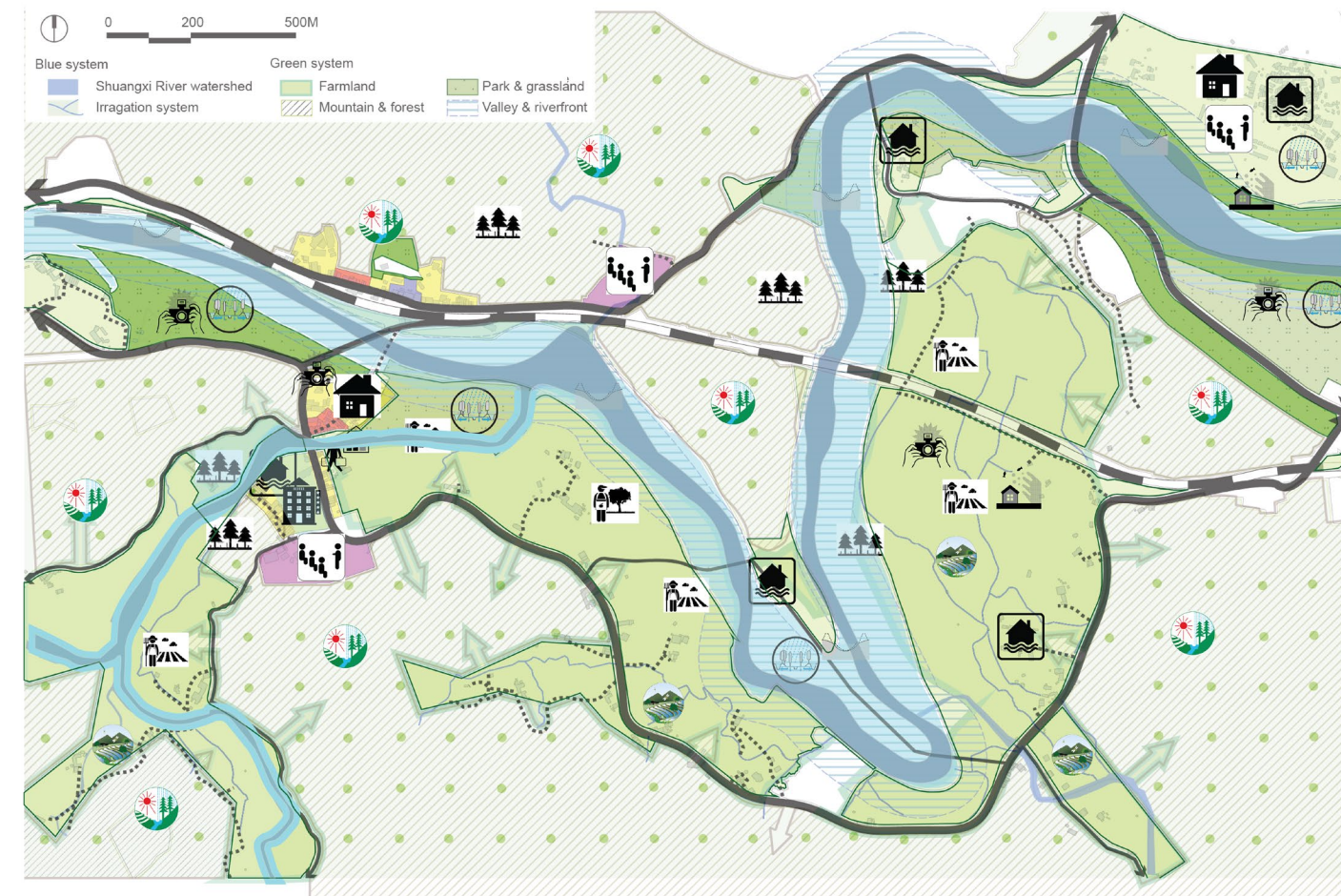


Figure 4.8 Shuangxi River valley area spatial development concepts

Source: Draw by author.



2. Adaptation plan in Gongliao

This study proposes six strategies to integrate conflicts into new development adaptation methods. These adaptation methods are based on current natural area conservation policy, flood mitigation policy, and local civic organizations' proposal, which focuses on soil and water conservation and forest protection in upstream, and flash flood mitigation method in downstream. The development principle highlights the general development direction, which should be the main consideration for both new and current development proposals. The waterfront wetlands, agriculture wetlands, paddy fields, secondary forests and mountain villages are recognized as one system that can co-evolution with social-ecological contexts. The proposed adaptation methods are multi-tasks resolving strategy including conservation-oriented and development-oriented methods. The conservation-oriented adaptation methods (ecological environment vitality, integrate landscape function, enhance waterfront function and quality) focus on preserving natural landscape function by enhancement and improvement of ecosystem function. The development-oriented adaptation methods (Flood resist neighbourhood, New alliance of tourism, Local knowledge educational program) focus on upgrading built-up area quality by redevelopment and renovation of urban function. A set of conservation oriented strategies and development oriented strategies are presented as follows:

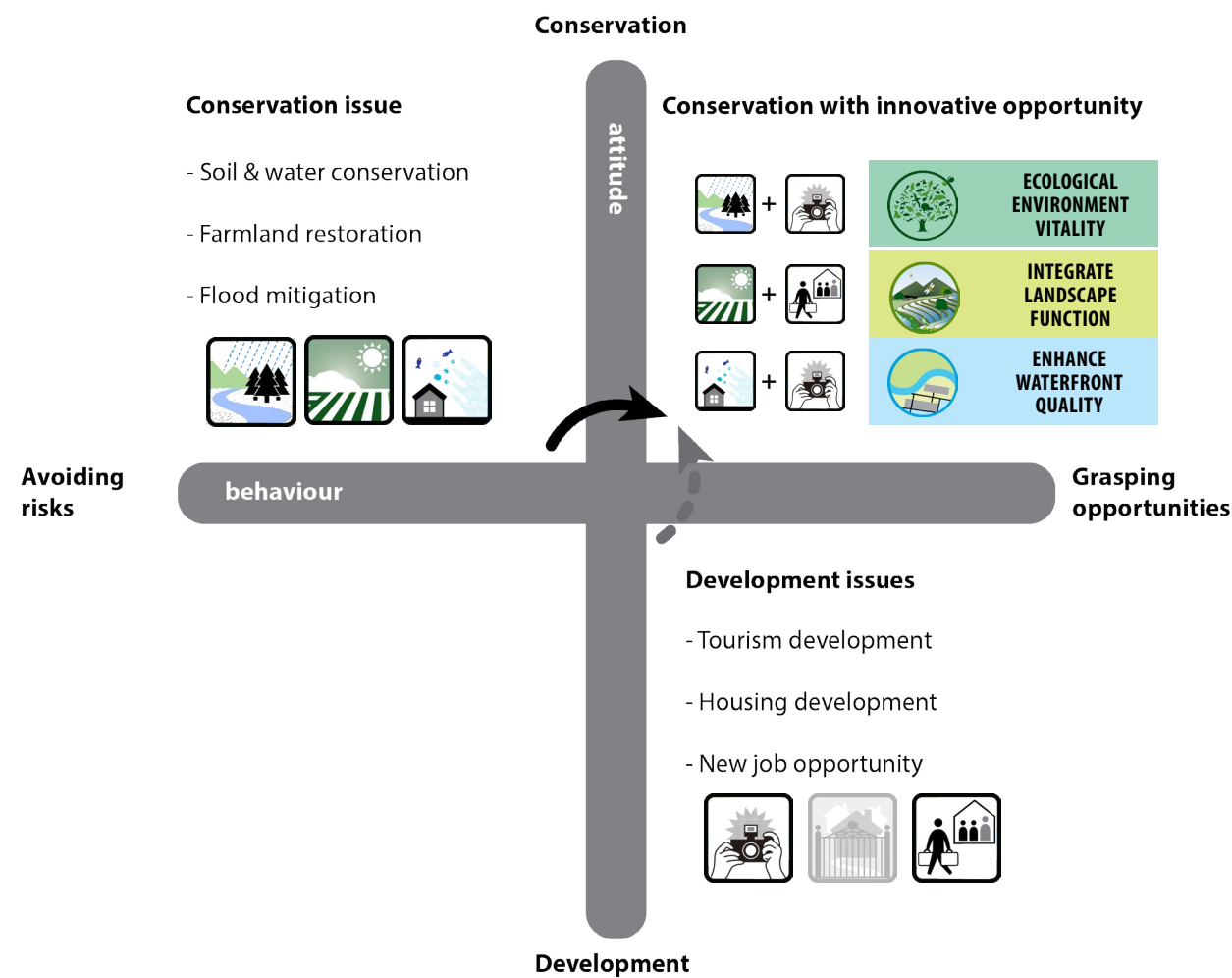


Figure 4.9 Integrate spatial issues into conservation-oriented strategies

Source: Draw by author.

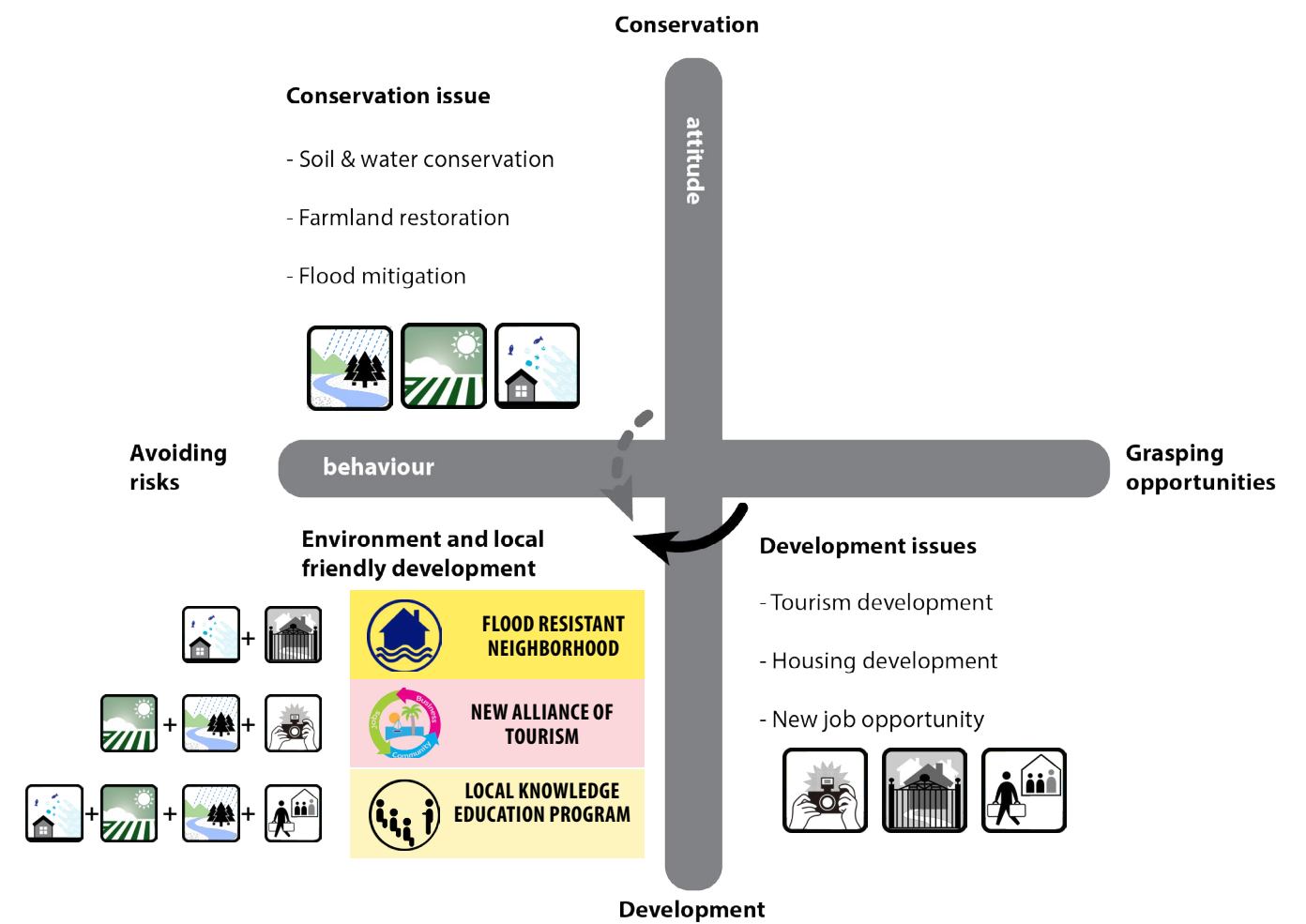


Figure 4.10 Integrate spatial issues into development-oriented strategies

Source: Draw by author.

3. Spatial development principle

The main concept to resolve land use conflicts is to integrate existing spatial concept into new action through different scale and multi actors. Through the spatial analysis conclusion, the limitation of available space and dynamic landscape function/potential natural risks, it is necessary to make the future spatial development with multi-function and compact land uses. Concerning the changing land use demand, the development principle highlight the general development direction and main value, which should be the main consideration for both new and current development proposals. priority spatial principles are the follows

3.1 Live with nature

Live with nature means the enhancement of harmonious relationship with human activities and nature environment. Both development and conservation adaptation plans should contribute to enhance the vitality of ecological system.

3.2 Live with water

Live with water means the improvement the living environment quality and safety with water. Take innovative action and integrate the living landscape, agriculture landscape and cultural landscape with water environment planning.

3.3 Reinforce of local identity

Reinforce of local identity means establishment of connections between the environment characteristics with relevant actors. A location related knowledge and a long term interrelationship benefit to the society, local economy and environment.

III. Strategies of adaptation plan in Gongliao

Reinforce local identity



Live with water



Live with nature

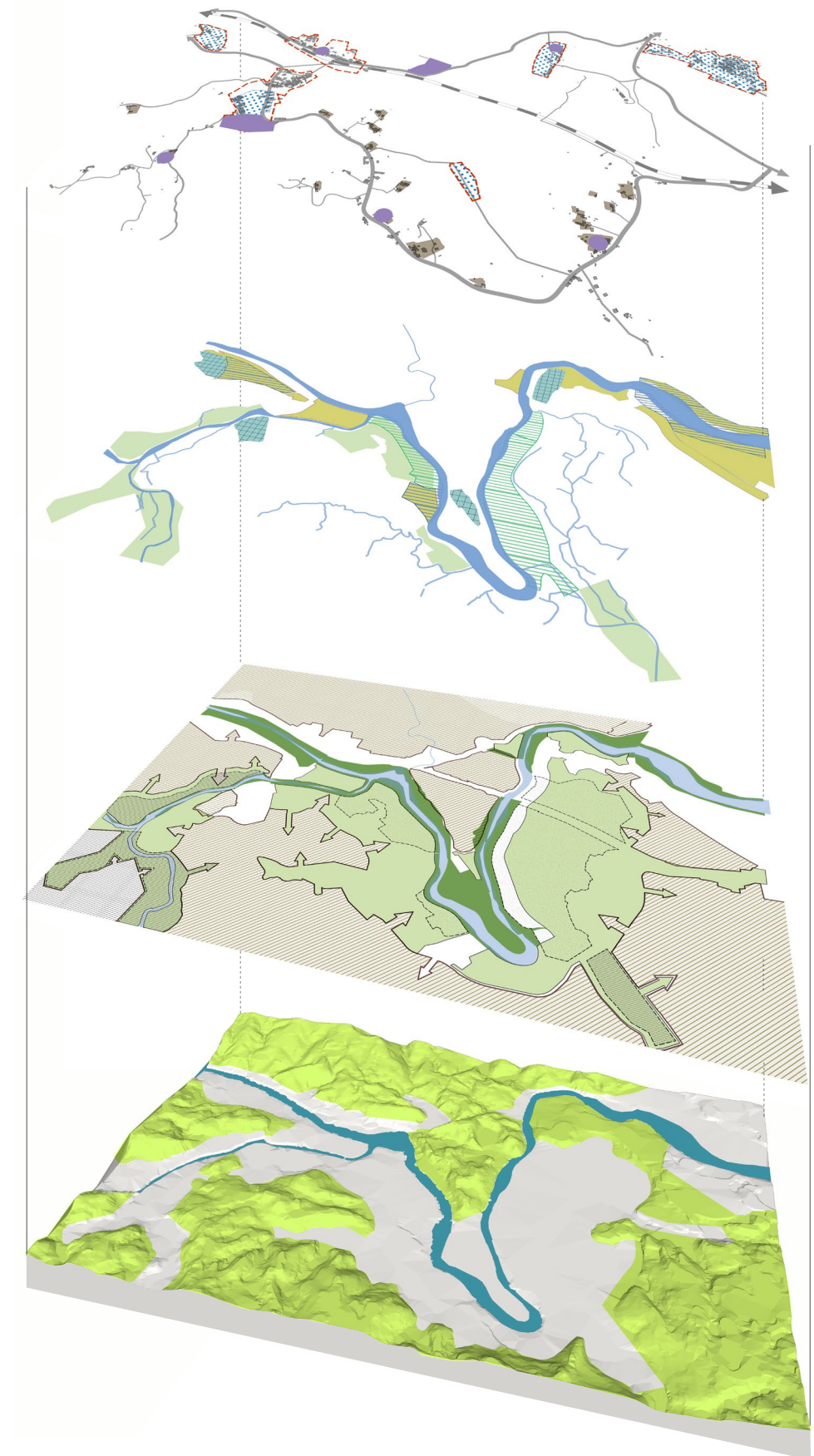


Figure 4.11 Strategy layers of adaptation plan in Gongliao

Source: Draw by author.






1. Ecological environment vitality

1.1 Function addressed

The condition of environment will be improved to maintain the uniqueness of coastal, riverfront and wetlands. In the future, the forest in whole Northeast coast area will be the nature and culture landscape heritage, which provide ecological and recreational function to Taipei region. In addition, Shuangxi River valley will become one of the most diverse wetland habitats for seasonal migrant birds. Methods and considerations of ecological conservation include:

- A. The quality of the natural landscape and the security of current settlements should be considered as the first priority.
- B. The mountain, valley and coast provide dynamic land use function to maintain soil and water conservation conditions in environmentally sensitive areas.
- C. Revitalize the wetlands systems and restoration of forest, farmland will improve ecological diversity and make Shuangxi River valley become the favourable seasonal migrant bird's habitat.

Live with Nature

-  Forest
-  Farm land
-  Waterfront wetland
-  Agriculture wetland (Paddy field)
-  Terraced paddy field

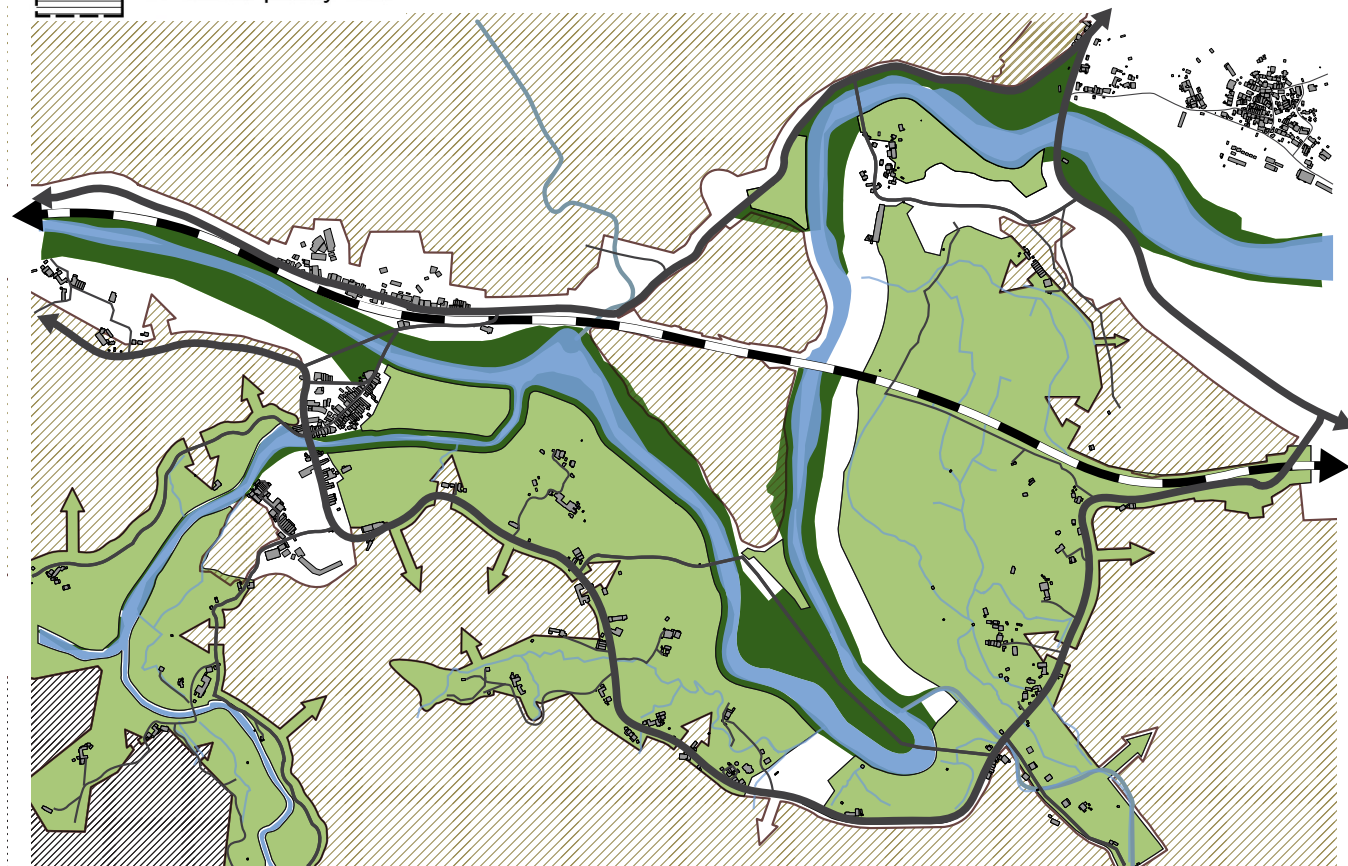
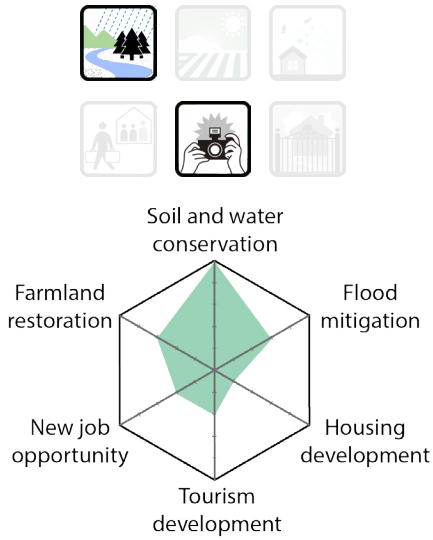


Figure 4.12 Ecological and natural environment distribution

1.2 Integrated issues



1.3 Collaboration stakeholders

Public sector



Private sector

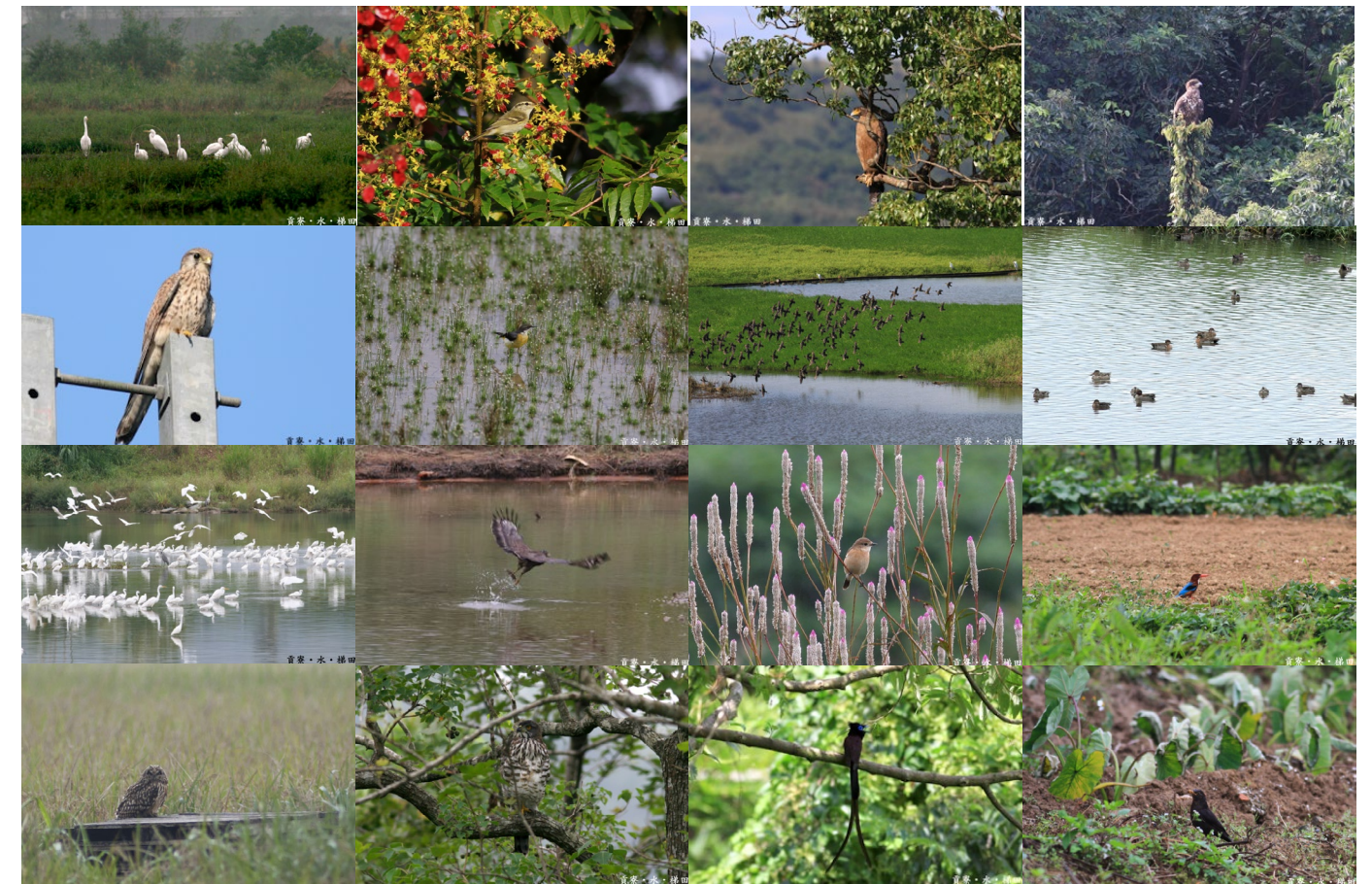


Figure 4.13 Diversity birds habitat in Gongliao

Source: kongliao-water-terrace.blog

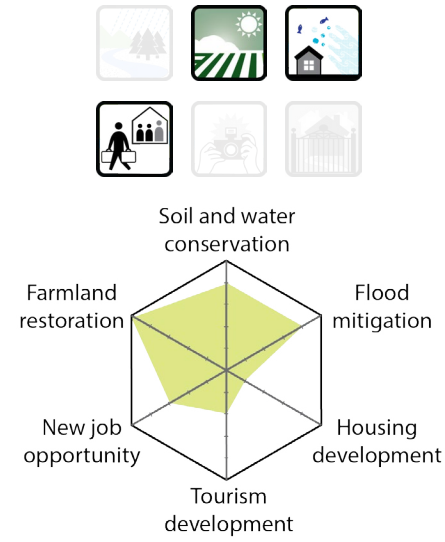
2. Integrate landscape function

2.1 Function addressed

The old farm land properties are modernized to meet the demand of contemporary land use especially support soil and water conservation and innovation agricultural /non-agricultural uses. Farm lands offer the place for the extension of city mentality and transitional landscape from built-up area to natural environment. Methods and considerations of enhance waterfront function and quality includes:

- A. Restoration of terraced paddy fields in upstream mountain and maintenance of flood plain paddy fields is the aim to build the connection with cultural landscape with flood mitigation methods.
- B. Restoration of farmland is a strategy to maintain the cultural and natural landscape, which will create local characteristic and attract younger generation to stay and live in the hometown.
- C. Innovation farming area is the opportunity to improve living environment quality through development.

2.2 Integrated issues



2.3 Collaboration stakeholders

Public sector



Private sector

Civic group



The locals



Developer



Live with Nature

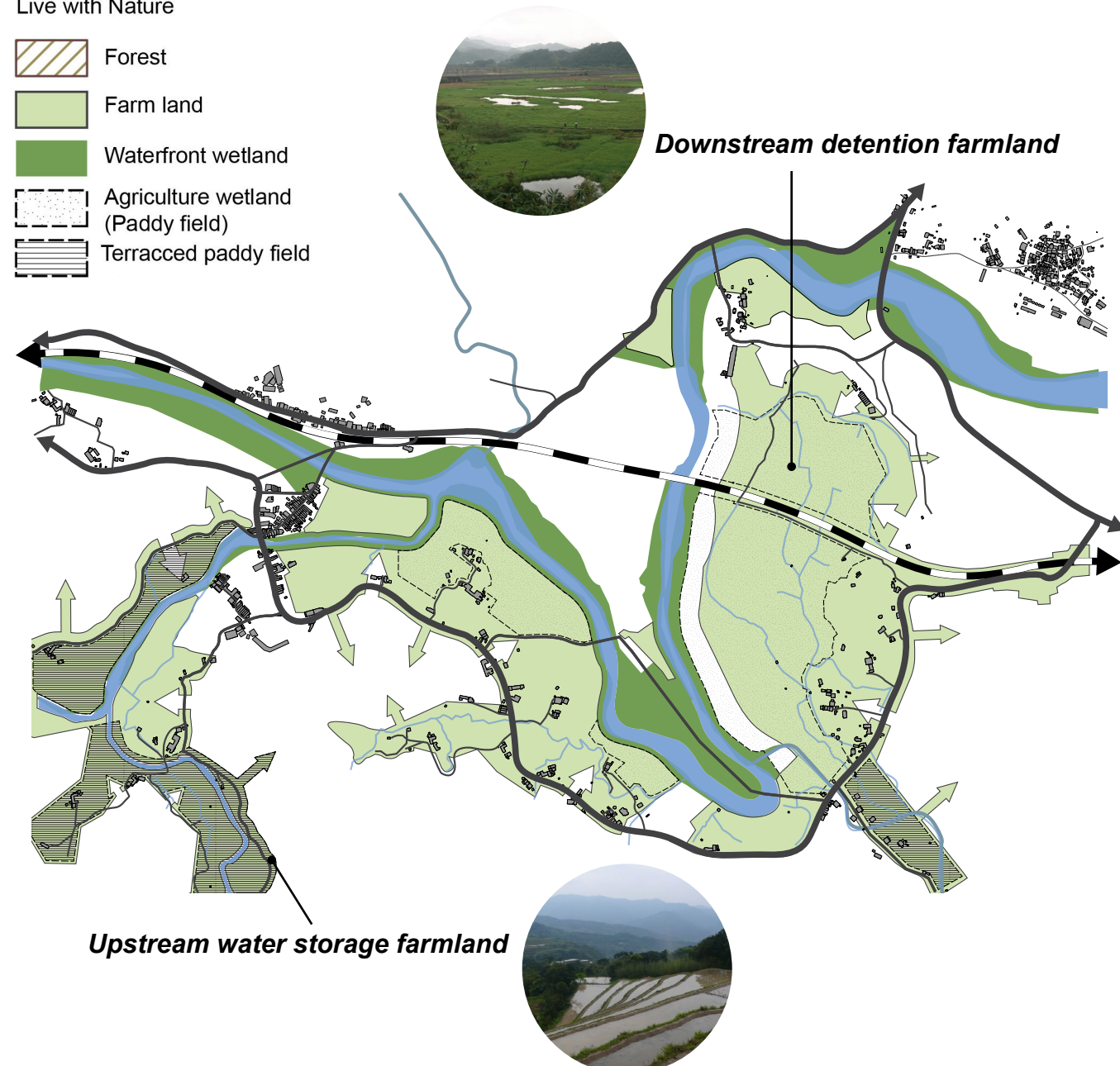
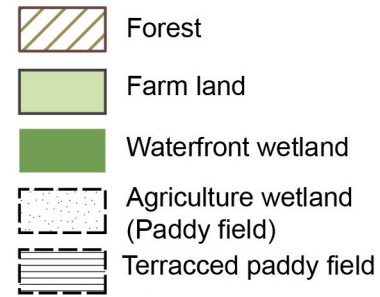
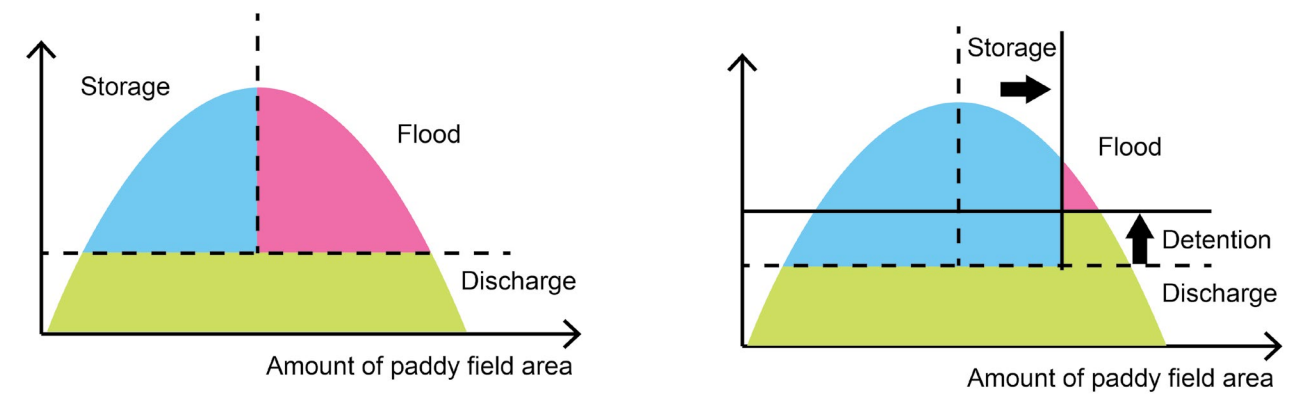


Figure 4.14 Integration of farmland and flood mitigation measure

Source: Draw by author.

Integrate farmlands with flood mitigation method



Integrate terraced paddy field into soil & water conservation function

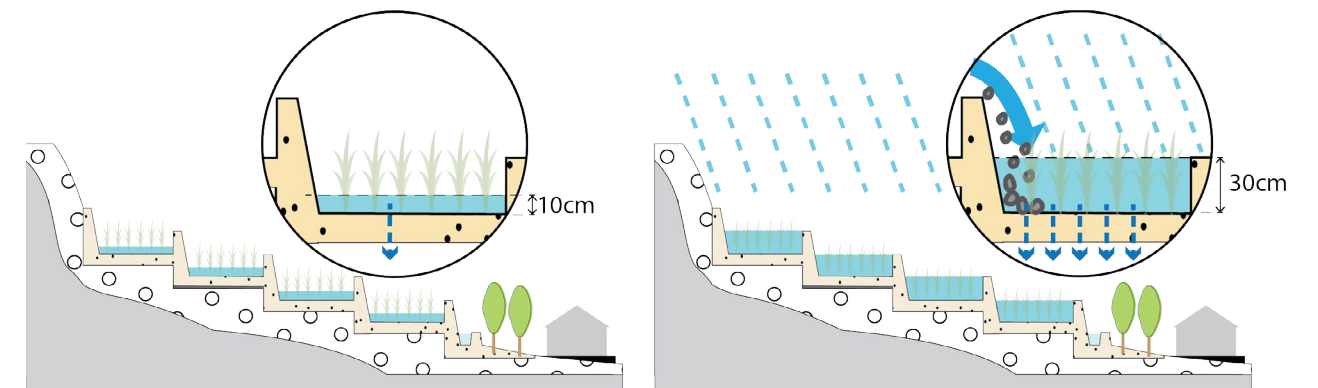


Figure 4.15 Terraced farming water restoration solution

Source: Draw by author.

3. Enhance waterfront function and quality



3.1 Function addressed

Enhance waterfront quality by integrating wetland with ecological, agricultural, and recreational function. The restoration of wetlands is a combination of ecological methods and recreational function for storm water storage. Methods and considerations of enhancing waterfront function and quality include:

A. Instead of build new dike and dam, rebuild current riverfront park as detention pond, riverfront wetland as a buffer area to collect flash flood water.

B. The riverfront agriculture wetland plays not only food production function, but also flood mitigation and agricultural wetland ecosystem functions.

Live with Water

-  Waterfront park
-  New waterfront neighborhood
-  Flood retention park
-  Farm wetland detention basin

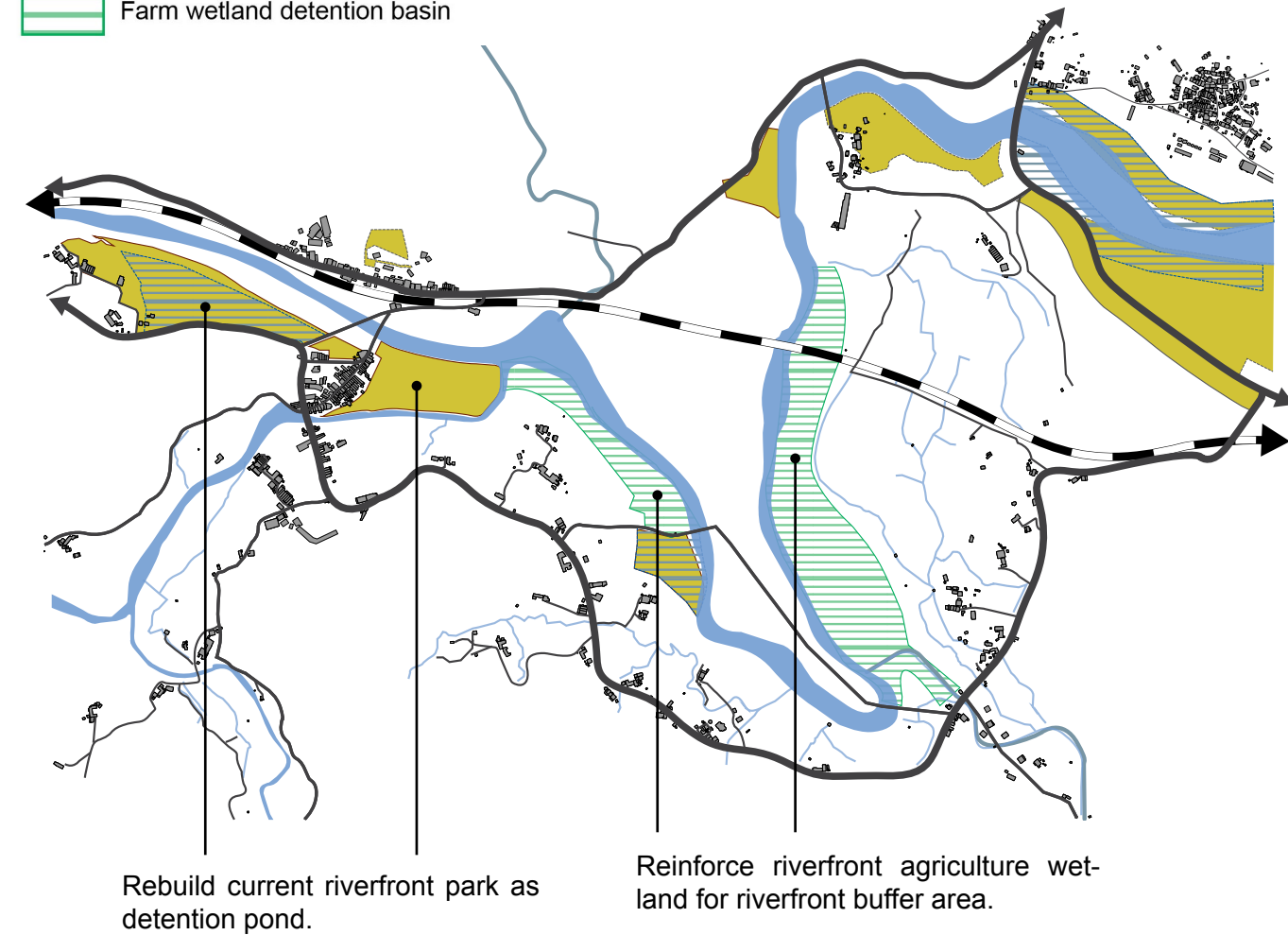
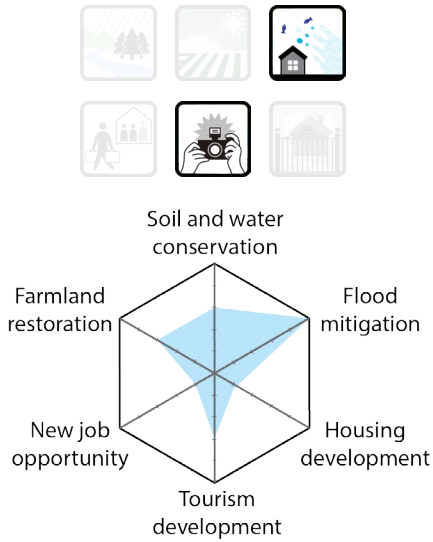


Figure 4. 16 Enhancing waterfront function and quality measure

3.2 Integrated issues



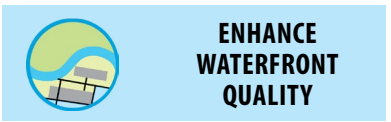
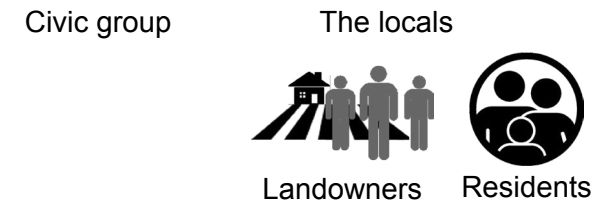
Source: Draw by author.

3.3 Collaboration stakeholders

Public sector



Private sector



Case study - Ecological detention basin in Southern Taiwan Science Park

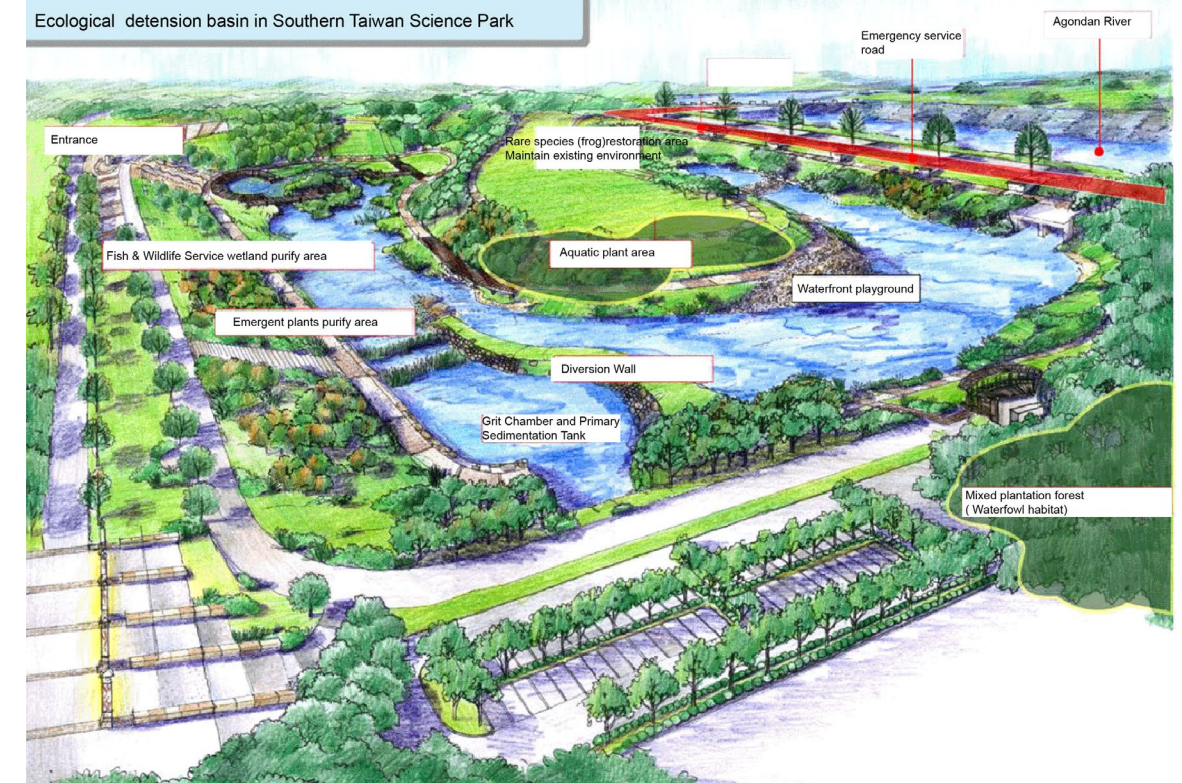


Figure 4.17 Ecological detention basin in Southern Taiwan Science Park

Source: Green pavilion website (<http://www.topid.net/>)

Integrate detention pond with waterfront park

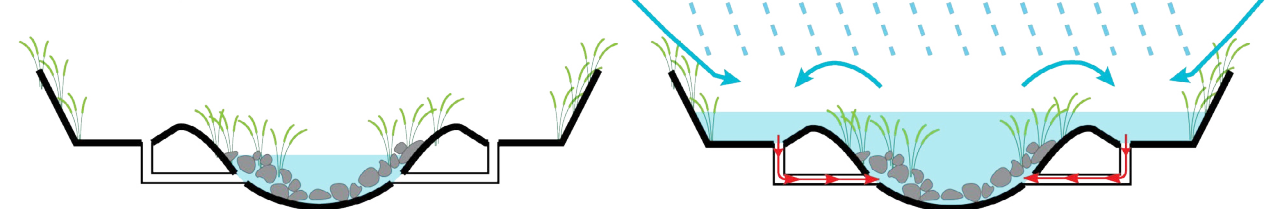


Figure 4.18 Water front park solution




Source: Draw by author.

4. Flood resist neighborhood

4.1 Function addressed

Flood resist neighbourhood refers to a solution allows exiting settlement to be resilient to flood issues. Methods and considerations of mover from flood risk neighbourhood to flood resist neighbourhood includes:

- A. Designate primary and secondary renewal unit and integrate flood mitigation method as the first priority.
- B. Redevelop the vacant residential area with amphibious function, which allows living with water and nature.
- C. The urban renewal solution is a special policy that make the housing reconstruction action possible in agriculture zone.

-  New waterfront neighborhood
-  Flood retention park
-  Farm wetland detention basin

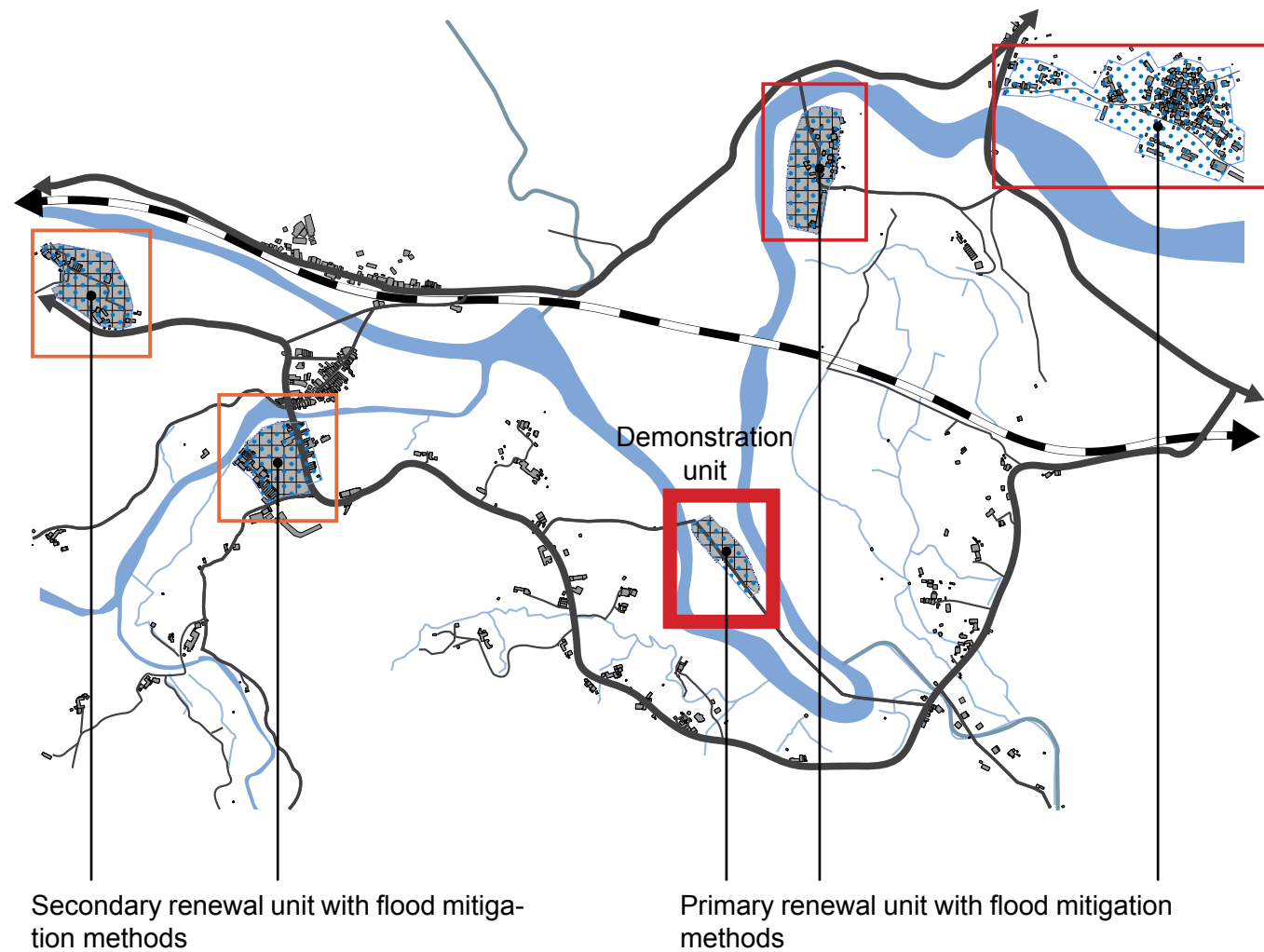
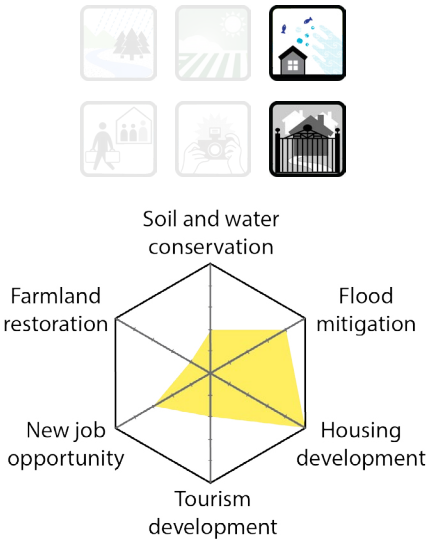


Figure 4.19 The designate renewal unit for flood prevention project

4.2 Integrated issues



Soil and water conservation

Farmland restoration

New job opportunity

Tourism development

Housing development

Flood mitigation

Source: Draw by author.

4.3 Collaboration stakeholders

Public sector



Private sector

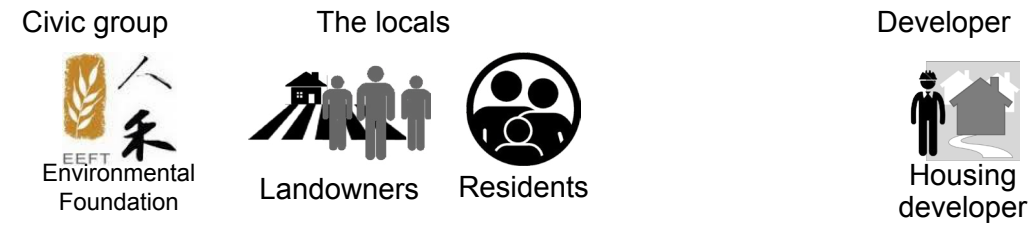
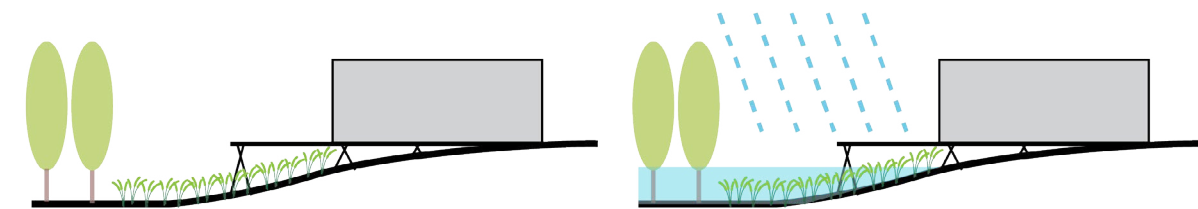


Figure 4.20 Elevated housing in Taiwan Southwest Coast National Scenic Area
Source: Yunlin Country Government website www.yunlin.gov.tw

Case study - Flood mitigation housing in Southwest Coast National Scenic Area in Taiwan
The new type of housing demonstrate the possible solution in high flood risk area

Flood resistant neighborhood



Source: Draw by author.

Figure 4.21 Elevated housing solution

5. New alliance of tourism

5.1 Function addressed

New alliance of tourism refers to establishing connections between farmers, local dwellers, developers and the general public in order to strike a balance between profitability and landscape conservation. The main idea is to improve the quality through tourism development. Methods and considerations of set up new tourism industry includes:

A. Instead of the big scale development in forest area, small scale renovation project related to innovation farming, eco-tourism and will be the main development direction.

B. Owing to the limitation development capacity, new investment should intensify the current settlement and its environment quality in designated village regeneration unit.

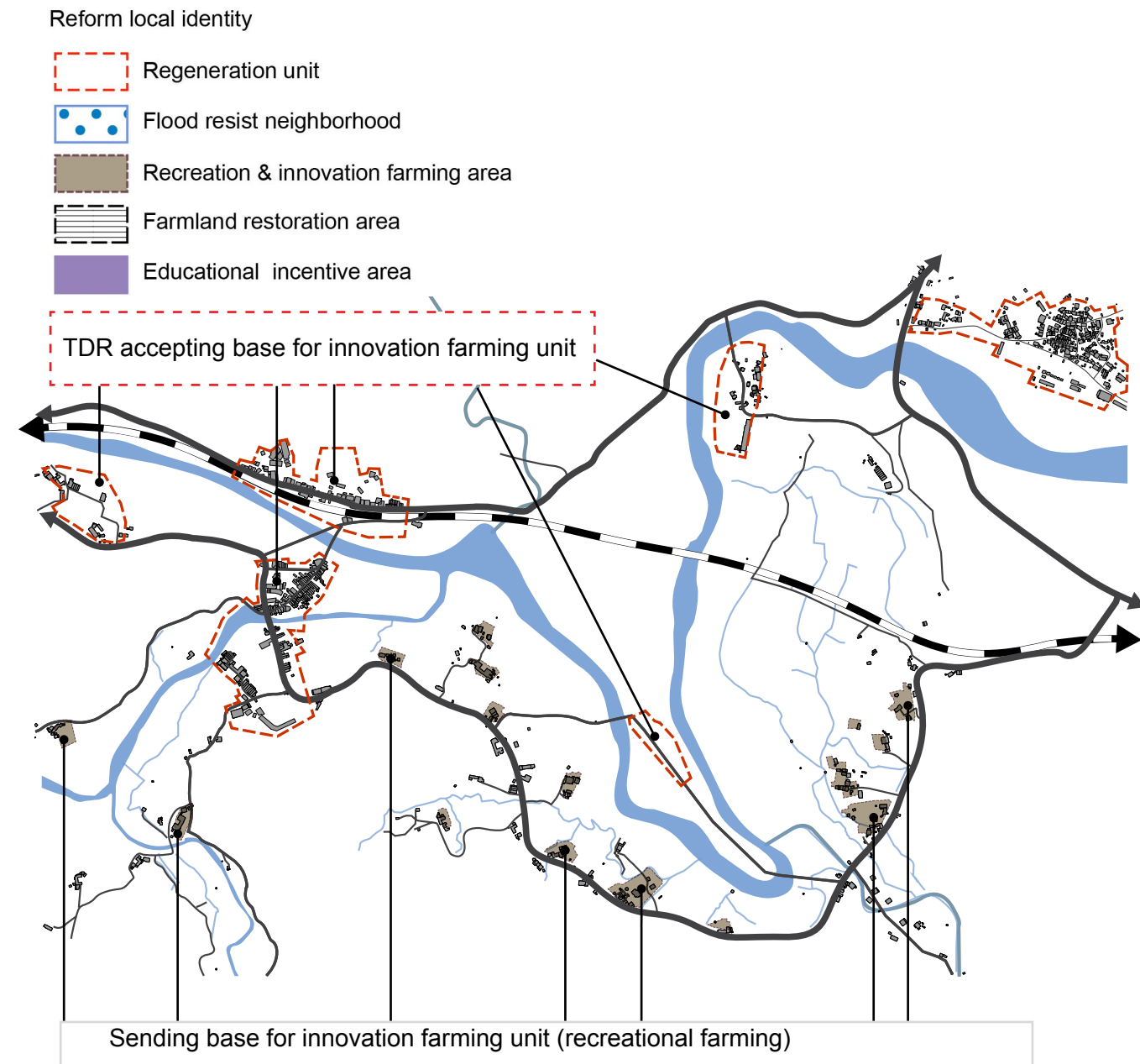
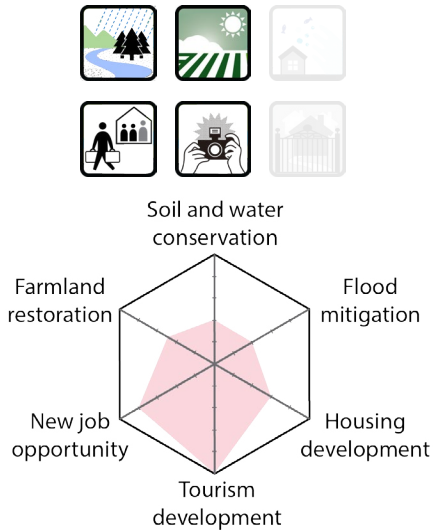


Figure 4.22 Transfer Development Rights (TDR) unit for innovation farming

5.2 Integrated issues



Source: Draw by author.

5.3 Collaboration stakeholders

Public sector



Private sector

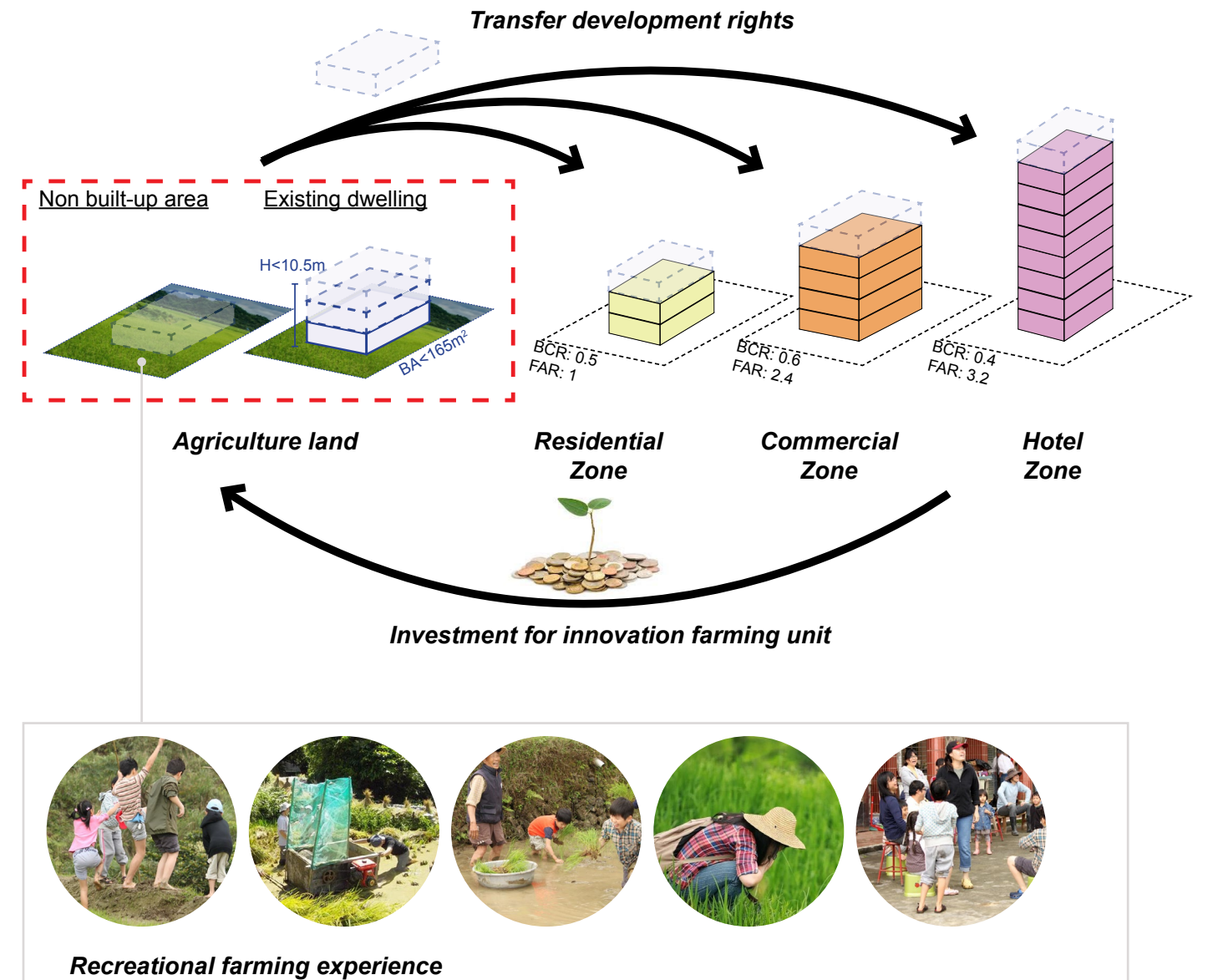





Figure 4.23 New alliance of tourism

6. Local knowledge educational program

6.1 Function addressed

The future development will bind with local vision. In order to maintain the knowledge and productivity for next generation, the unique knowledge to live with nature and water in Gongliao should be shared. Gongliao and Shuangxi River could be the demonstration site to illustrate the possible lifestyle to live with nature and water. Methods and considerations of enhance waterfront function and quality includes:

- Set up local culture and ecological foundation and training program.
- Share the knowledge with local residents as well as tourists.

-  Recreation & innovation farming area
-  Farmland restoration area
-  Educational incentive area

6.2 Integrated issues

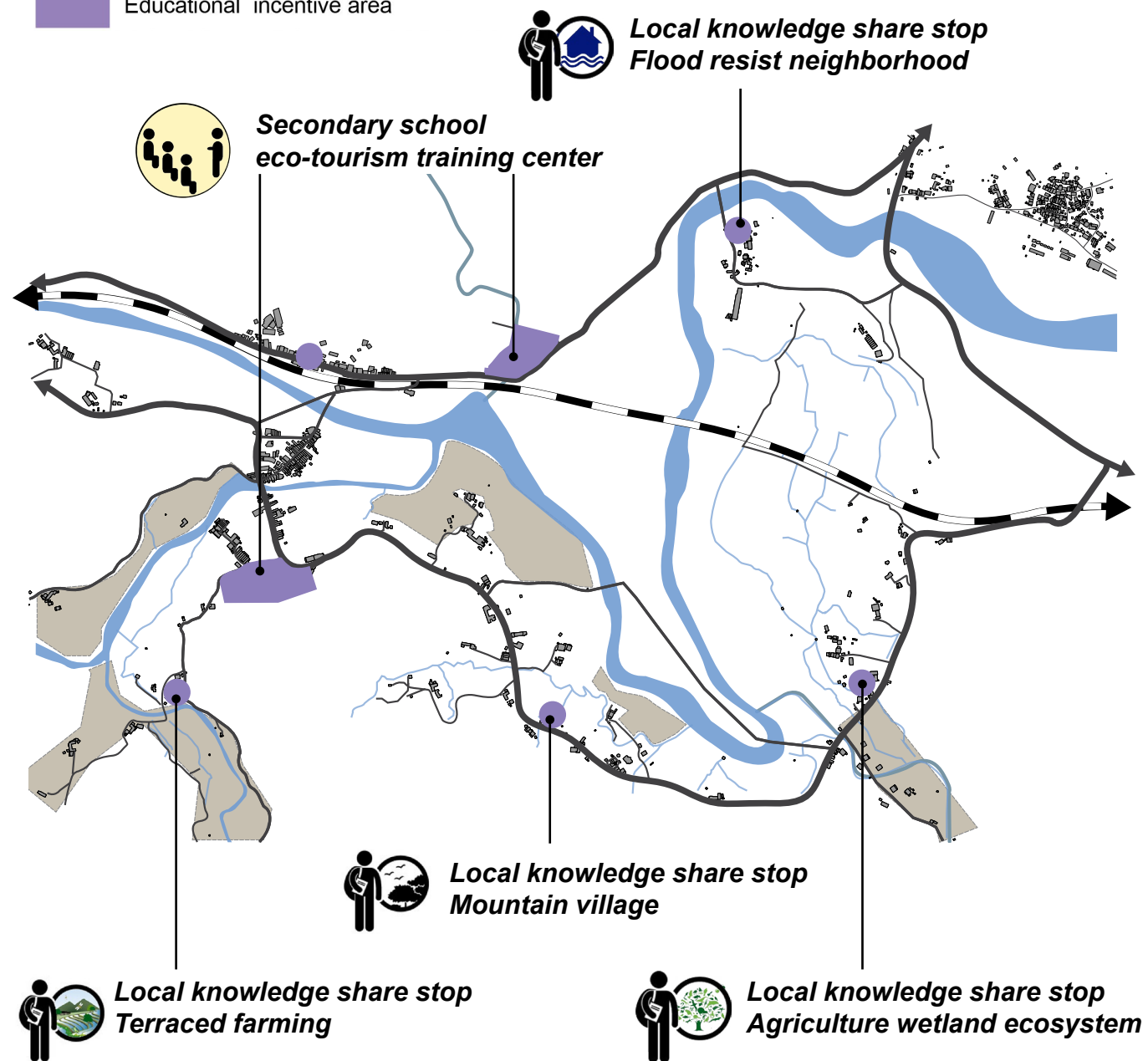
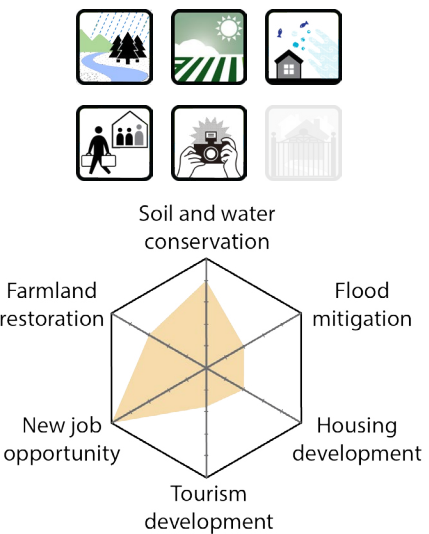


Figure 4.24 The local knowledge sharing networks

Source: Draw by author.

6.3 Collaboration stakeholders

Public sector



Private sector

Civic group



The locals



Eco-tourism training programme



Recreational farming



Eco-tourism training programme



Farming knowledge sharing activity

Figure 4.25 Impression for eco-tourism and local knowledge training programme

3.3 Proposed responsive plan making process

In order to make the adaptation plan operational in existing planning system, the following diagram proposed an improvement of plan-making process.

Now

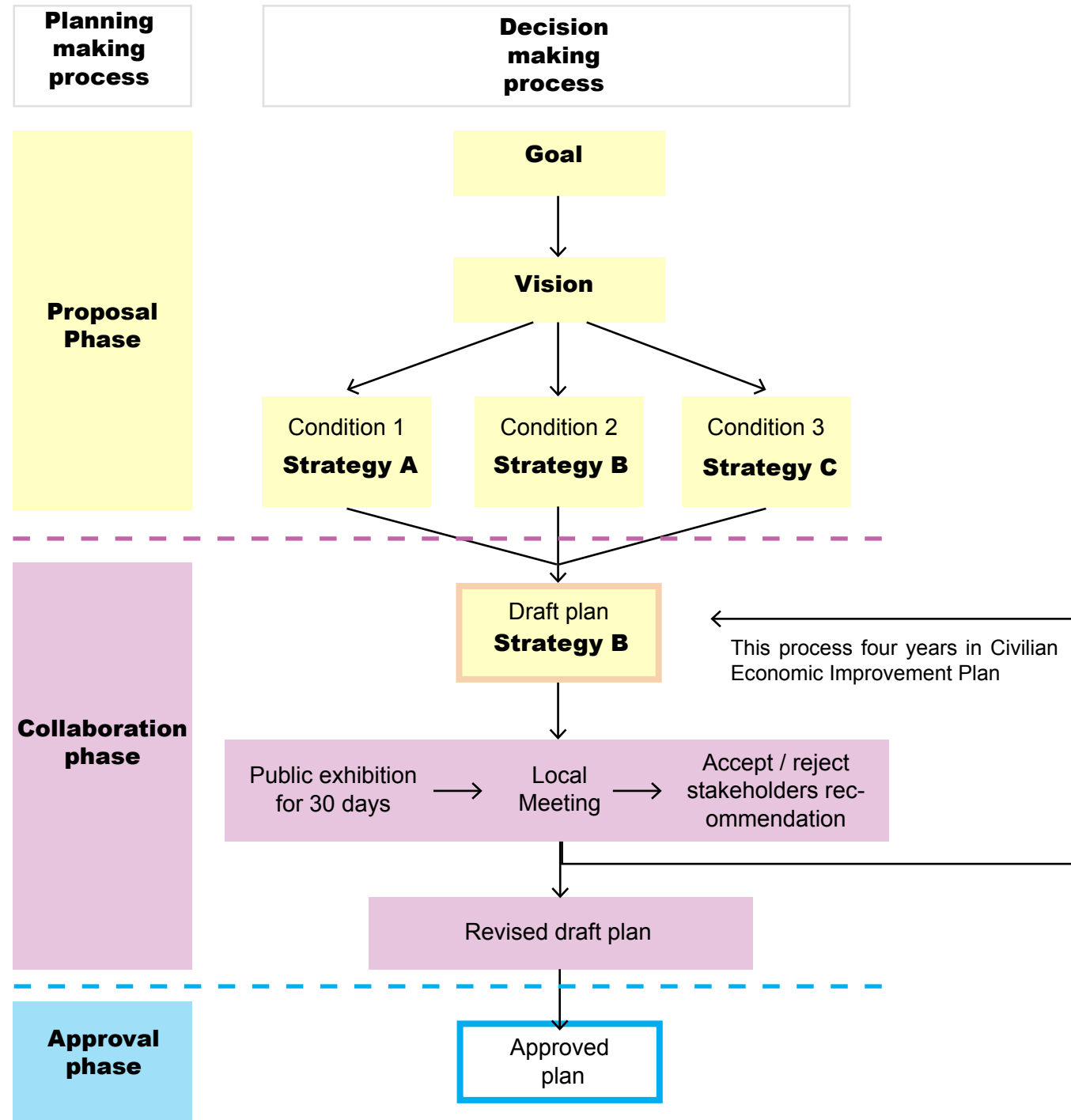


Figure 4.26 Plan making process in 3rd Comprehensive Review of NCNSA Master Plan and Civilian Economic Improvement Plan

Source: Author's own elaboration based on the involvement experience of the project

Proposed responsive plan-making process

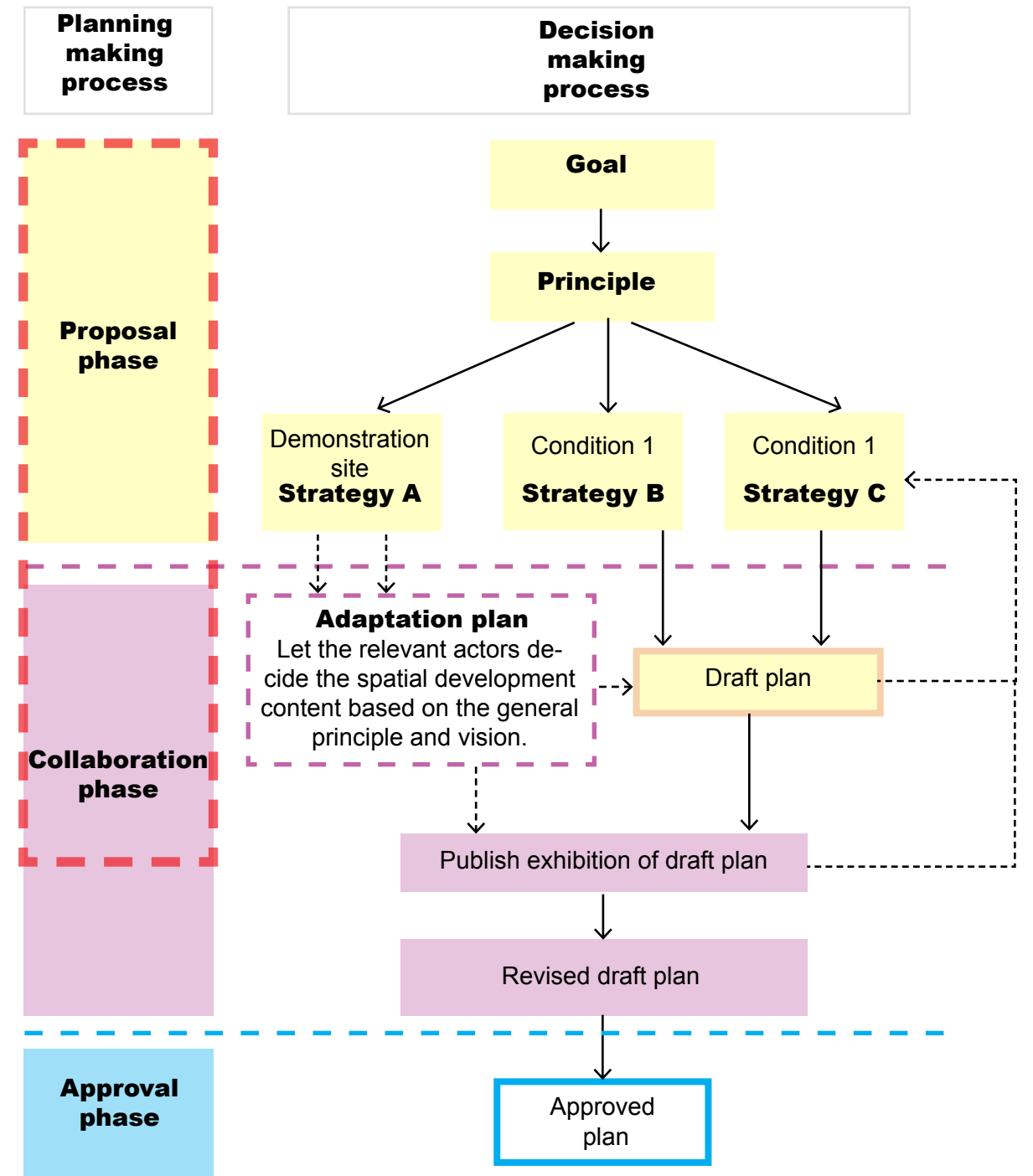


Figure 4. 27 Proposed plan making process of future plans

Source: Author's own elaboration

3.2 Recommend stakeholder collaboration form

Move from PPP (public private partnership) to PPPP (people public-private partnership)

Considering the complex relationship between private and public sectors and conflicts social value and interests, the recommend collaboration form should change of collaboration form is to move from P-P-P (public-private partnership) to P-P-P-P (people, public-private partnership). A successful plan also relies on a constructive dialogues and consensus making among multi stakeholder. The constructive dialogues is on the basis of open communication involving the exchange of information between relevant stakeholders, including central and local competent authority, councils, agencies, bureaus, civic group, NGOs, and local dwellers.





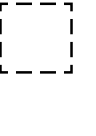





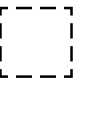


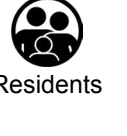


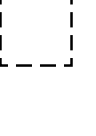

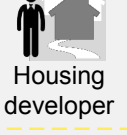
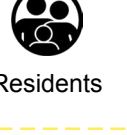

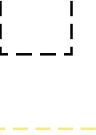

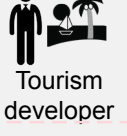


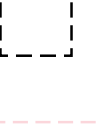





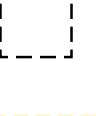
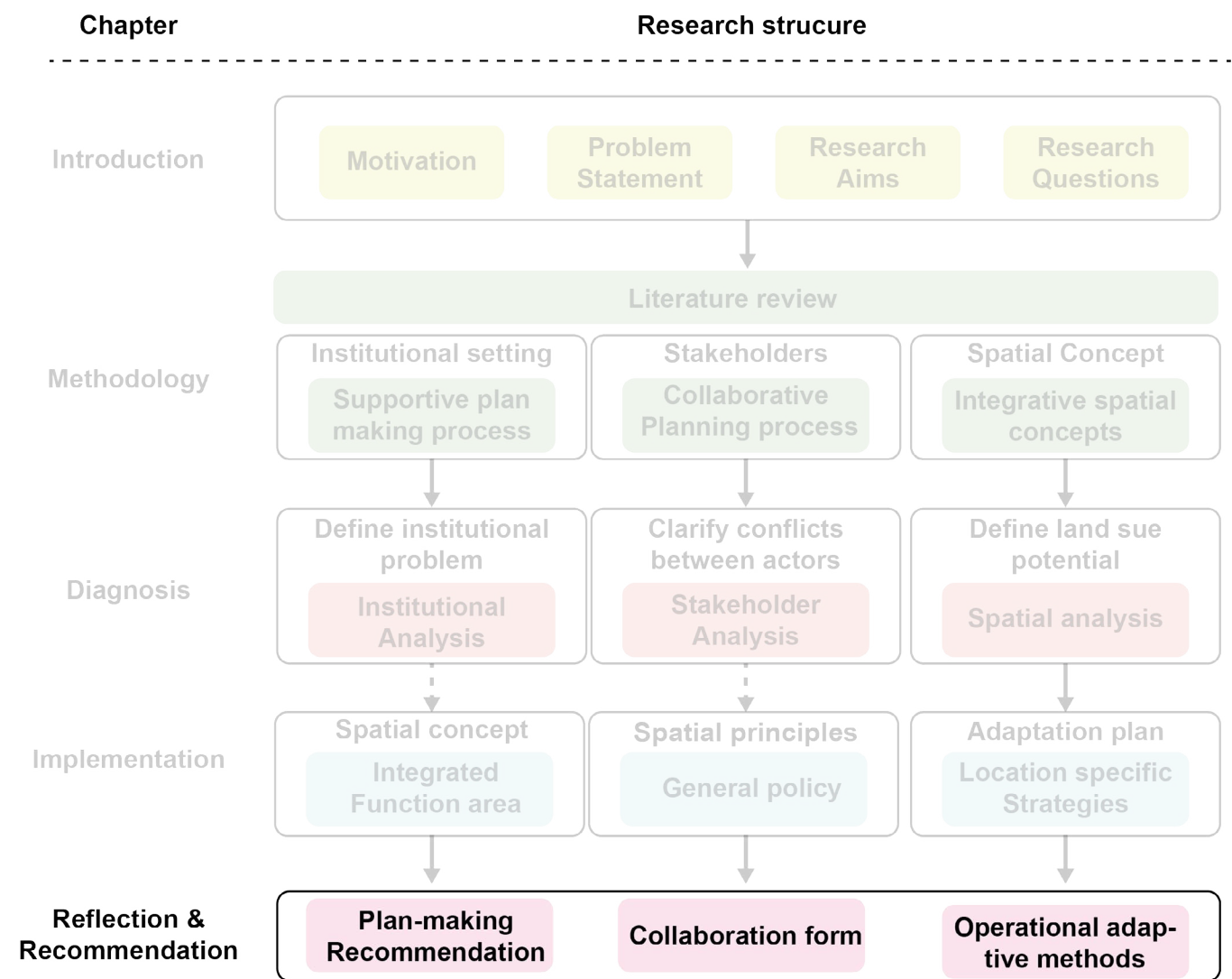
Adaptation strategy	Private sector	Local participants	Public sector / NGO	Other stakeholder
 Ecological environment vitality	 Area developer	 Residents	 Soil & Water conservation Bureau	
 Integrate landscape function	 Area developer	 Farmers	 Forestry Bureau  Agriculture Council	
 Enhance waterfront quality	 Area developer	 Residents	 Water Resource Agency  Construction & Planning Agency	
 Flood resistant Neighborhood	 Housing developer	 Residents	 Construction & Planning Agency	
 New alliance of tourism industry	 Tourism developer	 Landowners	 Tourism Bureau	
 Local knowledge education program	 Area developer	 Residents	 Environmental Ethics Foundation of Taiwan  Local newspaper	

Figure 4.28 Recommend stakeholder collaboration form

Chapter E. Evaluation & Recommendation



I. Evaluation

1. The relationship between research and design

The research aims to find possible solution in dealing with territorial conflicts in dynamic environment area. The research focus on three parts: existing planning proposal, landscape, and stakeholders.

First, the existing planning proposal has difficult in accommodating spatial changes and land use demand. The reason is the zoning control and regulations make development potential and capacity very limited.

Second, the dynamic landscapes dominate land use and its function. However, zoning cannot provide sufficient instrument for local users' demand and development opportunity. The rural landscape in this research site consist farmland, grassland, and secondary woods, zoning control can efficiently prevent environmentally sensitive areas from development, but a sub-zone for development with certain conditions is necessary.

Third, diversity of actors in the area shows complex interrelationship. New forms of planning framework which can reflect multi-actors demands and reach new commons of the area are necessary.

2. The relationship between the theme of the studio and the subject chosen within this framework

The research tackles with a territorial management issue that competing interests happened in Taiwan National scenic area. The Urbanism Research Theme international planning and developing regions focus on comparative analysis of verify forms of intervention through spatial planning and territorial management and building valid methodology for international case studies. In addition, Complex cities studio focuses research on spatial planning, spatial strategy formulation and design, my research theme will be relevant to The Urbanism Research Theme international planning and developing regions.

Taiwan is located in seismic zone and on the routes of South Pacific typhoon, more than 70 per cent of the total Taiwan area are designated as environmentally sensitive areas. Because the rapid urban development has occupied most of the plain areas, which increases the development pressure in urban fringe and rural area. Therefore, the existing planning regime in Taiwan needs to be elaborated and find alternative instruments to resolve the competing interests and conflicts in the case study area. A regional plan

in Northeast coastal national scenic area will be developed as an exemplary case that can define the development capacity for sustainable development. Hence, a planning regime that consider environmental, economic, and social factor into the conservation areas management needs to be clarified. Taiwan is part of South-east Asia developing regions, the study in Taiwan can learn the international spatial planning methodology, and transfer the experience as part of comparative analysis for future research.

3. The relationship between the methodical line of approach of the studio and the method chosen in this framework

Complex cities studio focuses research on spatial planning, spatial strategy formulation and design, therefore this research intends to test if adaptive planning approach could offer the potential to develop spatial vision and concept. In addition, this research also gives a test the applicability of shifting the planning tradition from plan-making to place-making in Taiwan. Instead of focus on ecosystem management, this research focuses on the possible strategy and instrument that could apply to the case study area.

II. Recommendations

The following conclusions summarize the research conclusion and indicate the possible direction to help traditional planning system to be more capable to dealing with conservation and development conflicts.

1. A clear stated goal and spatial development principle are the basis of future development vision.

A clear stated goal and spatial development principle are the basis of future development vision. The principle can be the standard and criteria when the local initiatives or government proposal against the general development vision. The development principle proposed in this project is a multi-function land use and compact networks development, which is the core value of the adaptation plan in Shuangxi River valley demonstration site.

2. Facilitate existing problems and avoid conflicts

The proposed adaptations methods try to integrate current planning proposals instead of propose new strategy. The adaptive planning approach could be a platform to accommodate competing social values and interests. Therefore, a holistic problem defines in spatial, social, economic and institutional context can avoid the planning practice aggravating existing problems.

3. An operational method is the strategy to integrate spatial issues and avoid conflicts.

An operational method is the strategy to integrate spatial issues and avoid conflicts. In order to make the policy operation, three themes and six implementation strategies were demonstrated in the previous chapter. Instead of proposing rigid rules, the adaptation methods used in Shuangxi River valley are regard as a demonstration to integrate conservation and development conflicts. In other words, this approach intends to resolve conflicts by providing alternative options instead of achieving definite objectives.

4. Use experimental implementation to advance the planning method

In order to advance traditional planning method in the premise of adaptive planning approach, the adaptation methods were test in this study as an experimental opportunity to facilitate spatial problems. The planning agency can designate experimental demonstration site as a platform for the locals and planning authority to test the development ideas.

5. Robust and flexible policy is still necessary

The development control and zoning is still effective way to prevent natural environment from destroy, a robust and flexible planning framework is necessary. Since the spatial development principle is a generic spatial policy that could apply to whole Northeast coast area, adaptation plan is the supplement of location specific strategy to demonstrate how adaptive approach could work in the existing spatial context.

III. The relationship between the project and the wider social context

Since the existing planning regime in Taiwan needs to be reviewed and find alternative instruments to accommodate competing interests and conflicts, the research in Northeast Coast National Scenic Area will be an exemplary case to understand how to integrate conflicts and generate possible adaptation plan in high landscape value areas. A adaptive approach that consider environmental, economic, and social factor into the conservation area management will transfer as an international spatial planning comparative analysis for further research.

Appendix I - References

Bibliography

- Briassoulis, H. (1989). Theoretical Orientations in Environmental Planning: An Inquiry into Alternative Approaches. *Environmental Management*, 381-392.
- Chen, L.-H., & Shih, H.-C. (2010). Current planning mechanisms in Taiwan. In R. Bristow, *Planning in Taiwan* (pp. 97-136). Routledge.
- CPAMI. (2010). *Third comprehensive review of Northeast Coast National Scenic Area Draft Master Plan*. Taipei: Construction and Planning Agency, Ministry of the Interior.
- CPAMI. (2011). *Civilian Economic Improvement Strategic Plan- Improving Land Utilization and Landscape Quality of Northeastern Coastal National Scenic Area*. Taipei: Construction and Planning Agency, Ministry of the Interior.
- Hartman, S., Rauws, W., Beeftink, M., & de Roo, G. (2011). Developing regional spatial concepts. In G. d. Roo, *Regions in Transition Designing for Adaptivity* (pp. 36-59). Eindhoven: Nai 010 publishers.
- Healey, P. (2006). *Collaborative Planning: Shaping Places in Fragmented Societies* (2nd ed.). New York: Palgrave Macmillan.
- Holling, C. S. (1978). *Adaptive Environmental Assessment and Management*. New York: John Wiley.
- Huang, S.-L., Jen, S.-L., & Hung, H.-C. (2006). *National Conservation Area Planning and Disaster Prevention Space Planning*. Taipei: Construction and Planning Agency, Ministry of Interior (in Chinese).
- Kato, S., & Ahern, J. (2008). 'Learning by doing': adaptive planning as a strategy to address uncertainty in planning. *Journal of Environmental Planning and Management*, 543-559.
- Ministry of Interior. (1992). *The Delineation of Environmentally Sensitive Areas of the Northern and southern Regions*. Taipei: Ministry of Interior.
- Soil and Water Conservation Bureau. (2011). *Slope-land area in Taiwan*. Nantou City: Soil and Water Conservation Bureau.
- United Nations University. (2010). *Satoyama-satoumi ecosystems and human well-being : socio-ecological production landscapes of Japan : Japan satoyama satoumi assessment : summary for decision makers*. Japan: United Nations University.
- Wollenberg, E., Edmunds, D., & Buck, L. (2000). Using scenarios to make decisions about the future: anticipatory learning for the adaptive co-management of community forests. *Landscape and Urban Planning*, 65-77.

Map references

Taiwan Construction and Planning Agency, Ministry of the Interior, (2010) Digital terrain model, 1:5000. Taipei.

Official documents

Construction and Planning Agency, Ministry of the Interior website [Online] Available from: <http://cpabm.cpami.gov.tw/docsrc/> [Accessed 21 November 2013].

New Taipei City Government website [Online] Available from: <http://www.ntpc.gov.tw/> [Accessed 30 September 2013].

Taiwan Central Weather Bureau website [Online] Available from: <http://www.cwb.gov.tw> [Accessed 11 October 2013].

Taiwan Water Resources Agency, Ministry of Economic Affairs, (2010) Flood prone area GIS data in Taiwan 2007-2010, [Online] Available from: <http://www.dprc.ncku.edu.tw/> [Accessed 31 August 2013].

Yunlin Country Government website [Online] Available from: <http://www.yunlin.gov.tw> [Accessed 19 March 2014].

Photograph references

Environmental Ethics Foundation of Taiwan website [Online] Available from: <http://www.eeft.org.tw> [Accessed 21 January 2014].

Flickr Website [Online] Available from: <https://www.flickr.com/> [Accessed 12 March 2014].

Flytiger Publications Inc. [Online] Available from: <http://www.flytiger.com.tw> [Accessed 29 October 2013].

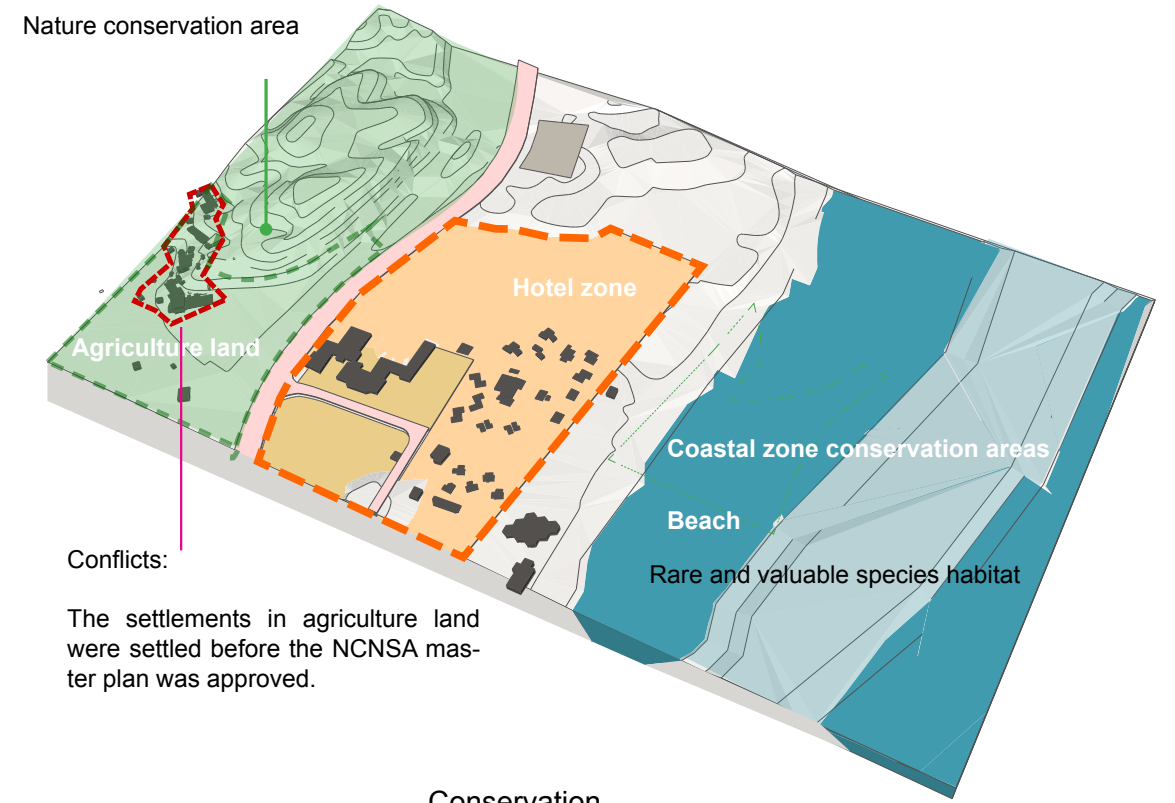
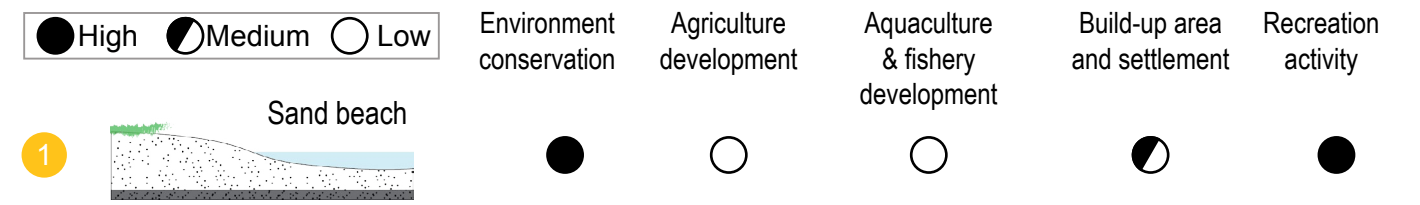
kongaliao-water-terrace.blog [Online] Available from: <http://kongaliao-water-terrace.blogspot.com/> [Accessed 20 June 2014].

New Taipei City Farmer market website [Online] Available from: <http://ntpcmart.tw/> [Accessed 10 April 2014].

TAIPEI TIMES Website [Online] Available from: <http://www.taipetimes.com/News/taiwan/archives/2011/07/20/2003508684> [Accessed 04 November 2013].

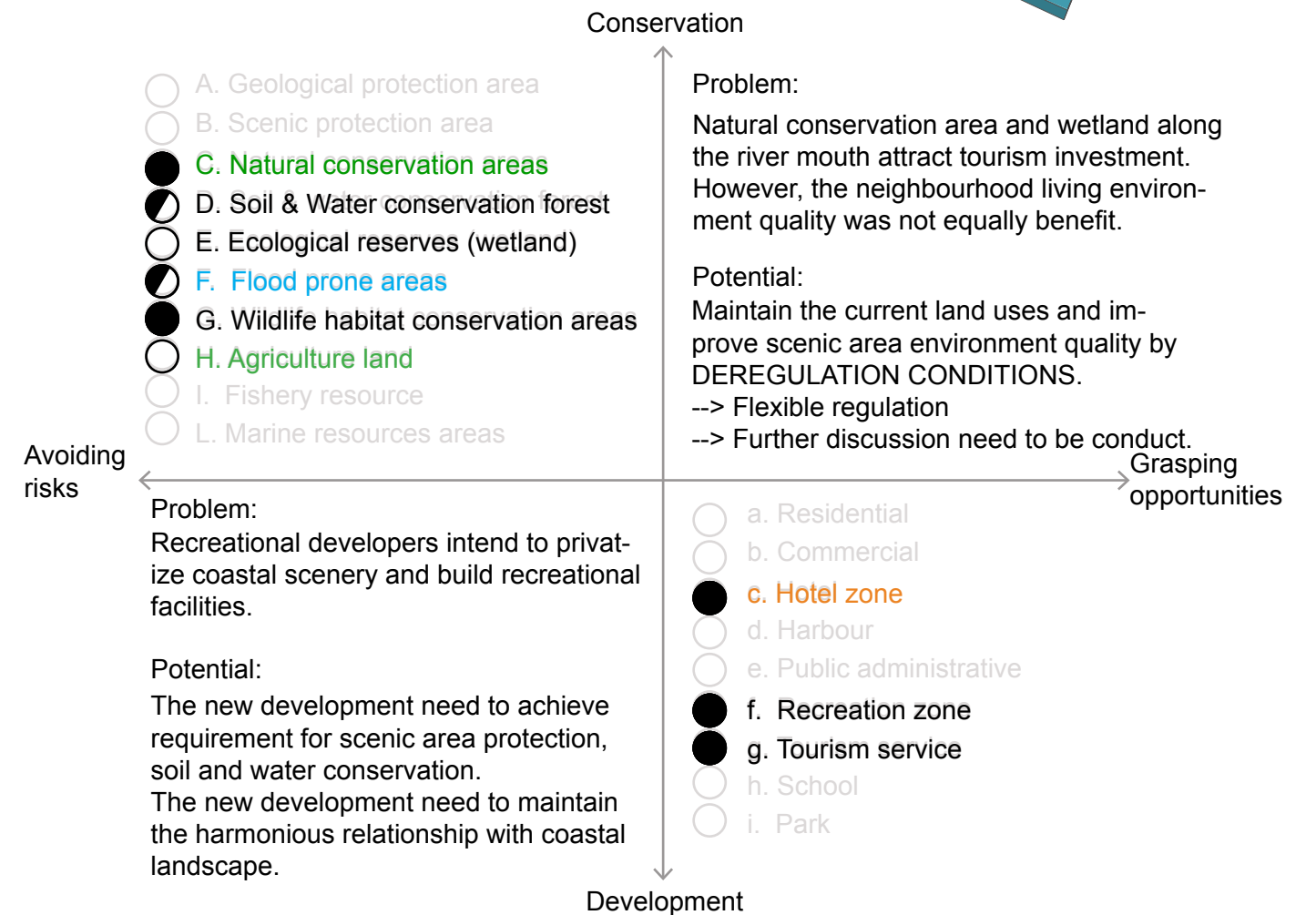
Xuite blog [Online] Available from: <http://blog.xuite.net/mejun0322/> [Accessed 16 November 2013].

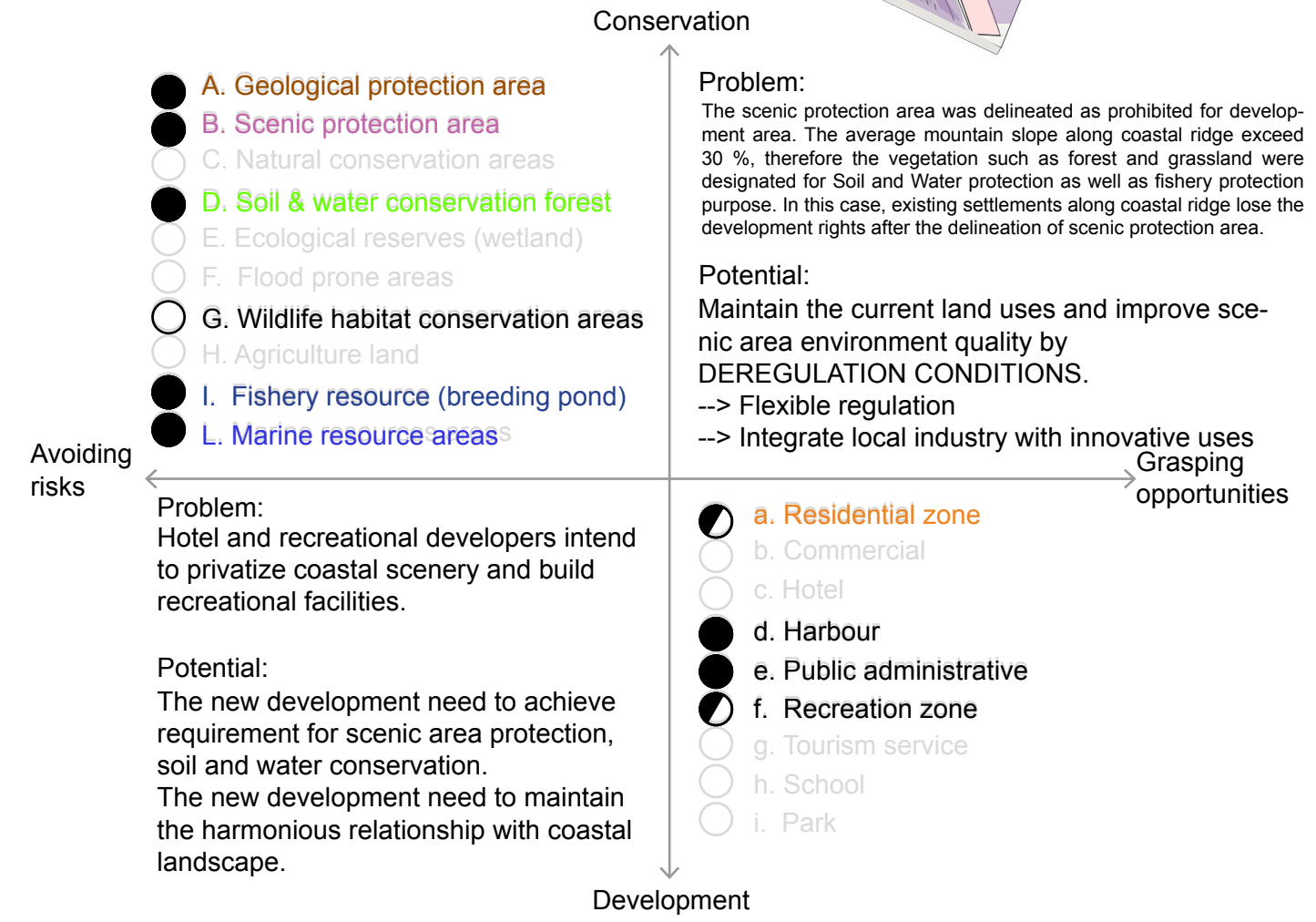
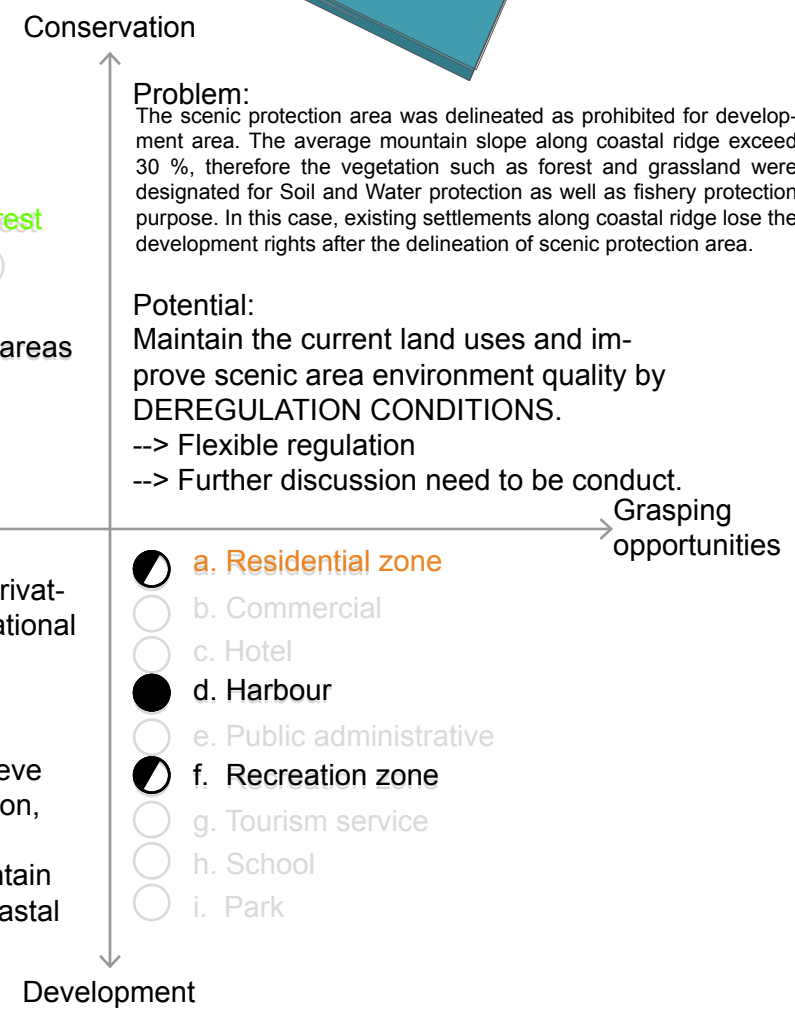
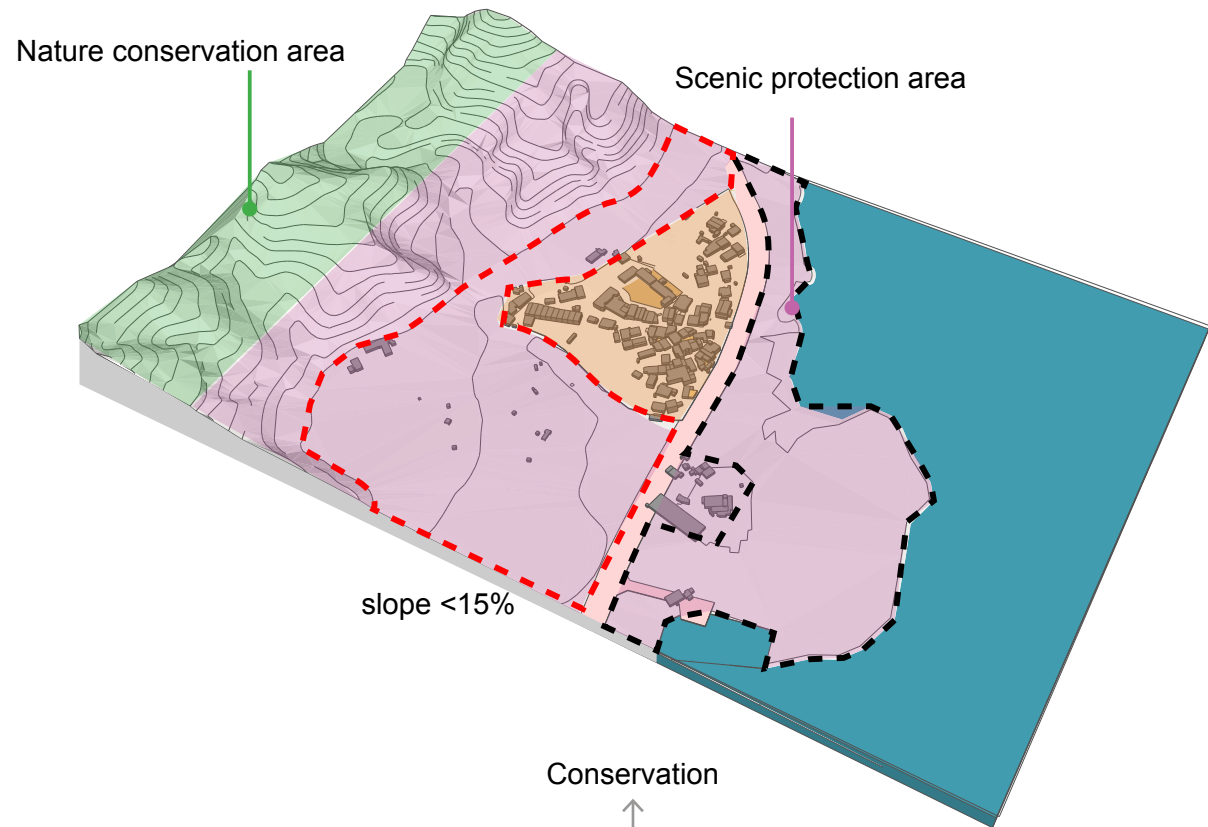
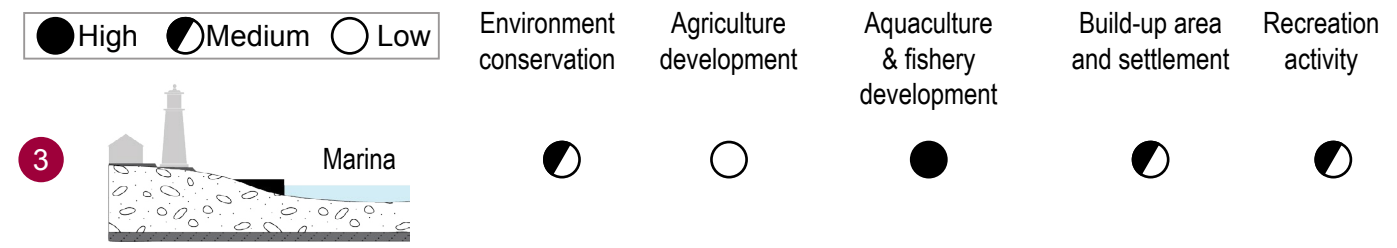
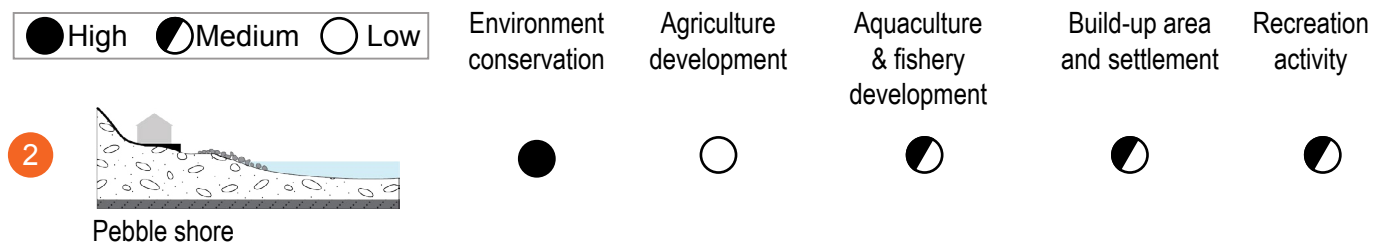
Appendix II - landscape types

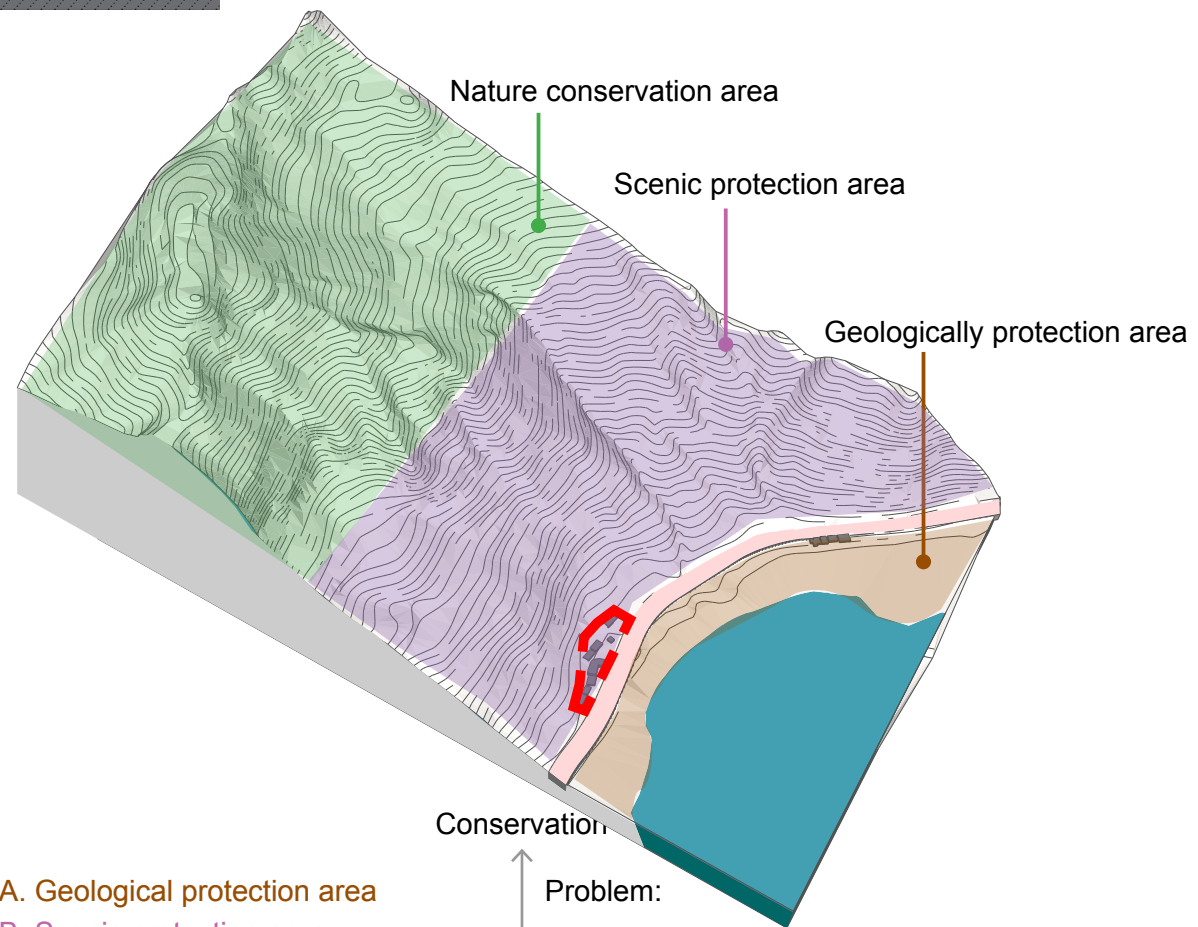
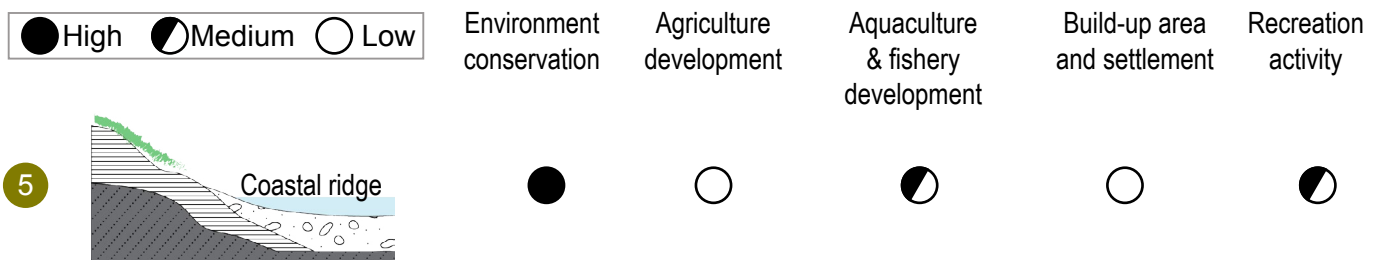


Conflicts:

The settlements in agriculture land were settled before the NCNSA master plan was approved.







- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource
- L. Marine resource areas

Problem:
The scenic protection area was delineated as prohibited for development area. The average mountain slope along coastal ridge exceed 30 %, therefore the vegetation such as forest and grassland were designated for Soil and Water protection as well as fishery protection purpose. In this case, existing settlements along coastal ridge lose the development rights after the delineation of scenic protection area.

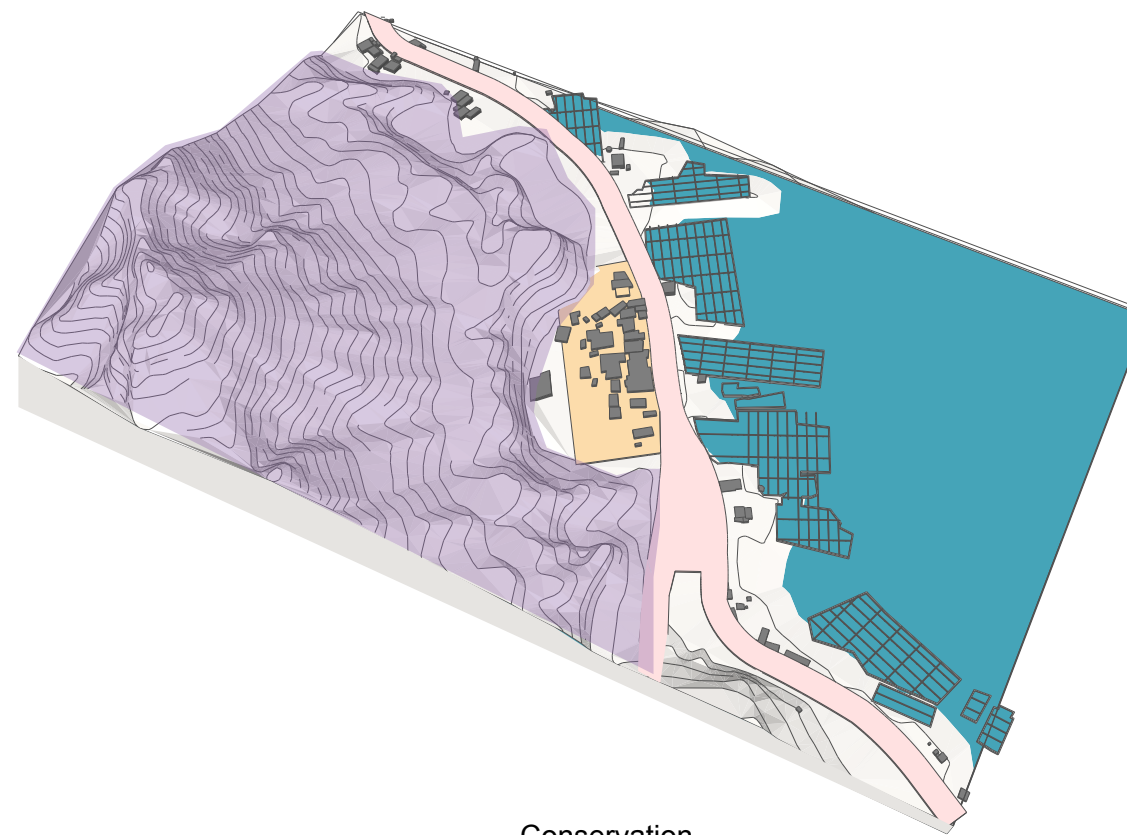
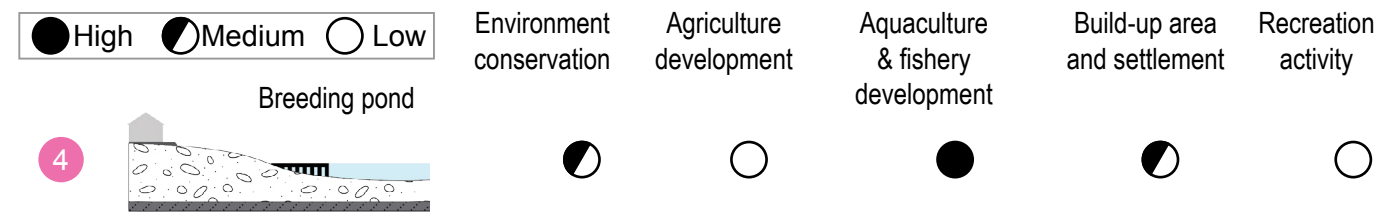
Potential:
Maintain the current land uses
--> Robust regulation

Problem:
Recreational developers intend to privatize coastal scenery, and build hotel facilities.

Potential:
Limited develop capacity
--> Robust regulation

- a. Residential zone
- b. Commercial
- c. Hotel
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School
- i. Park

Development



- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource (breeding pond)
- L. Marine resource areas

Problem:
The scenic protection area was delineated as prohibited for development area. The average mountain slope along coastal ridge exceed 30 %, therefore the vegetation such as forest and grassland were designated for Soil and Water protection as well as fishery protection purpose. In this case, existing settlements along coastal ridge lose the development rights after the delineation of scenic protection area.

Potential:
Maintain the current land uses and improve scenic area environment quality by DEREGULATION CONDITIONS.
--> Flexible regulation
--> Integrate local industry with innovative uses

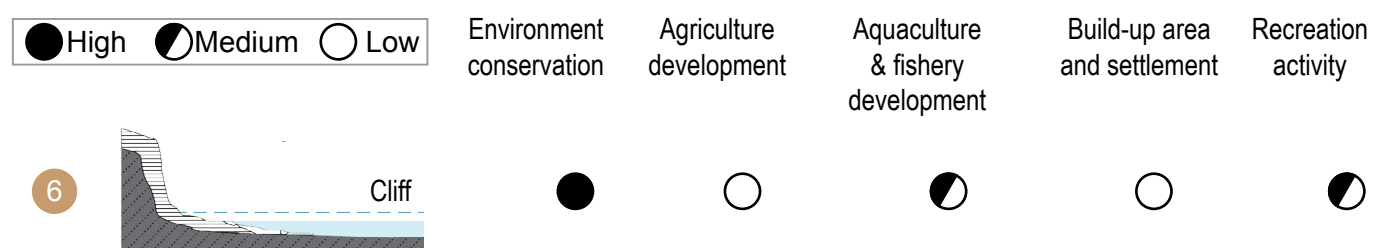
Problem:
Hotel and recreational developers intend to privatize coastal scenery and build recreational facilities.

Potential:
The new development need to achieve requirement for scenic area protection, soil and water conservation.
The new development need to maintain the harmonious relationship with coastal landscape, especially the aquaculture industry.

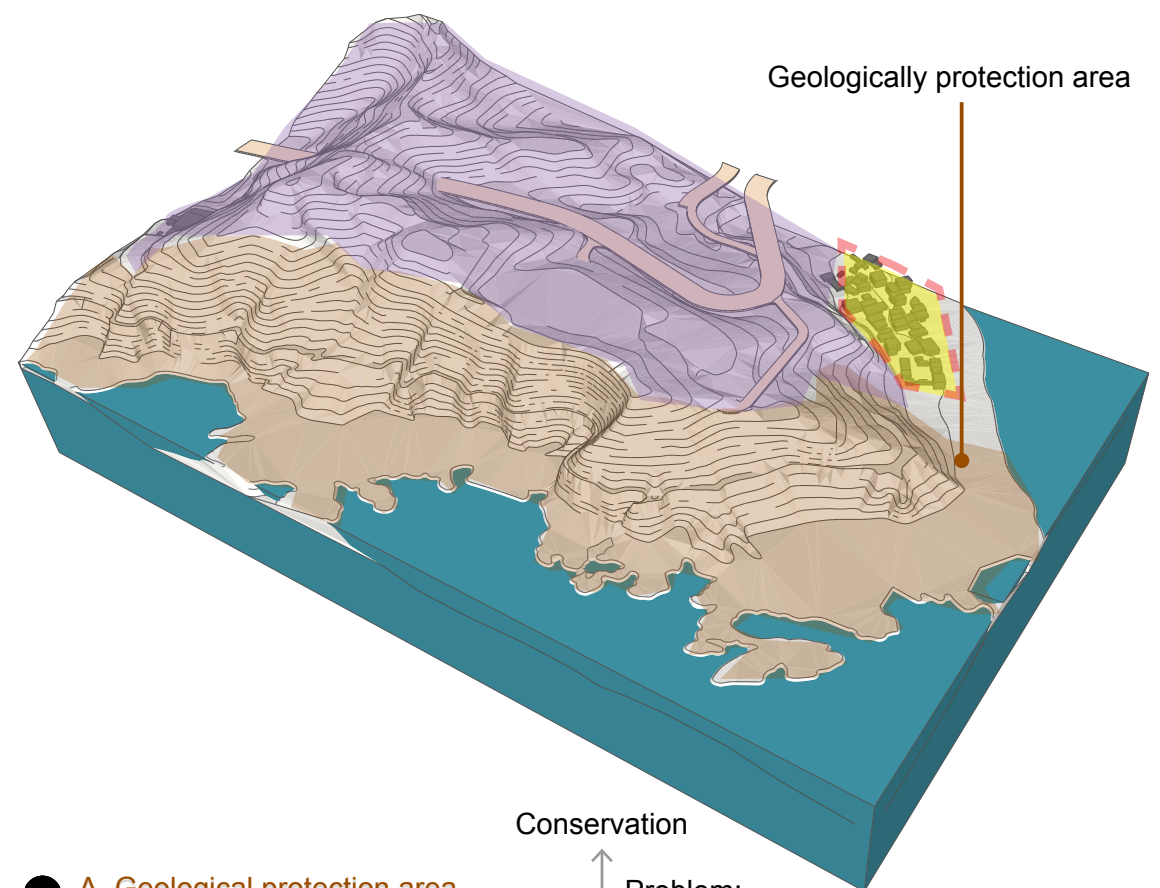
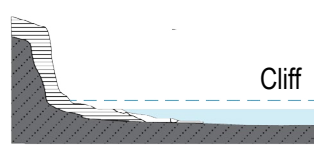
- a. Residential zone
- b. Commercial
- c. Hotel
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School
- i. Park

Development

INTRODUCTION
METHODOLOGY
DIAGNOSIS
IMPLEMENTATION
EVALUATION AND RECOMMENDATION
APPENDIX



6



- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource (breeding pond)
- L. Marine resource areas

Problem:
The scenic protection area was delineated as prohibited for development area. The average mountain slope along coastal ridge exceed 30 %, therefore the vegetation such as forest and grassland were designated for Soil and Water protection as well as fishery protection purpose. In this case, existing settlements along coastal ridge lose the development rights after the delineation of scenic protection area.

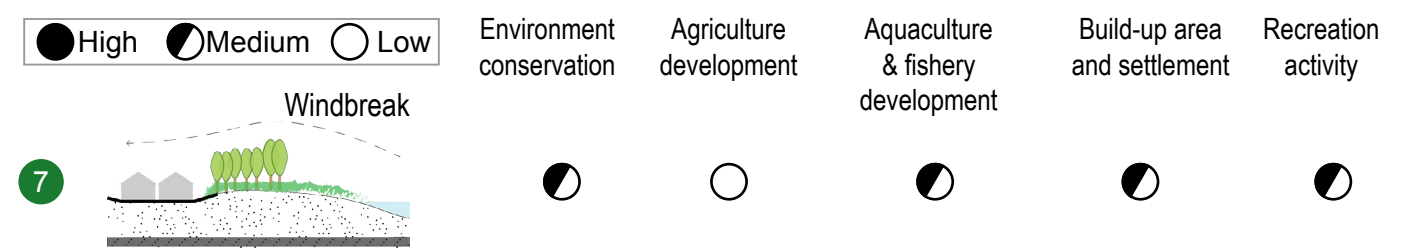
Potential:
Maintain the current land uses
--> Robust regulation

Problem:
Recreational developers intend to privatize coastal scenery, and build hotel facilities.

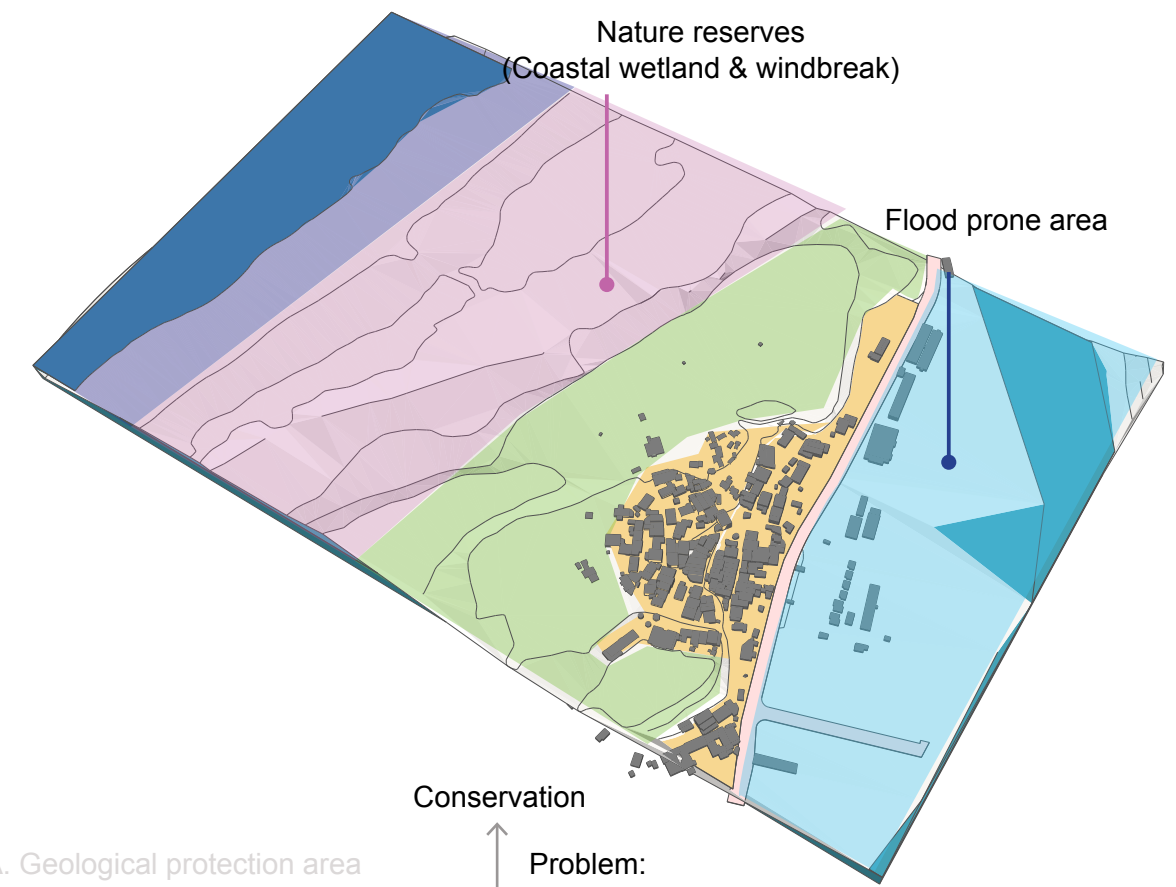
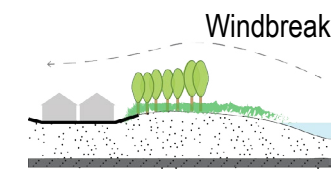
Potential:
Limited develop capacity
--> Robust regulation

- a. Residential zone
- b. Commercial
- c. Hotel
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School zone
- i. Park

Conservation
Avoiding risks
Grasping opportunities
Development



7



- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource
- L. Marine resource areas

Problem:

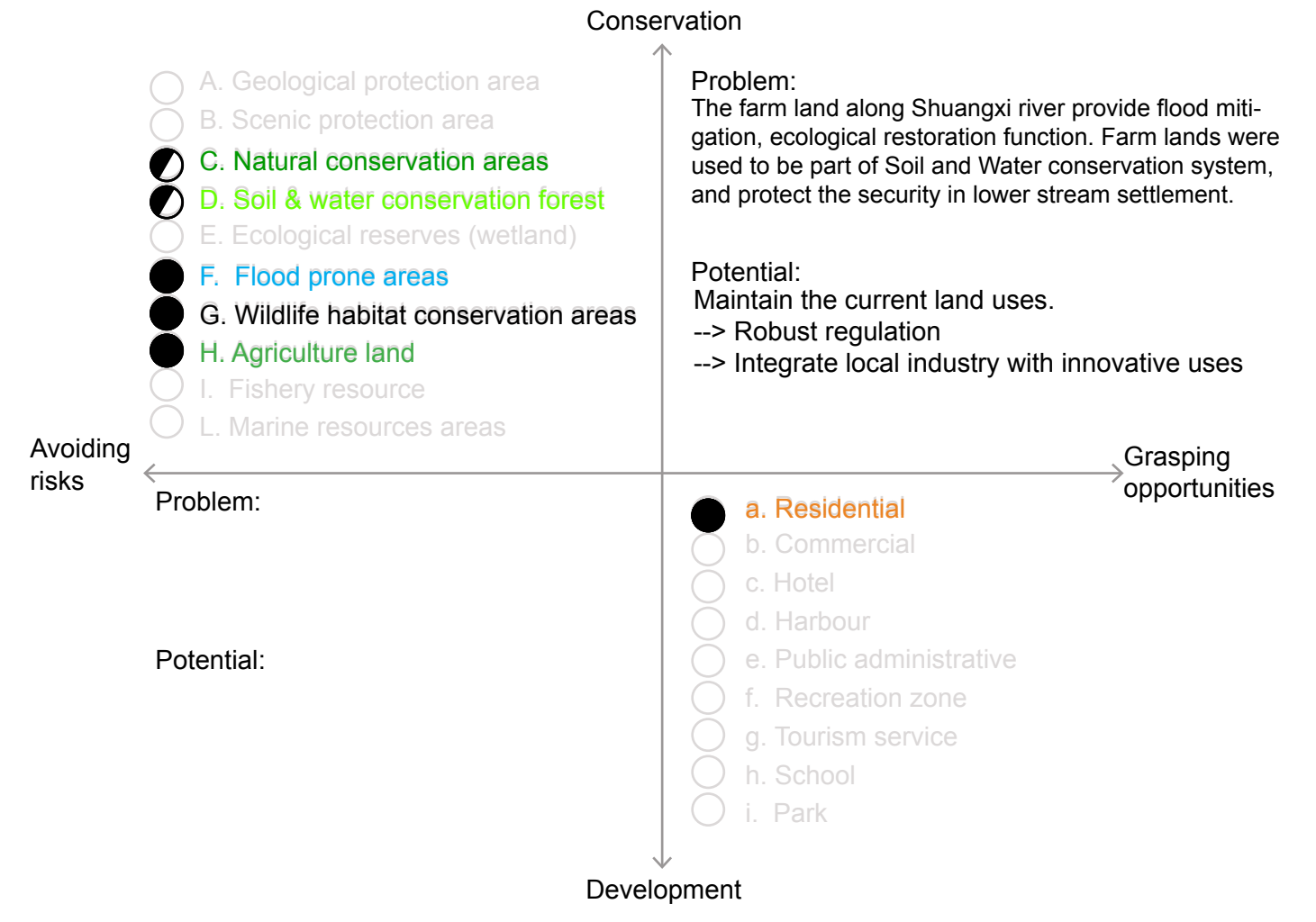
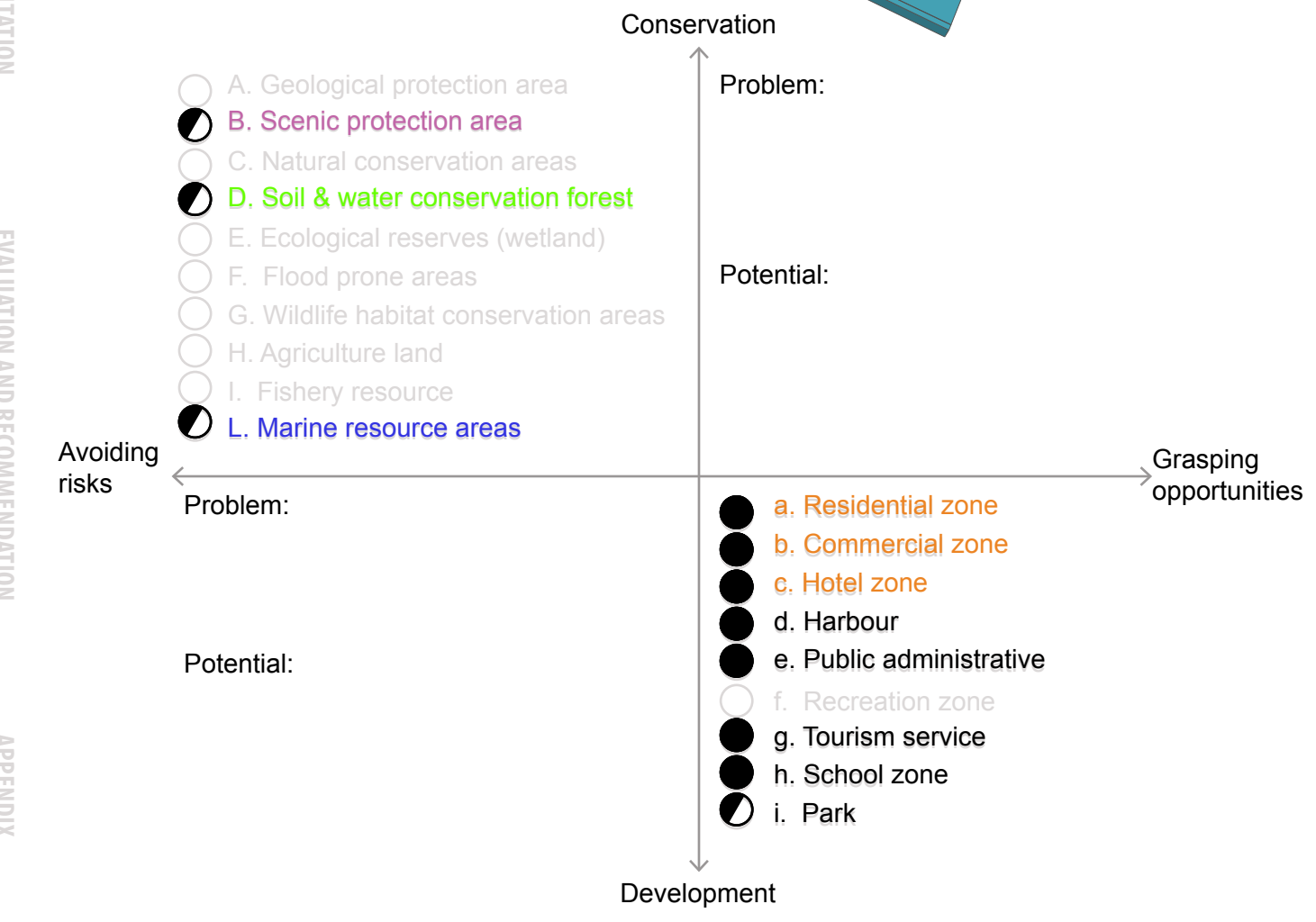
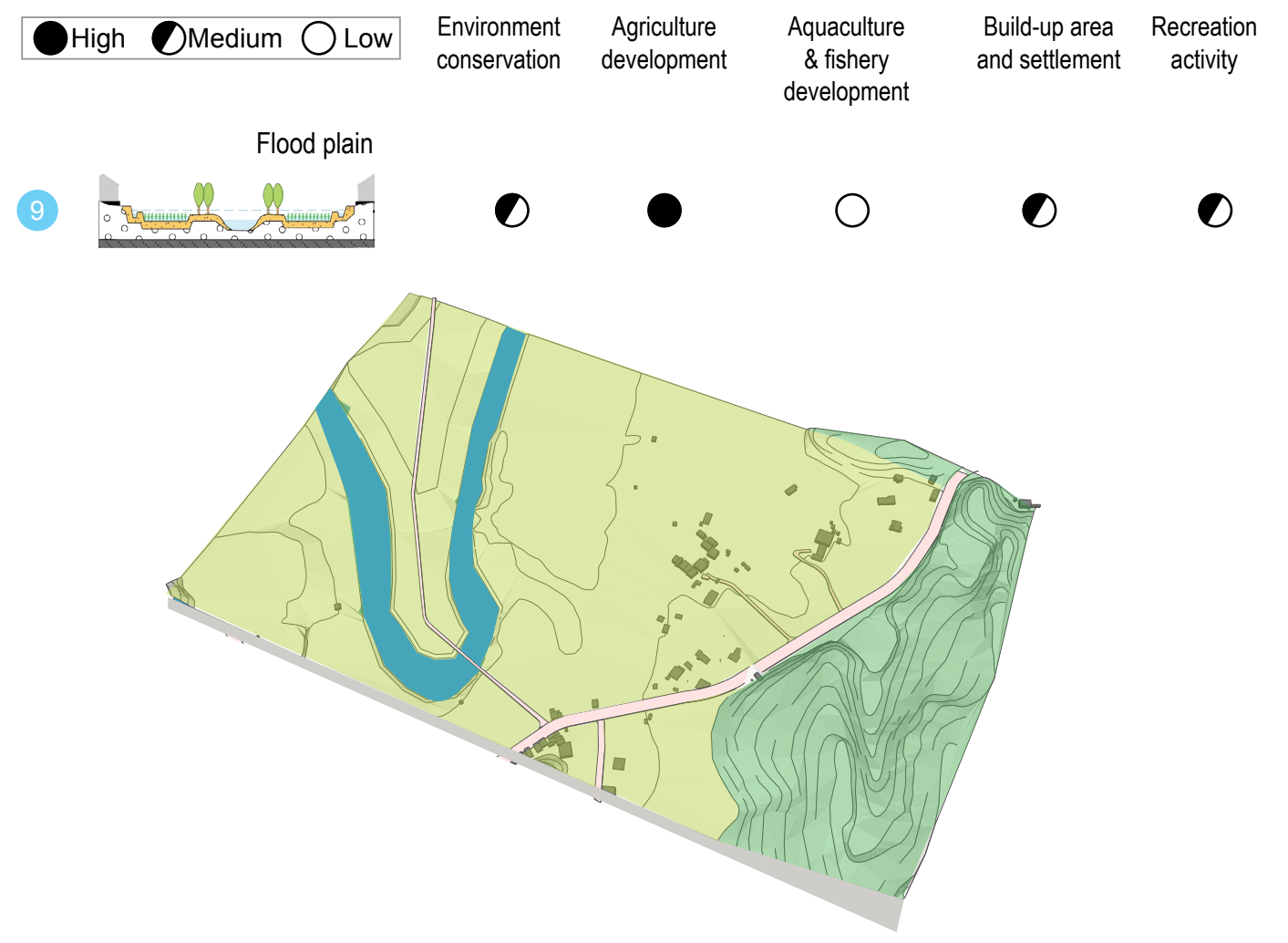
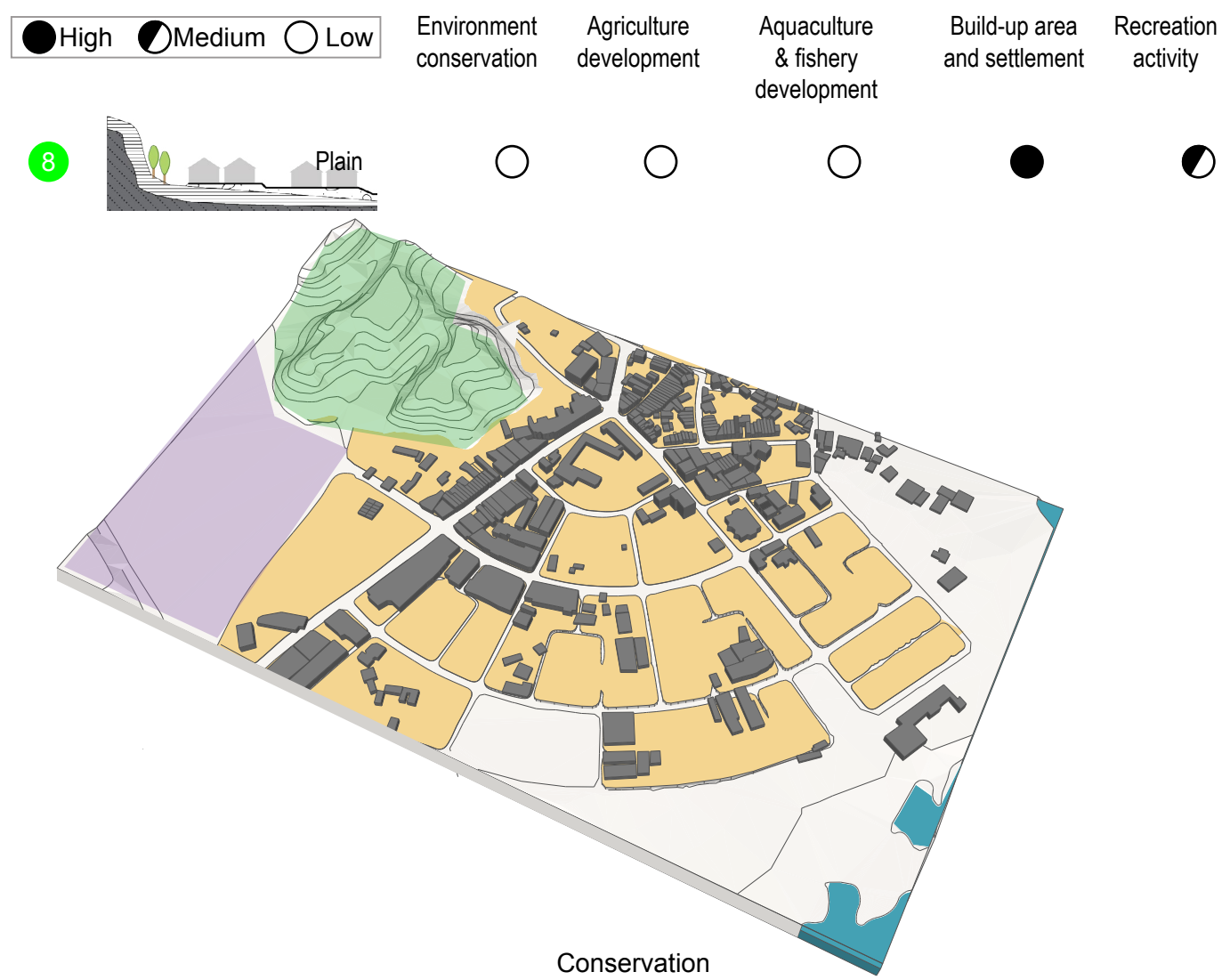
Potential:

Problem:

Potential:

- a. Residential zone
- b. Commercial zone
- c. Hotel zone
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School
- i. Park

Conservation
Avoiding risks
Grasping opportunities
Development



● High ● Medium ○ Low

Environment conservation

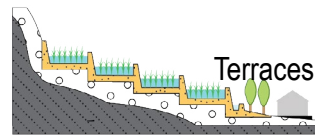
Agriculture development

Aquaculture & fishery development

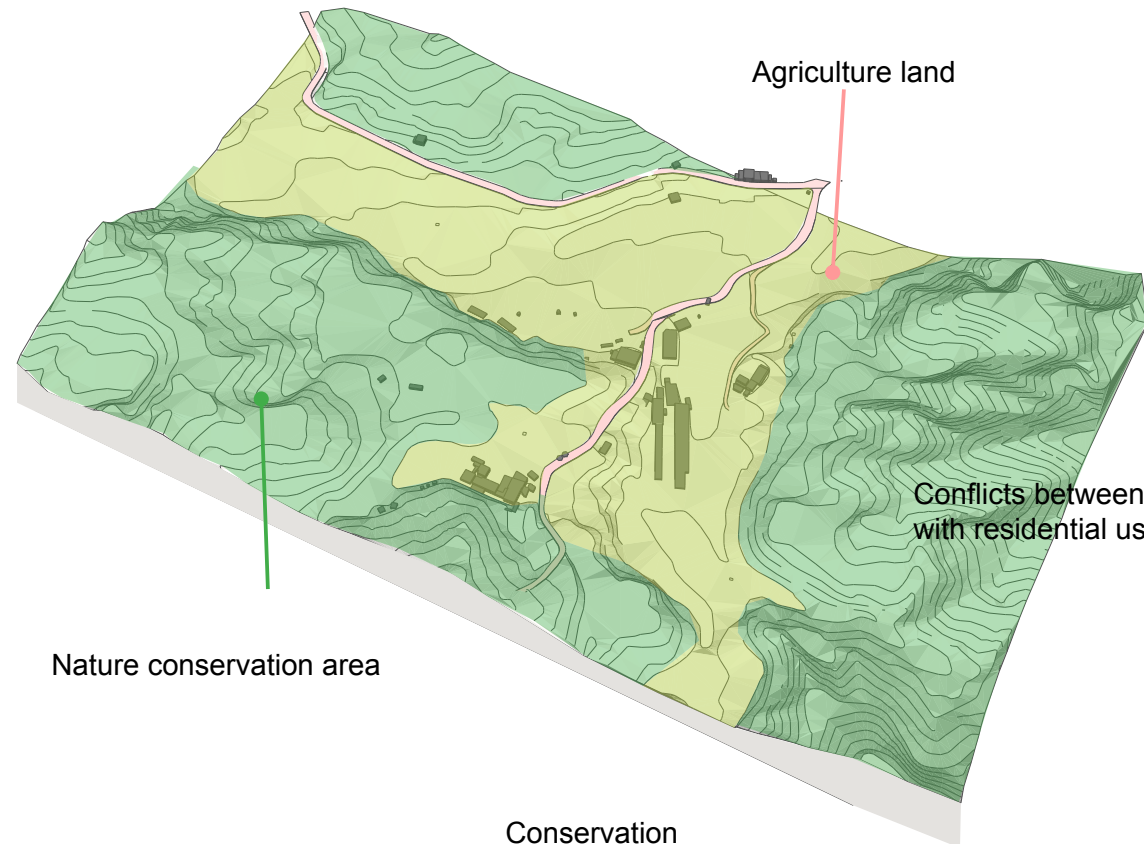
Build-up area and settlement

Recreation activity

10



Terraces



Agriculture land

Conflicts between scenic protection areas with residential uses.

Nature conservation area

Conservation

- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource
- L. Marine resource areas

Problem: The natural conservation area was delineated as restricted for development. The vegetation such as forest and grassland were provide function for soil and water conservation as well as ecological restoration. Farm lands were used to be part of Soil and Water conservation system.

Potential: Maintain the current land uses and improve scenic area environment quality by DEREGULATION CONDITIONS.

--> Flexible regulation
--> Integrate local industry with innovative uses

Problem:

● a. Residential

- b. Commercial
- c. Hotel
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School
- i. Park

Potential:

Development

● High ● Medium ○ Low

Environment conservation

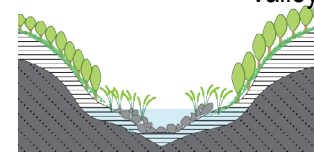
Agriculture development

Aquaculture & fishery development

Build-up area and settlement

Recreation activity

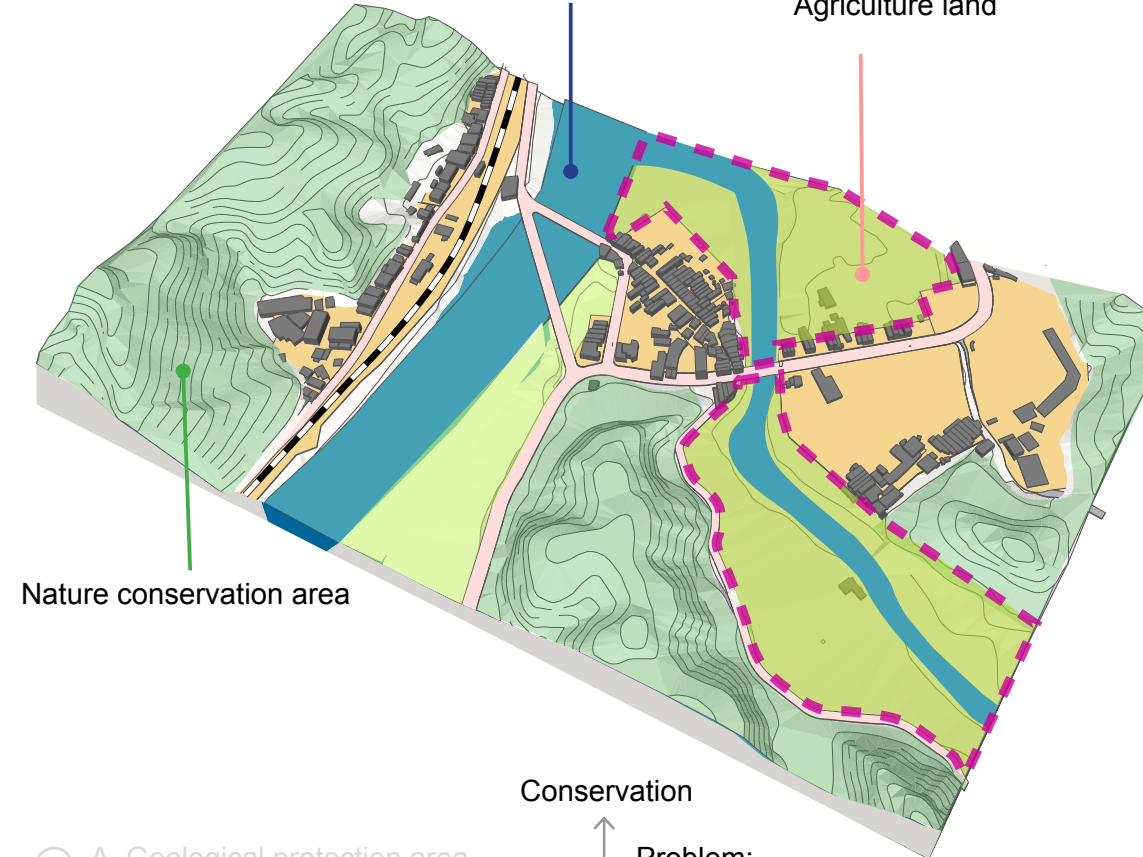
11



Valley

Flood prone area

Agriculture land



Nature conservation area

Conservation

- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource
- L. Marine resources areas

Problem: The settlements located along stream and mountain

Potential: Intensify the current land uses and improve natural conservation area environment quality by DEREGULATION CONDITIONS.

--> Flexible regulation
--> Further discussion need to be conduct.

Avoiding risks

Problem:

● a. Residential zone

- b. Commercial zone
- c. Hotel zone
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School zone
- i. Park

Potential: The new development need to achieve requirement for natural resource protection, soil and water conservation. The new development need to maintain the harmonious relationship with mountain and valley landscape.

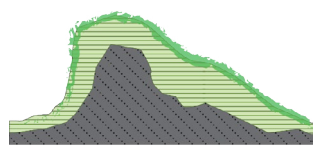
Development

● High ◐ Medium ○ Low

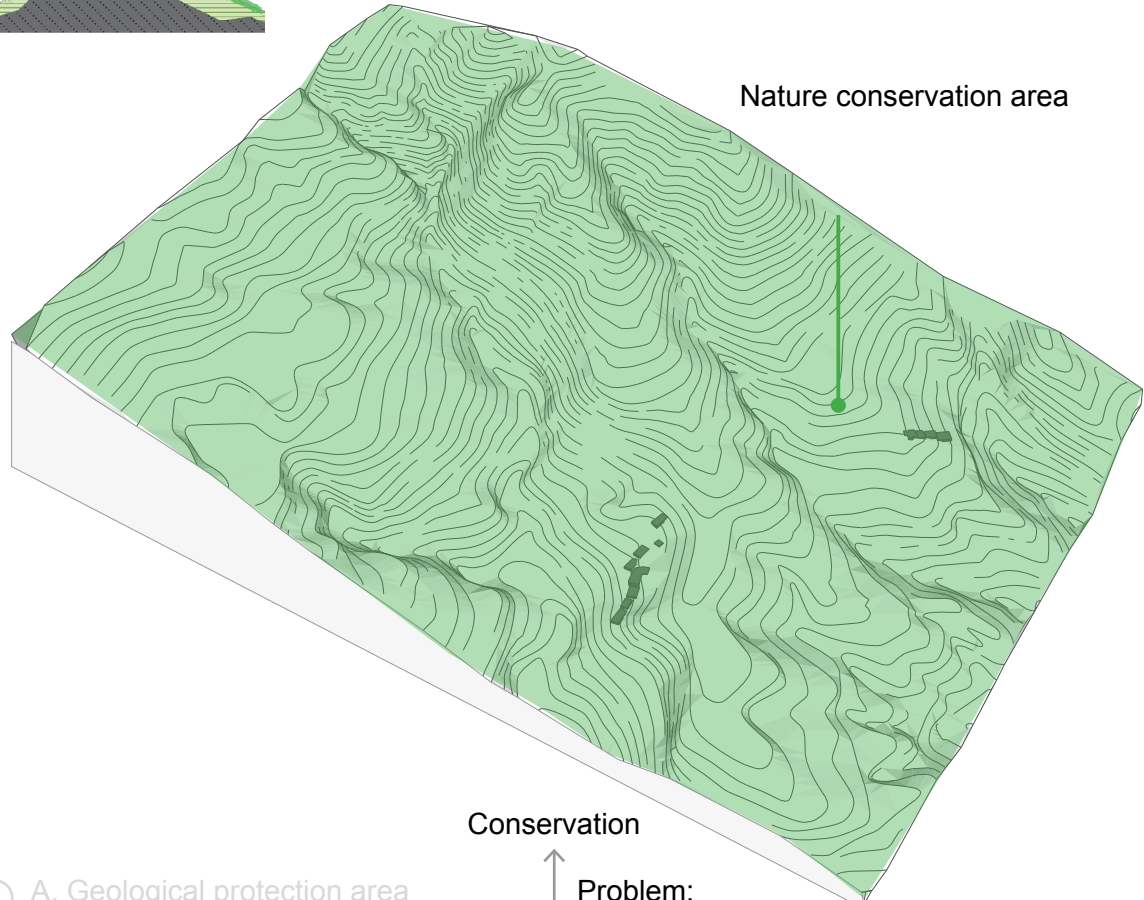
Environment conservation Agriculture development Aquaculture & fishery development Build-up area and settlement Recreation activity

Mountain ridge

12



● ○ ○ ○ ◐



Nature conservation area

Conservation

- A. Geological protection area
- B. Scenic protection area
- C. Natural conservation areas
- D. Soil & water conservation forest
- E. Ecological reserves (wetland)
- F. Flood prone areas
- G. Wildlife habitat conservation areas
- H. Agriculture land
- I. Fishery resource
- L. Marine resource areas

Problem:
 The natural conservation area was delineated as restricted for development. The vegetation such as forest and grassland were provide function for soil and water conservation as well as ecological restoration. Farm lands were used to be part of Soil and Water conservation system.

Potential:
 Maintain the current land uses.
 --> Robust regulation
 --> Integrate local industry with innovative uses

Avoiding risks

Grasping opportunities

Problem:
 Recreational developers intend to privatize forestry scenery and build hotel facilities.

Potential:
 Limited develop capacity
 --> Robust regulation

- a. Residential
- b. Commercial
- c. Hotel
- d. Harbour
- e. Public administrative
- f. Recreation zone
- g. Tourism service
- h. School
- i. Park

Development