SUB — URBAN. REINVENTING THE PERI-URBAN VILLAGE

ESTABLISH COORDINATING URBAN-RURAL DEVELOPMENT THROUGH VILLAGE TRANSFORMATION

SUB-URBAN.
REINVENTING THE PERI-URBAN VILLAGES

——Establishing coordinating urban-rural development through village transformation

Key concepts:
Peri-urban villages; rural industry convergence and agglomoration; knowledge economy

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P5 Report

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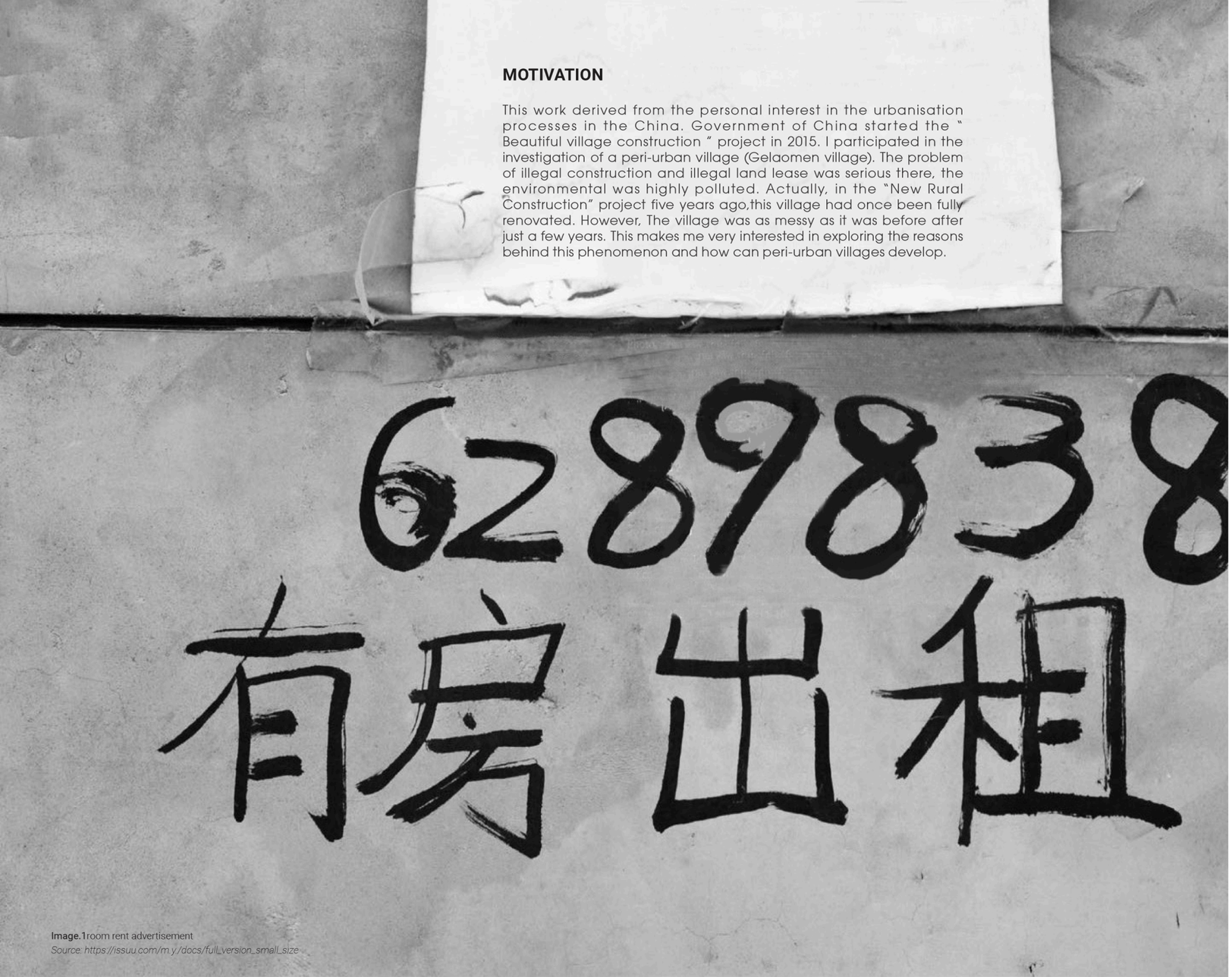

MOTIVATION

This work derived from the personal interest in the urbanisation processes in the China. Government of China started the " Beautiful village construction " project in 2015. I participated in the investigation of a peri-urban village (Gelaomen village). The problem of illegal construction and illegal land lease was serious there, the environmental was highly polluted. Actually, in the "New Rural Construction" project five years ago,this village had once been fully renovated. However, The village was as messy as it was before after just a few years. This makes me very interested in exploring the reasons behind this phenomenon and how can peri-urban villages develop.

Image.1room rent advertisement
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ABSTRACT

Two billion peasants stand at the entrance of industrial civilization, which is the main problem that the world raised to social science in the second half of the 20th century.

——Mendras Henri . La fin des paysans

Although the benefit of agglomeration has been hugely emphasized by the central government which led to the majority of amenities and services are only in cities and the household-registration system (Hukou) equipped the city with more advantages, the exclusively focus on "megacity-making" eventually leads tothe mega-city problems, environmental deterioration and the urban-rural disparity. In the 30 years since the reform and opening up, the rapid urbanization has brought many urban problems to China, such as the widening gap between urban and rural areas and the worsening environment.Urbanization is still in progress in China, with another 300 million people expected to become urban in the next decade.

Based on the studies of the Kunming peri-urban area, this project will analyze the competitive advantages and disadvantages of peri-urban agriculture development in Kunming, and reveals that the rural industry transformation is the development trend of peri-urban village reinvention from the perspective of realizaing the diversified agricultural values - economy, ecology and society values. This project will also discusse the spatial planning strategy of peri-urban villages under the guidance of industry agglomeration and knowledge economy, forms the benign growth boundary between urban and rural areas by constructing the multi-functional industrial-space system, and finally realizes the urban-rural coordinating development with different characteristics respectively.

KEY WORDS:
urbanization; peri-urban village; coordinating urban-rural development; industry agglomaration; industry convergence; knowledge economy

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1 INTRODUCTION

1.1INTRODUCTION

Image.1.1Land-lost farmers in cities

Since the reform and opening up, China has experienced a rapid increase in urbanization, from 19% to 59.19%, due to its long-standing "urban-industrial" developmentalism. Rapid urbanization and industrialization, on the one hand, lead to the emergence of urban problems, on the other hand, also lead to the widening gap between urban and rural development and the serious imbalance in the allocation of public resources between urban and rural areas, rural areas have long been in a weak position in the dual urban and rural structure , constantly being marginalized. Since the 1990s, the "three rural issues" have become one of the important themes in China's social development and rural research. Farmers' incomes are low, rural infrastructure is backward, and social order is chaotic. After entering the 21st century, the "three rural issues" further intensified. Breaking the urban-rural dual structure and integrating industry and agriculture, urban and rural areas as an organic whole is the basic way to solve the unbalanced development of urban and rural areas and the "three rural" problems in China.

The two-way flow of economic factors between urban and rural areas makes the peri-urban area become the gathering area of various economic factors and the coonnection of urban and rural areas. At the same time, as the frontier area of urban function transfer and rapid extension of spatial scope, it is also the most prominent area in the process of urbanization. It undertake the urban area function diffusion and accumulation of the rural resources as well, it is the frontier areas of urban spatial extension . It has a lot of development opportunities, but also is facing the most intense conflicts between urban and rural areas, inefficient economic mode, social structure problems, serious ecological damage so on, it is the most prominent problem area in the process of urbanization in China.

Taking the peri-urban villages as the research object, exploring the scientific transformation of the peri-urban villages has great significance to change the dual urban-rural structure and realize the integration development of urban and rural.

1.2.CONTEXT

1.Rapid urbanization of China

Since the founding of China, China's urban population and the number of cities have been growing, the urbanization rate has been gradually improved, especially after the reform and opening up in1978, China's urbanization process has been accelerated, entering a new stage of rapid urban expansion and rapid transformation of social and economic structure.

2.Industrilization and Market economy

The traditional agricultural society is gradually replaced by the city as the mainstay of modern industrial society. The trend of social modernization means the transformation from rural to urban social. In this process, labor is liberated, production is more efficient, total product is increased, It helps withe achieving pareto optimality, social welfare and social experience are also irreversible progress. But under the condition of market economy, labor capital flows into economic resources, land is converted into a virtual goods, capital and market positively will not consider the weak position of agriculture, instead, it take advantages of agriculture constitute and farmers' weak position to get maximum benefit. Farmers have become the disadvantaged group in modernization.

3.DUAL URBAN-RURAL SYSTEM

(1).Dual urban & rural household registration management system

The urban and rural population were completely separated through the agricultural Hukou registration system and the non-agricultural Hukou registration system.

(2).Dual urban and rural land management system

From the period of planned economy, China's law stipulates that urban land belongs to the state, rural land belongs to farmers community, the state for urban construction must pay for the requisitioned farm land.

(3).Dual urban and rural public administration system

Urban communities are managed by sub-district committees, the administrative expenses are borne by the government finance, while rural communities are managed by villagers' committees, which are organized by the villagers' autonomous organizations, and the villagers need to bear the administrative expenses themselves.

(4).Dual urban and rural social security system

The social security system does not cover rural areas, the social welfare security of rural residents mainly depends on farm land. The carriers of rural social security are mainly families and rural collective economic organizations.

2 PROBLEM FIELD AND TREND

2.1 PROBLEM FIELD

2.1.1
Rapid urbannization of China since 1978

Since the reform and opening up, the level of urbanization and industrialization in China has been rising rapidly.From 1949 to 1978, the number of Chinese cities increased from 132 to 193, from 1990 to 467, and from 2010 to 654. The urbanization rate also increased from 17.92% in 1978 to 26.94% in 1991, to 45.68% in 2008, and surpassed 50% in 2011. The UN's 2009 World Urbanization Outlook Amendment Report states that China has become the world's fastest urbanizing country in the past 30 years. The gap between urban and rural development is widening (*Chart1:coefficient of urban-rural dual structure*). On the one hand, it leads to the ever-evolving urban problems."Adventurous" urbanization has brought out-of-control space sprawl. Over the years of reform and opening up, China's urban construction land has experienced three large-scale expansions. *(Rao Chuankun et al., 2011; Wang Family and others, 2010; Lu Dadao, 2007)*. On the other hand, rural areas have been gradually marginalized.

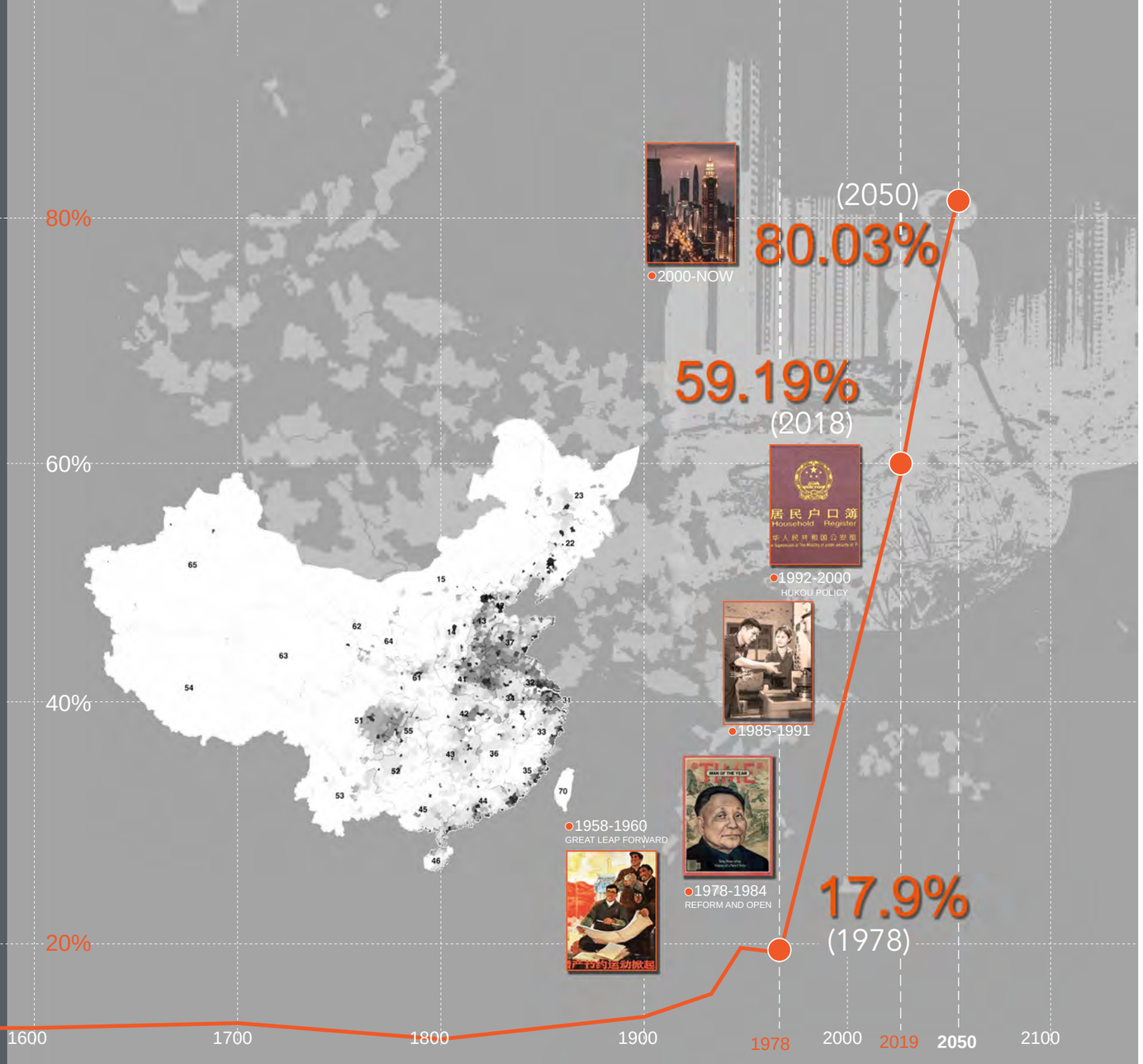

Fig. 2.1 Urbanization process of China from 1978

1.3.1Radical urbanization process

17.9% to **59.19%**

- **UK** 130 Years
- **US** 80 Years
- **10** million
- **40** Years

Since 2000, China’s average annual migration from rural to urban areas has exceeded 10 million.

- **3.63** million to **2.71** million
- **250** / Day

The basic village has been reduced from 3.63 million ten years ago to the current 2.71 million.Equivalent to disappearing at least one hundred basic villages per day on average

- ***What is the significance of the existence of numerous villages in China?***

80.03 %
more than 80 % of China's population will live in cities in 2050

300 million

At this rate of growth, after 30 years, there will be 300 million farmers lose their land and become new urban population. But as a developing agricultural country, it is impossible for China to provide so many job opportunity for these people in city in a short term.

Fig.3 Farmers lost land

2.3.2
long-term existence of “three rural issues” in China

Since the 1990s, the issue of "agriculture, rural areas and farmers" has become one of the important themes of Chinese rural research. The so-called "three rural" issue mainly refers to the development plight of farmers, agriculture and rural areas. From the perspective of farmers, the problem is manifested in the low income of rural residences. "hardness" in life, poverty and spiritual burden; from the perspective of agriculture, the problem lies in the low benifit of agriculture, and it is in a "dangerous" situation of being marginalized; from the perspective of the rural community, the problem lies in the backwardness of rural infrastructure and the rural life quality. What ’ s more serious than poverty is that this kind of performance reflects the Chinese rural and peasants are facing unprecedented challenges, and villages are constantly being drawn into the trend of marketization, urbanization, and globalization. No one can see a positive future. Therefore, on the one hand, more and more people left the countryside, the villages became empty, the ecological environment continued to deteriorate, and they were on the verge of decline; on the other hand, the remaining villages were generally in chaos. The social structure is facing a crisis of disorder. After entering the 21st century, the problems of agriculture, rural areas, and farmers have further intensified, manifested by the increase in agriculture from the original. Issues such as food security, rural development, and the low farmers' income have been transformed into the "three rural issues" —the protection of farmers' rights, sustainable rural stability, and agro-ecological security. Like other developed countries, China in modern times has also adopted modernization methods without exception. To use the mordenization, urbanization and industrilization way to solve the problem of "agriculture, rural areas and farmers" simply and recklessly.

Especially since the reform and opening up, the development goal of government-led urbanization is to reduce farmers and rural areas. The methods adopted include the indirect marginalization of rural areas and the direct elimination of villages. This simple approach of urbanization has severely affected both rural and urban society. First, while the rate of urbanization is accelerating, urban problems are emerging. Including diseases in large cities (difficulties in transport, medical care and school education, traffic congestion, etc.), floating population issues (employment housing, education, management of migrant workers , etc.), agricultural food safety issues (agricultural safety, agricultural product quality), etc.; As farmers and rural areas continue to decline and decay, villages are gradually included in the "dissolution" development way. In the prediction of this development prospect, the local government's willing to supply rural with public goods is seriously insufficient, rural economic production activities are on the verge of decline, and rural society is marginalized.

From 2000, the Central Government's "Document No. 1" on the issue of "agriculture, rural areas, and farmers" shows that the goverment has begun to respond to rural issues at a political level and re-examine the significance of rural development. *Building new socialist villages* published by the State Council in 2005 is the government's formal response to the "three rural" issues and rural future. The significance is that, on the political level, taking the rural area as the basic content of state governance, giving a clearer future direction to the rural development ; on the social development level, trying to promote the self-development of rural society and establishing a positive interaction between the country and rural society. However, at the operational level, there is no clear explanation of what constitutes the new villages, how to establish a new village, and what kind of new villages should be built. The concept is ambiguous and the theoretical explanation is not clear enough. To solve this dilemma, it is necessary to clearly understand the mechanisms and paths of new rural construction, and these must be based on an overall consideration of the rural community and the urban.

Under the impact of the torrent of modernization, the traditional village community relying on the small-scale peasant economy has gradually been broken. Such a differentiation phenomenon has also achieved China's industrialization and modernization. This process is still ongoing. No one knows where it will end. "

This means that further research of rural development must clearly answer the following questions: 1. What is rural in Chinese context? What's the meaning of their existence? 2. If the existence of rural is necessary and meaningful, what is their future development orientation ? 3. At the policy level, what kind of explanation and guarantee should the goverment give to the rural future?

Coefficient of urban-rural dual structure

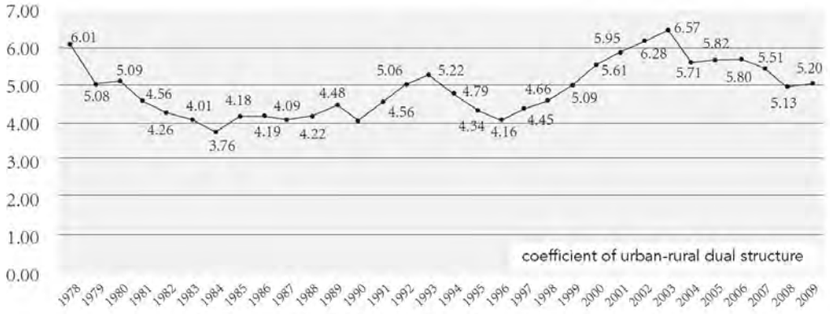

Figure.2.2 Source: Relevant data compilation calculation of China Statistical Yearbook 2010
Urban-rural dual structure coefficient = (total output of secondary and tertiary industries / number of laborers in secondary and tertiary industries) / (total output value of primary industry / number of laborers in primary industry)

Chart 2. income gap between urban - rural residence

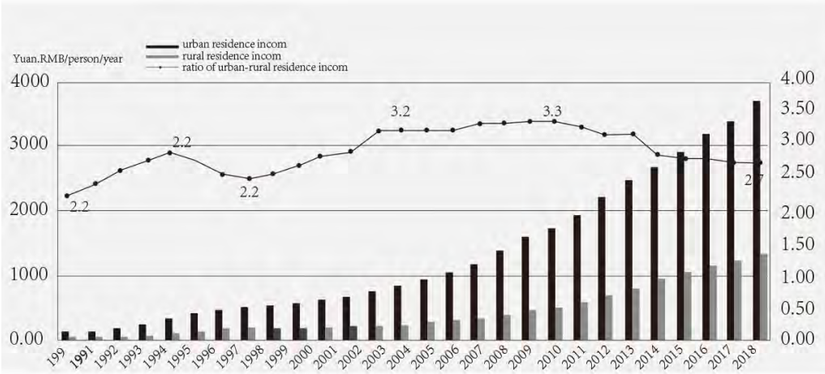

Figure.2.3 Source: Relevant data compilation calculation of China Statistical Yearbook 2010
ratio of urban-rural residence incom = urban residence incom /rural residence incom

Image.2.2 leftover children and the olds

Image.2.3 land aquisition in urban village

Image.2.4 Rural social security problem

Image.2.5 vegetable growing on the grown

Non-benign urban-rural relationship

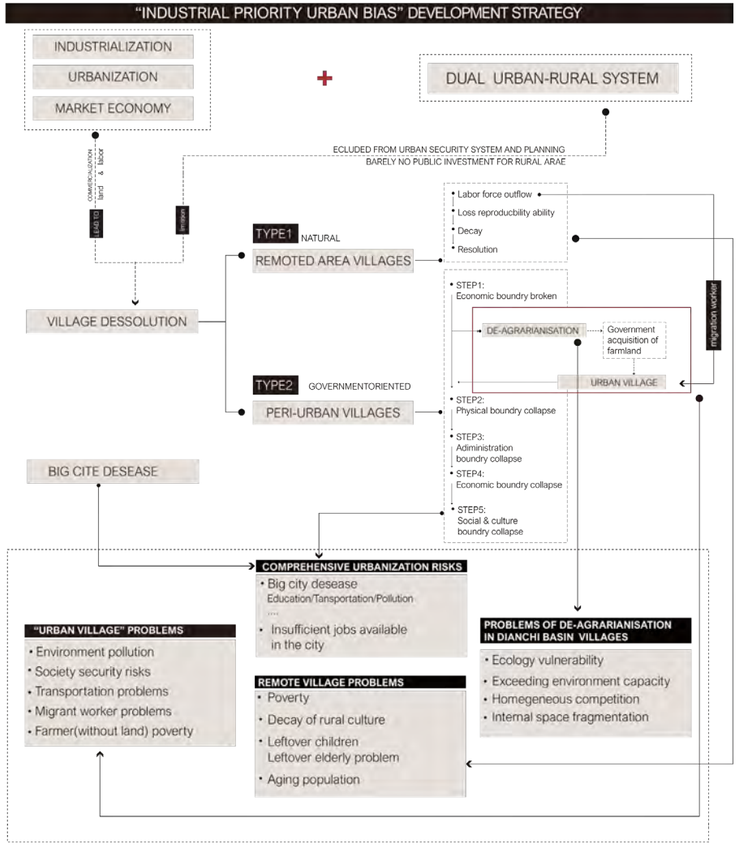

Figure.2.4 Non-benign urban-rural relationship

2.3.3
Coordinating urban - rural development model as the fundamental strategy of solving “three rural issues”

The core of the "three rural" problem is the difficulty of increasing farmers' income. The growing income gap between urban and rural residents has become a concentrated reflection of China's "three rural" issues at this stage. The gap between urban and rural areas is first manifested as the gap between urban and rural industrial development, which in turn has led to a gap in income between urban and rural residents. In 2010, China's GDP for the whole year was 3,979.8 billion RMB, increased by 10.3% over the previous year. Among them, the added value of the primary industry was 4,047.9 billion RMB, increased by 4.3%. The added value of the secondary industry was 18,864.8 billion RMB, increased by 12.2%. The added value of the tertiary industry was 17,100 billion RMB, increased by 9.5%. The growth rate of the primary industry is significantly lower than the growth rate of the secondary and tertiary industries.In 2010, the per capita net income of rural residents was 5,919 RMB, the actual increase in per capita disposable income of urban residents was 10.9% over the previous year . This is the first time since 1998 that the actual growth rate of rural residents's income has exceeded that of cities and towns, and the ratio of urban and rural residents' income has shrunk to 3.33: 1 , as shown in Chart 2. In addition, the disposable income of urban residents fails to cover the various in-kind subsidies. Taking social security benefits into account such as medical care, education, pension insurance, unemployment insurance, and minimum living allowances, the widen income gap between urban and rural residents could be even greater.

The World Bank (1998) argued in a report that these benefits should reach about 3/4 of the disposable income of urban residents. If adjusted according to World Bank estimates, the gap between urban and rural areas is close to 6: 1. The World Bank stated in the report that "data from 36 countries shows that it is extremely rare that the ratio of income between urban and rural areas exceeds 2: 1. In most countries, rural income is 2/3." It can be seen that the income gap between urban and rural residents in China is still hovering at a high level, far beyond a reasonable range.

The dual structure between agriculture-industrial and urban-rural exists universally in developing countries. The experience of developed countries shows that the transformation of urban-rural integration model is conducive to the progress of national economy and the realization of social justice. In order to fundamentally solve the three rural issues, it need to jump out of the traditional way of thinking. By integrating the rural economy into the national blueprint for market-oriented and socialized development, the urban and rural relationship can transfer from one-way supply to an coordinating development model with complementary advantages and mutual cooperation.

2.3.4
Rural industry transformation is an important foundation for Coordinating urban-rural development

The integration development of urban and rural areas refers to the dynamic development process in which, after the level of productivity reaches a certain height, the free flow of production factors, mutual cooperation, complementary advantages and interdependence between urban and rural areas, and the integration of urban and rural economy, society, culture and ecology become increasingly integrated and sustainable.

The connotation of urban-rural integration is very complicated, but it must be based on the continuous improvement of economic strength, and the national economy is an organic whole composed of different industrial sectors. Industry is the foundation, carrier, and driving force of economic development. The break of the organic connection between urban and rural industries will inevitably lead to the abnormal development or stagnation of the national economy, and will also bring a series of serious social problems. The rationality of urban and rural industrial structure determines whether a reasonable division of labor and cooperation can be formed between urban and rural areas, determines whether the urban and rural economy can develop harmoniously and healthily, and determines the progress of urban-rural integration.

The 17th National Congress of the Communist Party of China clearly stated that it is necessary to accelerate the formation of a new pattern of urban and rural integration economic and social development. The Third Plenary Session of the 17th CPC Central Committee clearly stated that it is necessary to coordinate urban and rural industrial development, optimize rural industrial structure, develop rural service industries and township and village enterprises, and guide the flow of urban capital, technology,talents, management and other production factors to the rural community. The outline of the Twelfth Five-Year Plan proposes that Promoting economic growth to rely on the first, second and third industries to promote the shift.

At present, China's urban and rural economicand social development is seriously unbalanced, and the income gap between urban and rural residents is increasing. The main source and most prominent manifestation is the irrational industrial and rural industrial structure and the uncoordinated development of urban and rural industries. First, the uneven development of urban and rural industries, the lagging development of the secondary and tertiary industries in rural areas, the weak infrastructure, and the low degree of agricultural industrialization and scale production have hindered the improvement of agricultural productivity. Second, the degree of connection between urban and rural industries is not high, employment connection between urban and rural areas are week, investment linkages between urban and rural industries are dysfunctional, and the role of the city in driving and radiating rural areas has not reached its full potential. Third, the urban and rural industrial structure is highly isomorphic. The problem of convergence between rural industry and urban industrial structure in terms of industry and product structure is serious. There is no reasonable industrial division of labor between urban and rural areas, resulting in low-level excessive competition between urban and rural industries in terms of factors and markets, which affects the optimal allocation of resource elements. With the optimization and upgrading of the industrial structure, the urban and rural industries are trapped in a vicious cycle of low isomorphism. The existence of these problems restricts the comprehensive, coordinated and sustainable development of urban and rural economy and society. Therefore, the advancement of the urban-rural integration process must be based on and motivated by urban-rural industrial cooperation. Only through urban-rural industrial cooperation can the urban and the countryside be fundamentally connected to achieve the integrated development and virtuous circle of urban-rural industries, promote the urbanization process, and promote the agricultural industry. It will provide a solid foundation and support for the formation of a new pattern of integration of urban and rural economic and social development.

2.2 TREND

2.1.1 Multiple values of peri-urban agriculture

(1)economic value

The economic value of agriculture refers to the "economic benefits of rural land to its owners or users" as a production space, which can be summarized as the value of land resources, the provision of local food and the solution of local employment. The economic value of peri-urban villages has two characteristics: one is that the economic value of peri-urban villages used for agricultural production and land lease is decreasing. For the peri-urban villages, the economic value of agricultural production in rural areas is closely related to its scarcity. With the saturation of agricultural products market and the emergence of surplus agricultural products, the opportunity cost of agricultural products production in peri-urban villages rises, and the economic value of rural land for agricultural products production begins to decline. The second is that the economic value of rural land in the peri-urban villages is rising after it is converted to non-agricultural land, but the cost of land acquisition for farmers is limited. The city development strong demand for land, and the land supply is limited, therefore, the city's land on the land market price has risen perpendicularly. In terms of the economic value of rural land, the economic value of agricultural production decreases with the development of cities, while the potential economic value of non-agricultural production increases.

(2)ecological value

From the ecological point of view, rural farmland, farmland, water system and forest are of ecological value, having the ecological utility of flood control, water conservation, soil erosion prevention, soil purification, rural landscape and air purification. With the improvement of urbanization, the city begins to benefit from these functions, and the countryside has the ecological value of serving the city by providing these functions. Other functions that were not obvious at first have been greatly developed in recent years with the urbanization process, such as purification and landscape functions. The city is expanding day by day, the traffic is increasingly crowded, the shortage of industrial and commercial land leads to the shortage of green and public space. As an open system, a city cannot realize a virtuous ecological cycle by itself, and it needs to continuously draw material and energy from the outside world. The existence and development ofperi-urban villagea can make up for the deficiencies of the city and provide an ecological balance for the city. The higher the level of urban development, the higher the ecological value beyond the traditional economic functions mentioned above will be, and agriculture and rural areas will go beyond the traditional definition that the production of agricultural products is the only task in the general concept.

(3)social values

The relationship between rural areas and cities is complementary. The development of rural areas can provide landscape and space different from that of cities, make up for the shortage of urban development, provide different public and open space, and provide places for people to get close to nature and experience rural life. In the process of exchanges between urban and rural residents, create local employment opportunities for farmers, provide a wide variety of employment space, such as agriculture, commerce, tourism, catering and other service industries, attract returnees, protect social stability and diversity, and spontaneously supplement the village public facilities;Maintain and continue local customs and regional culture, the coexistence of diverse cultures, stimulate the vitality of the community.

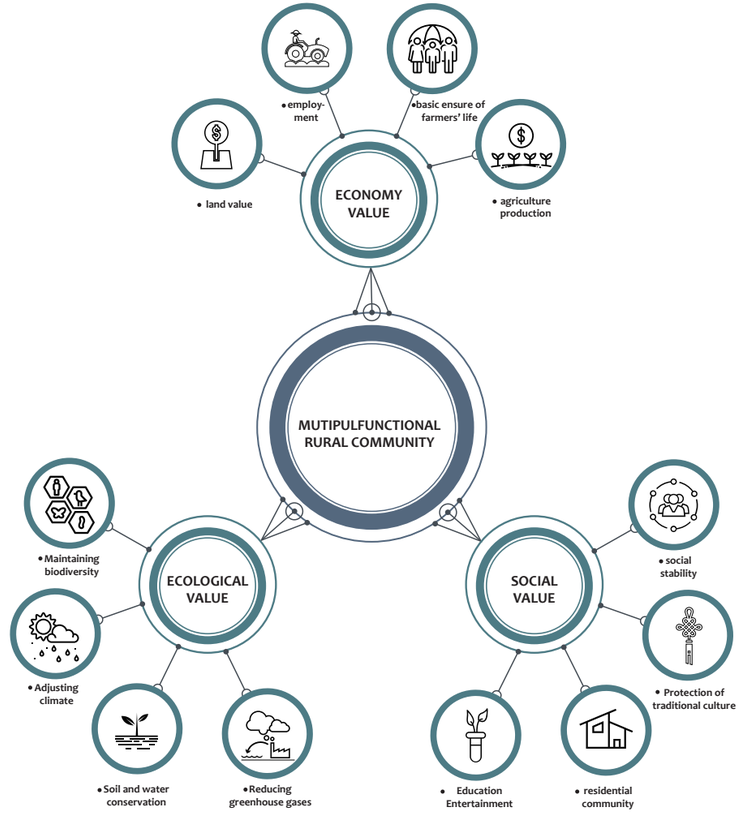

Figure 2.5 multipule function of peri-urban agriculture

SODA Osamu-Philosophy of Agricultural Science□Year 2000 Agriculture refers to the broad concept of agriculture, which consists of agriculture, rural areas and land, not only the agriculture with industrial nature

2.2.2 The return of agricultural value in the period of ecological civilization

Under the impact of modernization, the traditional village community based on small-scale peasant economy gradually collapse. But such differentiation also contributed to the modernization. This process is still in progress, "We don't even know where this great change will end." Do China's numerous villages still have significance of existing? If so, how to reverse their weak position? In what form should they exist?

Throughout the development of human society, the value of agriculture changes with the development of social economy.The emergence of human civilization is marked by agriculture. In the long history, agriculture has been an important factor to maintain social stability. After the industrial revolution, the world entered the era of industrial civilization. With the improvement of production technology and the rapid growth of the world's population, the production value of agriculture was mentioned as the first place. However, due to the excessive application of pesticides and fertilizers, agriculture became the main source of non-point source pollution in the world. During the period of ecological civilization, the decline of the countryside, food safety and ecological pollution made people re-aware of the essence of agriculture, which has multiple values in addition to production. In 1988, in the "The future of rural society", the European Union proposed the theory of multifunctional agriculture, pointing out that in addition to production functions of agriculture, social, cultural and ecological non-commodity functions are particularly important. Japanese scholar Osamu(2003) summarized agricultural and rural functions including economic functions, ecological environment functions, and social and cultural functions in Philosophy of Agricultural Science, and pointed out that as "production space", "ecological environment space" and "living space", rural areas should pursue the realization of comprehensive value.

The superposition and interweaving of economic, ecological, and social values generate comprehensive agricultural values. These values are generated on the basis of agriculture and are realized in the process of transforming traditional agriculture to modern agriculture and production functions to service functions.Under the background of the development of ecological civilization, modern agriculture has been given the responsibility of increasing farmers' employment and promoting the exchange of urban and rural economic factors!. As a well-functioning ecosystem, the modern countryside can provide a space different from that of the city and give play to the significance of the countryside as the home of human spirit.

THE CONSTITUTION AND CHANGE TREND OF **ECONOMIC VALUE**

FUNCTION	BENEFITE	VALUE CHARACTERISTICS	TREND
Agricultural production	agricultural income	The price scissors between industry and agriculture causes the low agricultural output value	The market price of land is rising, but the value of production used for agricultural products is decreasing
Land is leased or used for rural industry	rent income	Limited dividend benefit	
Urbanization use	compensation for land acquisition	Below the market price of land, farmers' capital are losing	

THE CONSTITUTION AND CHANGE TREND OF **ECOLOGY VALUE**

FUNCTION	VALUE CHARACTERISTICS	TREND
The value of maintaining and repairing the urban ecology in suburban areas	To make up for the increasingly scarce green space in urban development	The more developed the city, the more obvious the ecological function of the countryside and the higher the ecological value
Rural landscape	In the process of urban development, the rarer the rural landscape, the higher the value	
Water and soil protection, ecological conservation	The barrier between city and nature	

THE CONSTITUTION AND CHANGE TREND OF **SOCIAL VALUE**

FUNCTION	VALUE CHARACTERISTICS	TREND
Value of social stability	The basic guarantee of farmers' employ-ment and food safety	The higher the degree of urban development, the higher the social stability, spiritual sustenance and traditional cultural value of the rural
Spiritual sustenance value	Kinship , Idyllic life ideal	
culture value	Diversity, natural harmony culture	

Figure.2.6 The consititution and change trend of peri-urban agriculture

3 METHODOLOGY

3.1 CONSTRAIN AND OPPORTUNITIES

3.1.1 The constraint of dual urban-rural structure on the development of peri-urban villages

The dual urban-rural structure system has seriously restricted the development of peri-urban village, farmers and agriculture. Although the peri-urban villages are geographically close to the urban and its industry is greatly influenced by the urban, the collective-owned land system determine that the industry type on the agricultural land can only mainly be agriculture. At present, the economic benefit of agriculture is low, farmers' income cannot be guaranteed if they only rely on agriculture. In addition, farmers are not covered by the state's social security system, so they cannot enjoy the welfare guarantees provided by the state like the basic living subsidies, public health care,etc. The rural social security are mainly families and rural collective economic organizations. Accompanying it is a dual public investment and management system, the management costs of urban communities are borne by the government finances, but peri-urban villages are not included in the unified urban planning and management. There is barely no government's public investment, villagers need to bear the management costs and public goods supply. The distribution of public resources is seriously uneven.

3.1.2 Opportunities and Challenges faced by the peri-urban villages in the process of rapid Urbanization

On the other hand, urbanization is impacting the peri-urban villages with great leading advantages. As the peri-urban villages are located on the buffer zone of urban growth, they have unique economic structure, social structure, convenient geographical location and transportation facilities, and relatively complete infrastructure facilities. The two-way flow of factors between urban and rural areas makes peri-urban villages inevitably subject to the impact of complex economic activities. Faced with a large number of migrant workers in the city, driven by a large gap in low-cost urban housing and economic benefits, villagers have chosen to build low-cost housing for rent, or illegally occupy agricultural land as garbage dumps or rent them to polluting industries to get economic benefits. The peri-urban villages have gradually become settlements for low-income migrant workers, storage areas for urban waste and gathering place for polluting industries. The internal structure of the village is usually chaotic, with high building density, serious violations of regulations, natural environment being constantly occupied, the villagers' living environment is harsh.

Problem analysis diagram

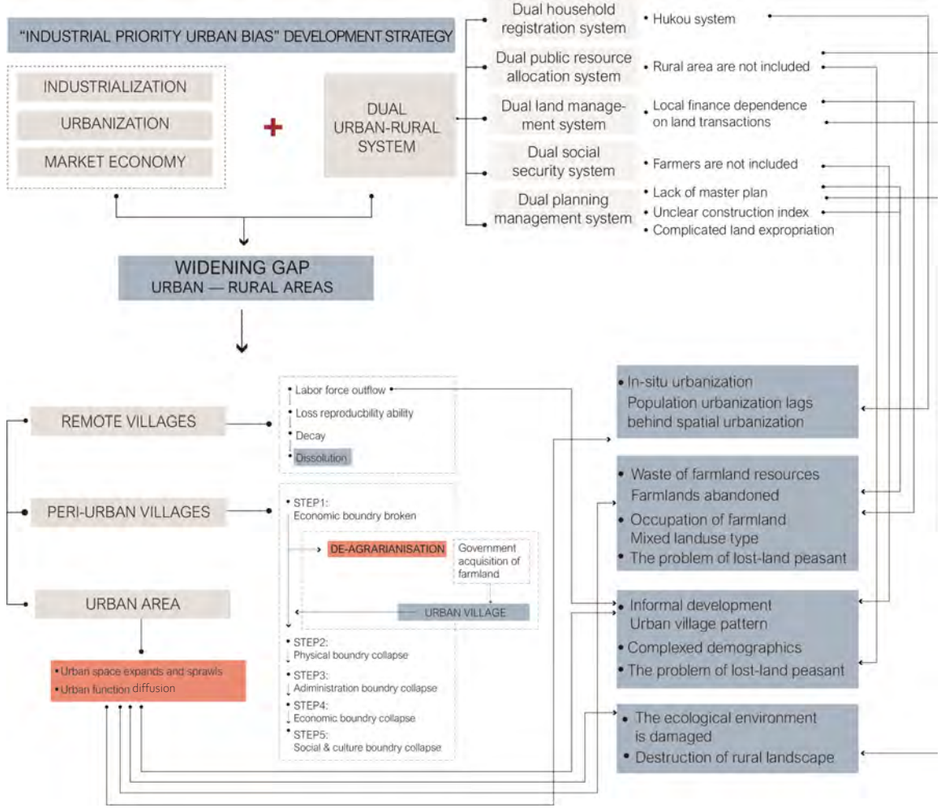

Figure 3.1 problem analysis diagram

3.2 PROBLEM STATEMENT

3.1.1
Overview problems of peri-urban villages

The side effects of urban-rural dual structure and the "diffusion effect" & "polarization effect" of the city central on the peri-urban villages

Under the wrestle between stimulation of **rapid urbanization** and the constrain of **dual urban-rural system**, the peri-urban villages are in the areas with the most drastic changes of economic factors, the most **disordered land use** and the **weakest community governance**. Strong **conflicts** have formed between economic and social justice, short-term and long-term benefits, urban development and rural protection. The development of peri-urban villages is facing a series of problems that need to be solved:

① **Lack of master planning, economic and social development is in a relatively disordered state:** peri-urban villages are not within the scope of urban master planning. Due to the direct impact of urban development, land use is disorder and constantly changing, land use efficiency is low, functions are fuzzy;

② Problem of convergence with the urban **industrial structure:** in the long-term, it will cause obstacle of single economic structural and single function, reduce the sustainability of overall development.

③ The **social structure** is complicated, the **governance system** is weak: the peri-urban villages are the main settlements of the migrant population, the proportion of floating population is large. Coupled with its special geographical location, where the urban and rural governance systems are intertwined, the responsibilities are unclear, peri-urban villages often become vague area in social governance.

④ The invasion of urban construction and lifestyles has made the village gradually **lose it's traditional rural characteristics**. The rural community network originally composed of kinship, geography, and clans suffered from disintegration. The village's intangible cultural heritage facing the risk of decay.

3.1.2
Problem statement

Peri-urban villages are experiencing economic prosperity under the **"diffusion effect"** of city center, at the same time , they also bear the constraint of the **"polarization effect"**. The "polarization effect" of the city center is a resistance to the social and economic development of the urban periphery. The strong pulling power of city center has caused **labor and capital to flow out** of the rural area.

The homogeneity of urban industry diffussion resulted in the **single industrial structure** of the peri-urban villages and **low level of rural industry technology**. With the large number of **polluting industries** moving from urban to urban periphery, the **deterioration of the ecological environment** in peri-urban villages is particularly prominent, and the **ecological capital is devalued** seriously. Due to the lack of scientific and standardized planning and corresponding governance systems, on one hand,rural land cannot be effectively integrated, which leads to a **decline in land use efficiency and benefits**. On another hand, as a major gathering place for immigrant populations, **social security problems** have long existed in many peri-urban villages.

Per-urban villages in Kunming are faced with the pressure of industrial upgrading and the severe challenge of protecting the ecological environment during development.

3.3.RESEARCH AIMS

Based on the theory of urban diffusion effect and industrial integration, this project aims to establish the sustainable development pattern of peri-urban villages by exploring the mechanism and path of rural industry upgrading and knowledge economy, in order to improve the level of rural economic development and the living environment, reduce the adverse effects of urban polarization effect effectively.

In the new trend of agricultural development, re-examining the value and significance of peri-urban villages under the guidance of mutipulfunctional agriculture; promote a extension research on the spatial development pattern, future development, functional orientation and the relationship between various elements of peri-urban villages.

Providing a new way of thinking for solving the"Three rural issues"that have existed for a long time in China. By redefining the role and function of peri-urban villages so that they are no longer be the subsidiary of the urban area but an indispensable part in the modern industrial system.

On the one hand, they can take the role in sharing urban pressure, on the other hand, it gives full play to its function of ecological protection, food security and economic value, to achieve the goal of promoting integrated development of urban and rural areas.

3.4. RESEARCH QUESTION

Difinition
- What is the potential of peri-urban region?

Evaluation
- What are the new values of peri-urban region should be reactivated through the intervention?

Aim

Difinition
- What is the connotation of peri-urban region?

Evaluation
- What is the current situation of peri-urban region of Kunming?
- What are potential and weakness of peri-urban region of Kunming?

where

How to reinvent **peri-urban region** in Dianchi Basin by promoting **industrial upgrading** and **knowledge economy** in order to achieve the **coordinating urban-rural development ?**

Blueprint

Difinition
- What is the connotation of coordinating urban-rural development?
- What are the causes of the imbalance between urban and rural areas in Kunming?
- What new role should the village play in the coordinating urban-rural model?

How

Difinition
- What is the connotation of knowledge economy and industry upgrading?

Evaluation
- What is the basis of knowledge economy development of peri-urban region in Dianchi basin?

Design/Integration
- How does the agriculture sector responds to the knowledge economy and industry upgrading?

3.5. BASIC RESEARCH SCALE

(1)CHOOSE “VILLAGE” ADN "TOWHSHIP" AS THE BASIC RESEARCH SCALES

Village is the most basic administrative unit in China (tablet1.). The population, land and culture of rural areas are associated with villages. Villages have always been the most important basic community in China, agriculture mainly takes place on the farmland belonging to the village; The culture of the village has the most shareable and bonding function for the villagers. Secondly, it is a long process to transfer a large number of people to urban, therefore, villages will continue to exist and play an important role in organizing life and production of rural residences.

The reinvention of peri-urban villages is the trigger of realizing the coordinating development of urban and rural areas. On one hand, it is conducive to the urban industrial upgrading, on the other hand, it can accelerate the process of rural industrialization. Peri-urban area is the joint of urban and rural, industrial and agricultural, and primary,secondary, and tertiary industries, because it is located in the connection between urban and rural areas and has the dual attributes of both. There is huge potential to become a link to the extension of urban functions to rural area, a carrier for the accumulation of rural resources, and a platform for absorbing surplus rural labor force.

Promoting the reinvention of peri-urban villages can promote the convection of urban and rural economic factors like population, land, capital, technology, information; strengthen urban-rural spatial linkages; optimize the allocation of resources of urban-rural area; rationally allocate the urban and rural population distribution and achieve urban-rural population integration; adjust the economic structure and solve rural employment and social security problem. Therefore, by redefining the role and function of village, the village reinventioncan enable the peri-urban village no longer be the subsidiary of the urban area, but an independent role in the modern industrial division of labor system, become an indispensable part of the urban-rural continuum.industrialization, and urbanization.

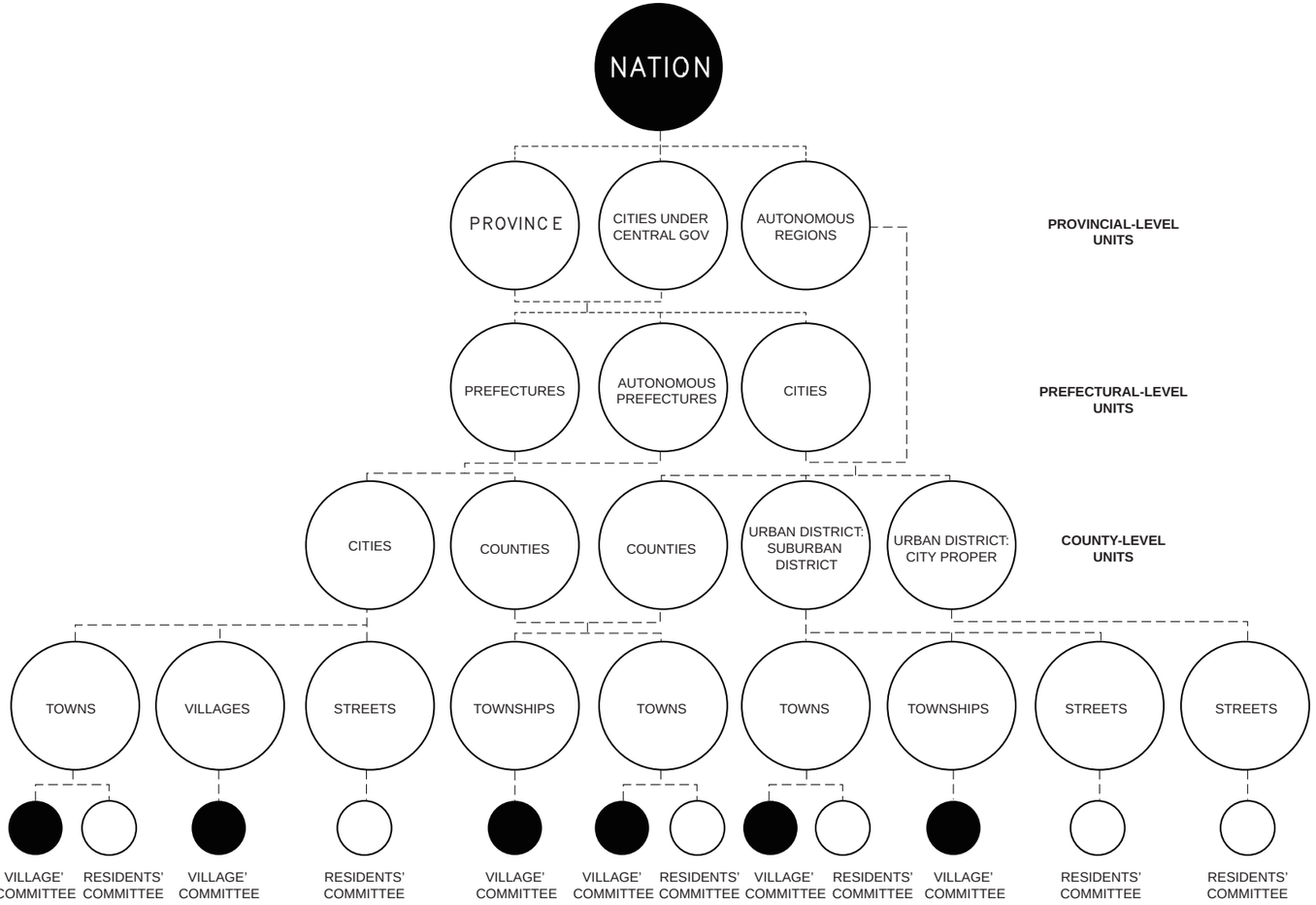

Figure 3.2 Administration hierarchy structure of China

3.6.METHODOLOGY FRAMEWORK

METHODOLOGY

The overall methodology framework is shown below. This framework shows the main logic line: start from motivation, problem context, analysis and statement to research questions. Based on research questions and above problem statement, I come up with my conceptual framework, and use various methods approaches to answer the research questions and propose the expected research outcomes.

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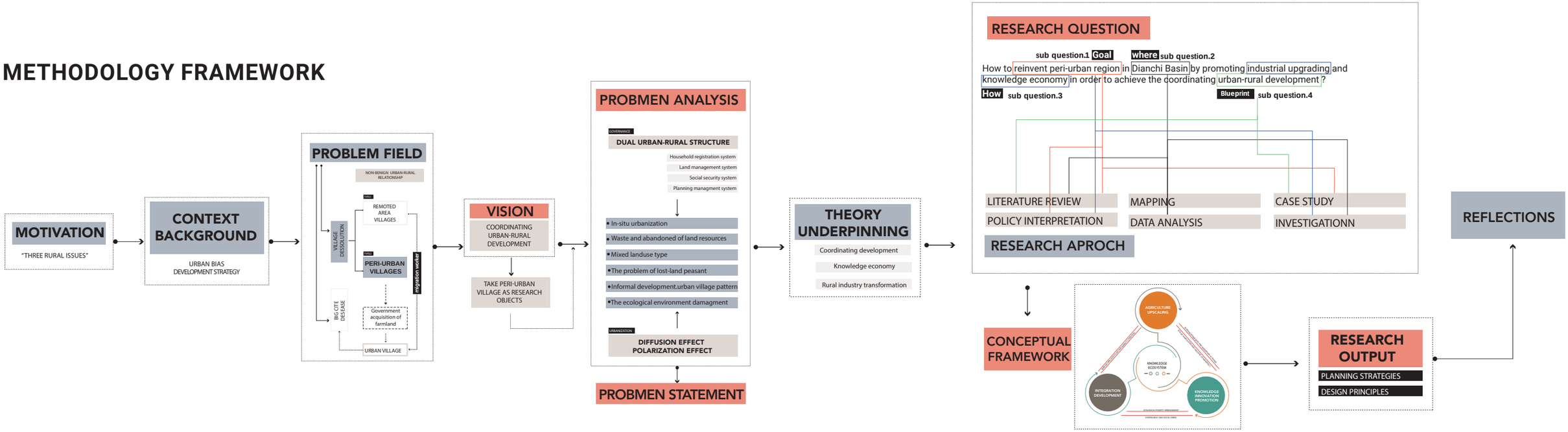

Figure 3.3 Methodology framwork

3.7. THEORY UNDERPINNING

3.7.1. MODELS OF THE PERI-URBAN INTERFACE

(1)Growth pole theory and uneven development

● Urban bias strategy

Urban bias is a common approach adopted by the government of many developing countries, so as China. Urban bias implies the transfer of economic resourcesinvestment and growth in the rural sector, price controls, and politicalrepression (Lipton, 1977). Across the developing world, governments extractresources from agricultural producers, and such neglect of agriculturaldevelopment is generally seen as one of the main obstacles to sustainabledevelopme as planned, spreads to ruralareas in a process of regional development (Rondinelli, 1985; Unwin, 1989). This process can be called the"polarization-diffusion effect". John Friedmann, Stuart Holland, and Gunnar Myrdal elaborated on Perroux and established the theoretical framework of uneven development inthe center-periphery relationship, which stresses that regional imbalancesbased on chronological gaps appear inherent in the integration processesDobrescua & Dobre, 2014). The center-periphery relationship explains thestructural relationship between the advanced or metropolitan"center"and aless developed "periphery, "either within a particular country, or between capitalist and developing societies.

● "Diffusion effect" and "polarization effect" of the urban center

In the 1950s, French economist, Francois Perroux developed the theory ofunbalanced growth sectors or regions, naming the theory as polarizeddevelopmenIt "or"growth pole, "Perroux (1950) argued that development is an unbalanced and hierarchical process. Only certain business units act as the engine of growth, and they are identified as economic poles of growth. Perroux assumed that governments of developing countries invest in capital-intensiveindustries in large urban centers or regional capitals, and this can in turninduce economic growth and welfare which, if goes

The theories of the growth pole and uneven development have beeenassociated with a centralized " top-down planning " system (Stohr , 1981) . Thesetheories were highly accepted by the centralized and " monolithic " system in most developed countries . For instance , since the establishment of thePeople's Republic of China , the central government has adopted an industrialization-oriented and urban-biase dinstitutional arrangement, and much less resources have been delivered to the rural area except during thecultural revolution when the state policy was diverted from urban areas to thecountryside , in part , due to the collective endeavor of communes (NolanWhite , 1984) . Nevertheless , the urban bias polices were readopted after thereform opening With the introduction of the tax sharing system reform in 1994local governments preference for urban bias policies was enhanced , leading toincreasing urban-rural income disparity and great social risks . Moreover ,experiences from Latin America and Africa have proved that the urban biasstrategy has found difficulty in achieving success . In contrast , it has maintainedor even increased inequality between urban and rural areas , especially since theexpected " trickle down effects " have been replaced instead by adversebackwash effects , " resulting in a rural-urban conceptual dichotomy (Unwin ,1989)

Policies formulated from this optimistic conception emphasize the role of thecity, industrial orientation, and the development of capital-intensive and highech industries, showing the theory has an obvious urban bias. Due to the urgentpursuit of economic growth in developing countries, although some authorsshow evidence demonstrating its lack of success, growth pole-oriented policieshave been widely used in developing countries(Adell, 1999).

(2) Networked model and coordinating development

● Networked model

The networked model recognises the need to upgrade infrastructure both at rural and urban level to achieve the necessary connectivity of the network, but it also gives strong emphasis to local roads among major centres, villages and towns within the region. Upgrading local infrastructure services available to households is a key factor, the quality of regional daily life being considered a key for economic growth. (Douglass, 1998a) Even from the point of view of the growth centres (with a "balanced regional development" in mind) an integrated network of dynamic centres is more likely to counterbalance a big city than some artificially boosted growth centre. (Douglass, 1998a)

● coordinating development

With the advancement of economic reform, especially rural reform, the urban-rural isolation pattern of "urban industry and rural agriculture" caused by the urban-rural dual system has been broken.Urban and rural economies are permeating each other and the links between urban and rural areas are gradually strengthened.At this time, the process of rural industrialization started and made brilliant achievements, township enterprises and the resulting rapid development of rural urbanization,The essence of rural-urban integration lies in breaking the urban-rural divide, realizing the free and orderly flow of factors, narrowing the urban-rural gap and coordinated economic and social development.Rural-urban integration is one of the goals of the reform, and its realization will take quite a long time (Zhang Junlin, 2003). The development process of urban-rural integration can be divided into three stages. The first stage is to actively develop township enterprises and small towns, expand the connection between urban and rural areas, and gradually realize the close integration of urban and rural areas.The second stage is to integrate urban and rural communities and gradually realize the integration of urban and rural communities.The third stage is to realize the integration of urban and rural areas on the basis of the integration of urban and rural economy and community (Ju Futian, 2004) .Some opponents put forward that China does not have the conditions for the implementation of urban-integration at present, and the relationship between urban and rural areas should still be dominated by cities and accelerate the process of industrialization and urbanization until the material and technological conditions are ready to implement urban-rural integration (Li Yingsheng).

With the continuous study of this concept, a consensus has been reached on the inevitability and necessity of integrated development. The integration of urban and rural areas is the inevitable choice for the comprehensive development of urban and rural areas and the construction of new urban-rural relations.The integration of urban and rural areas is not the disappearance of the difference between urban and rural areas or the homogenization of urban and rural areas, but when the productive forces develop to a certain level, urban and rural areas give full play to their respective advantages, rational flow of urban and rural resources, and finally form a unity of interdependence and benign interaction.The driving force of its development is "the centripetal force and centrifugal force of big cities". The resistance to its realization lies largely in the urban-rural dual system, and the path to its realization is to reform the urban-rural dual system.

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3.7.2.PERI-URBAN VILLAGE REINVENTION

(1)Connotation of peri-urban village

Although theory of peri-urban area is quite mature, it is still difficult to define it accurately or determine an accurate boundary in practice. There are differences in terms of academic expressions, such as urban-rural fringe, the area of urban sprawl, urban shadow zone, etc(Tablet.1). The description is also slightly different due to different research perspective, "Obvious industrial land and agricultural land conversion zone" (H.W. Ahrwein), "It is a region that is neither agricultural nor urban. It is an area where agriculture is declining" (G, Pryor) "A zone of social and demographic changes in land use, located outside built-up areas and suburbs" (l. g. Leeds). Although the above definitions are not completely consistent, they all emphasize the transition characteristic of peri-urban area, reflecting the continuous change area between urban and rural areas.

To sum up, peri-urban area in this paper refers to: "A unique regional entity formed by the development of urbanization to a certain stage. It is the place where urban and rural area penetrate each other and work together, acute contradiction region between urban and rural areas. It is formed between urban and rural areas, and its characteristics, structure, function and essence are between the geographical urban built-up areas and rural areas. It is a crossing zone where the social, economic, and cultural elements of urban and rural area interact and penetrate each other." Due to China's land ownership system, there is a clear boundary between administrative villages, each administrative village is composed of their residential land and agricultural production land. So the "village" mentioned in this paper refers to such administrative units.

(1)Fate of peri-urban village

For the fate of peri-urban villages in the process of modernization, the existing theories mainly focus on villages termination and villages transformation. According to the village termination theory, the process of modernization has made market economy become a universal social development rules. As a result, the consumer communities will replace the traditional rural community, so peri-urban villages will eventually decay. In terms of the pattern, there are both the way of being absorbed by the urban and the way of termination through village amalgamation under the guidance of government planning(Tian Yipeng, Han Dan, 2011).Many doubters put forward that such judgment ignores the particularity and difference of social development in different countries. It is impossible for China to copy the development premise or the development process of developed countries. On the other hand, as a developing country, it is impossible for China to transfer the huge amount of rural labor force to non-agricultural employment in the short term.Opponents doubted basic assumptions about the destiny of peri--urban village in modernization studies. They can be transformed smoothly through an intermediate form between rural and urban(Mao Dan, 2010). The progress of China's industrialization did not significantly reduce the rural population. On the contrary, it strongly stimulated the rural communities, especially the advanced development of village communities, created a new community form of industrial village or "super village" (Zhe Xiaoye, Chen Yingying, 2000).

(2)Village transformation

In the previous researches, there are many studies from the perspective of politics and economics, emphasizing that rural transformation refers to the horizontal disintegration and recombination of social spatial structure caused by capital accumulation.The representative view is the rural transformation from productivism to post-productivism (Halfacree,1975). There are also abundant studies on village transformation of China in recent years. From the perspective of planning, some studies believe the factors that affect the peri-urban village transformation mainly include the transition characteristics of peri-urban area and the construction of administrative system(Liu Jingjing, 2010). Some studies from the perspective of economics think that unreasonable industrial distribution is the core problem of current peri-urban village transformation, village culture should be used to the development of characteristic and diverse rural industries, and achieve dislocation development with central cities (Tian Yinsheng, 2013).

(3)Conclusion

To sum up, Chinese villages play complex and multiple roles— basic administrative units organization of the collective economy and societal community. Therefore, this paper will define the transformation of villages from three dimensions: industry transformation, governance mode adjustment and social restructuring. Village transformation is multi-dimensional, but it must be based on the improvement of economic strength. Take industrial transformation as the engine and governance transformation as the driving force, the comprehensive transformation of village community's social function is finally completed. Therefore, this paper will classify the peri-urban villages from the perspective of industrial transformation, and divide their development types into three categories based on industrial factors and resource endowments: village with traditional agricultural industry as leading industry, village with supporting industries as leading industry and village with service industry as leading industry. The mechanism and strategy of rural transformation will be discussed respectively.

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3.7.3 RURAL INDUSTRY UPAGRADING

(1) MECHANICAL AGRICULTURE AND INDUSTRY AGGLOMARATION

Krugman(1991,1995,2000), based on the traditional theory of increasing returns, proposed the famous core-periphery model based on the framework of dixit and stiglitz's general equilibrium analysis of monopolistic competition. He believes that industrial agglomeration is generated by the interaction of increasing returns to scale of enterprises, transportation costs and the movement of production factors through market conduction. Once such a cyclical accumulation process occurs, industrial agglomeration can self-enhance and continue. Porter(1998,2002) believes that industrial agglomeration is caused by competition, which is conducive to improving industrial competitiveness and national competitiveness, and proposes the famous "diamond" model. According to the model, the competitive advantage of cluster mainly depends on several factors: factor conditions, demand conditions, related industry support and enterprise strategy, structure and competition.

Fujita (1990,2005) believes that geographic agglomeration can greatly reduce the cost of communication and promote the exchange of information.It also analyzes the effect of transportation cost on economic agglomeration and studies the transformation of economic agglomeration and dispersion mode caused by the gradual reduction of transportation cost of different kinds of products.

For the agricultural industry agglomoration study, There are researchers argue that of agricultural industry cluster can realize the combination of small-scale peasant economy and scale economy, the agricultural industry agglomeration can reduce the transaction cost, regional brand and enterprise brand construction, public resource sharing and technology innovation to realize scale economies.(Yang li and Wang Pengsheng). The development development.(Xiao Chaosu and Yi Lianhong).In order to achieve the expected goal of agglomeration development, corresponding social security measures should be taken, such as strengthening leadership and control, reforming the current household registration system, providing legal protection and improving the quality of rural financial services.Based on the analysis of the changes in China's major agricultural production agglomeration situation, on the basis of from two aspects: the central government and local government Zhang Hongsheng discussed the government's influence on the agglomeration of agricultural production, pointed out our country government entities at all levels shall by creating a more competitive economic environment to influence the spatial location and scale of agricultural production agglomeration, thus promote the improvement of agricultural production agglomeration competitiveness.

But when look into the goals of machanical agriculture and farmers, there are both overlaps and contradictions between the goals of modern mechanical agriculture and farmers. Farmers expect to obtain more employment opportunities and economic income with minimal capital input, while mechanized agriculture requires higher up-front capital input and greatly reduces the number of jobs due to the use of machines.

Comparison of modern mechanical agriculture and traditional agriculture

Figure 3.4 Comparison of output and labor demand between smallholder and mechanized agriculture

common and conflicts between the goal of farmer and goal of mechanized agriculture

Figure 3.5 Goals of mechanized agriculture and farmers

(2)The convergence of agriculture and related industries

Since the 1970s, with the information technology revolution and the rapid development of its industry, the western developed countries in the field of information industry appeared the phenomenon of industrial cross-integration development, which caused the academia and government departments to pay close attention to and research, and gradually formed the theory of industrial convergence.

Applied basic research in the theory of industrial convergence, the a new concept of "agricultural industry integration" was put forward, The convergence of agriculture and related industries means to make agriculture and other industries in such aspects as technology, products, services, market mutual confluence, to create another form of the value of the body (li Sheng he, Li Shixin, 2009). The classification of the convergence of agriculture and related industries is not uniform. According to the definition of agricultural industry convergence and the three major industry classification standards of the national bureau of statistics, the agricultural industry convergence is divided into intra-industry convergence and inter-industry convergence (Wang Xiangkun, Xi Xiaoli). According to the different types of fusion industry, it is divided into four types- extended convergence, crossed convergence, regrouped convergence and modified convergence(he licheng, li shixin).

As for the promotion mechanism of agricultural industry convergence, scholars believe that the most important factor in China's agricultural development is the science and technology investment policy mainly from the perspective of the government, farmers and enterprises (Huang Jijin). Government departments should formulate reasonable industrial technology policies, break the division of departments, strengthen the coordination between agriculture and other industrial management departments, and actively provide public services for industrial integration (He Licheng, Li Shixin). Farmers should actively learn knowledge of agricultural science and technology, and establish new production and market concepts (Wu Ying, Liu Zhiying, Feng Zhipei). Enterprises should start from research needs, promote technological innovation and integration, and realize rational flow of resources through mixed mergers, strategic alliances and other forms (Wu ying,Liu zhiying).

3.7.4 KNOWLEDGE ECONOMY

New measures for the New Economy (report by Charles Leadbeater, June 1999; Kok Report, 2004: ESRC, 2005) point out the definition of knowledge economy with slightly different perspectives. After a review of this literature and a selection of key articles and books, we can conclude that the knowledge economy is a contemporary economic structure, based on the intensive using of knowledae in all economic activities fromgricultura and manufacture industries to service industries as well as high-tech and creative industes oreover, as Winden (2007) and Brinkely (2006) mention, knowledge itself is a key driver of economicgrouthas the knowledge-based / creative industries are the ones contributing the most fo economic performance nowadays. Many statistics and indicators that show improvements in the performance of cities and regions are supporting the importance of knowledge economy: investments on knowledge-based industries are increasing; the proportion of knowledge workers in the labour market is rising; and knowledge exportation is growing.

Currently, the knowledae is one of the most significant assets for the economy and some regions. Many worid-famous cities, such as London or Paris, can be represented as strong knowledge city-regions, and this can be explained through their economic sectors. These worid-competitive economic sectors are strongly combined with particular knowledge that has emerged on the basis of earlier socio-economic conditions and is very path dependent.Furthermore, foundations of the knowledge city, suqqested by van den Berg (2005), are presenting some key criteria: knowledge base, economic base, quality of life, accessibility, urban diversity, urbar scale and social equity, through which one could analyze cities and their potential for knowledqe.based development, their capacity for attracting knowledge workers, creating knowledge, applying knowledge and developing growth clusters.

3.7.5 CONCLUSION

Knowledge factors and industrial agglomeration can bridge this gap.Through the introduction of knowledge elements to create more other jobs, and improve the knowledge level of the workforce, enhance their competitiveness. Industrial agglomeration reduces capital input per capita by attracting individuals and enterprises with the same goals to cooperate.

Knowledge economy

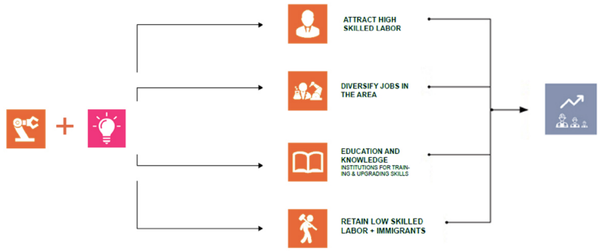


Figure 3.6 Knowledge economy create job positions

Agglomorartion and convergency

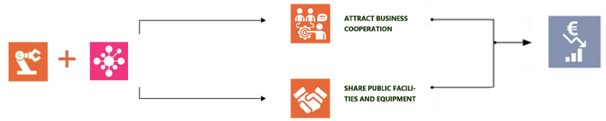


Figure 3.7 industry agglomoration reduce average investment

3.8.THEORITICAL FRMAEWORK & CONCEPTUAL FRAMEWORK

Knowledge ecosystem model is a new paradigm of planning based on industrial reconstruction. Based on the new trend of modern agriculture development and ruran industrial transformation, it aims to broaden the academic scope of rural planning on the basis of traditional rural planning theory, strengthen the guiding role of rural planning in the alignment of intensivere development, eco-innovation and knowledge encouragement. The goal is achieving the sustainable industrial structure transformation and livable space forming in the synchronous progress.

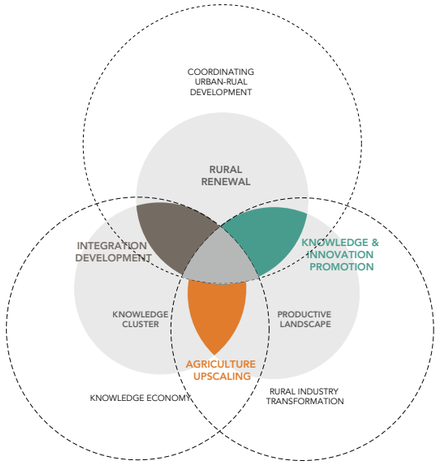


Figure 3.8 Theoritical framework diagram

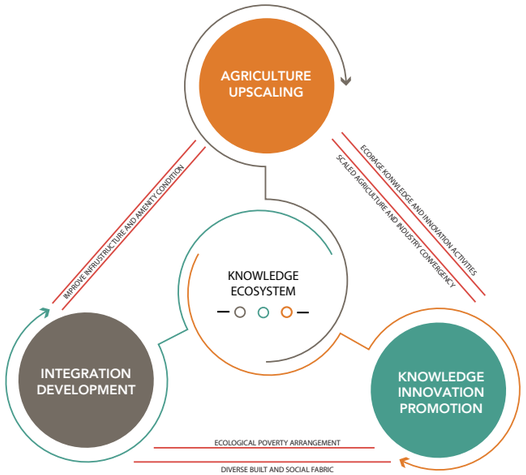


Figure 3.9 Knowledge ecosystem model

3.9. WORK FLOW

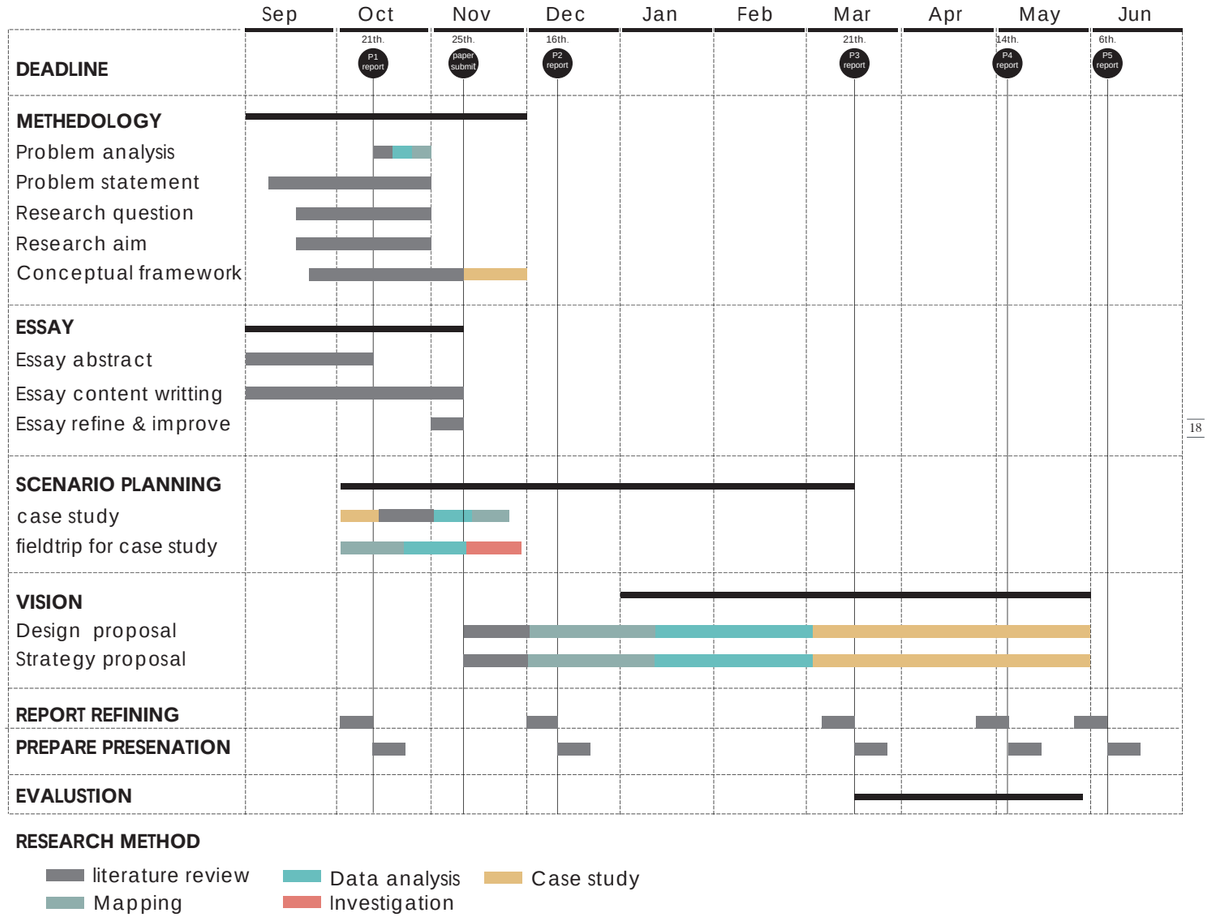


Figure 3.10 Time planning table

4 ANALYSIS CHAPTER

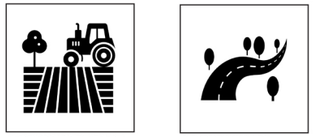
4.1 DEFINE THE ANALYSIS PILLAR AND SCALE

4.1.1 FIVE ANALYSIS AND EVALUATION INDICATORS

The first step was to analyze the peri-urban condition according to the theory of knowledge foundations (van den Berg, L. 2005), to evaluate if knowledge economy is a relevant subject to develop in this region. According to these 4 topics:

Knowledge base -Quality of life -Accessibility - Agriculture base

This will help to determine the potential of the peri-urban region of Kunming has a knowledge agriculture development base and will show its strengths and weaknesses in relation to knowledge-based development.



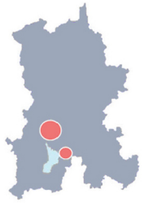
AGRICULTURE BASE

ACCESSIBILITY

QUALITY OF LIFE

KNOWLEDGE & IN-NOVATION VITALITY

4.1.2 THREE MAIN ANALYSIS SCALE



Kunming city

Answer sub-questions:

- What is the connotation of coordinating urban-rural development?
- What are the causes of the imbalance between urban and rural areas in Kunming?
- What new role should the village play in the coordinating urban-rural model?

town&township

Answer sub-questions:

- What is the current situation of peri-urban area of Kunming?
- What are potential and weakness of peri-urban region of Kunming?
- How does the agriculture sector responds to the knowledge economy?

village

Answer sub-questions:

- What are the new qualities of peri-urban villages should be reactivated through the intervention?
- How to realize the intenvention spatially?

4.2 INTRODUCTION OF REGION

City Kunming

*The research site are the peri-urban villages located in the **Dianchi Basin**, in **Kunming city**–called as "Spring City", is the **capital of Yunnan Province** and the central city of central Yunnan, and is one of the important central cities in western China approved by the State Council. As of 2018, the city has jurisdiction over 7 districts, 3 counties, 3 autonomous counties, and 1 county-level city, with a total area of **21,473 square kilometers**, a built-up area of 435.81 square kilometers, a permanent population of **6,850,000**, and an urban population 49.902 million people, with an **urbanization rate of 72.85%***

Image 4.1 View of Dian lake

SITE LOCATION

China —— Yunnan province

—— Kunming city

4.2.1 Important industrial town in southwest China

Industry as an important force to promote social and economic development in Kunming and even Yunnan Province. Determined by the level of industrialization development and the advantages of regional resources, Kunming industrial enterprises are mainly extensive resource-intensive enterprises.

Among the traditional pillar industries, the resource-processing industries like metallurgical industry and the chemical industry are th e dominated type , which rely heavily on natural resources, and most of them belong to industries with severe environmental pollution.

4.2.2 Industry upgrading

Due to the rapid development of urban industry, urban problems such as tight land use, population expansion, environmental degradation, insufficient water supply and traffic congestion have been caused.

Since the 1970s, Kunming has begun to adjust the urban industrial layout and urban land structure. For those located in the core area of the city or have heavy pollution, or occupying cultural relics and historic sites, and scattered plant sites, have adopted adjustment measures for relocation and evacuation to urban fringe areas.

4.2.3 Limited development area—as a mountainous city

At present, the industrial layout of Kunming City has basically formed a three-layer layout. The core area within the second ring is mainly distributed with some light industries such as textiles, and small and medium-sized machinery processing and repair industry. The urban fringe area has become the main distribution area of Kunming industry, and it is also the area where the city's major large and medium-sized enterprises are concentrated.

As a mountain city, yunnan has a very limited area suitable for construction, which only exists in the plain area on the west bank of the Dianchi basin. Comparing built up area range from 1974 to 2016 , can find that the center city has the tendency of continuous development, main show is as the spread to south near Dianchi lake, suitable space for the construction in old city center has been almost filled, This shows that the effect of urban ecological isolation zone on the separation of urban clusters is not obvious,there is a lack of effective planning to guide urban spatial form.

TOPOGRAPHIC AND ECOLOGICAL CONDITION

Limited urban development conditions

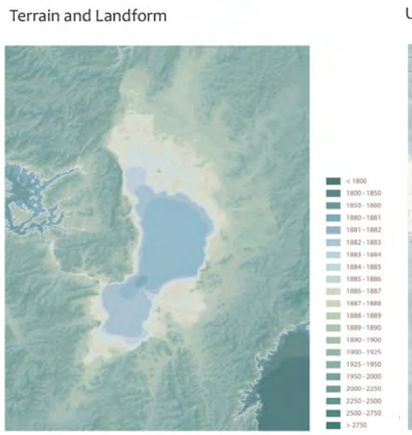


Figure 4.1

Figure 4.2

3D Terrain Model Simulation Arround Dianchi Dian lake

Image 4.2

4.3 DECODING KUNMING CITY

4.3.1 THE SITUATION

MONOCENTRIC DEVELOPMENT PATTERN

The urban pattern of Kunming shows an obvious mono-center pattern. As the capital city of Yunnan province, the urban center area is not only the center of Kunming, but also the center of the whole province. With a high degree of resource aggregation, the urban center area is not only a political center, but also a center of economic, culture , science and education. The urban center area has ccomplete infrastructure, and the level of economic development and urbanization is much higher than the surrounding counties. This center has a strong attraction effect. On the one hand, the rural population outflow into the city continuously stimulates the development of the city by providing the city with sufficient labor force , on the other hand, it also creates enormous pressure in urban center.

Kunming towns are distributed in basin and platform areas, forming a plateau city surrounded by mountains. Kunming city has a typical plateau landform, mainly composed of flat land, platform and mountain.The mountain from Dian lake to the periphery can be divided into three levels: the first level is the basin, which consists of Dian lake and its flood plain, alluvial plain, lacustrine plain and delta plain.The second level is the platform, composed of hills, low mountains, hills and lake terraces;The third level is the peripheral mountainous area, which is composed of low mountains and Zhong Shan mountains. This area is generally cut by medium and shallow degrees, and the slope is generally steep.

Dian lake is the largest surface water body in this area, which plays an important role in storing and regulating surface water.Dian lake is the largest natural freshwater lake in the Yunnan-Guizhou plateau and the sixth largest inland freshwater lake in China.Under the constraint of natural environment, urban land is limited.

4.3.2 THE PROBLEM

EXCESSIVE URBAN PRESSURE & MARGINALIZED VILLAGES

The tendency of marginalization of rural area means that rural communities are gradually being separated from the mainstream regional economic development dominated by cities,The importance and influence of rural areas on regional economic development are decreasing, and they are passively exposed to the radiation of urban development. The characteristics of peri-urban village marginalization tends to occur with the advancement of industrialization and urbanization in central cities, Rural marginalization and declining agricultural growth rates contrast sharply with rapid industrial development process of urban.

The noumenon value of the peri-urban villages and their future development have been neglected, and they have become the subsidiary of the urban development. Various resources owned by the countryside, such as land and labor, flow into the city, and the capacity of ecological purification and regeneration are used for low price by the city for the increasing waste disposal. Compared with cities, rural self-development is put on hold and rural public infrastructure

construction lags behind. The living standard of farmers increases slowly or even decreases, and the accumulation of human capital of farmers is insufficient, and their own development ability and space are limited.Moreover, economic decline has been accompanied by social and cultural decline.

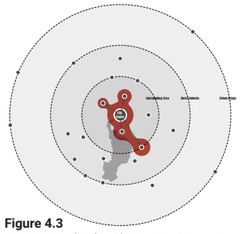


Figure 4.3
monocentric development pattern

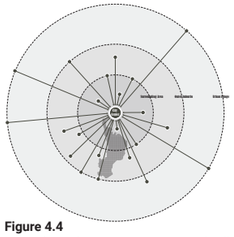


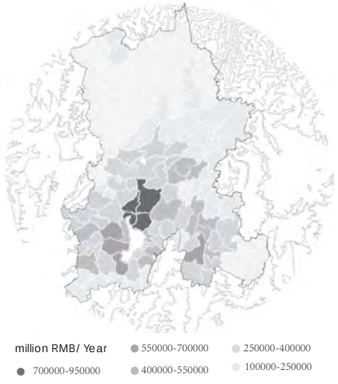
Figure 4.4
Excessive urban pressure & Marginalized villages

MONO-CENTRIC DEVELOPMENT MODEL

1. Residential land

2. Urbanization level

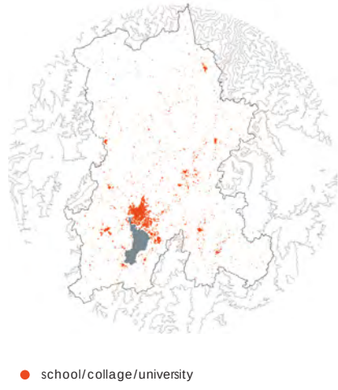
3. Gross population



4. Enterprise distribution

5. Technology centre

6. Education distribution



7. Business service facilities

8. Public service facilities

Figure 4.5 Rescource distribution in Kunming

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No.	District / County Name	Map	Area km^2	Population					Urbanization level	Gross domestic product *		Each industry * accounts for the proportion of total output of each county	Proportion of industries * in each county to the total output value of each industry	Number of education institutions				Investment in public facilities *million RMB/Year*	Number of the enterprise
				Gross Population	population density/km^2	Migrant Population	Change of the migrant population	Trend of population quantity						primary school	Junior high school	Senior high school	Special education institution		
❶	Lu Quan		4378.00	396400	97	3722		−	4.65%	7500.36 2078.13 2124.92 3297.31				170	15	2	0	2435.53	33
❷	Dong Chuan		1158.79	310000	151	3606		−	20.31%	7769.49 565.39 4184.00 3020.10				59	8	2	0	2484.45	5
❸	Xun Dian		3396.00	457000	130	6561		−	5.80%	7607.79 2091.14 2430.12 3086.53				114	13	3	1	2626.27	120
❹	Jin Ning		1336.66	300000	224	13273		−	16.77%	11291.51 1990.64 4399.31 4901.56				18	11	2	0	2326.98	15
❺	Guan Du		5520.00	882000	1394	665367		+	44.15%	90447.16 832.23 33068.941 36391.65				71	19	16	0	4299.78	122
❻	Wu Hua		3980.00	872700	2280	336783		+	83.53%	92868.93 201.74 49896.53 42770.66				43	10	17	1	3610.21	93
❼	Pan Long		3400.00	809881	2415	517888		+	80.71%	52608.93 485.23 15731.51 36391.65				62	20	9	1	3913.70	34
❽	Song Ming		1357.29	339700	230	5997		−	9.38%	9882.32 1422.15 4858.07 3602.10				46	8	3	0	2120.73	8
❾	An Ning		1313.00	367000	282	69650		−	41.73%	26015.20 1255.76 11960.42 12799.02				19	9	6	0	2919.09	32
❿	Xi Shan		881.32	784000	884	364590		+	52.92%	45552.88 353.52 12311.16 32888.20				68	19	10	1	3807.70	69
⓫	Yi Liang		1913.53	431000	227	13981		−	11.94%	15054.35 4298.69 4359.79 6395.87				66	12	2	1	1725.84	6
⓬	Shi Lin		1777.00	258000	154	7739		−	9.65%	7067.81 1796.38 1840.20 3431.23				16	5	2	0	1530.06	4
⓭	Cheng Gong		661.00	350000	651	75181		+	16.67%	18041.91 486.86 9891.34 7663.71				17	3	6	0	2492.00	22
⓮	Fu Min		1030.00	149000	155	5052		−	11.19%	5872.24 953.72 2927.48 1991.04				26	6	2	0	1049.31	4

Figure 4.6 Data gathering *Source:Kunming Yearbook,2016*

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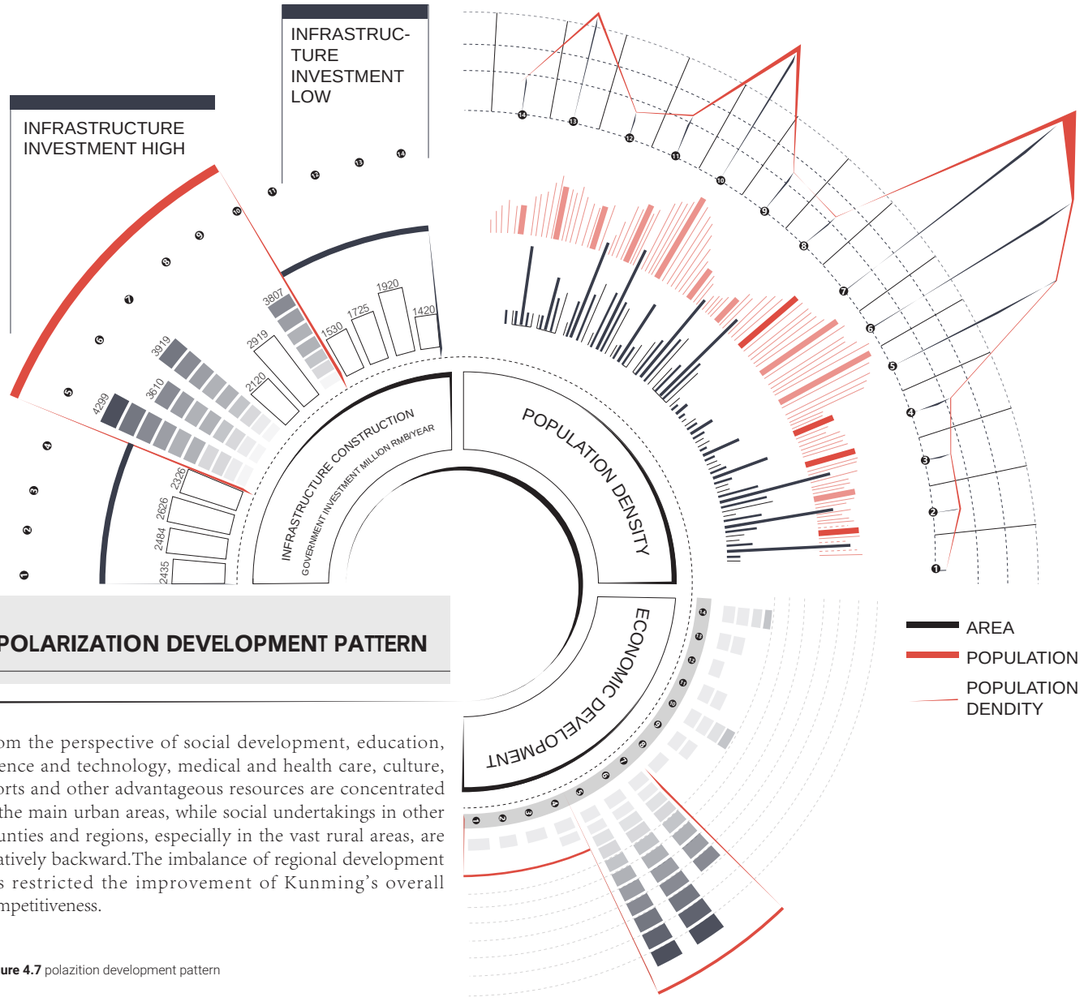
MONO-CENTRIC DEVELOPMENT MODEL



POLARIZATION DEVELOPMENT PATTERN

From the perspective of social development, education, science and technology, medical and health care, culture, sports and other advantageous resources are concentrated in the main urban areas, while social undertakings in other counties and regions, especially in the vast rural areas, are relatively backward.The imbalance of regional development has restricted the improvement of Kunming's overall competitiveness.

Figure 4.7 polazition development pattern

Image 4.2 Rural and urban view

Migrant workers in Fuangzhou Railway station

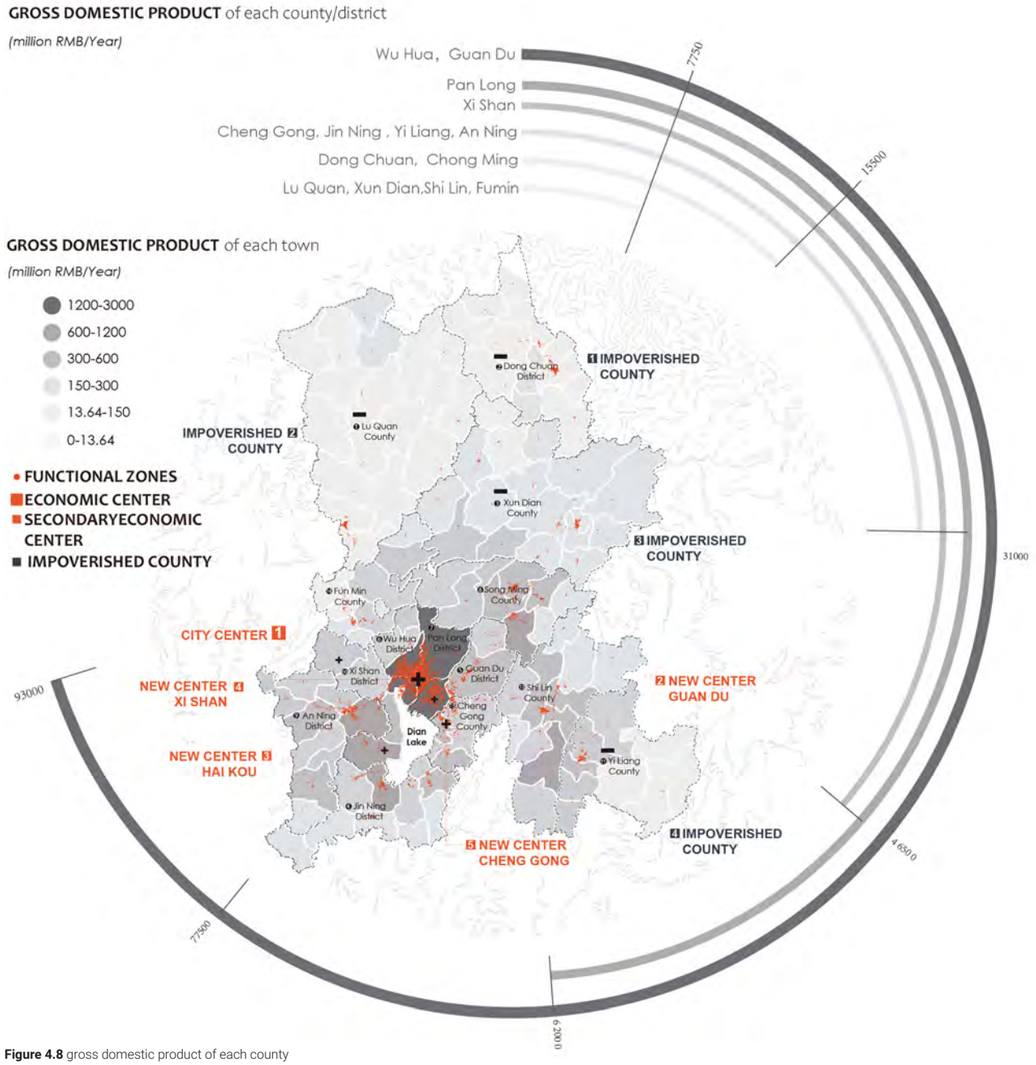


Figure 4.8 gross domestic product of each county

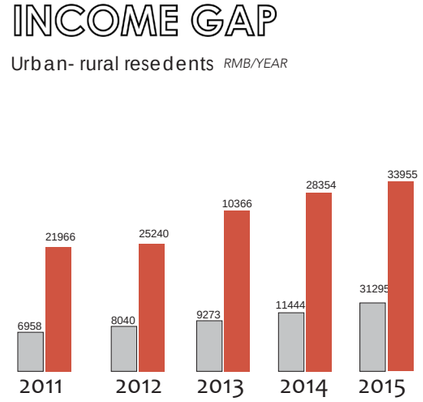


Figure 4.9 urban-rural residence income gap

CHALLENGE 1.

UNBALANCED ECONOMIC LEVEL

The economic development of different districts and counties in kunming is unbalanced.The main city of Kunming has formed a strong effect of polar accumulation. The urban center (four districts) occupies less than 1/10 of the city's land area, accommodates more than 50% of the city's population, accounts for 75% of the city's economic aggregate, 60% of the city's local fiscal revenue, and has completed nearly 55% of the city's capital construction investment. In addition, the city center and the surrounding areas also gathered the city and even the province's most large industrial enterprises, institutions of education and scientific research institutions, medical and health institutions, financial and insurance institutions and government administrative agencies.

From the perspective of per capita GDP, it can be roughly divided into three levels: Wu Hua district, Pan Long district, Guan Du district, Xi Shan district and An Ning city are at the first level. Their per capita GDP is higher than the average level of the whole city, basically reaching the mature stage of industrialization and relatively developed economy. Although the industry of Chenggong county and Yiliang county is not developed, but the agricultural conditions are better, the economy in the city's middle level, ;Jinning county, and the northern five counties ' GDP are less than 1/3 of the city's average level, belong to the third level.From the perspective of fiscal revenue and expenditure, only the three districts of Guandu, Panlong and Xishan had balanced revenue and expenditure in 2004 -2005, and their fiscal situation was relatively in the good situation. However, the other 11 counties and districts were in fiscal deficit, so the economic development momentum needed to be strengthened urgently.

CHALLENGE 2.

A MASS MIGRATION FROM RURAL TO THE URBAN

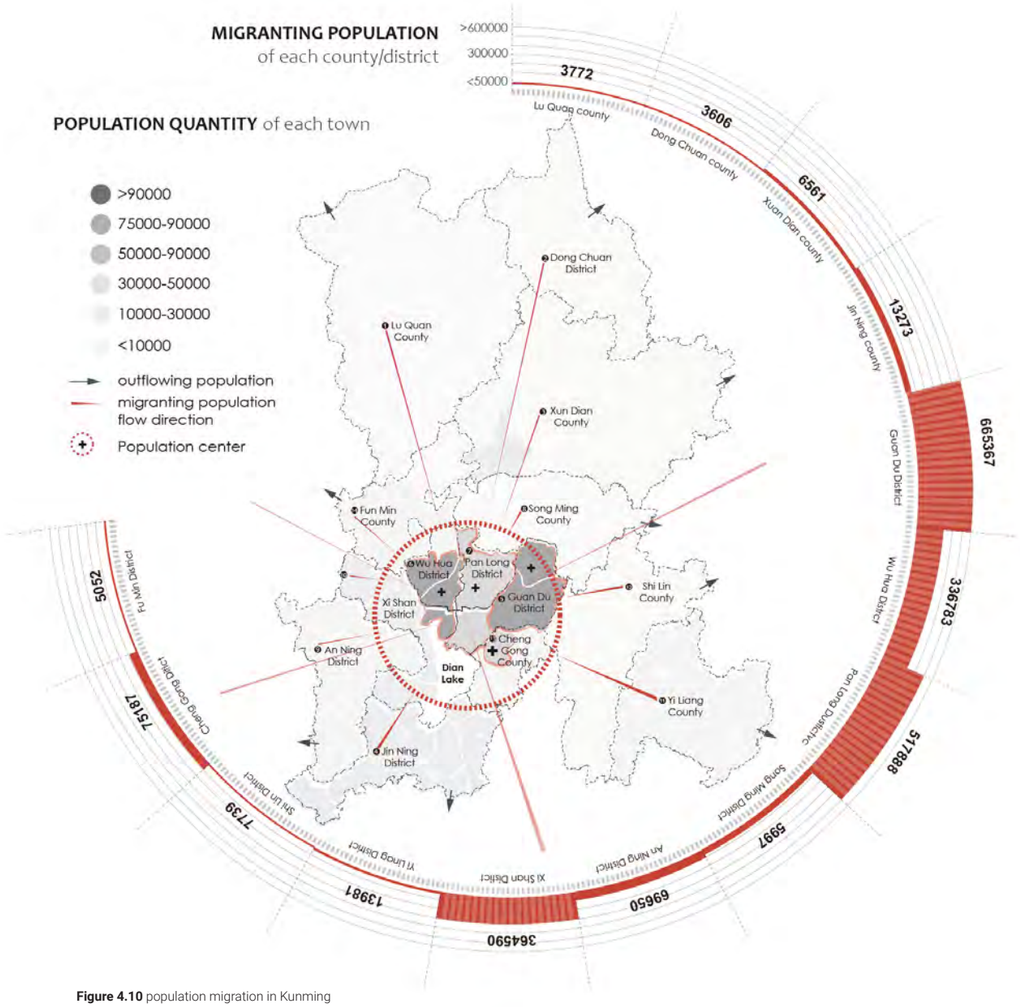


Figure 4.10 population migration in Kunming

Percentage of migranting people of each district/county

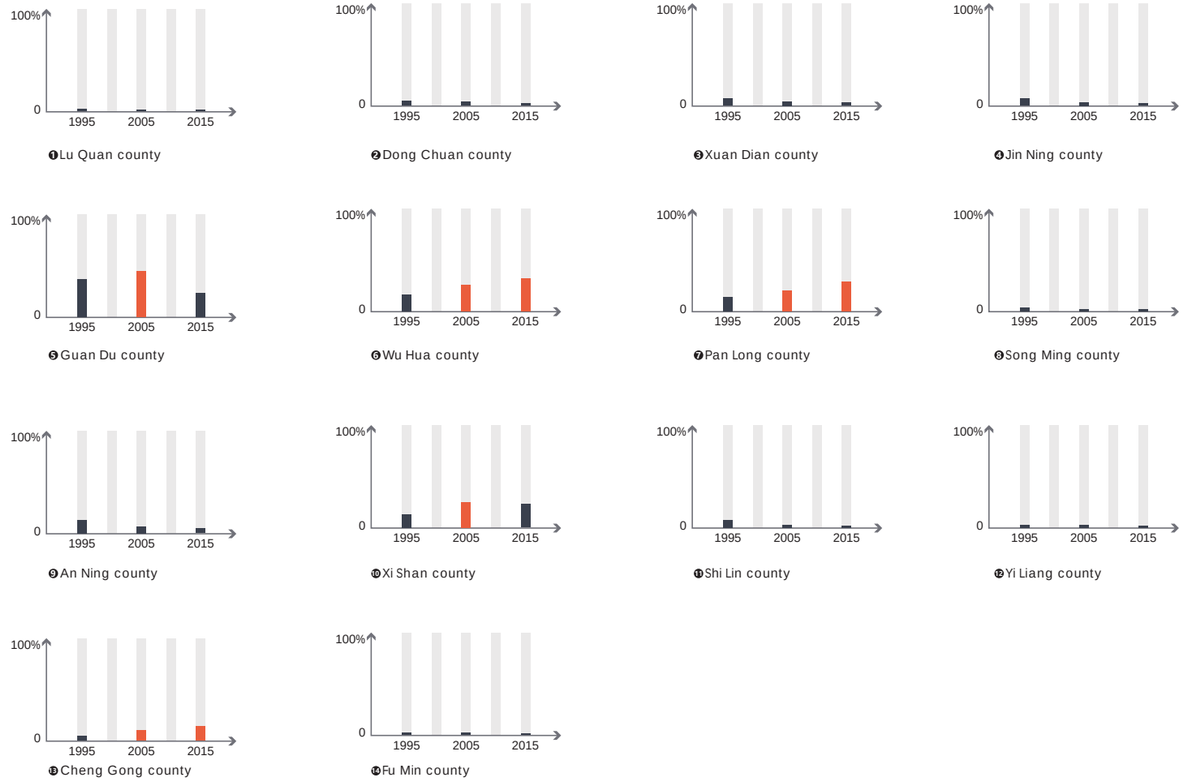


Figure 4.11 population population

Image 4.3 Migranting worker in Spring festival

The high population density of the urban center & Dissolution of rural area

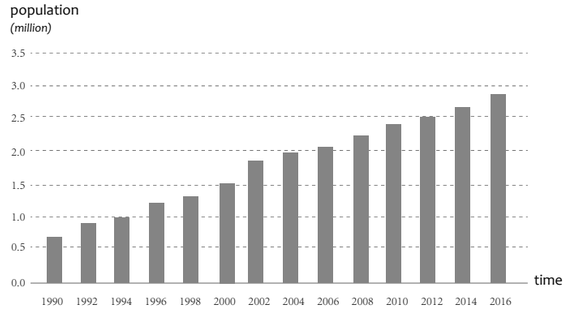


Figure 4.12 Population change of urban center

The floating population in kunming is mainly flowing within the province, accounting for 66.7% of the total floating population of the whole province. Among them, the floating population from Yunnan prefectures accounts for 54.1% of the total population and 81.9% of the floating population within the province. The leading sources are Qujing (18.2%), Zhaotong (10.1%), Dali (3.4%), Chuxiong (3.1%) and Honghe (2.9%).Floating population in Kunming urban area (from the surrounding county) accounted for 12.0% of the total population, accounting for 18.1% of the floating population in the province, they are mainly from Luquan (4.8%), Xundian (1.9%), Yili (1.4%) and Songming (1.1%). In addition, the inter-provincial floating population in Kunming accounts for 33.9 percent of the total floating population, with Guizhou (10.2 percent), Sichuan and Chongqing (3.9 percent) leading the list.Most of the floating population in Kunming comes from the province and surrounding provinces, and the migration amount of population is inversely proportional to the migration distance. The influencing factors are mainly the migration cost, suitable climate conditions and similar cultural customs.

By the end of 2016, Kunming had a floating population of 219.46 million, and the floating population in the four main urban areas -Wuhua, Panlong, Guandu and Xishan was 1.836 million, accounting for 85.83% of the city's total floating population. Panlong district was the secound largest district, with a percentage of 23.60%;Third is the Xi Shan district, accounting for 16.61%; Wuhua district, accounting for 15.30%.Overall, the geographical distribution of floating population in Kunming, showed obvious imbalance.

The flow of the floating population is mainly within the province, it is concentrated in the four main urban areas, and the floating population in the suburban counties is decreasing. Kunming is the provincial capital city with the highest development priority, industrial support, economic concentration and social concentration in Yunnan province, the demand for labor and appeal is very strong, and political, cultural and transportation center of Yunnan, its social living environment is superior, so as traffic is becoming more and more developed, the migration costs to reduce gradually, yunnan around the state and its was a lot of the rural population flow to Kunming and its four big districts.

In recent years, Kunming Chenggong district appear the phenomenon of a large increase of the floating population, also is because it actually

become the key area of the construction of modern new Kunming in Yunnan province, is the new administrative center of Kunming city and modern city demonstration area, with its relatively superior carrying capacity and carrying space become a new choice of the floating population flow.

Since the 1990s, the floating population in Kunming has been increasing year by year.When in 1990 the fourth census of the floating population is only about 180000 people, 1995 to 310000, 1996 to 400000, rose to 600000, 1998, 2001 and beyond, according to Kunming municipal public security bureau was 730000, 2005 in 920000, has ballooned to 1.51 million in 2008, 2010 had reached 2.19 million, compared with 2001 in Kunming for floating population increased by 1.46 million.In recent ten years, Kunming has witnessed the largest increase in the floating population.According to the research report on population, economy, society, resources and environment coordination and sustainable development during the 12th five-year plan period of Kunming city, the proportion of floating population in the total population of Kunming city increased from 19.4% ~ 20.5% in 2005 to 20.7% ~ 21.8% in 2008 during the 11th five-year plan period, which also showed an upward trend.

CHALLENGE 3.

URBAN SPACE PRESENTS THE TREND OF SPRAWL

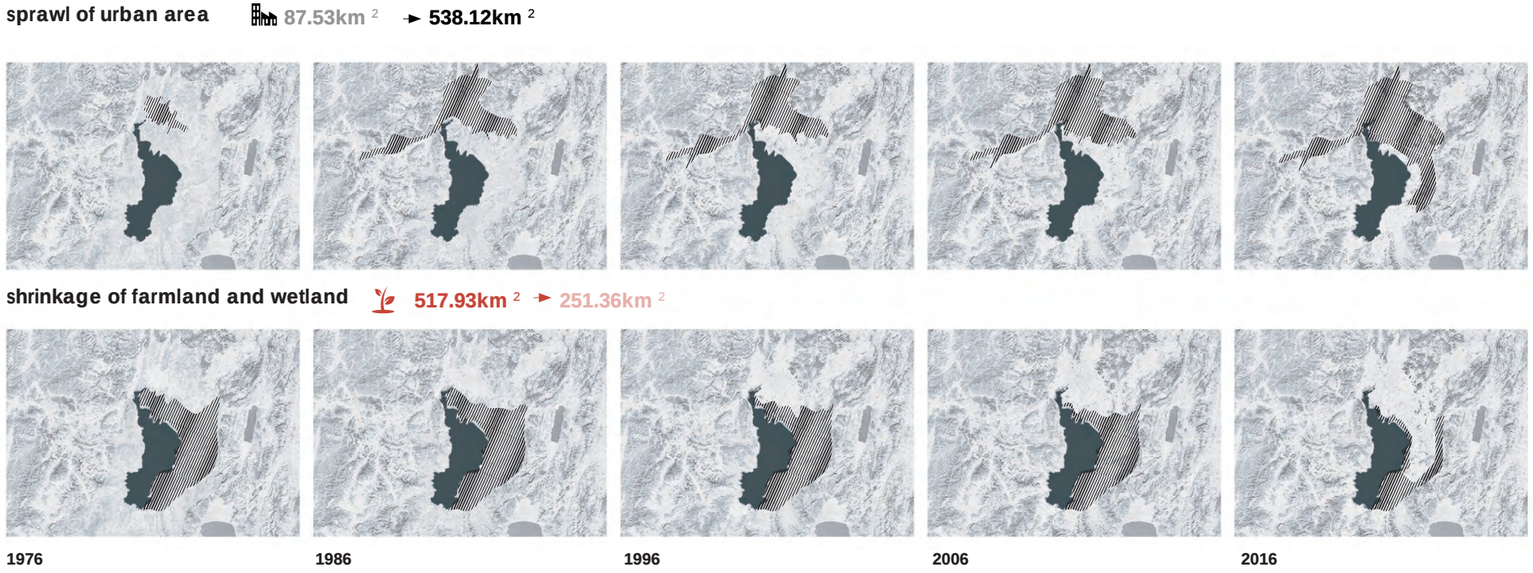


Figure 4.13 Land type changing in Dianchi Basin

Changes of land use area in Dianchi basin

Dianlake basin in early construction land (1974) mainly locate in the north shore of Dian lake area, gradually spread to the outside (1988), due to the basin is surrounding by mountains and facing the water, this special geographical restrictions, The construction land in the later period gradually began to develop eastward and southward (2008),The space shows that the city is constantly encircling the dianchi lake, except for the expansion to the west.

It can be seen from the histogram of changes in various types of land use that during the development process from 1976 to 2016, the proportion of forestland was the largest, and there was no significant change in the first four periods until a slight decrease in 2016, which was largely related to the geomorphic distribution characteristics and land use status of the Dian lake basin. The comparison shows that cultivated land decreased from 17.81% in 1976 to 8.64% in 2016, while construction land increased from 3.01% in 1976 to 18.50% in 2016, The cultivated land area and the construction land area are all in the land type the change is bigger.Only the value of construction land has been increased, indicating that its area continues to increase, with the maximum annual change rate reaching 11.83%.The change of the other four types of land is basically negative, and the total area of each type is decreasing continuously on the whole, among which the maximum annual change rate of cultivated land is -3.43%.The area of Dian lake waters is also shrinking. In the early stage, agriculture, forestry, animal husbandry and sideline fishery are developed, and fish pond breeding in reservoirs is active.In the later period, although the shrinking of large patches in Dian lake was curbed, the protection of small lakes and small reservoirs, such as Jindian reservoir, was reduced due to urbanization and real estate development, rivers dried up, water area and patches decreased, and a large number of small water surface disappeared.

The main reasons for the expansion of construction land in the Dianchi basin are as follows: in the first stage,due to the implementation of the cigarette industry in Kunming and the strategy of strengthening the industrial city and the industrial city, the construction and development of large-scale cigarette producing , mechanical and electrical industries, the urbanization is in the initial stage; In the second stage, the regional production factors are optimized and reorganized and the industry is due to the country western development strategy, the construction of major infrastructure projects and industry base attracted the domestic and foreign capital to participate in Kunming hydropower, mining and the depth of the advantages of the biological resources development, Kunming economic and technological development zone, high-tech industrial park, tourist resort for kunming industry development provides a rare opportunity and also poses a deepening of Dian llake lake pollution. Stage 4 is due to the implementation of the strategy of modern new Kunming, around the Dian lake as the center of urban planning and construction, and the national construction of economical society and the requirement of economical and intensive utilization of land, and the Dian lake management and ecological engineering construction, the extended area continue to increase but slow down the speed compared with the previous stage.

The rapid expansion of towns and villages brought about by rapid economic development, industrialization, rural tourism and agricultural planting such as flowers and orchard bases are the main drivers of land use change, while a large amount of farmland, other land (garden and grassland) and water are swallowed up.From the perspective of the types of land use, the loss of arable land, other land, arable land, mainly converted to construction land and arable land;Some arable land and other land use occupy water areas, especially surrounding wetlands.

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shrinking water body, decreasing woodland & farmland, expanding urban area

Figure 4.14 land type use change

URBAN FUNCTION DIFUSSION & INDUSTRY RELOCATING

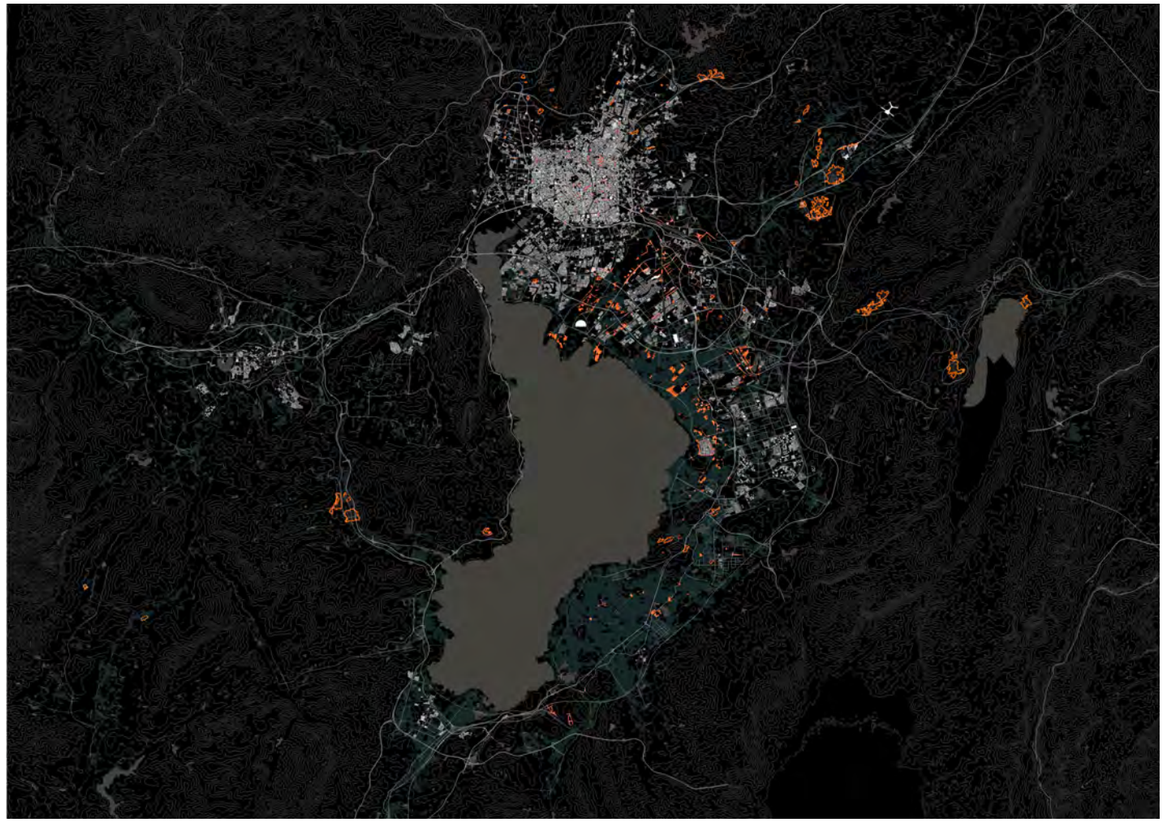
Most of the industrial parks in kunming are in **small scale**, **developing slowly**, the **layout is unreasonable**, they are not supportive enough in economic. Except to the high-tech development zones and economic and industrial parks, other industrial parks are **in shrinkage**.And because they are the resource consumptive industry type, the **pollution is heavy**, the **resource consumptions** are serious

Industry park

Industry area

Figure 4.15 Urban function diffussion in Dianchi Basin

PATCHWORK INDUSTRY ZONES IN PERI-URBAN VILLAGES



urban

Industry area

N

0 3.5 7 14

Industrial areas in rural areas are usually located in **peri-urban villages** near towns or the main roads, adjacent to farmlands, most of the rural industry are in **small scales,** some rural industrial parks have only one or two small businesses.Therefore, caused the enterprise shows **scattered, disorder layout**

Figure 4.16 Industry zones in Dianchi Basin

CHALLENGE 4.

UNREASONABLE INDUSTRIAL STRUCTURE AND LAYOUT

The characteristics of the village industry development are as follows: taking the village as a unit, the industry scale is small, the layout is scattered and messy, and the system has not yet been formed. The existing industries have shown certain regularity in space, forming obvious zonal (extended highway), cluster or dot distribution characteristics (near the water source of Dian lake).

In the industrial community, the village has different status due to its different conditions. Some villages with obvious resource advantages and sufficient industrial development power often occupy the core position in the industrial community and can also constitute a certain radiation force to the surrounding villages. However, villages with relatively backward conditions tend to lack autonomy in industrial development, which is prone toblind obedience, simple replication of advantageous village industries and poor development effect, even constitute vicious competition, resulting in waste of resources and so on.

Main industry type of Kunming

Kunming's main pillar industrial product output in China's similar products rank

Industry type	cigarette manufacturing	Fertilizer manufacturing	non-ferrous metal metallurgy	Coal mining	Power generation	stell	Cement production	Sulfuric acid production
ranking	1	8	2	18	17	20	14	1

Figure 4.17 Industry ranking of Kunming

Industry structure of each county/district

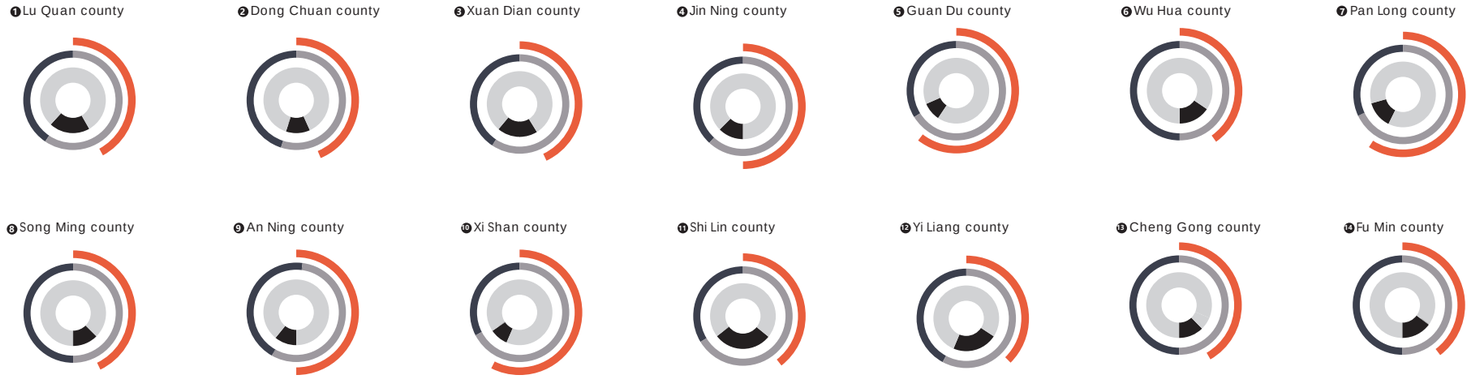


Figure 4.18 Industry structure of Kunming

Image 4.4 Water pollution of Dian lake

CHALLENGE 5.

DEPRECIATION OF ECOLOGICAL CAPITAL

Figure 4.19 Urban sprawl in Kunming

Water quality in the Dianchi basin deteriorated in the 1980s, Whether sea or inland sea water quality reached the bad V classes, The grade of water quality in upstream water sources is also declining.

The main reason is that the use of water resources in the Dian lake basin by industry, agriculture and population growth has reached the limition of natural water purification and recovery caoacity. According to statistics, The average water supply in the dianchi basin over the years is 570 million cubic meters, After controlling the upstream reservoir and using water for industrial, agricultural and domestic use along the way, the amount of water finally flowing into dianchi lake has averaged 480 million cubic meters for many years Excluding the water used for industry, agriculture and domestic use around the lake, the average annual water supply into the Dian lake is only 400 million cubic meters.Due to the increase of population, the water resources per capita in Dian lake is only 4% of the provincial average and 13.3% of the national average. Dianreceives up to 600,000 cubic meters of urban sewage every day.

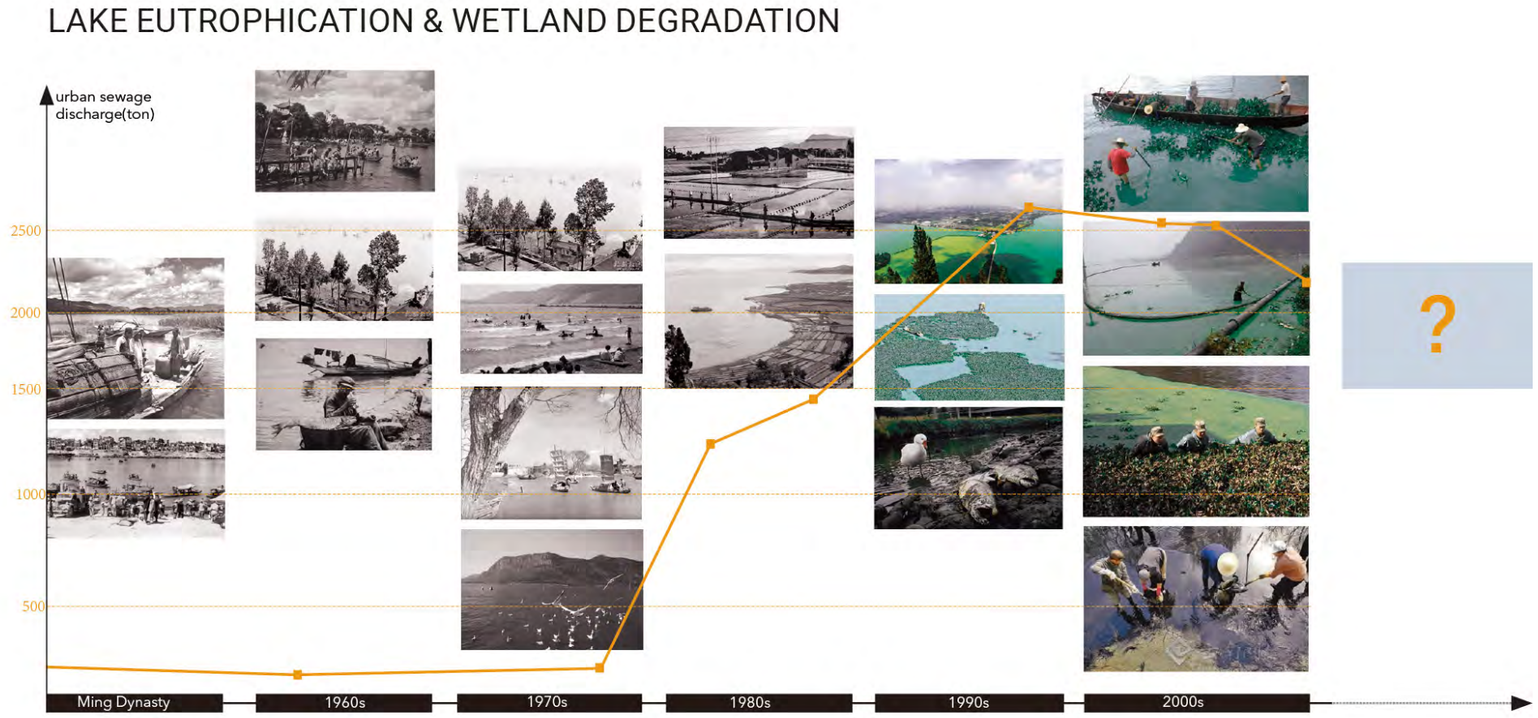


Figure 4.20 Dian lake pollution

The challenge of environment carrying capacity

In the 1980s, the development of industry and agriculture in the Dian basin was at the expense of water resources.A large number of tributary water bodies are polluted by domestic sewage, industrial sewage and agricultural non-point sources when flowing through urban areas, industrial areas and agricultural areas, resulting in the overall deterioration of tributary water bodies in the whole basin.The surging domestic water consumption caused by the increase of population is an important part of the water resources problem in this period, and the structure of urban domestic water consumption has also changed. Since the 1980s, with the increase of water consumption in social services, commerce, health, sports and other social undertakings, the proportion of water consumption in enterprises has also increased.In terms of agricultural water, there are more than 600 pumps along the Dian lake alone, which irrigated 232,000 km^2 of farmland and consumed about 130 million cubic meters of Dian lake water every year.

In terms of industrial water use, the amount of water extracted from the dianchi lake reached 87.32 million cubic meters in 1982 only in the Dian lake, 124.5 million cubic meters in 1985, and the total amount of industrial water used in the Dian lake basin reached 290 million cubic meters in the same year.1990 ring water corporations have 44, Dian lake area in thousands of more than 100 cubic meters of water enterprise has 11, respectively is PuPing village power plants, Kunyang phosphate fertilizer plant, sodium tripolyphosphate plant, YunFeng paper mill, Yunnan smelter cement setting, fertilizer plant in kunming, yunnan, kunming, yunnan, dyeing factory, paper mill treasure, optical instrument factory, water below 1 million cubic meters of other units have 33. Industrial development that reflects the century 80 s Dian lake watershed serious consumption of water resources in Dian lake watershed. As the water consumption of the three types increased, so did the amount of substances entering Dian lake with sewage.In 1986, 11 million tons of industrial wastewater was discharged into Dian lake.After 1985, 27,854 tons of organic pollutants were discharged into Dian lake every year, 332 tons of heavy metals were discharged, 34.8 million tons of urban sewage was discharged, 150 million tons of industrial wastewater was discharged, and 139,000 tons of organic pollutants were discharged into agriculture and animal husbandry.A large amount of chemical substances are discharged into different water bodies in the Dian lake basin, resulting in the increase of chemical substances in the main water bodies in the whole basin.

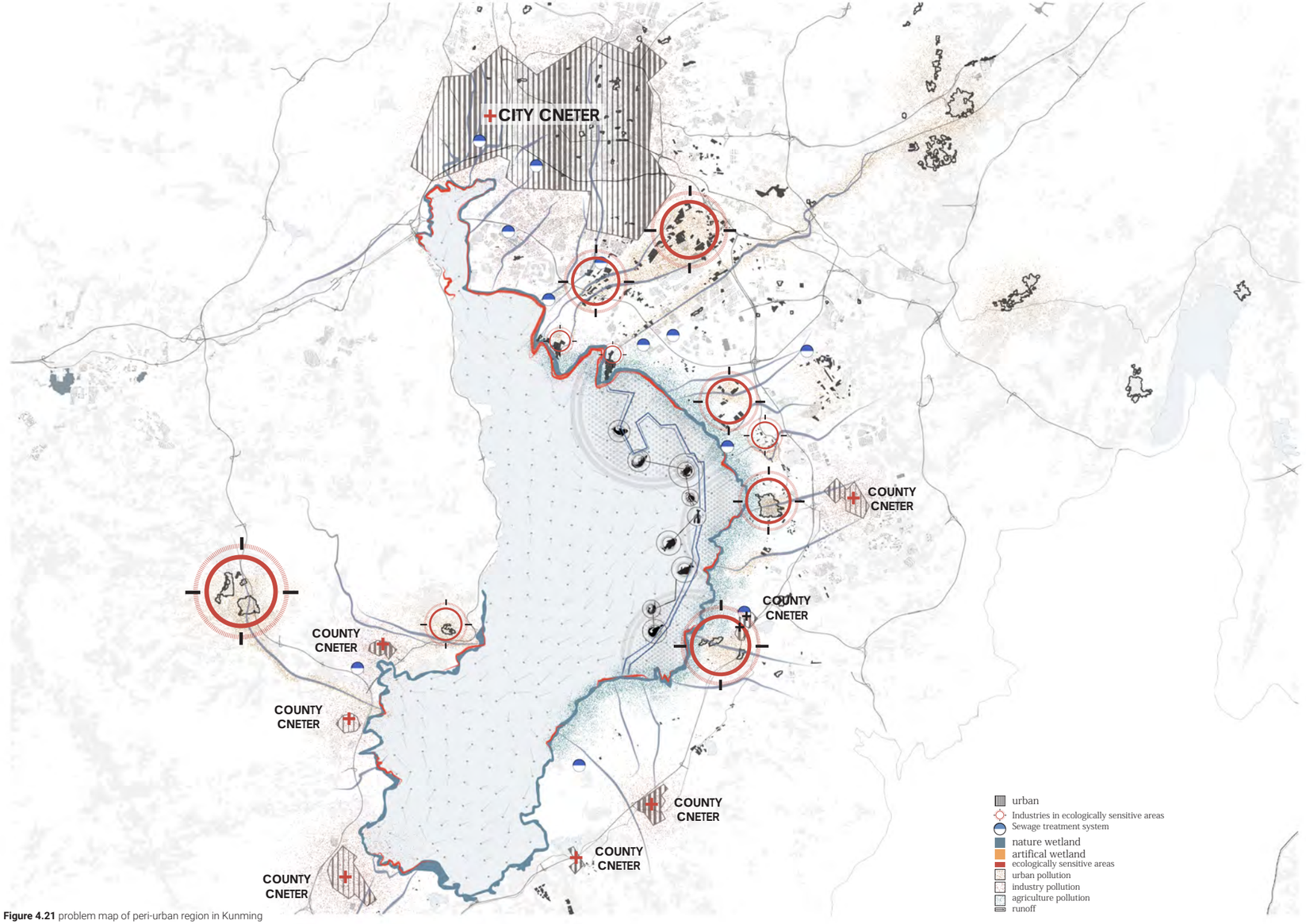


Figure 4.21 problem map of peri-urban region in Kunming

PERI-URBAN AREA PROBLEM MAP

low accessibility

The level of rural road traffic construction is low. A considerable number of rural areas have no asphalt or cement roads, and gravel roads account for about 70% of rural roads. As a result, agricultural products produced by farmers cannot be delivered to cities and towns in time, and industrial and consumer goods from cities and towns cannot enter the countryside. As a result, farmers' lives become more closed, and the free flow of economic factors between urban and rural areas cannot be realized.

The unreasonable industrial structure aggravates the deterioration of ecological environment

Cultivated land decreased year by year, per capita cultivated land in kunming decreased from 0.1033 ha in 1978 to 0.0768 ha in 1977. The loss rate of cultivated land reaches 0.22% per year, The development of rural industrialization is a policy put forward with the emergence of surplus rural labor force in order to absorb the surplus labor force nearby. Although township enterprises have made positive contributions to the rural economy and even the whole national economy, the layout of township enterprises, on the one hand, has invaded a large number of cultivated land. On the other hand, industrial pollution is difficult to be effectively controlled, and pollution has gradually become an important problem affecting agricultural development and farmers' quality of life.

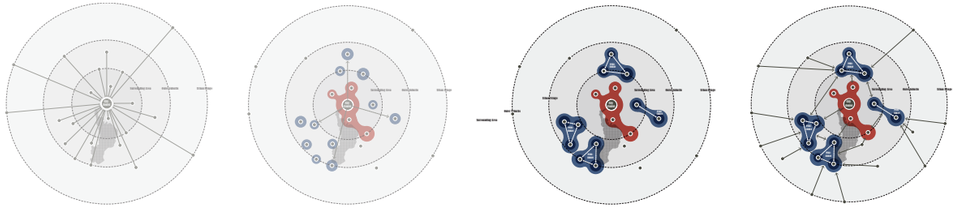
Land and nature resources waste, pollution, inefficient use

With the development of rural economy, soil erosion in rural areas is serious. Serious pollution from non-point sources in rural areas, excessive application of chemical fertilizers, loss of livestock droppings, and many garbage problems caused by changes in rural production and lifestyle have become constraints to the improvement of urban living quality. This leads to the pollution of drinking water in cities, endangers food safety and human health, and affects the environmental quality of rural areas.

CONCLUSION AND PROPOSAL ON THE CITY SCALE

THE CHANGE what is the new development pattern?

POLYCENTRIC & COORDINATING URBAN-RURAL DEVELOPMENT



Forming the secondary centers by re-evaluating the value and the charicteristic of the peri-urban villages to share the heavy preasure of urban center and stimulate and stimulate the development of the peri-urban areas. Forming the pocycentric development pattern to achieve the coordinating urban-rural development.

Figure 4.22 Abstract diagram of urban pattern of Kunming

4.4. DECODING PERI-URBNA REGION

4.4.1 TOWNSHIP AS THE RESEARCH SCALE OF INDUSTRY CLUSTER

The Dianchi basin has a vast area and more than 1000 villages and towns of different levels are scattered. Such a large number is a difficulty for the research, and the size gap between the area and the village is too large. Therefore, the town is introduced as the scale for the research of rural industrial agglomeration.

Town between the city and the countryside, belonging to the transition between urban and rural areas, is the link and bridge between the city and the rural. To strengthen the connection between city and countryside, active rural commodity economy plays a decisive role. The coordination function of town's urban-rural connection is mainly reflected in the transfer function of people, logistics, capital flow and information flow between the city and the countryside. For example, it can not only provide the city with abundant agricultural and sideline products, industrial raw materials and supporting products needed by the city's large-scale industrial production, but also expand the sales channels of agricultural products. Town, as a transfer station between urban and rural areas, must play an important role in promoting the coordinated development of urban and rural areas while actively serving urban and rural development.The construction and development of the town is conducive to the coordinated development of urban and rural areas.

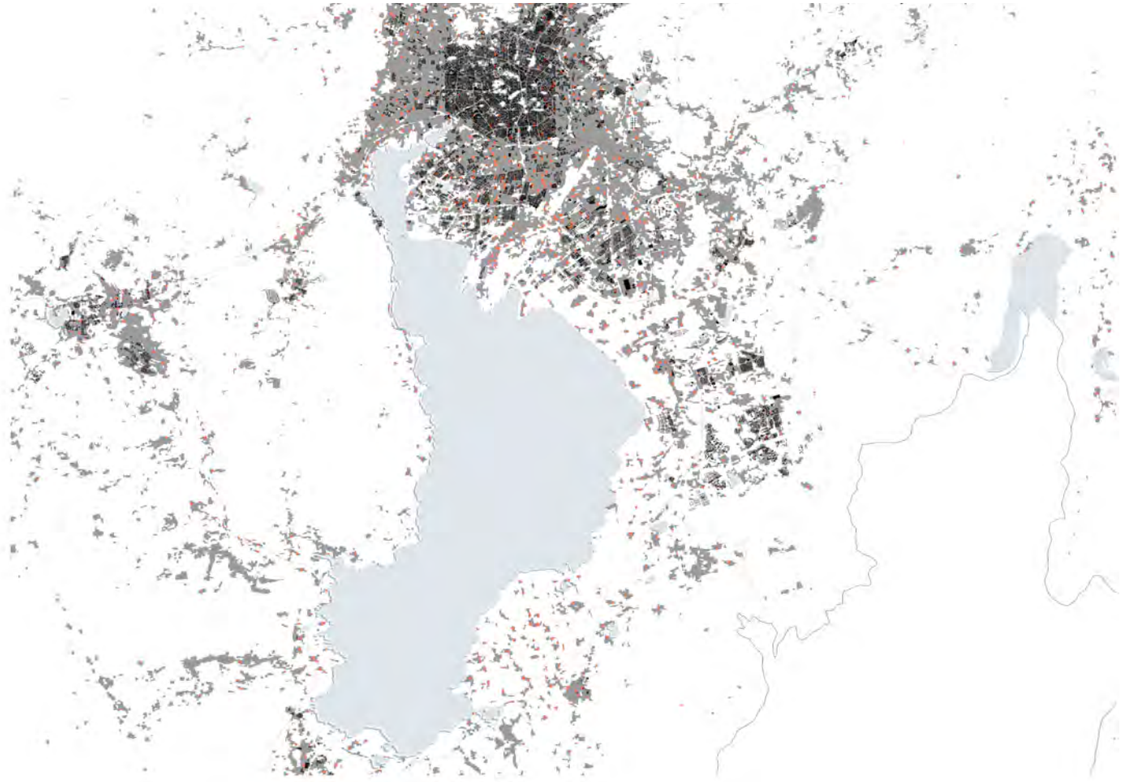
For the development of rural industrial clusters, due to the economies of scale and economies of scope, industrial clusters can absorb the aggregation of production factors and labor factors other than the cluster, and the scale and influence of the cluster continue to expand, and the external effect is more and more obvious.If the space is too dense, there will be "diseconomies of scale." Therefore, there is an appropriate criterion for the occurrence of positive effect, which produces positive effect in the range and negative effect in the excess. So the peri-urban villages are no longer suitable for oversized clusters. From the perspective of the cluster radius of industrial agglomeration, at present, Chinese farmers still travel mainly on foot, followed by a large proportion of electric vehicles, accounting for 35%.The most acceptable time for farmers to arrive at the tilling site is 5 to 15 minutes.Electric vehicle has the characteristics of convenience and environmental protection. It is a kind of vehicle widely used in urban and rural areas of kunming in recent years.The average speed of electric cars is 20km/h, the same as that of buses. Therefore, in the determination of the space scale, the distance and time (3 km in 10 minutes, 5 km in 15 minutes) that can be borne by electric cars or buses are referred to, and the service radius of the leading community public service facilities is 3 to 5 km.The maximum service radius should not exceed 5km.

Such a scale is similar to the size of the town, so it is reasonable to choose the town as the scale for the preliminary intervention of the research, which is conducive to delineating an appropriate research scope for further analysis.

county & district

town&township

VILLAGES IN BASIN AREA



residence space

village site

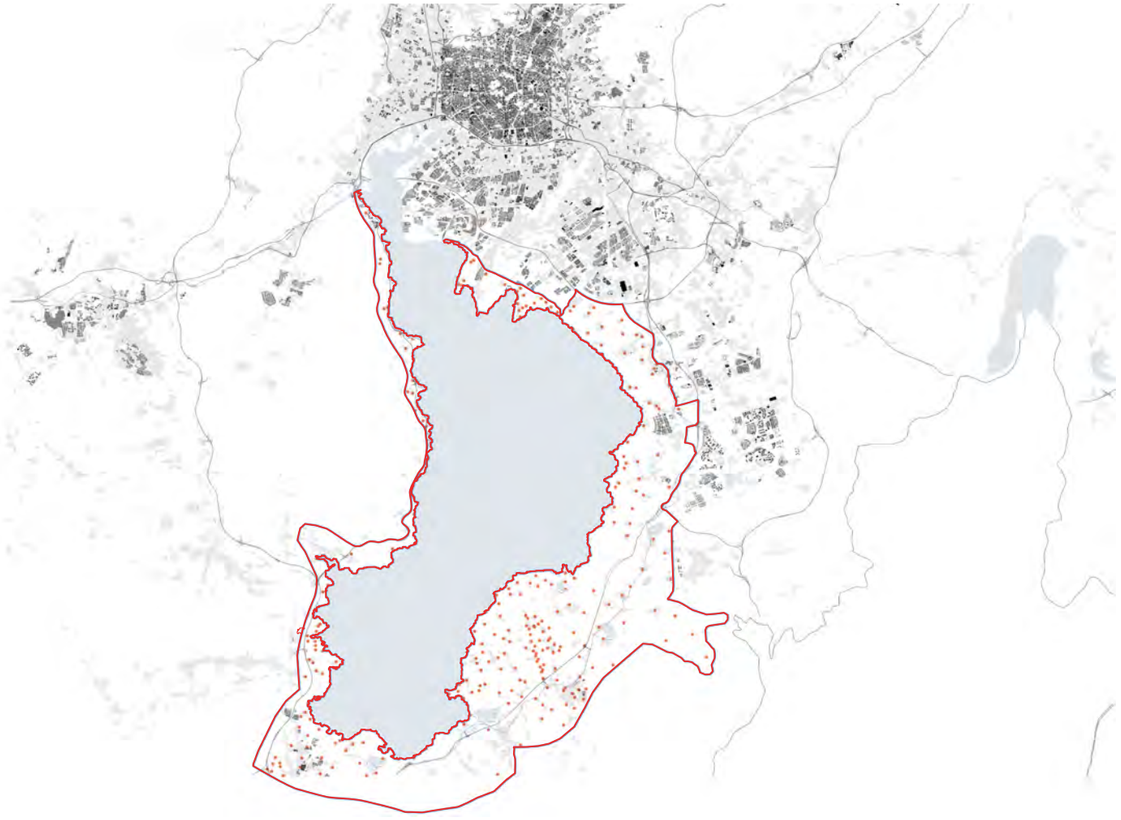
There are more than thousand villages in the Dian basin. villages in the center of the city have lost the farmland and turned into urban villages. Peri-urban villages are close to the city, which are greatly affected by the city on the edge of the urban sprawl.The distribution of peri-urban villages is relatively discrete and the density is relatively low.

N

5 0 5 10 15 20 km

Figure 4.23 Villages in peri-urban region of Kunming

236 TARGETED PERI-URBAN VILLAGES



residence space

village site

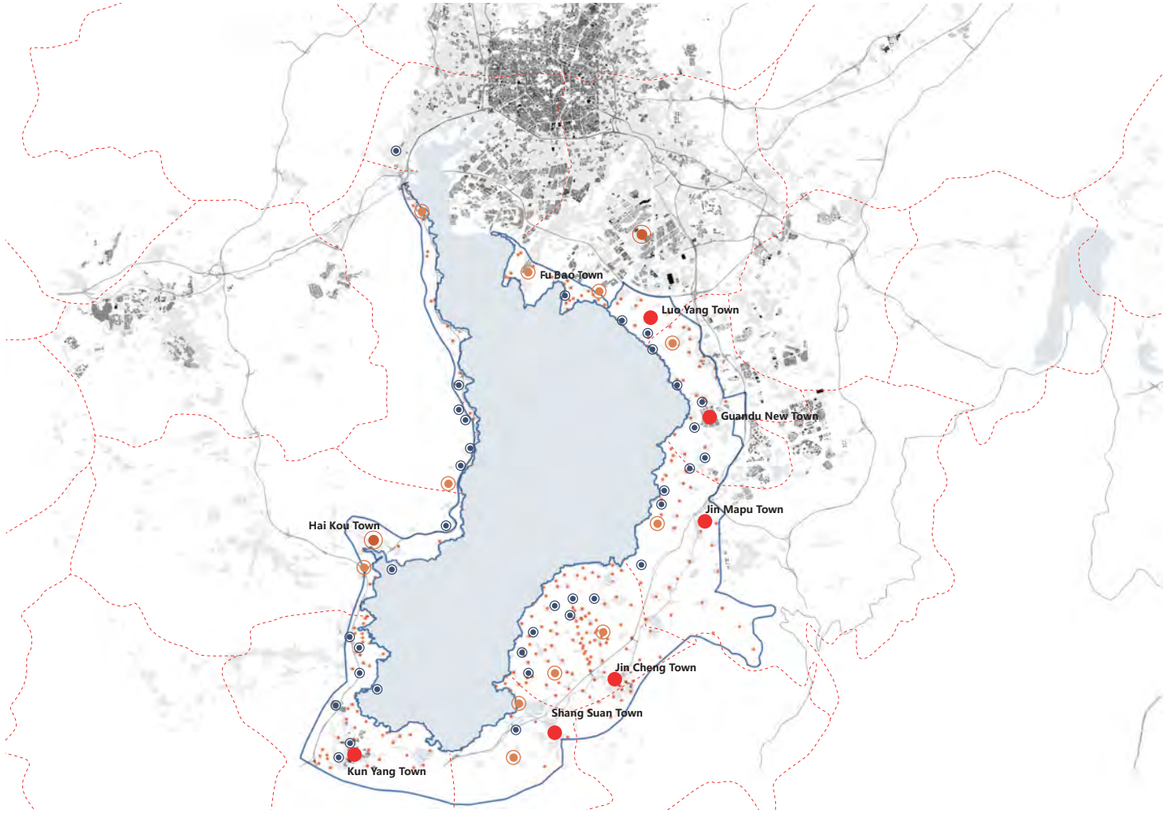
The targeted villages of this project are the villages in the inner urban fringe of Kunming city, which are under strong urban diffusion effects . But at the same time, they still have the characteristics of traditional villages. There is a certain amount of agriculture land in the village, some villagers are still engaged in agricultural planting. Urban villages whose farmland has been requisitioned and those are already in the blueprint for future urban planning is not include in the scope of this project. The project will involve 236 targeted villages.

N

5 0 5 10 15 20 km

Figure 4.24 Targeted villages in peri-urban region of Kunming

LOCALIZE THE INDUSTRY CLUSTERS

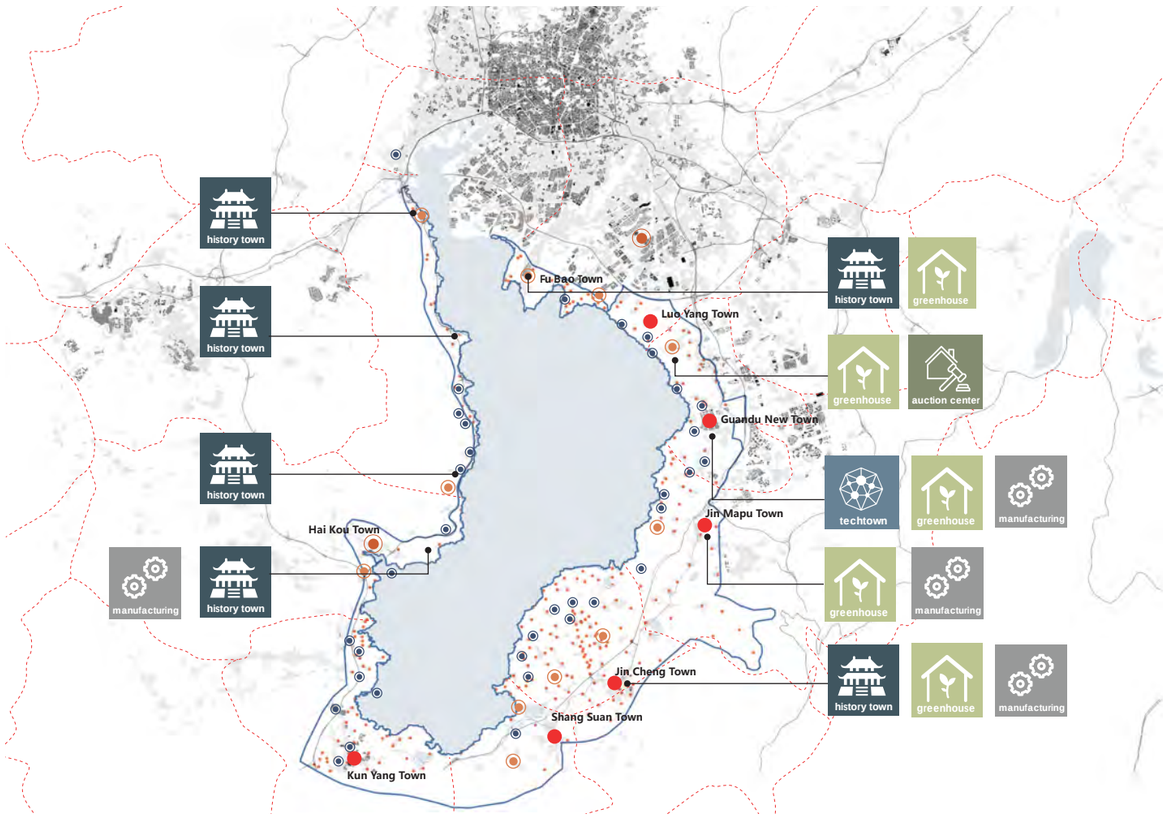


Township is the middle scale between county and village, townships are public service centers and commercial centers of the surrounding villages, which are formed in a bottom up way. The **service radius** of the town is between **3-5km**, the villages within this range can form an industrial agglomaration with the township as the core.

Figure 4.25 Localize industry clusters

4.4.2 EVALUATING PERI-URBAN REGION BY FOUR INDICATORS

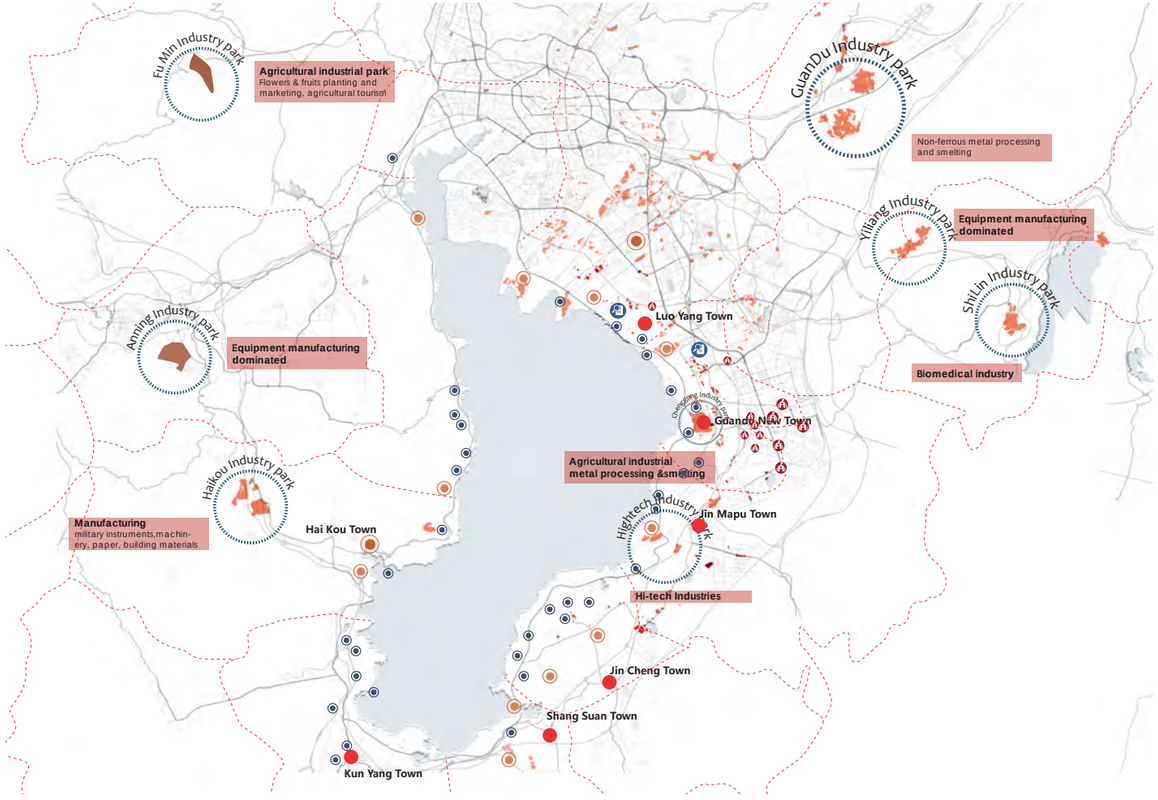
INDICATOR1:KNOWLEDGE AND INNOVATION VITALITY



There are 9 towns in Dianchi basin. Each town has **different functions and advantageous industries**. For example, the flower industry in Dounan town, and Jincheng and Fubao town are famous ancient towns with unique historical and cultural characteristics and developed tourism. Jinmapu town is adjacent to Chenggong new town, manufacturing industry developed.The towns in Dianchi basin region show **diversity**.

Figure 4.26 Function of towns in peri-urban region of Kunming

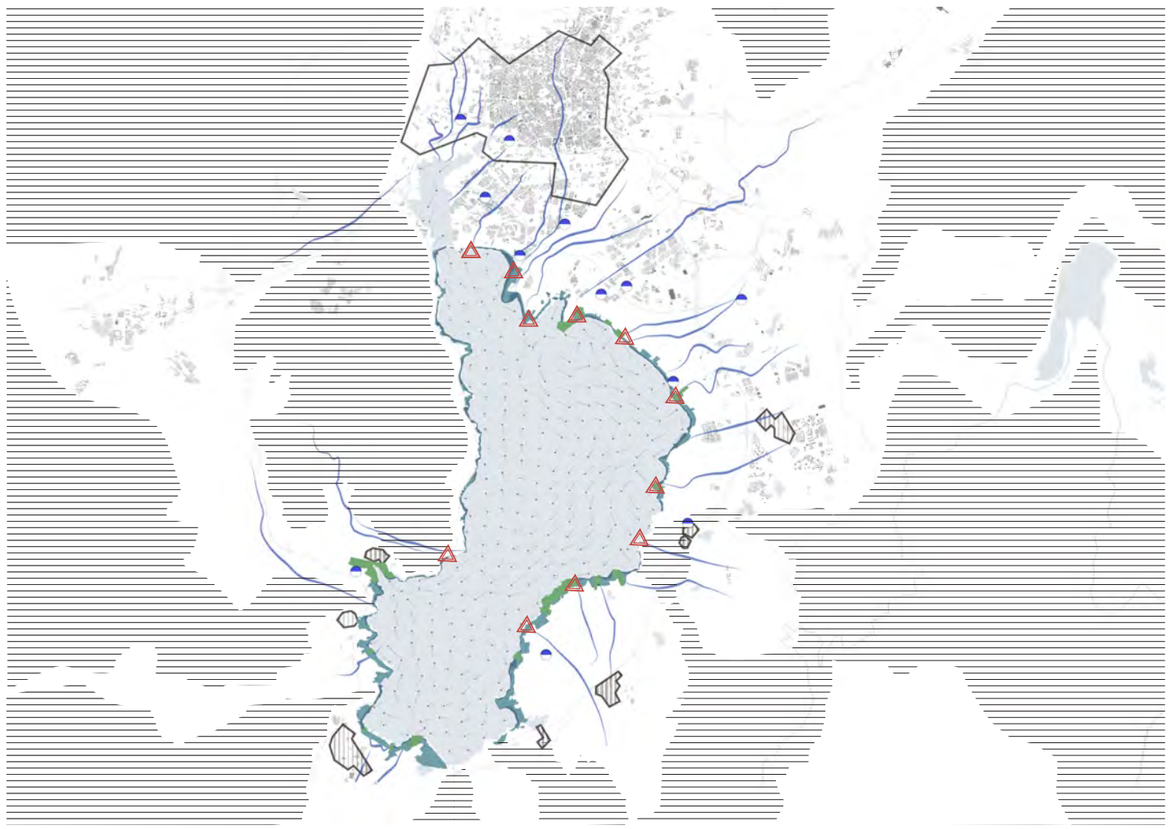
INDICATOR1: KNOWLEDGE AND INNOVATION VITALITY



There are two large industrial parks in the Dian basin, namely the **high-tech industrial park** and Chonggong industrial park, which are mainly engaged in agricultural products processing and metal processing. Industrial parks have high creative and production potential. Chenggong new town is the **university zone** of Kunming, with a number of scientific research institutions and institutions, which makes this area with high innovation

Figure 4.27 Industry parks in peri-urban region of Kunming

INDICATOR2: LANDSCAPE DIVERSITY / ECOLOGY CONDITION



There are abundant wetland resources around dianchi lakeThe wetland in Dian basin has **discontinuous ecological barrier** due to the **degradation** year by year. Due to the influence of **mountain topography,** many **ecological fragile zones** are formed at the entrance of rivers into lakes.

Figure 4.28 Ecological condition in peri-urban region of Kunming

INDICATOR3: ACCESSIBILITY — TRANSPORTATION SYATEM ANALYSIS

expressway
secondary road
bus station
arterial traffic
subway
railway
subway station

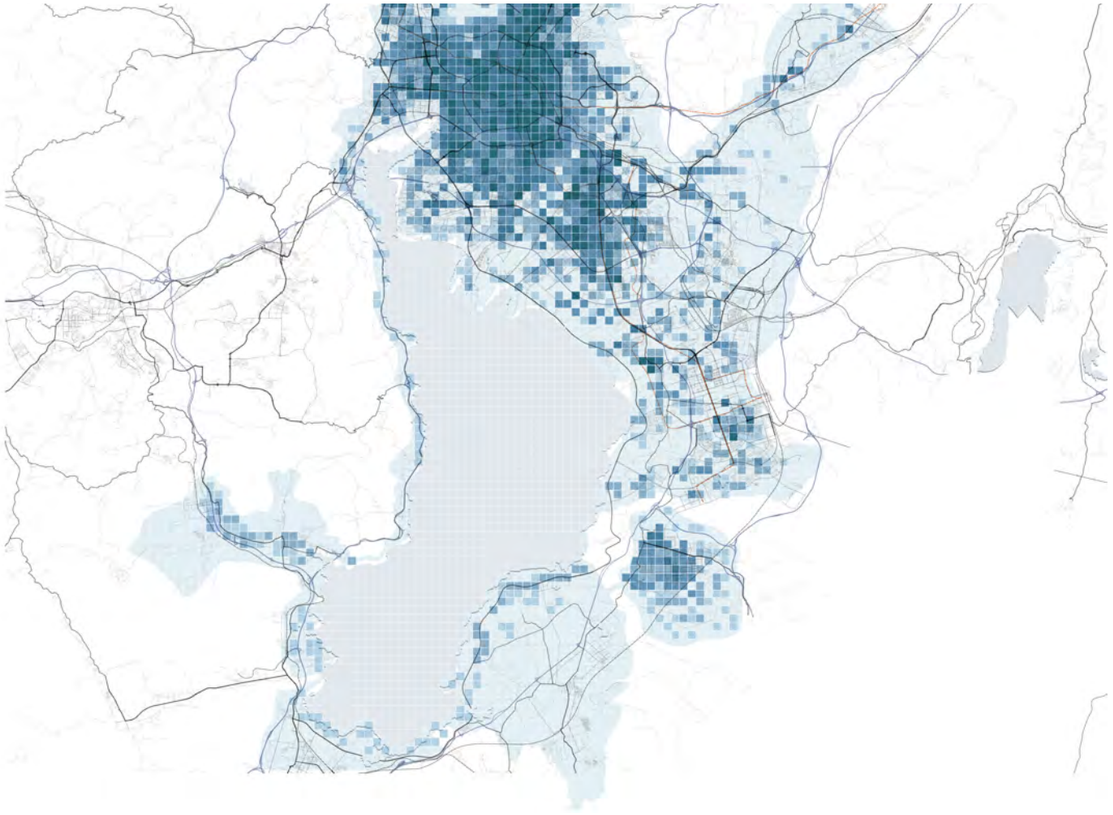
N

5 0 5 10 15 20 km

Compared with the dense road network and public transportation stations in the city center, the accessibility of peri-urban areas is relatively **low**, and the accessibility decreases with the increase of the distance from the urban center area.

Figure 4.29 Transport system in peri-urban region of Kunming

INDICATOR3: ACCESSIBILITY



Accessibility
of public transportation

LOW HIGH

N

5 0 5 10 15 20 km

The urban center and Chenggong new city have high accessibility, while the accessibility of other peri-urban areas is low except for main traffic lines and important public transportation stations.

Figure 4.30 Accessibility assessment in peri-urban region of Kunming

Image 4.5 Flowers auction

INDICATOR4: AGRICULTURE BASE

Flower industry as sunrise industry in Dianchi basin

3.33% China's flower planting area has grown by an average of 3.33% annually since 2012

1630000km² of flower planting area in China(2019)

4190000 job positions of flower industry in China

50% Fresh cut flower sales in Yunnan account for about 50% of the national market

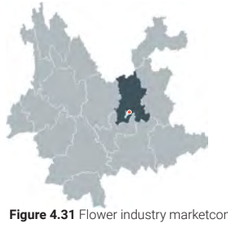
104100km² of flower planting area in Yunnan(2019)

180000 job positions of flower industry in Yun nan

10.39% Kun Ming's flower planting area has grown by an average of 10.39% annually

80% Fresh cut flower sales in Kun Ming account for about 50% of the Yunnan market

71030 job positions of flower industry in Kunming



78.8% Fresh cut flower sales in Yunnan account for about 78.8% of the provincial market

3.08km² of flower planting area in Dian basin (2019)

20000 job positions of flower industry in Dian basin

Figure 4.31 Flower industry marketcondition of China

Figure 4.32.China Cut Flower consumption

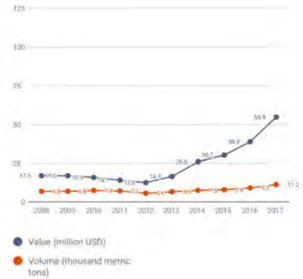
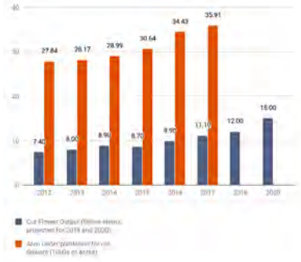


Figure 4.33.China Cut Flower export

Figure 4.34.Kunming Cut Flower Industry



Data source:Yunnan Flower Technical Training and Promotion Center

Trends of floriculture sector in the Kunming

Why flower industry could be draiving force of rural economic?

Flower consumption demand is an important factor that determines and affects the development of flower industry.The progressive realization of strategic target as China's economy and people's living standards improve, people can have higher requirements on the quality of life, flowers will become the important people in the spirit of consumer goods, expanding market potential. China has become one of the top seven countries in the world with the production capacity and consumption potential of fresh cut flowers. In Beijing, Shanghai, guangzhou flower production is growing at 30% to 40% a year, is still far cannot satisfy the need. According to the analysis of consumption economics, after the development stage of subsistence consumption and durable goods consumption, the cultural consumption stage is bound to follow, and the flower consumption will be more and more.

In the past 20 years, China's flower industry has beendeveloping rapidly, with an average annual growth rate of over 20%.The flower production area increased from 14,000 square meters in 1984 to 43 square meters in 2003, an increase of 30.7 times, with an average annual increase of 19.8% in 19 years. From the output value of 600 million yuan in 1984 to the sales volume of 35.3 billion yuan in 2003, an average annual growth of 23.9%. Its growth rate far exceeds the level of domestic economic growth and flower growth of any country in the world. China's flower production area has accounted for more than one third of the world's total flower cultivation area, flower production has a considerable scale. With the rapid development of economy and the improvement of people's living standard, the production scale, output value and importance of flower industry in social life will be more and more high, and the market demand potential of flowers is constantly expanding, gradually becoming an important commodity that directly enters the tertiary industry from the primary industry (planting industry). The scale of China's flower industry, its specialized workers and its socio-economic functions show that China's flower industry has formed an industry and is a rapidly expanding new industry.

The flower industry provides a lot of job opportunities.According to Dutch flower industry statistics, in 1987 the number of people engaged in the flower industry in the Netherlands was 65,000. Including 23000 flower producers market of 3400 people, 6000 related industries, wholesale output operators of 10000 people, 23000 people related to the retail.That is to say, every flower producer wants to have 2 people to provide a series of service for its on average antepartum, produce, postpartum. The flower industry accommodates a large number of surplus labor in urban and rural areas.At present, the number of flower practitioners in China has reached 10,000. In the future, there will be a great trend of development. Thedevelopment of the flower industry will promote the improvement of the employment structure, provide employment opportunities for more rural surplus labor and laid-off workers, and promote social stability and unity.

Flower industry and Sustainable Development Goals

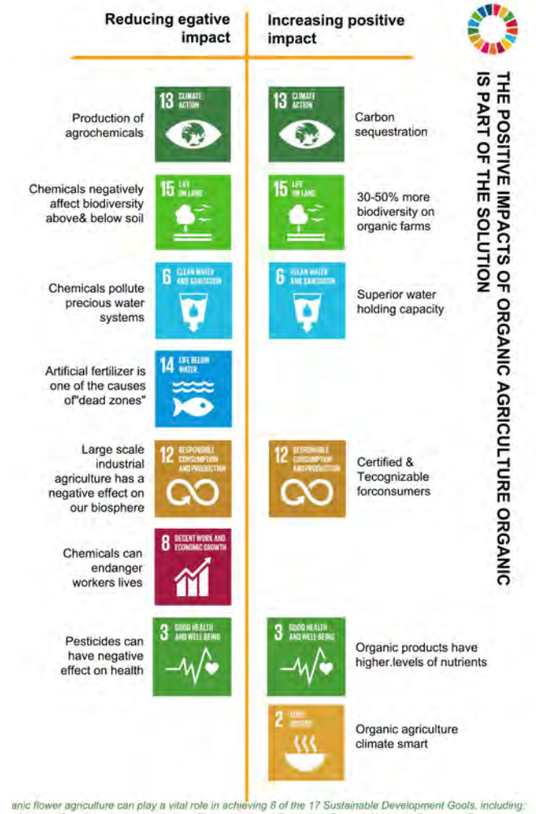
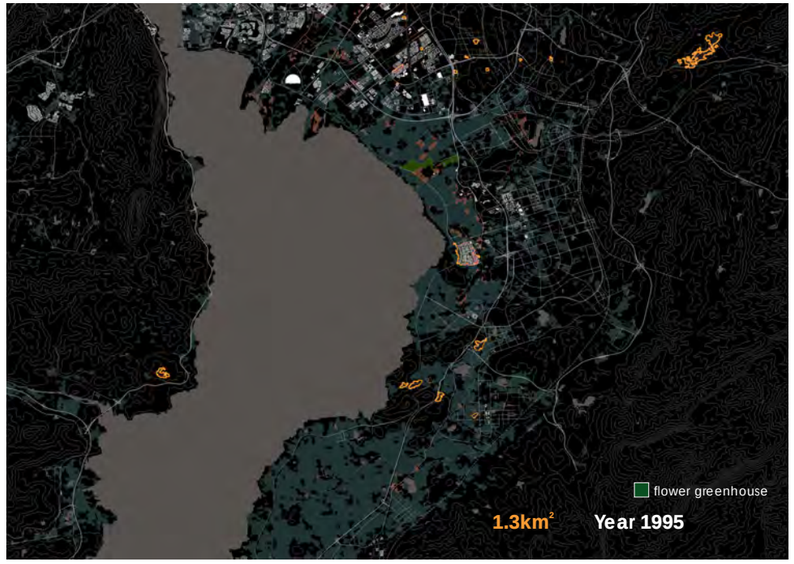
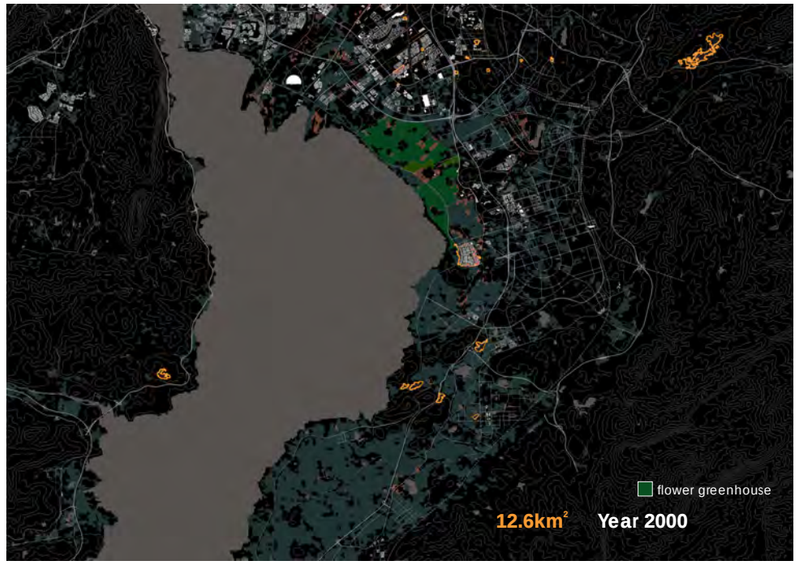
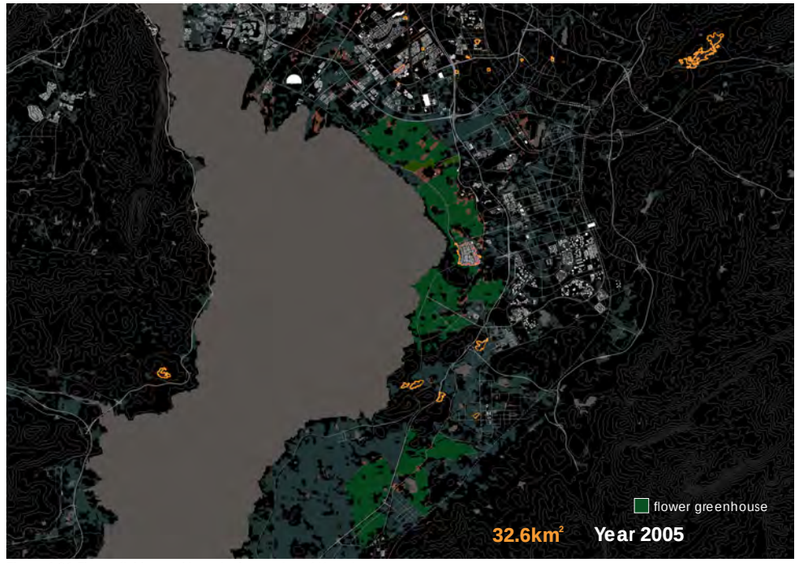


Figure 4.35 Flower industry and Sustainable Development Goals







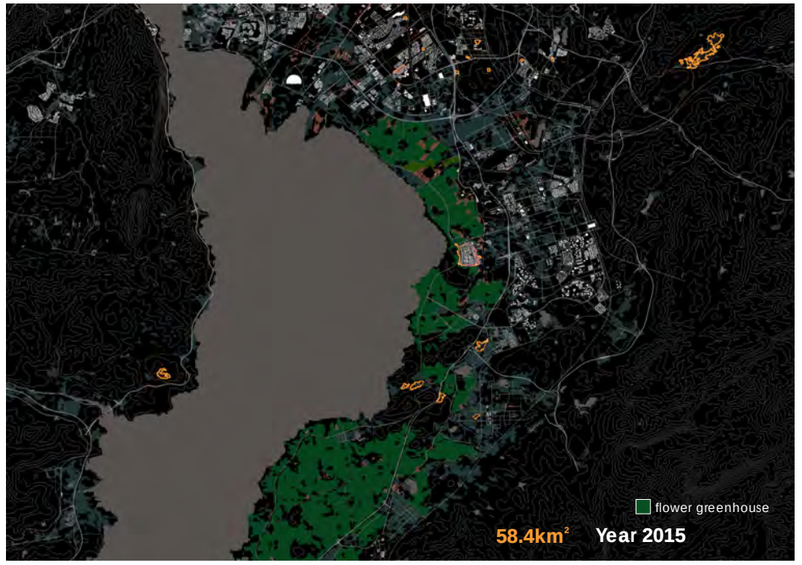
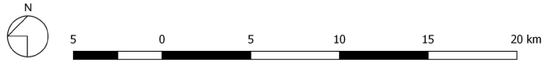


Figure 4.36 Flower field sprawl in peri-urban region of Kunming

42

Flower green house spread in Dianchi Basin

With the Increased economic income through flower planting in the northern villages of Dianchi lake, people gradually saw the benefits of planting flowers. Instead of planting crops, which were of low economic value, villagers planted large areas of flowers. Flower greenhouses gradually spread in the eastern basin of dianchi lake, growing from 1.3 square kilometers in 1995 to 58.4 square kilometers in 2015.



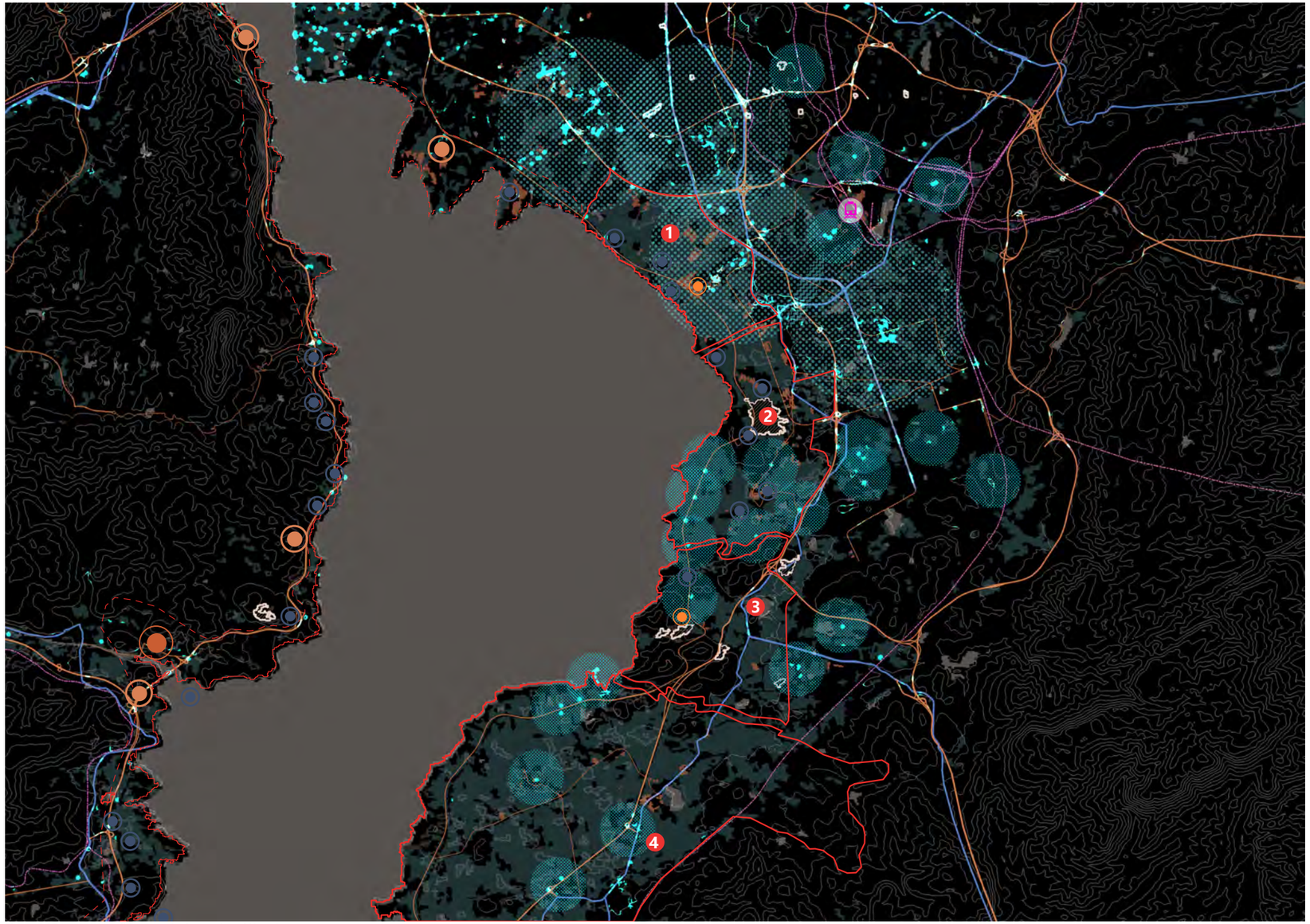


Figure 4.37 Logistic condition in peri-urban region of Kunming

Flower logistic condition

Flower is a kind of special fresh agricultural products, with the characteristics of perishable value, product value with time, quality availability, product vulnerability, etc.Yunnan flower supply logistics is developed along with the development of yunnan flower industry.The specific performance is as follows :

1. Flower producing area is too scattered, logistics cost is high;

2. Logistics distribution area is not centralized, and there is a lack of professional companies engaged in short-distance logistics service;

3. In the whole industry, there is no cold chain transportation in the supply logistics link, so the product quality is difficult to be guaranteed, the degree of specialization is low, and the product has a large loss (quality, quantity) in the whole short-distance transportation process;

4. The majority of flower farmers and small companies have poor awareness of modern logistics, and fail to realize the improvement of flower quality, loss reduction and added value through logistics.

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4.5. DECODING DOUNAN CLUSTER

Why Dounan cluster?

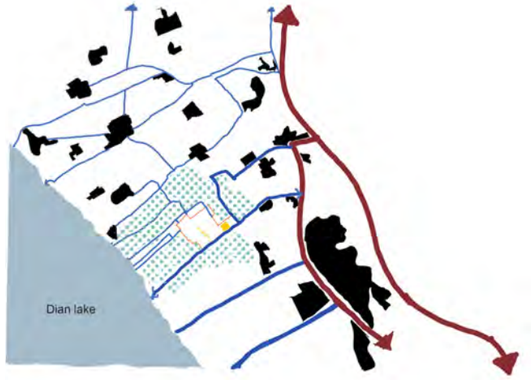
Dounan village belongs to Kunming Chenggong county, Dounan town. Except Dounan village, Dounan town is also under the jurisdiction of other 10 administrative villages, Dounan town has a unique climate and soil conditions, so agriculture is more developed.The flower planting area is 829 hectares, accounting for 64.5% of the total cultivated land area of the town. In 2001, it was named "the hometown of flowers and trees in China" by the state forestry administration. The reputation of Dounan town mainly stems from Dounan village, one of the administrative villages under its jurisdiction. According to the market share and consumer awareness of Dounan flowers, "Dounan flowers" was evaluated as a brand with a value of 3.2 billion RMB, making it the first flower brand with intangible assets in China.

In the late 1980s, farmers in Dounan began growing flowers, mainly for sale in downtown Kunming. From 1991 to 1994, the area of flowers in Dounan expanded to 800 hectares, and florists spontaneously purchased flowers in Dounan village, forming a roadside market for flower trade, known as "flower street" by local people. In 1995, the government invested 3.84 million RMB to set up the country's first village flower market in Dounan.The market covers an area of 5 hectares, and there are 1.5 ~2 million flowers on the market every day, A pattern of professional transactions has taken shape. In 1998, the government invested 65 million yuan in Dounan and built a flower trading market with more than 500 shops with 800 standard booths. The Dounan flower wholesale market has developed into the largest wholesale market of fresh cut flowers in China. The flower auction market is modeled on the Aalsmeer fresh cut flower auction market in the Netherlands and promotes the development of the flower industrythrough this advanced flower marketing method.

In 2003, a flower logistics distribution center was built in Dounan village, which integrates the functions of flower collection, transportation, storage, packaging, fumigation and so on. The centercovers an area of 15,000 square meters, with 2,430 square meters of flower freight area, 1,100 square meters of flower cold storage, and 2,052 square meters of flower postharning processing and packaging space. With the expansion of flower trading scale, the original trading center could no longer meet the use demand, and a new flower auction center was established in 2015.

The development process of Dounan cluster

Year 1991-1997

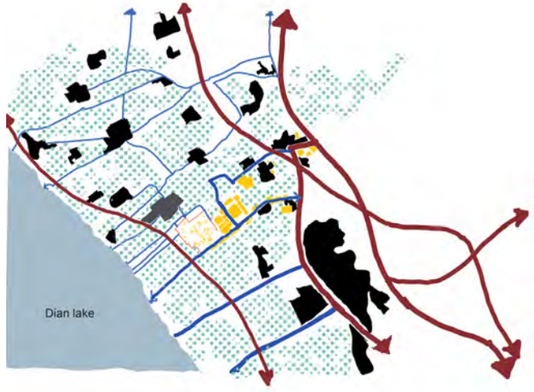


The government invested in building a new flower trading market for Dounan village, and a professional trading pattern was initially formed. There are refrigeration and preservation, freight, information services and other supporting facilities.

Year 1998-2001

The number of local farmers and non-local florists engaged in the transportation and sale of fresh cut flowers has reached more than 230.The flower trade market has become crowded, unable to accommodate the growing flower trade, the lack of infrastructure has become a restriction.

Year 2002-2015



In July 2005, the government of Yunnan province and Yunda technology company. jointly funded the establishment of China's largest flower auction market -- KIFA,

Year 2015-now

Dounan village learned from the Netherlands Aalemeer flower auction market as the model. With the development, the insufficient space has become a bottleneck restricting the further development of the flower industry cluster in Dounan.

Figure 4.38 Development process of Dounan auction center

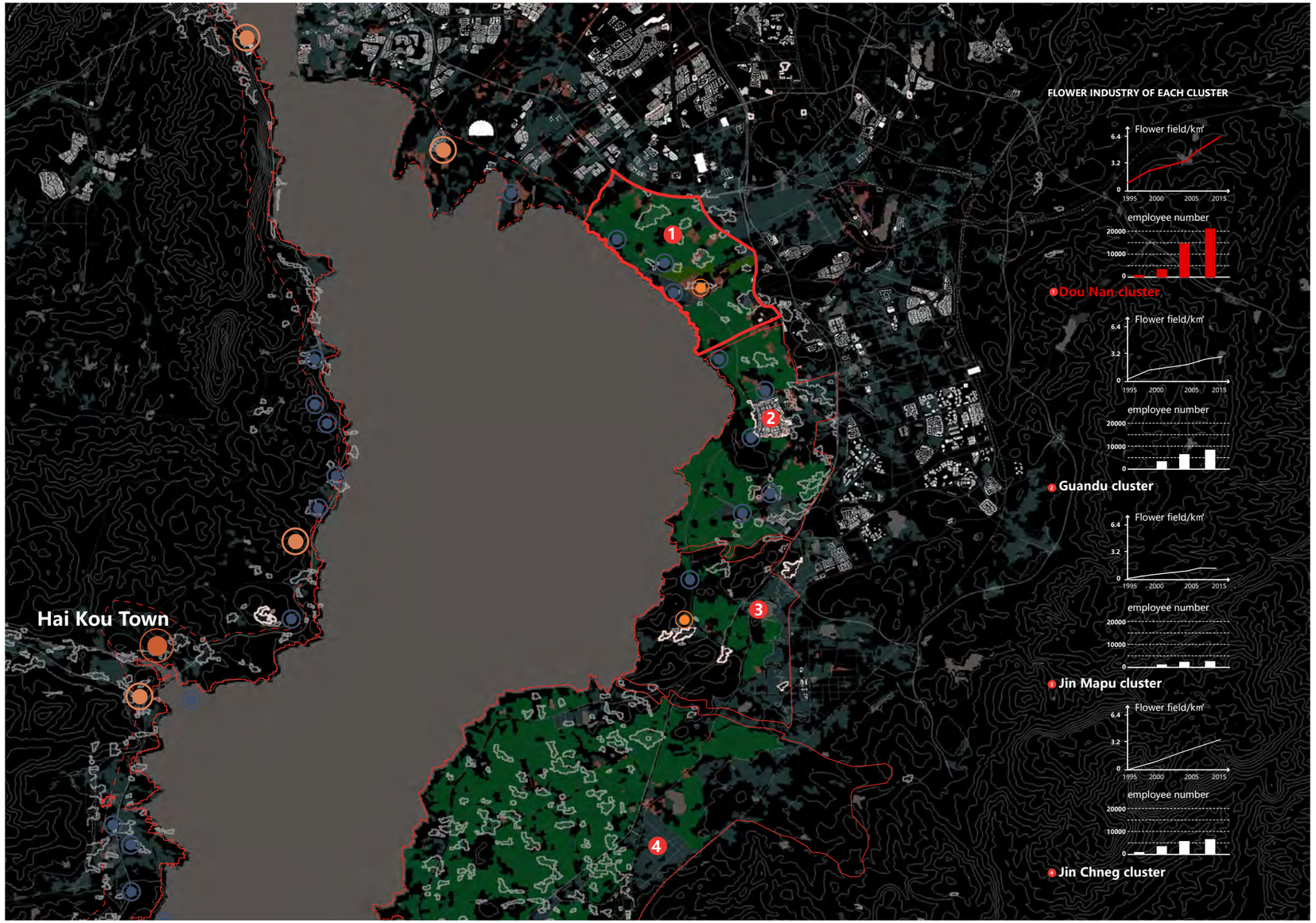


Figure 4.39 Flower industry condition of each town in peri-urban region of Kunming

4.5.1 EVALUATING DOUNAN CLUSTER BY FIVE INDICATORS

INDICATOR1: AGRICULTURE BASE

Image 4.6 Biggest flower auction center in Asia

Image 4.7 Dounan Flower Market warehouse

Upon on the analysis of flower development history and huohui yield in Dounan cluster,Compared with other villages and towns, The Dounan Cluster is the most competitive region in the Dianchi Basin, with the highest level of flower planting and the greatest potential of innovative industry. Villagers have higher planting experience and economic basis, which provides more possibilities for the promotion of mechanized production.As there are many flower companies in the town, Knowledge Economy has a good industrial foundation.

1.Transportation system and External traffic connection

Asian scale

Figure 4.40 Transportation connection of China with southeast Asia

City scale

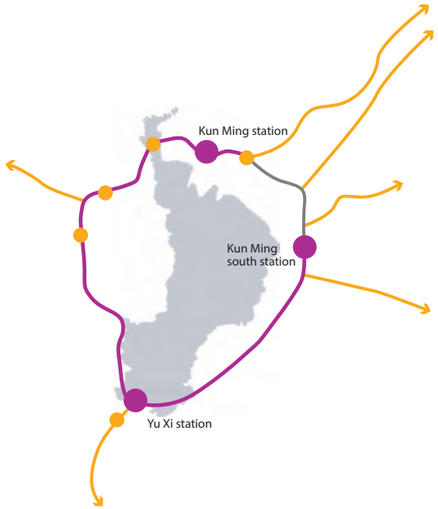


Figure 4.41 Railway connection in Kunming

Cluster scale

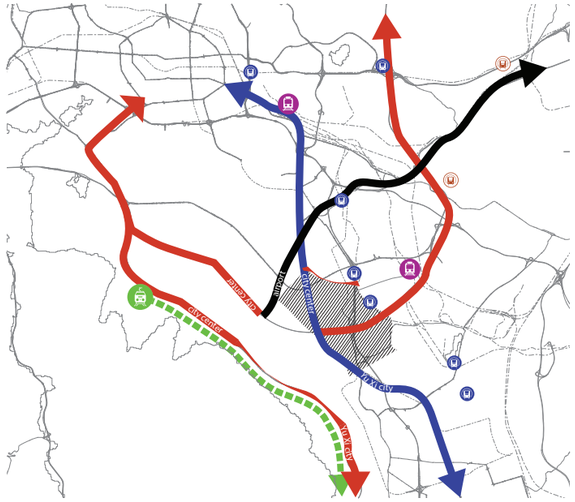
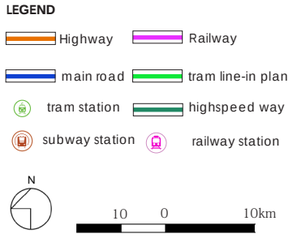


Figure 4.42 Transportation connection of Dounan cluster

Yuxi city is an important link between China and other southeast Asian countries. Yuxi railway station is connected to kunming south railway station. This rail transit is crucial for kunming to connect with southeast Asian countries.

A provincial highway runs diagonally through the Dounan cluster, connecting with the main city to the north and extending southward to jincheng district and yuxi city in the south.To the east, there is a national highway extending to Kunming airport.The subway station at the northeast corner ensures the high accessibility between dounan cluster and the

Figure 4.39 Flower industry condition of each town in peri-urban region of Kunming



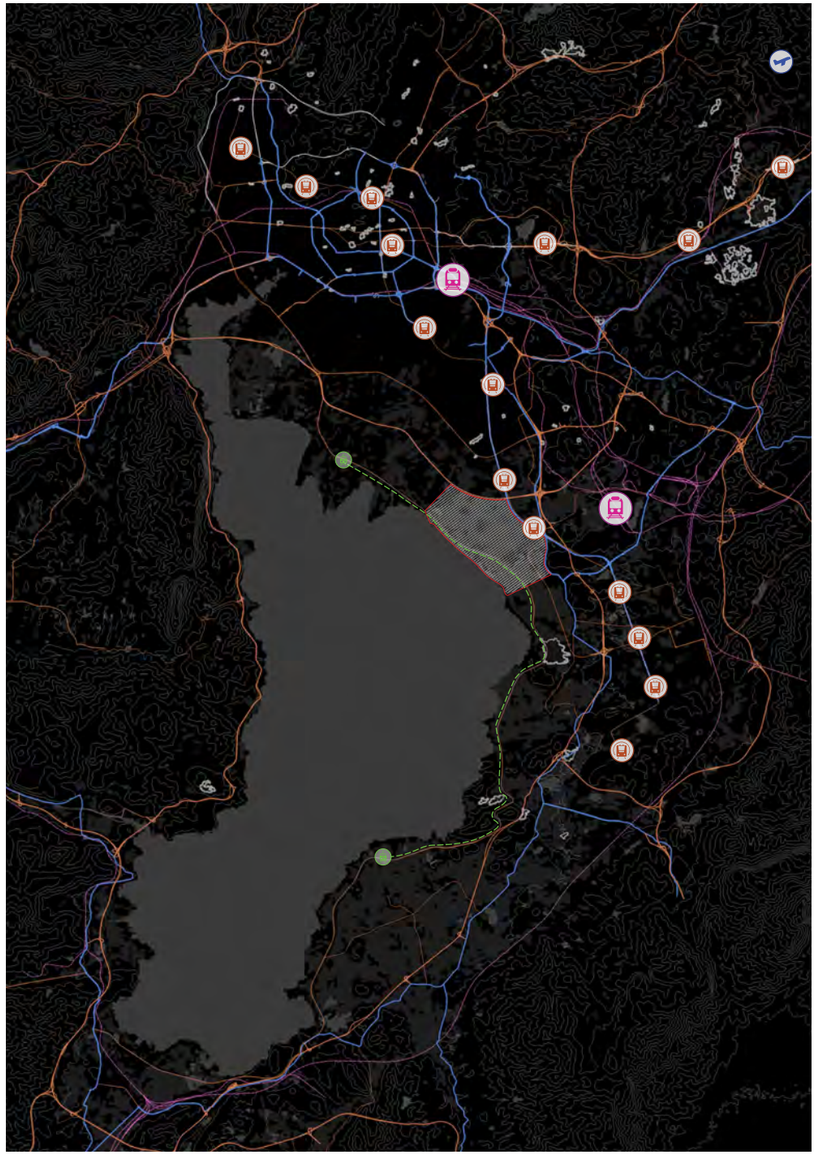
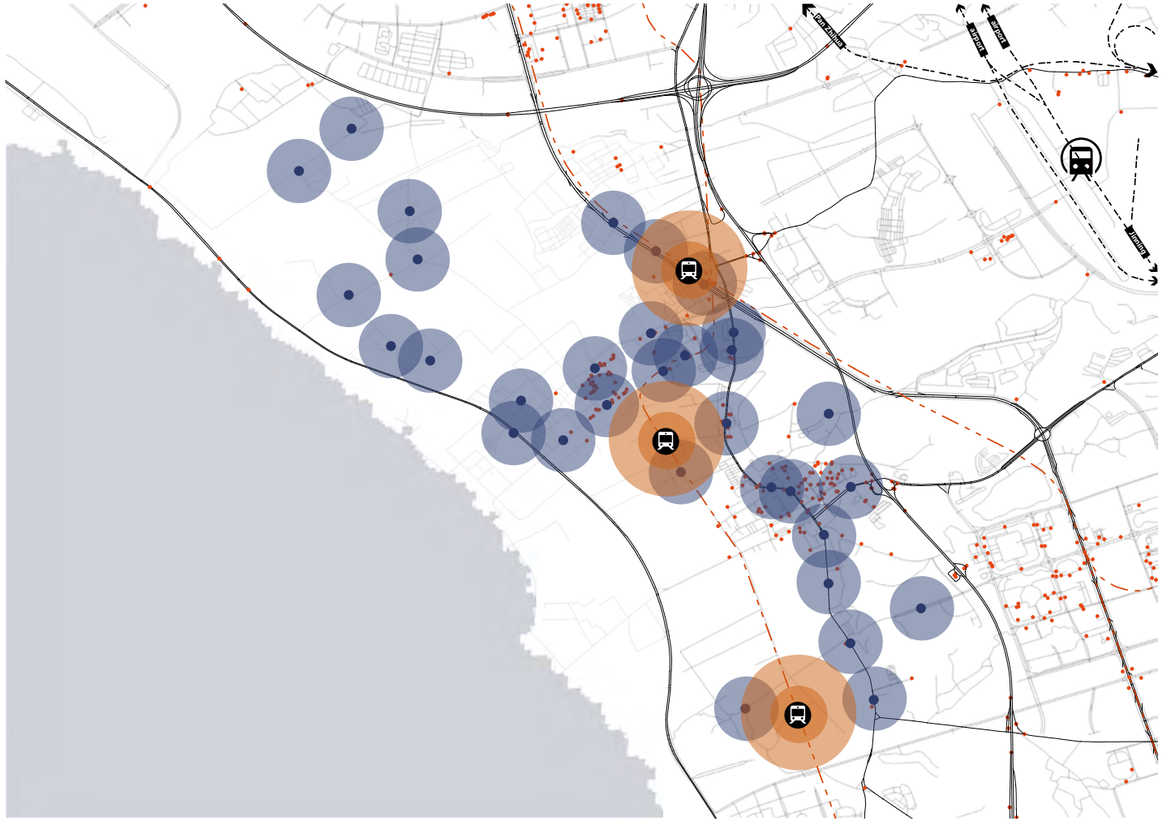


Figure 4.43 Flower industry condition of each town in peri-urban region of Kunming

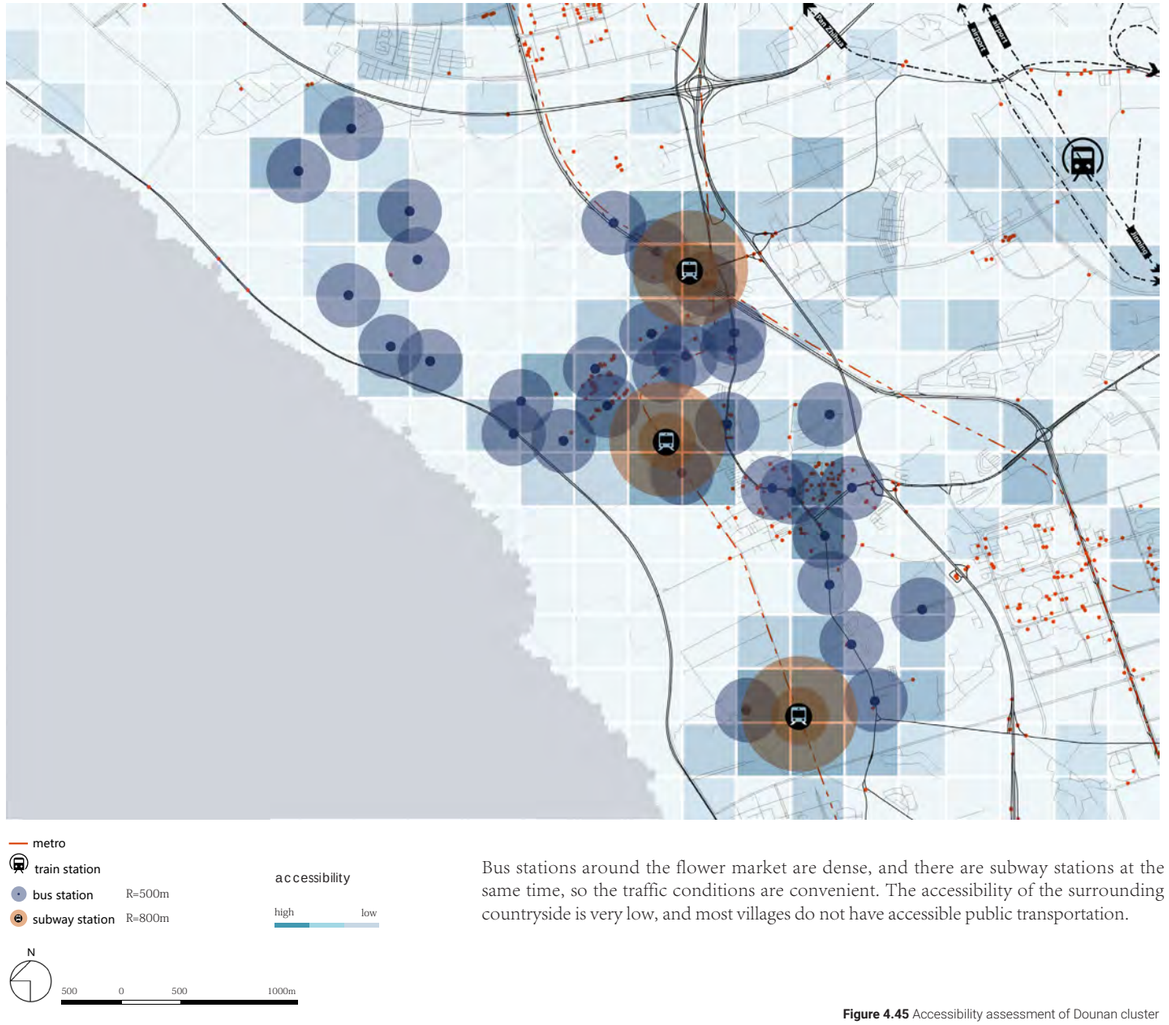
PUBLIC TRANSPORTATION SERVICE RANGE OF DOUNAN CLUSTER



Take the service radius of the bus as 500 meters and the service radius of the subway as 800m as the standard, the coverage of public transport is very limited, the accessibility of Dounan Town is uneven.

Figure 4.44 Transport system in Dounan cluster

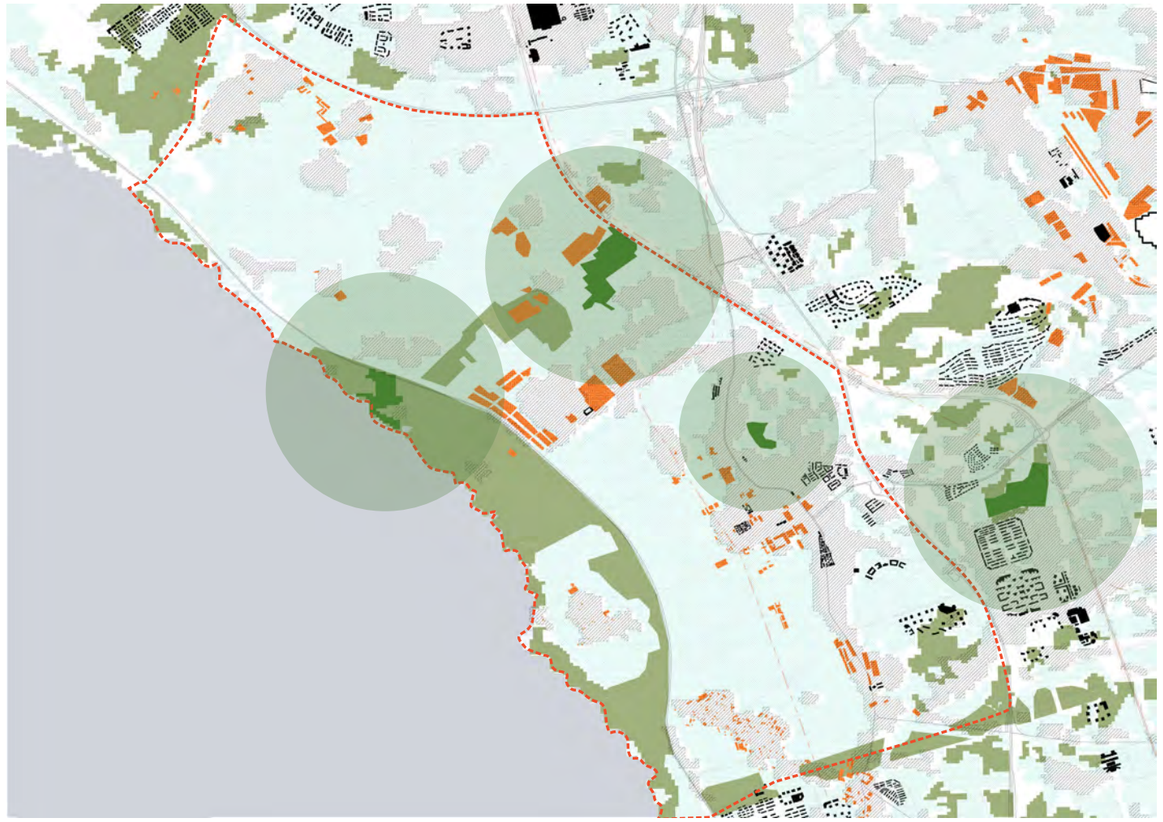
ACCESSIBILITY ANALYSIS IN BASIN AREA



Bus stations around the flower market are dense, and there are subway stations at the same time, so the traffic conditions are convenient. The accessibility of the surrounding countryside is very low, and most villages do not have accessible public transportation.

Figure 4.45 Accessibility assessment of Dounan cluster

PUBLIC SPACE SERVICE RANGE OF DOUNAN CLUSTER



There are only four public greens in the area of Dounan Town, and the scale is very small. Taking the service radius of 1000 meters as the standard, most villages are not within the service range of public green space.

Figure 4.46 Parks and recreation area in Dounan cluster

EDUCATION SERVICE RANGE OF DOUNAN CLUSTER

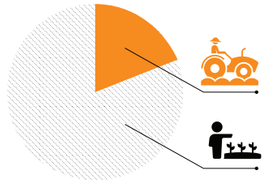
The educational resources in Dounan Town are seriously lacking, and the allocation of primary schools and kindergartens is below the standard. There is only one middle school in the whole town, which cannot meet the needs of the residents of the town, nor can it bear the potential population growth in the future.

Figure 4.47 Schools in Dounan cluster

4.5.2 ANALYSIS CONCLUSION ON PERI-URBAN REGION SCALE

weakness

1.Family - based planting
cannot meet the standards of specialization



80% of the production is still carried out by individual households

2.The scattered flower producing areas
resulting in high logistics costs.

3. No professional cold chain logistics center in Yunnan province

4. Weak research ability and awareness
At least 20%~30% of the profit of the flower industry needs to be paid to the owner of new patent of flowers as a variety royalty, and most of the licensed varieties are those that will be eliminated from the market, so they lack competitiveness in the market.

Image 4.8 vinyl tunnel

Image 4.9 Artificial pruning flower branch

Image 4.10 Flowers warehouse

5 SCENARIOS

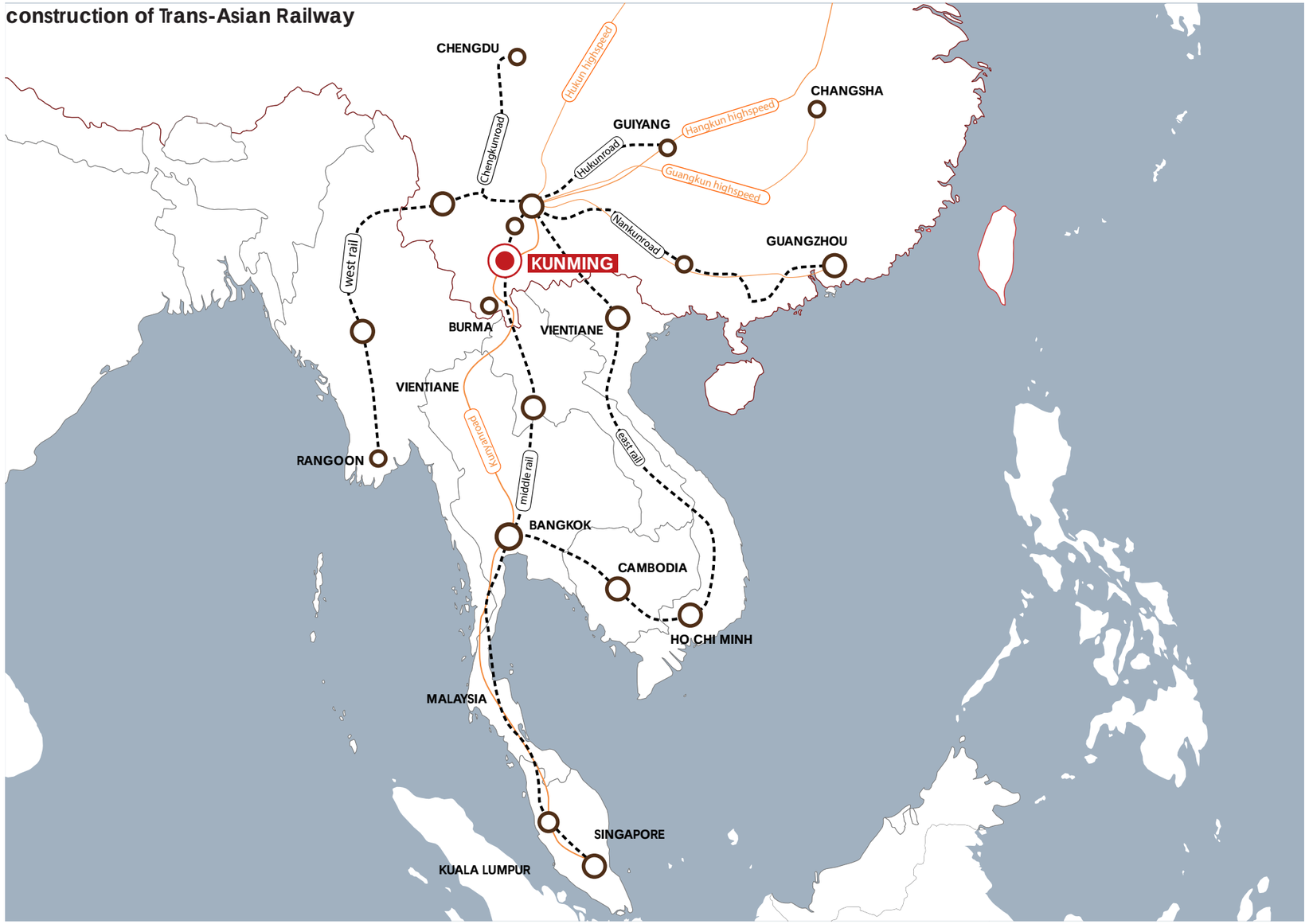


Figure 5.1 Trans-Asian Railway system

scenario on global scale

KUNMING:Asian flower trading center, logistics distribution center, information center.

scenario on regional scale

1.The key issues
Industry clusters promotion

2.Driving force
1.funding
2.policy
3.behaviour and willing of the citizens
4. change of population
5. Technique upgrading
6. Homogeneous competition
7. Construction of railway
8. Construction of Cheng Gong new town

Importance and uncertainty level of factors

level of uncertainty			importance
low	middle	high	
②	① ⑦	⑥ ④ ⑤	high
		⑧ ③	middle
			low

Four scenarios

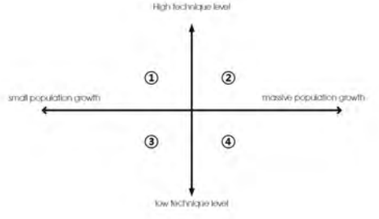


Figure 5.2 Scenario base evaluation

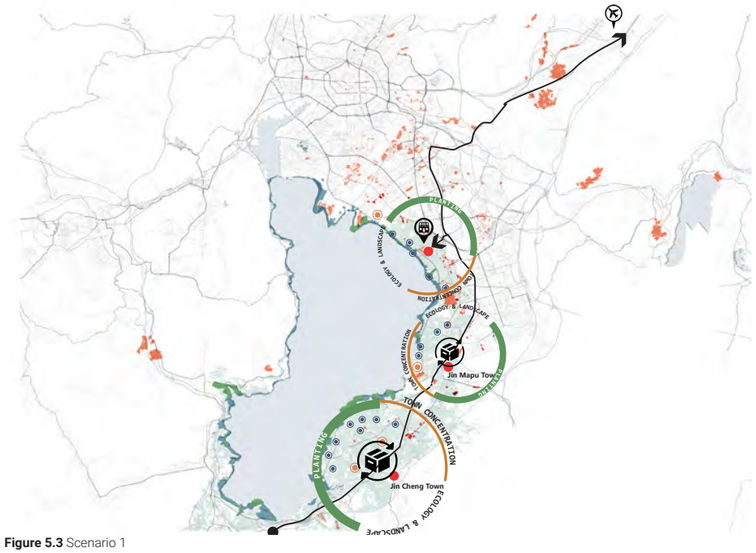


Figure 5.3 Scenario 1

Senario1:
Mechanized production is gradually spreading
small population growth

The development level of the three clusters was similar, and all groups gradually changed from small family planting to mechanized planting. The Jincheng cluster in the south had more suitable conditions for mechanized development due to its large flat terrain.

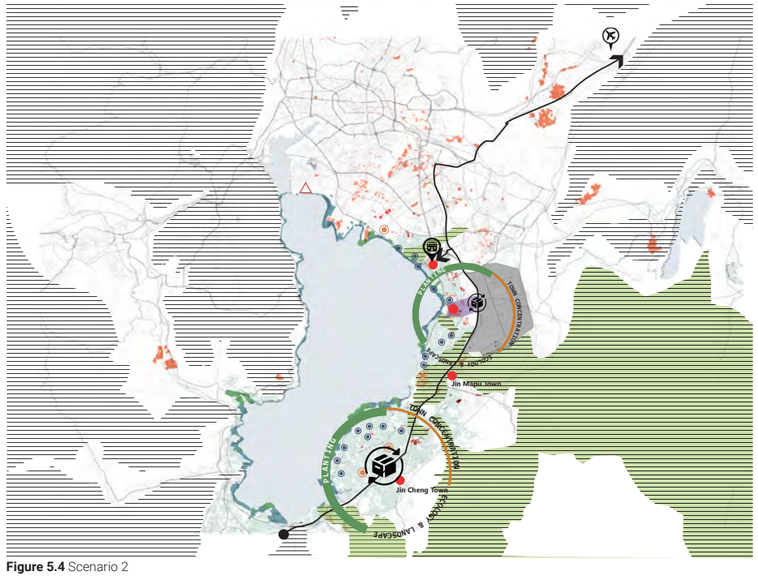


Figure 5.4 Scenario 2

Senario2:
High technique level
massive population growth

Due to the huge population growth, the Chenggong group began to develop the manufacturing industry related to mechanized agriculture based on its manufacturing industry, providing a large number of jobs.

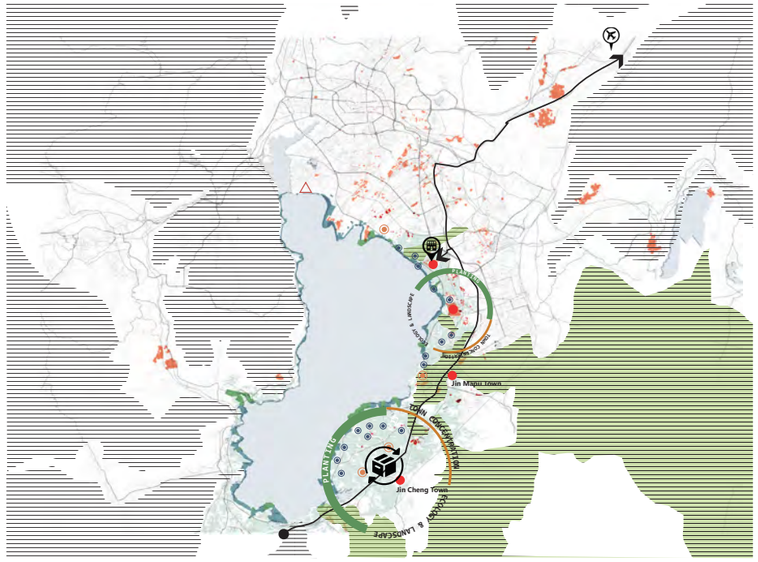


Figure 5.5 Scenario 3

Senario3:
High technique level
small population growth

With the improvement of mechanization level, the production efficiency of Dianchi basin has been greatly improved, and the economic benefits have been remarkable. The natural environment and the quality of life have been attached importance to, and the land in some ecologically fragile areas has been returned to nature and farmland has been returned to nature.

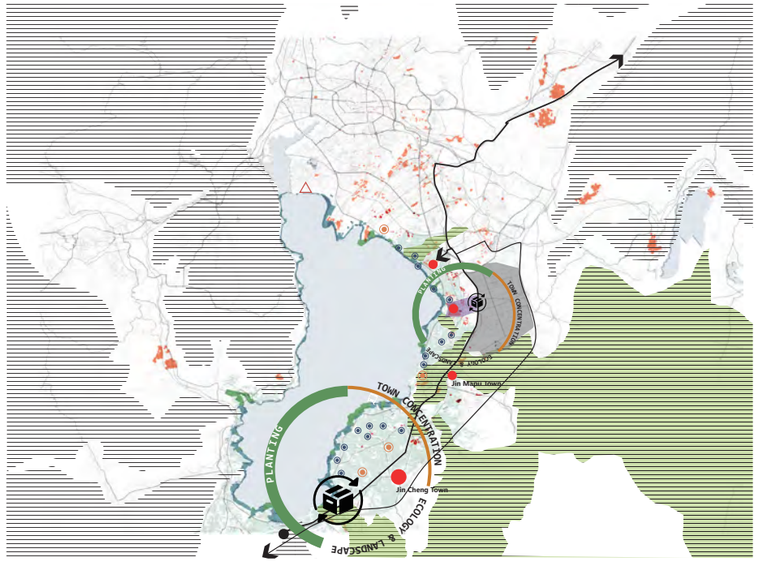


Figure 5.6 Scenario 4

Senario4:
High technique level
massive population growth
Trans-Asian Railway completed

Due to the opening of the trans-asian railway system, Jincheng has become the gateway of Kunming and even yunnan to southeast Asia. The cheap railway transportation has greatly reduced the transportation cost of flowers, and Jincheng has become an important distribution center of flowers in Kunming.

VISION & GOAL- Towards a knowledge ecosystem

Competitiveness:
Reidentify the role of Peri-urban region;
Boosting the local economy

Diversity:
Improving the capability of accommodating a diverse built and social fabric

Sustainability:
Manage the ecological poverty;
Realize circular economy

Livibility:
Creating a liveable and attractive peri-urban region

Adaptibility:
Improve the capacity of peri-urban region to respond to changing circumstances

The peri-urban region in Dianchi basin will be a environment sustainable region with high competitivness and diversity, consolidating itselft as a new growth pole of Kun Ming and promoting the coordinating rural-urban development.

Figure 5.7 vision

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6 STRATEGY IMPLEMENTATION

6.1 STRATEGY INTERVENTION SCALE

Figure 6.1 Intervention scales

This chapter will explain the strategy and its implementation from the two dimensions of town and village.As an industrial cluster in peri-urban region, town plays a agglomeration effect and is a basic production unit in this project.The original production mode based on village is reorganized, the layout of infrastructure and equipment based on town is carried out. Villages are the basic communities in rural region. Therefore, this chapter will give detailed explanations and examples on the spatial implementation of various strategies on this scale.

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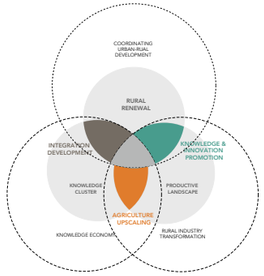
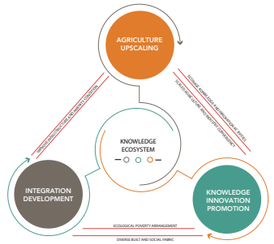
6.2 PRINCIPLES

For the vision of knowledge ecosystem, there are three principles derived from the theoretical research, they are intergration redevelopment, agriculture upgrading and knowledge innovation promotion. The goal is to achieve a knowledge ecosystem which is a sustainable peri-urban region with high competitiveness, diversifies social and living environment. Each of the three principles are interrelated with each other, the strategies are derived from their relationships.



THEORITICAL FRAMWORK

Figure 6.2 Theoritical framwork



MAIN CONCEPT

Figure 6.3 Conceptual framwork

6.3 NEW QUALITY

Towards a knowledge ecosystem

Competitiveness:
Reidentify the role of Peri-urban region;
Boosting the local economy

Diversity:
Improving the capability of accommodating a diverse built and social fabric

Sustainability:
Manage the ecological poverty;
Realize circular economy

Livibility:
Creating a liveable and attractive peri-urban region

Adaptibility:
Improve the capacity of peri-urban region to respond to changing circumstances

6.4 STRATEGIES

The five strategies are derived from the conceptual framework and principle, and the items that can be spatialized in the planning principle are summarized into five basic implementations, as follows:

Encourage Knowledge and innovation activities; Improve infrustructure condition;Ecological security pattern; High quality neighborhood with diverse built and social fabric; scaled agriculture and industry convergency.

In this chapter, how to implement the strategy will be explained one by one from the two scales of Dounan cluster and Jiangwei village.

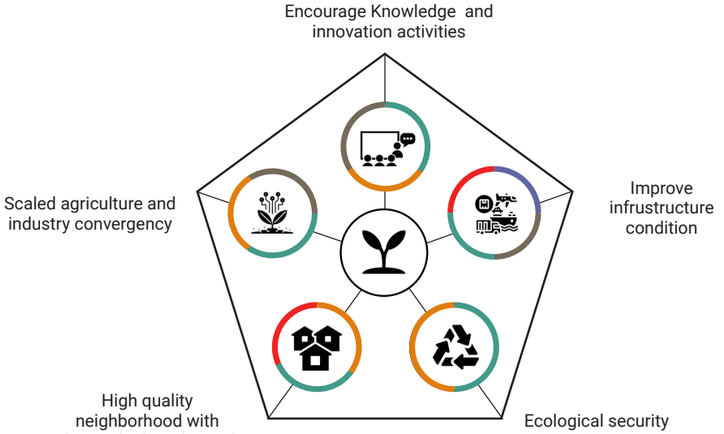


Figure 6.4 Strategy framwork

6.4 STRATEGIES

STRATEGY1:

Improve infrustructure and amenity condition

The improvement of the infrastructure is the foundation of the solution, providing for the improvement of other aspects. The improvement of infrastructure conditions mainly includes the improvement of traffic conditions, the supplement of educational facilities and agriculture facilities. The construction of the road system can increase the accessibility of the area, and the cold chain logistics system can guarantee the quality of flowers. The number of secondary and primary schools should be arranged according to the size of the regional population, ensuring that there are kindergartens and primary schools in each village and a sufficient number of secondary schools in each town.

STRATEGY 1	GOAL
1a Transportation system construction land consolidation Network with diverse means of transport Improve logistic condition 1b Supplement of education facility 1c Supplement of agriculture facility	Competitiveness · Livibility · Sustainability · Diversity · Adaptibility ● Introduce public transportion system and infrastruacture building strategy to broden social welfare and economic opporunities ● Prepare for the implementation of mechanized agriculture ● Guarantees the flowers quality by providing cold chain logistics ● Support current needs and future population growth by providing adequate educational institutions

IMPLEMENTATION

1a +Provide vehicular roadway, bicycle lanes and sidewalks;
+Give priority to public transport construction;
+Set up Logistics distribution centers inside each cluster;
+Widen the roads around the production space appropriately;

1b + Keep the village within the service of the school (500 m for primary and kindergarten, 1000 m for secondary school);

Figure 6.5 Strategy 1

STAKEHOLDER ANALYSIS

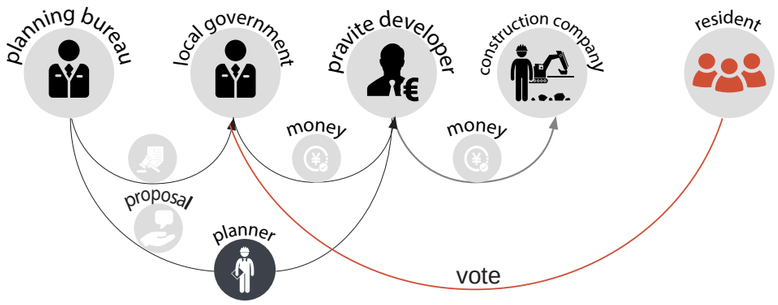


Figure 6.6 Stakeholder analysis for strategy1

TIME PHASING

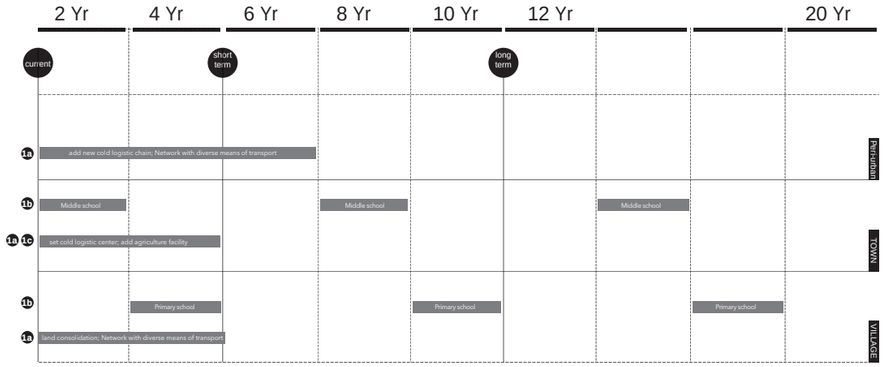
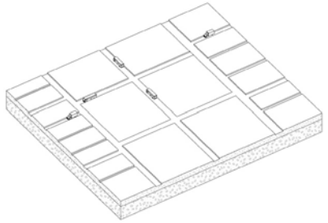


Figure 6.7 Time phasing for strategy1

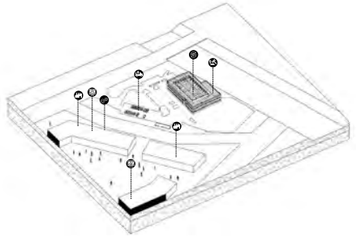
Implementations of strategy 1

1a **Land consolidation**



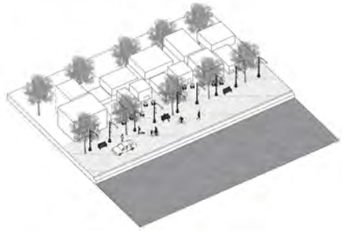
Scale of implementation: Peri-urban region
Time: Medium Term
Starting: in 2 years
Actor: Government, developer, villager

1a **Improve logistic condition**



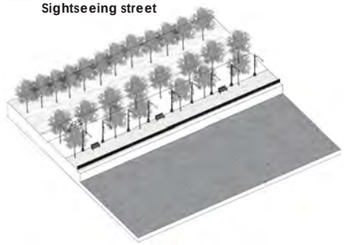
Scale of implementation: Town
Time: Medium Term
Starting: in 4 years
Actor: Government, developer

1a **Network with diverse means of transport**
Sharred street



Scale of implementation: village
Time: Short Term
Starting: 2-4 years
Actor: villager, developer

1a **Network with diverse means of transport**
Sightseeing street



Scale of implementation: village
Time: Short Term
Starting: 2-4 years
Actor: villager, developer

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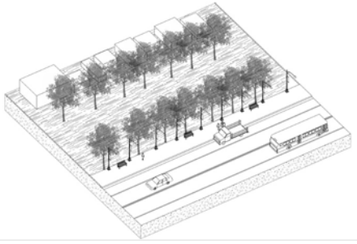
1a **Network with diverse means of transport**
Motor way

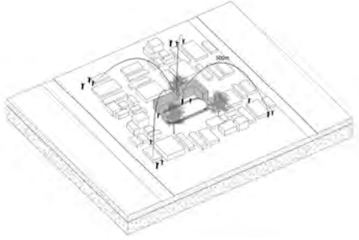


Scale of implementation: Town
Time: Short Term
Starting: in 2 years
Actor: Government, developer

1a **Network with diverse means of transport**
Road for greenhouse

Scale of implementation: Town
Time:n Short Term
Starting: in 2 years
Actor: Government, developer

1b **Supplement of education facility**
Primary school

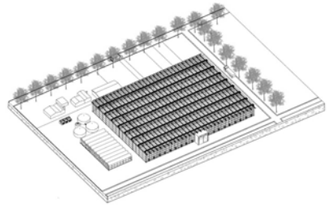


Scale of implementation: Village
Time: Short Term
Starting: in 4 years
Actor: Government, village commission

1b **Supplement of education facility**
Middle school

Scale of implementation: Town
Time: Short Term
Starting: 2-4 years
Actor: Government

1c **Supplement of agriculture facility**



Scale of implementation: Town
Time: Short Term
Starting: 2-4 years
Actor: Government

Figure 6.8 Toolkits of strategy1

STRATEGY2:

Ecological security pattern

Circular Economy and Ecology preservation are two components of the Ecological security pattern.The former focuses on circular energy flow, such as the reuse of wastes, while in terms of space, it requires the arrangement of some facilities. The second measure calls for the protection of ecologically fragile areas, such as wetlands and mountain areas. On the one hand, it can improve ecological diversity, on the other hand, it can also improve the quality of living environment

STRATEGY 2

- 2a Energy landscape
- 2b Waste reuse
- 2c Emissions control
- 2d Habitat preservation
- 2e Water managment

GOAL

Competitiveness · Livibility · Sustainibility · Diversity · Adaptibility

- alleviate the contradiction of insufficient agricultural resources
- achieve sustainable economic growth with minimum resource consumption and minimum environmental cost
- Prevent ecological deterioration
- Conservation of biodiversity
- Improving living quality
- Increasing ecological capital

IMPLEMENTATION

- 2a +Combine solar panels with a greenhouse
- 2b +Collect platycodon grandiflorum from cut flowers
  +Encourage the use of organic fertilizers instead of chemical fertilizers
- 2c + Assess the industries in the ecologically fragile areas, relocate and ban the polluted factories,
  +Control the discharge of waste gas and waste water
- 2d +Take agricultural land out of natural habitats
  +Build buffer between production land and westland around Dian lake
- 2e +Reuse rain water, flooding control

Figure 6.9 Strategy 2

STAKEHOLDER ANALYSIS

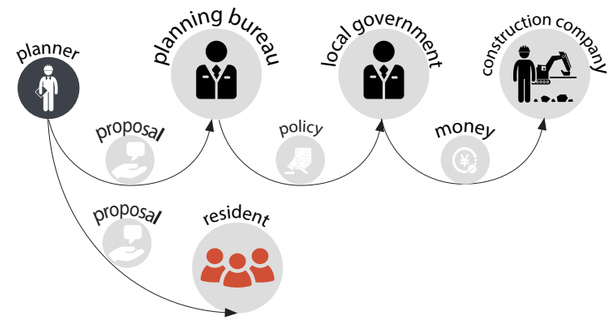


Figure 6.10 Stakeholder analysis for strategy2

TIME PHASING

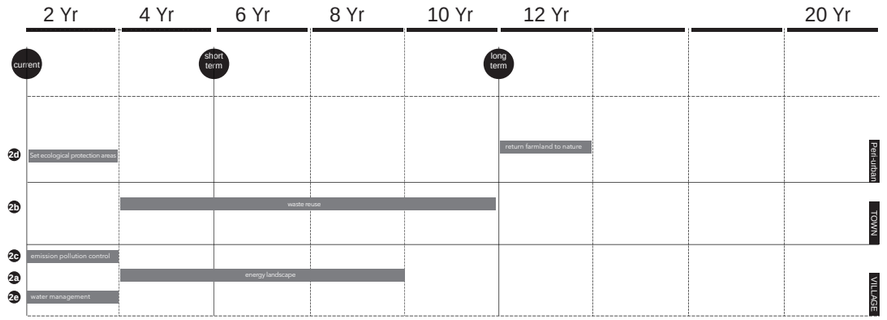
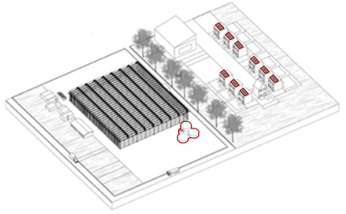


Figure 6.11 Time phasing for strategy2

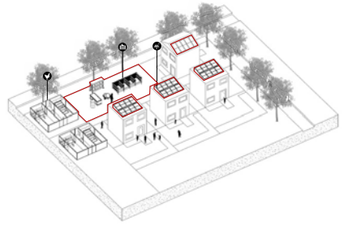
Implementations of strategy 2

2a **Energy landscape**



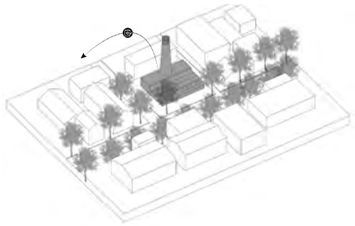
Scale of implementation: Town
Time: Medium Term
Starting: 4-8 years
Actor: developer, villager

2a **Energy landscape**



Scale of implementation: village
Time: Medium Term
Starting: 4-8 years
Actor: villager

2c **Emissions control**



Scale of implementation: village
Time: Short Term
Starting: 2-4 years
Actor: villager, developer, government

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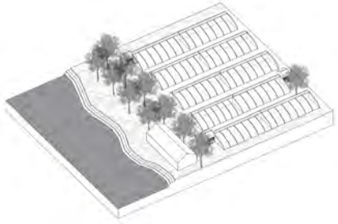
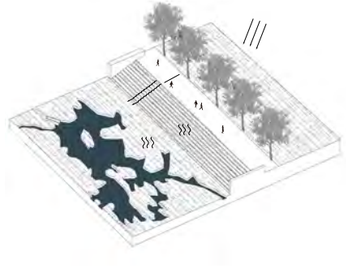
2d **Habitat preservation**



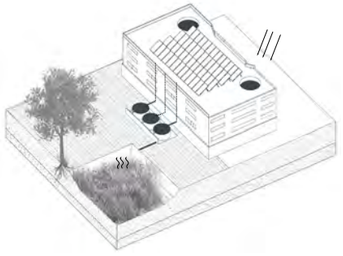
Scale of implementation: Peri-urban
Time: Long Term
Starting: in 2 years
Actor: Government, developer,villager

2e **Flooding control**
Filtering green stage



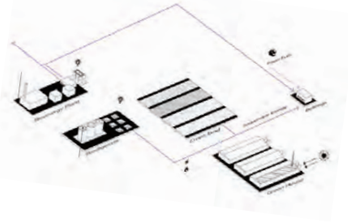
Scale of implementation: Town
Time:n Short Term
Starting: in 2 years
Actor: villager

2e **Water managment**



Scale of implementation: Village
Time: Short Term
Starting: 2-4 years
Actor: villager

2b **Waste reuse**
Energy circular



Scale of implementation: Village
Time: Short Term
Starting: In 5 years
Actor: Government, village commission

Figure 6.12 Toolkits of strategy1

STRATEGY3:
Scaled agriculture and industry convergency

STRATEGY 3	GOAL
	● Competitiveness ● Livibility ● Sustainibility ● Diversity ● Adaptibility
3a industry agglomoration land consolidation Land circulation model	● Increase production efficiency ● Improve the quality of agricultural products ● Raise the level of mechanization and liberate the labor force ● Agglomoration effect, enhance competitiveness ● Share infrastructure and reduce investment
3b industry convergency Industrial chain extension	● Improve the economic efficiency and output value of agriculture ● Enhance the competitiveness of agricultural scientific research ● Create more job opportunities ● Stimulate the integration and communication of different industries and social groups
3c branding 3d training	● Enhance the brand effect and competitiveness of local agriculture

IMPLEMENTATION

3a	+ Encourage farmers to transfer land use rights +Encourage farmers to cooperate with companies +Joint venture to purchase agricultural machinery to improve the level of mechanized planting
3a	+ Tourism industry +Manufacturing +Biological sciences +Service industry
3a	+ Media advertising +Brand logo is added to the building facade and printed on the products
3d	+Provide mechanized farming operations courses for farmers and workers +Provide vocational education facility，school，studio， library,ect.

Figure 6.13 Strategy 3

In this project, agricultural industry upgrading mainly included the Industry Convergency and industry agglomeration.

In order to realize the circulation of rural land use right, the land policy should be improved.In space, land should be reclassified by land consolidation to provide a spatial basis for the implementation of scale agriculture and modern agriculture.

Through technological innovation, the integration of various factors of production extends the industrial chain, improves economic value and increases employment opportunities.

STAKEHOLDER ANALYSIS

Figure 6.14 Stakeholder analysis for strategy3

TIME PHASING

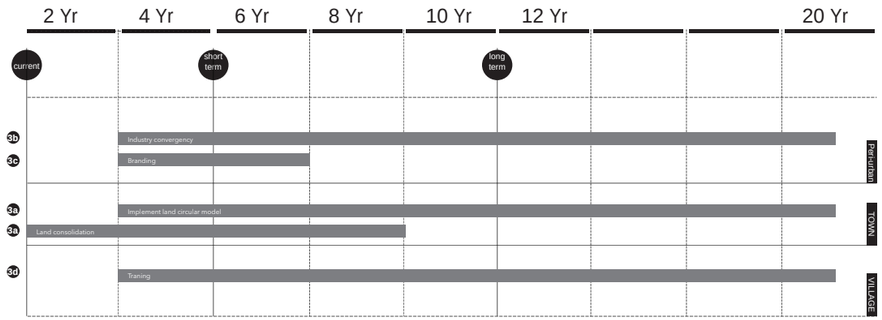


Figure 6.15 Time phasing for strategy3

3a

Agriculture pattern

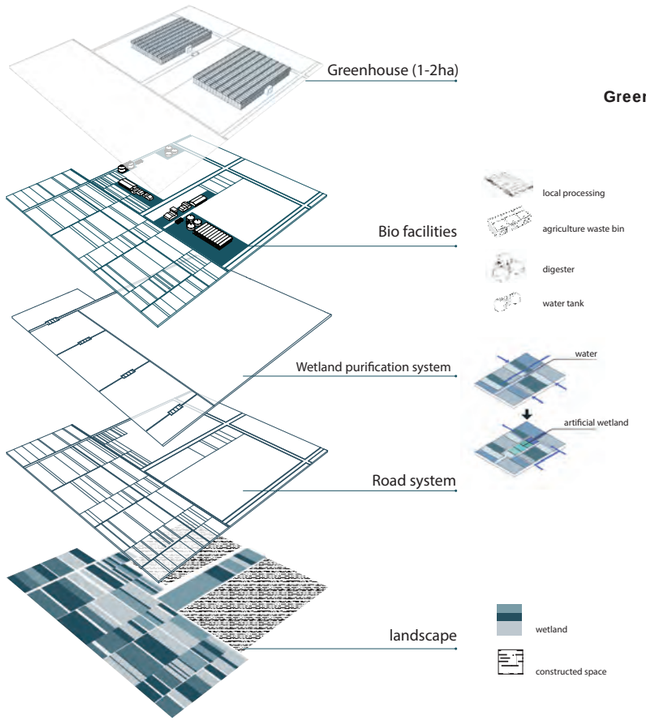


Figure 6.16 New agriculture pattern

Adaptive infrastructure structure

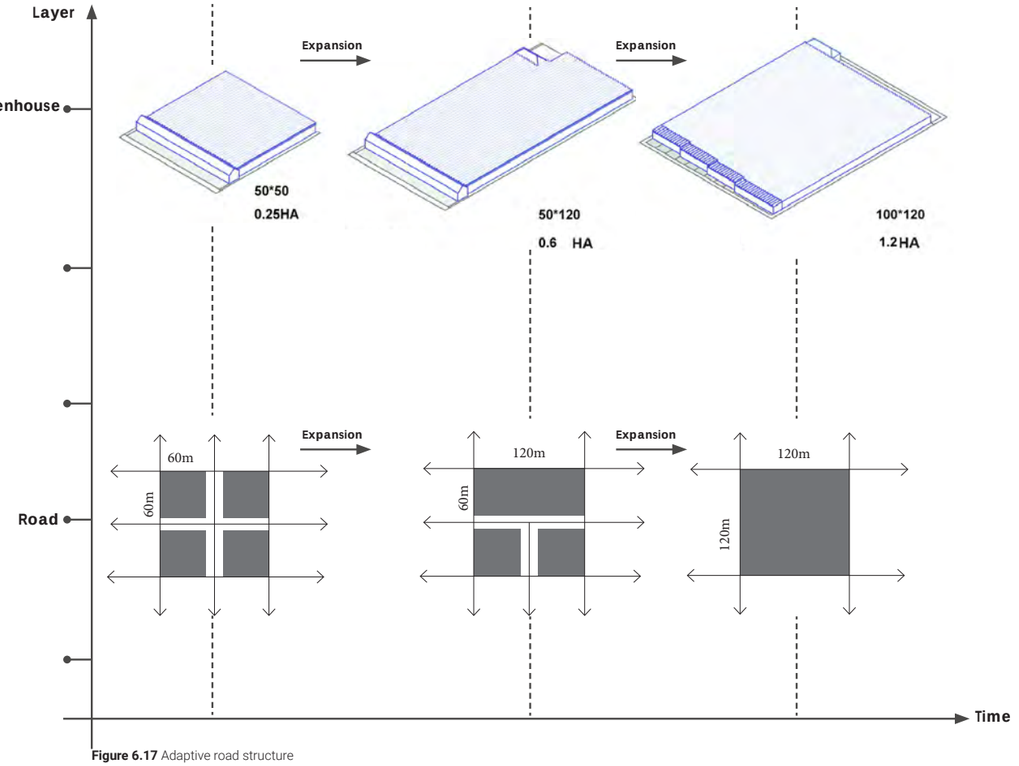


Figure 6.17 Adaptive road structure

3b

Industry convergency

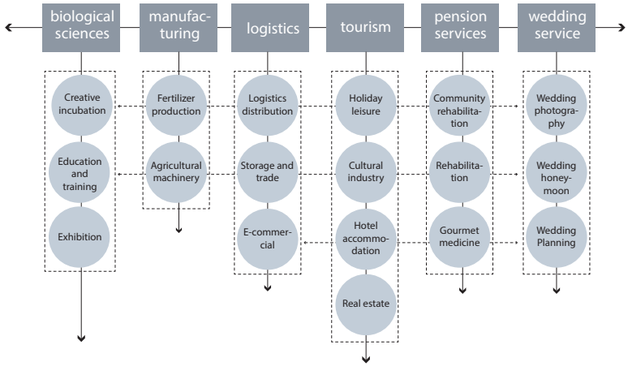


Figure 6.18 Industry convergency way

At present, most of the flower planting in Kunming is still small-scale and family-oriented. According to the observation, the flower field layout in Kunming has a certain pattern: it is arranged in a strip with a width of about 50-70 meters.This layout pattern is a result of the size of the plastic greenhouse.This is close to the size of a small greenhouse, so the gap between the roads is set at 60m. When the greenhouse area expands, such a network structure can still meet the needs of agriculture.

STRATEGY4:

High quality neighborhood with diverse built and social fabric

Different from the traditional government-led urbanization mode, this project advocates the bottom up self-renewal to provide high quality neighborhood with diverse built and social fabric. Rural industries should be innovated, polluting industries banned and potential industries transformed.

The improvement of rural living and public environment is realized through the self-renewal of villagers.In the face of future population growth, land should be planned for new housing, while maintaining a livable scale with a radius of 500 meters in the rural area.

STRATEGY 4	GOAL
	Competitiveness · Livibility · Sustainibility · Diversity · Adaptibility
4a Rural industry renewal	Prevent environmental pollution and protect rural ecology Reuse equipment and plant resources to avoid waste Protecting corporate interests
4b Rural self-orgnised renewal rural self-orgnised renewal new block construction	Enhance social equity and protect vulnerable groups through technical training and knowledge dissemination Encourage innovative enterprises with environmental protection and high technology level Stimulate the transformation of polluting enterprises

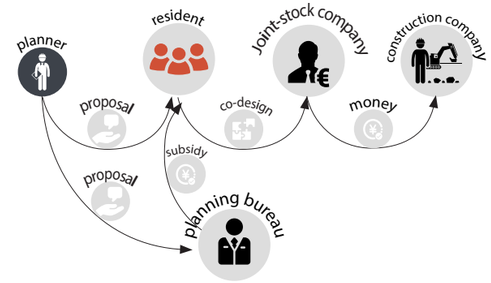
IMPLEMENTATION

4a
+ Support emerging zero-pollution industry development
+ Encourage the transformation of potential rural industries
+ The reuse of equipment and facilities

4b
+ Reasonable neighborhood scale (500m)
+ The style and scale of new building should be harmony between the new residence block and the village community
+Provide guidlines and suggestions for local people's housing renewal

Figure 6.19 Strategy 4

STAKEHOLDER ANALYSIS



SPATIAL PATTERN OF TOWN

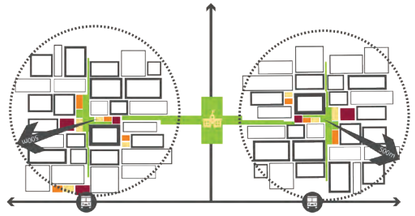


Figure 6.20 Stakeholder analysis for strategy4

TIME PHASING

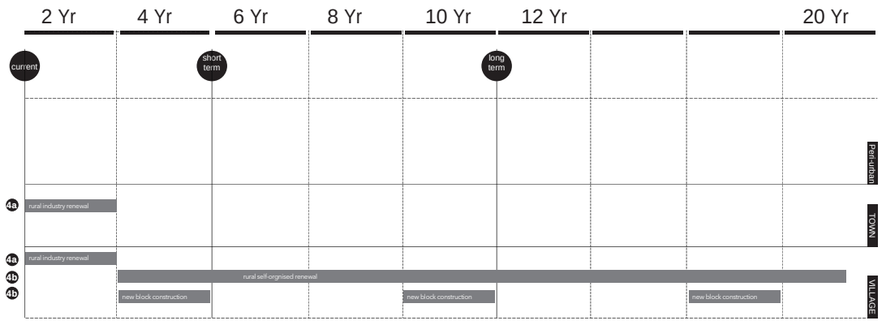


Figure 6.21 Time phasing for strategy4

STRATEGY5:

Encourage Knowledge and innovation activities

Knowledge is a key factor to promote the upgrading of rural industry and improve the efficiency of agricultural production.

In order to encourage the development of knowledge economy and promote innovation, improvement should be made from two aspects.First of all, adequate education facilities should be provided, such as schools, libraries and incubators for new businesses.

On the other hand, policies should be adopted to encourage innovative activities and knowledge industries, such as appropriate tax cuts for corresponding enterprises and groups to promote cooperation and contact between them and villagers.

STRATEGY 5	GOAL
	Competitiveness · Livibility · Sustainability · Diversity · Adaptibility
5a Stimulate innovation activities provide education facilities public event	● Raise the level of knowledge and skills of the workforce ● Conservation of traditional village culture heritage ● Brand culture promotion ● Attract knowledgeable group
5b policies tax burden shift cooperation & eliminating barriers startsup company incubator	● Enhance social equity and protect vulnerable groups through technical training and knowledge dissemination ● Encourage innovative enterprises with environmental protection and high technology level ● Stimulate the transformation of polluting enterprises

IMPLEMENTATION

5a
+ coonstruct school, workshop,library,ect
+ Organise local cultural events or public welfare activities
+Allowing the presence of the current informality economy on the street and provide them with better free trade zones

5b
+ implemented the pigouvian tax
+building affordable housing
+Increase public spending and government funding on new machinery
+Service industry

Figure 6.22 Strategy 5

STAKEHOLDER ANALYSIS

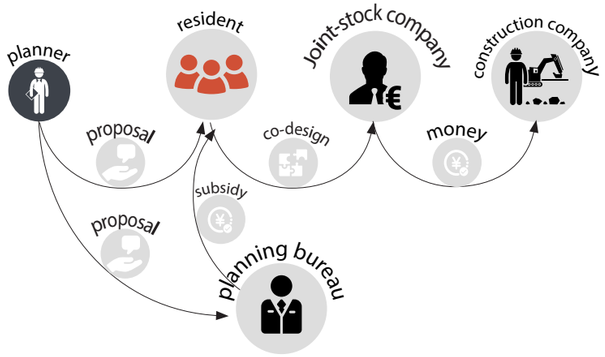


Figure 6.23 Stakeholder analysis for strategy5

TIME PHASING

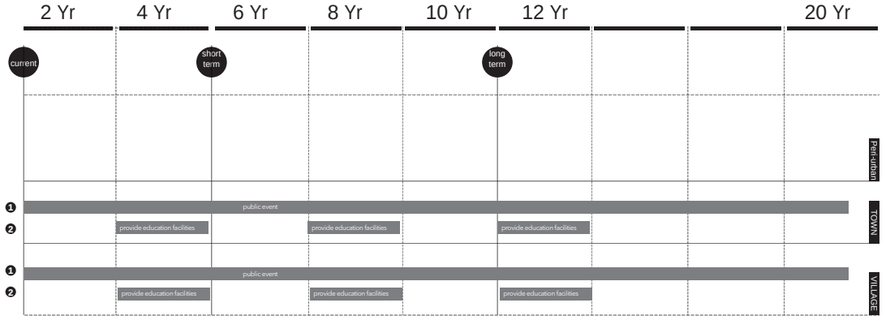


Figure 6.24 Time phasing for strategy5

Implementations of strategy 4 & 5

4a **Rural building renewal**

Scale of implementation: village
Time: Medium Term
Starting: 2-4 years
Actor: developer, villager

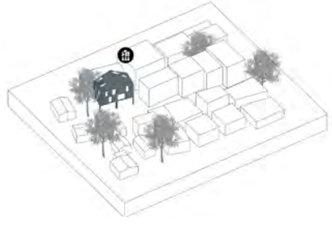
4b **Open space forming**

Scale of implementation: village
Time: short Term
Starting: 4-8 years
Actor: villager

4b **New housing**

Scale of implementation: Peri-urban
Time: Long Term
Starting: short-6 years
Actor: Government, developer,villager

5a **Vocational training space**



Scale of implementation: village
Time: Short Term
Starting: 2-4 years
Actor: villager, company

Figure 6.25 Toolkit for strategy4 & 5

TOOLKITS—how to renewal private building into publicfunction

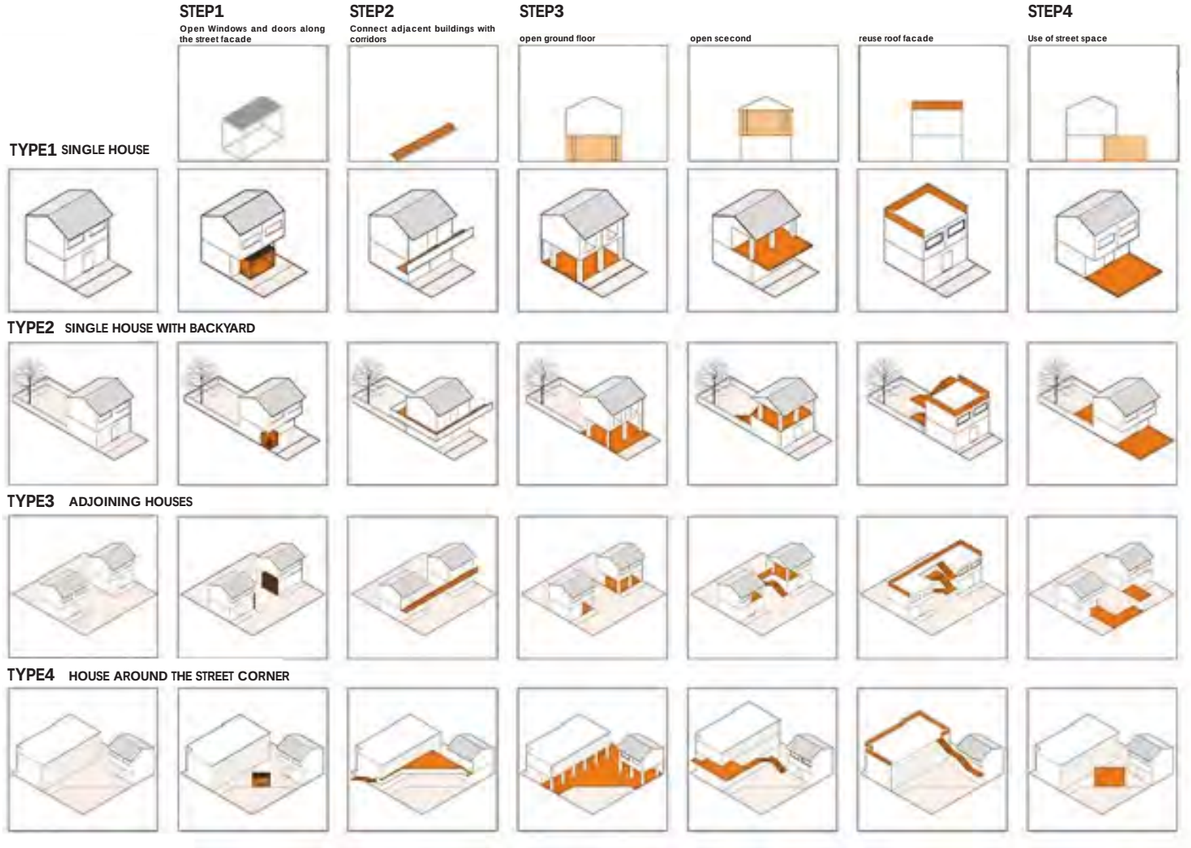


Figure 6.26 Toolkit for building renewal

STRATEGY		GOALS	IMPLEMENTATION
		Competitiveness Livibility Sustainability Diversity Adaptibility	
STRATEGY1: Improve infrustructure and amenity condition	1a Transportation system construction	Introduce public transportion system and infrastruacture building strategy to broden social welfare and economic opporunities Prepare for the implementation of mechanized agriculture Guarantees the flowers quality by providing cold chain logistics Support current needs and future population growth by providing adequate educational institutions	1a +Provide vehicular roadway, bicycle lanes and sidewalks; +Give priority to public transport construction; +Set up Logistics distribution centers inside each cluster; +Widen the roads around the production space appropriately;
	Network with diverse means of transport		
	Network with diverse means of transport		
	Improve logistic condition		
	1b Supplement of education facility		1b + Keep the village within the service of the school (500 m for primary and kindergarten, 1000 m for secondary school);
	1c Supplement of agriculture facility		1c +Icrease the digester and compost for agriculture
STRATEGY2: Ecological security pattern	2a Energy landscape	alleviate the contradiction of insufficient agricultural resources achieve sustainable economic growth with minimum resource consumption and minimum environmental cost Prevent ecological deterioration Conservation of biodiversity Improving living quality Increasing ecological capital	2a +Combine solar panels with a greenhouse 2b +Collect platycodon grandiflorum from cut flowers +Encourage the use of organic fertilizers instead of chemical fertilizers 2c + Assess the industries in the ecologically fragile areas, relocate and ban the polluted factories, +Control the discharge of waste gas and waste water 2d +Take agricultural land out of natural habitats 2e +Build buffer between production land and westland around Dian lake
	2b Waste reuse		
	2c Emissions control		
	2d Habitat preservation		
	2e Water managment		
STRATEGY3: Scaled agriculture and industry convergency	3a industry agglomoration	Increase production efficiency Improve the quality of agricultural products Raise the level of mechanization and liberate the labor force Agglomoration effect, enhance competitiveness Share infrastructure and reduce investment	3a + Encourage farmers to transfer land use rights +Encourage farmers to cooperate with companies +Joint venture to purchase agricultural machinery to improve the level of mechanized planting
	land consolidation		
	Land circulation model		3a + Tourism industry / Manufacturing / Biological sciences / Service industry
	3b industry convergency	Improve the economic efficiency and output value of agriculture Enhance the competitiveness of agricultural scientific research Create more job opportunities Stimulate the integration and communication of different industries and social groups	3a + Media advertising +Brand logo is added to the building facade and printed on the products
	Industrial chain extension		
	3c branding		
	3d training		3d +Provide mechanized farming operations courses for farmers and workers +Provide vocational education facility，school，studio，library,ect.
STRATEGY4: High quality neighborhood with diverse built and social fabric	4a Rural industry renewal		4a + Support emerging zero-pollution industry development + Encourage the transformation of potential rural industries + The reuse of equipment and facilities
	4b Rural self-orgnised renewal	Enhance social equity and protect vulnerable groups through technical training and knowledge dissemination Encourage innovative enterprises with environmental protection and high technology level Stimulate the transformation of polluting enterprises	4b + Reasonable neighborhood scale (500m) +The style and scale of new building should be harmony between the new residence block and the village community +Provide guidlines and suggestions for local people's housing renewal
	rural self-orgnised renewal		
	new block construction		
STRATEGY5: Encourage Knowledge and innovation activities	5a Stimulate innovation activities	Enhance social equity and protect vulnerable groups through technical training and knowledge dissemination Encourage innovative enterprises with environmental protection and high technology level Stimulate the transformation of polluting enterprises	5a + coonstruct school, workshop,library,ect + Organise local cultural events or public welfare activities +Allowing the presence of the current informality economy on the street and provide them with better free trade zones
	provide education facilities		
	public event		
	5b policies	Raise the level of knowledge and skills of the workforce Conservation of traditional village culture heritage Brand culture promotion Attract knowledgeable group	5b + implemented the pigouvian tax +building affordable housing +Increase public spending and government funding on new machinery +Service industry
	tax burden shift		
	cooperation & eliminating barriers		
	startsup company incubator		

Figure 6.27 Strategy toolkit

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6.5 TIME PHASING

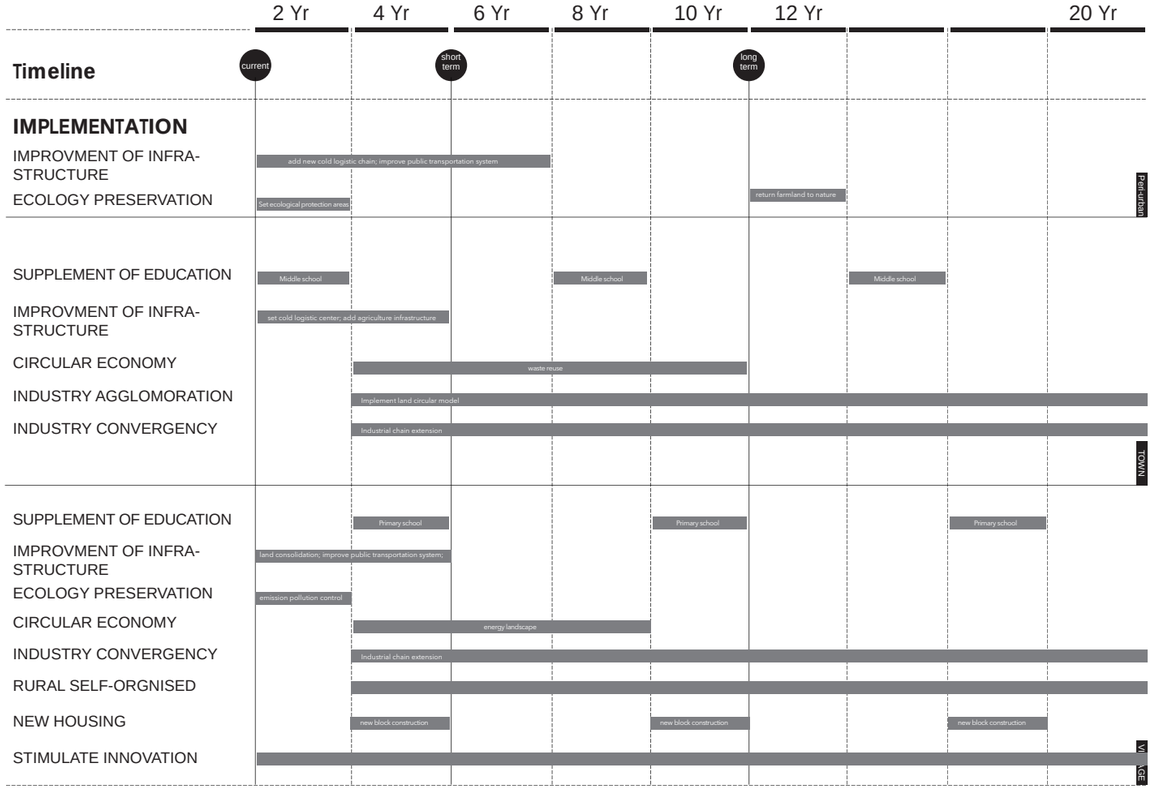


Figure 6.28 Time phasing

6.6 IMPLEMENTATION ORDER ON CLUSTER SCALE

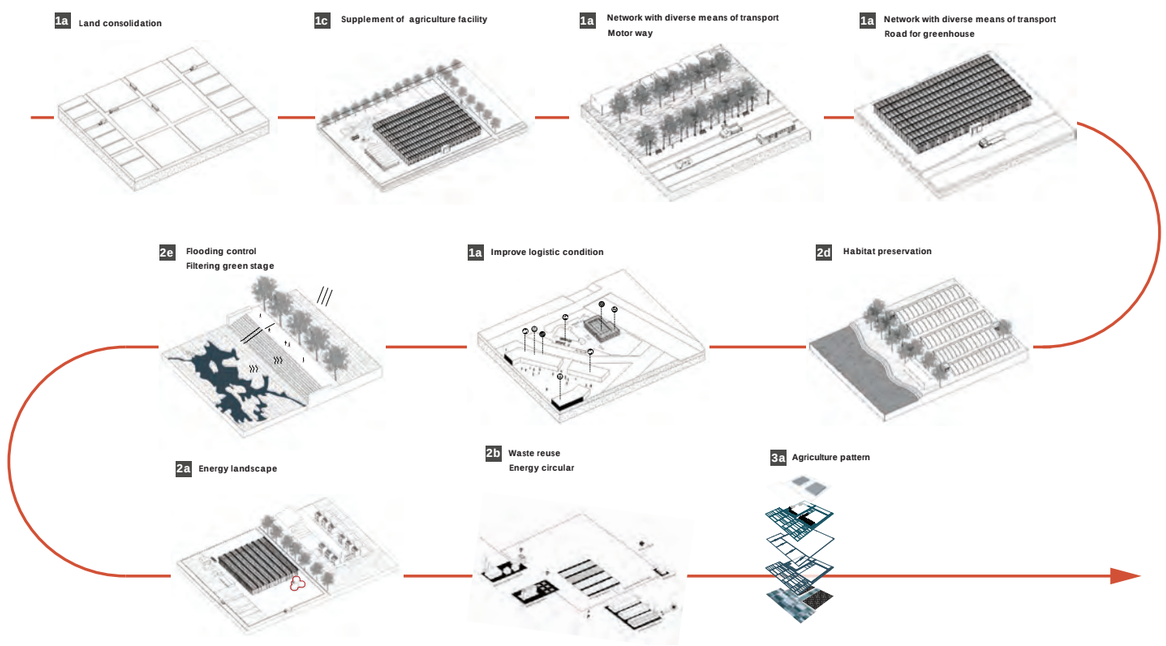


Figure 6.29 Implementation order on town scale

6.5 IMPLEMENTATION ORDER ON VILLAGE SCALE

ON VILLAGE SCALE

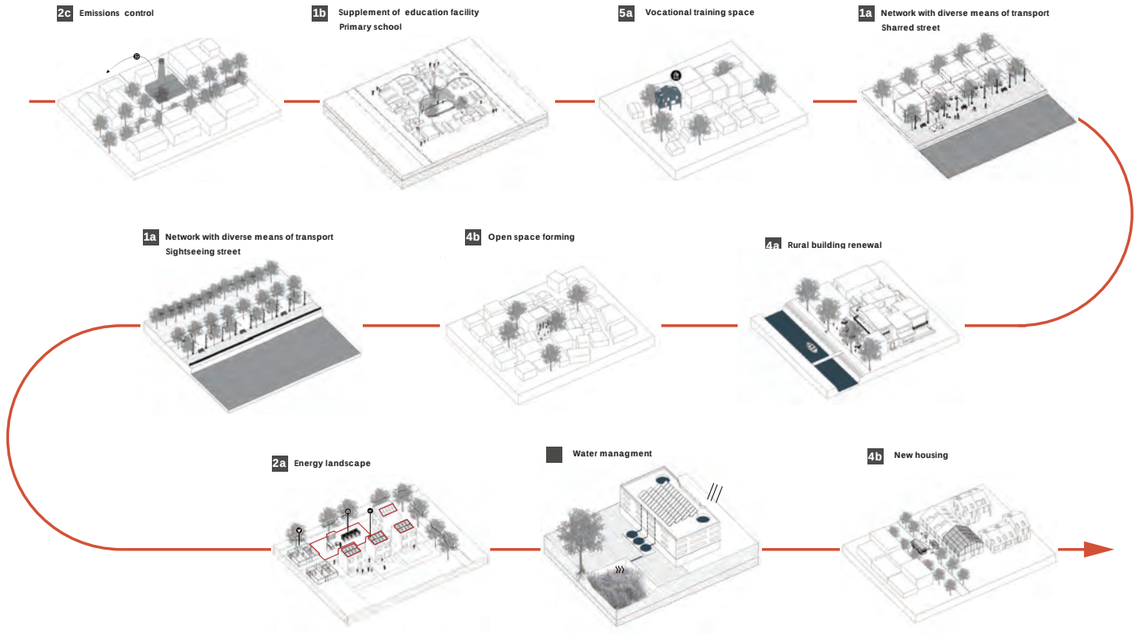
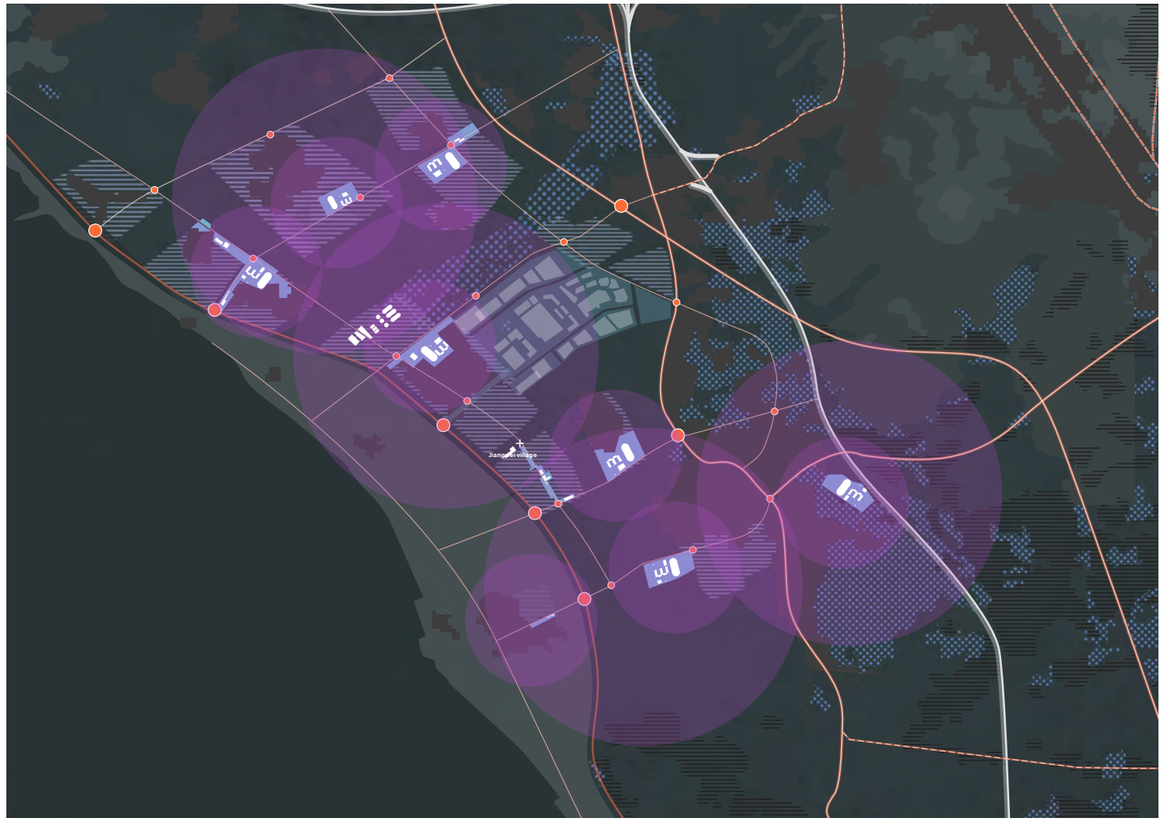


Figure 6.30 Implementation order on village scale

7 TEST DESIGN

7.1 PLANNING FOR DOUNAN CLUSTER

EDUCATION FACILITIES OF DOUNAN CLUSTER



primary school R=500m

middle school R=800m

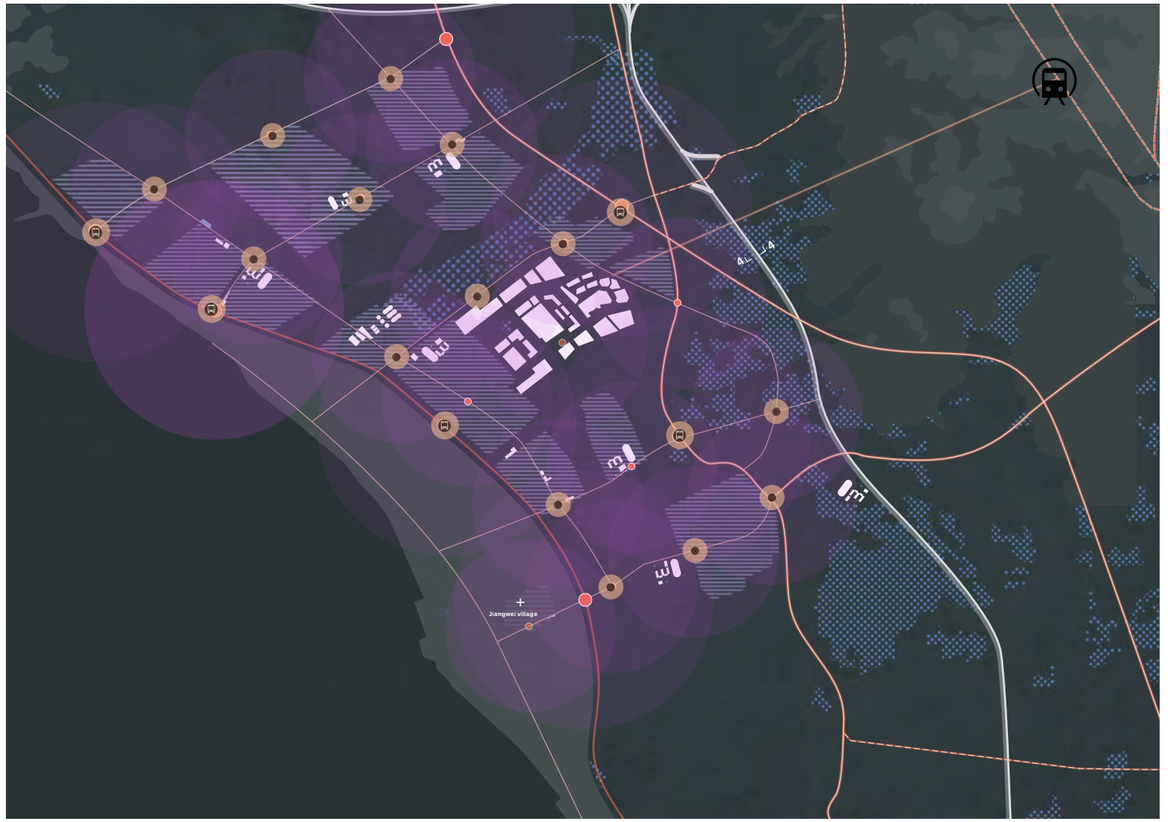
N

500 0 500 1000m

Figure 7.1 Education facility layout of Dounan cluster

According to the analysis of the present situation of Dounan cluster, the infrastructure is seriously inadequate, especially in primary school and middle school.Such a situation cannot support the future development and population rise of Dounan.Therefore, we should set up more schools reasonably. According to the service radius of the primary school is 500 meters, each residential area should be equipped with a primary school and a kindergarten;The service radius of the secondary school is 1000 meters, so the two communities should be equipped with a secondary school to meet the needs of the residents.

Tansportation system of Dounan cluster



train station

bus station R=500m

subway station R=800m

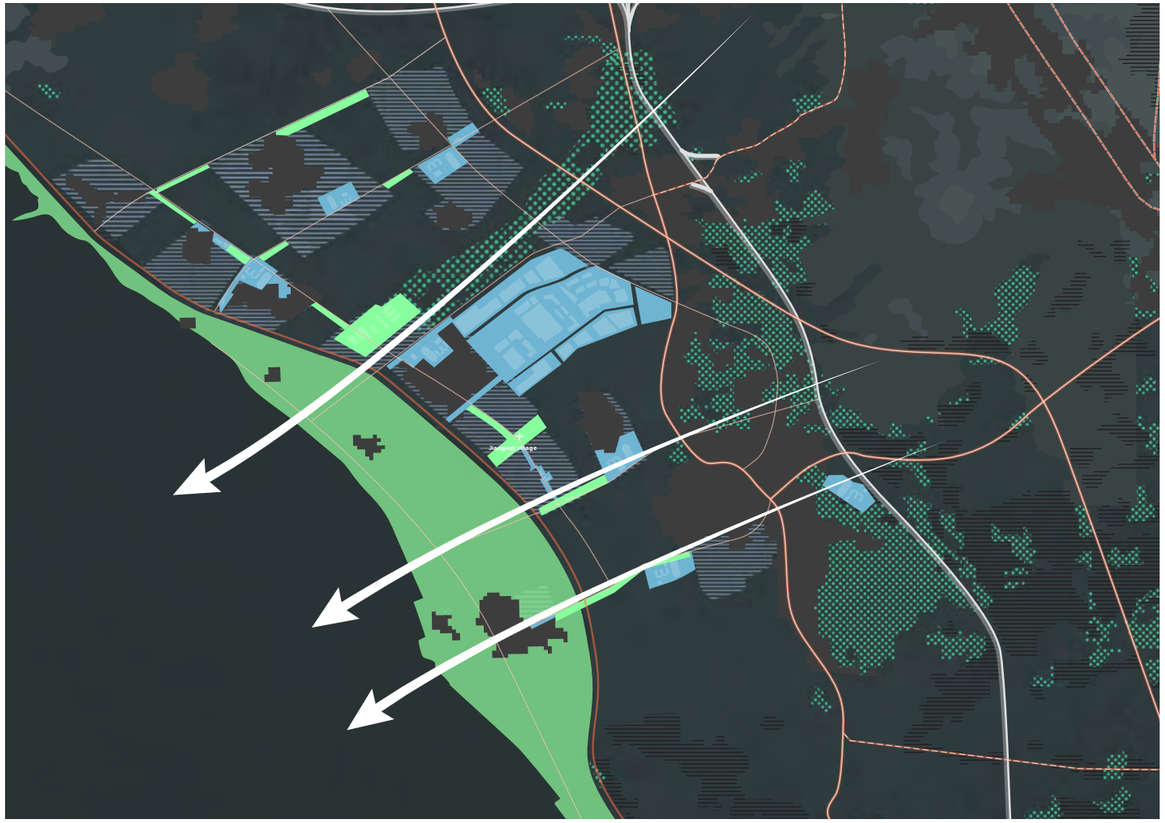
N

500 0 500 1000m

To improve the road traffic system, the traffic outside the base is connected with the urban main road, and there are subway and tram lines on the east and west sides of the Dounan cluster, which can improve the accessibility of the group.The communication between dounan flower center and Kunming south railway station is beneficial to the transportation of flowers and the saving of costs.Add bus lines within the group, according to the bus stop service radius of 500 meters, to ensure that each community can have public transportation directly.

Figure 7.2 Transportation network of Dounan cluster

ECOLOGY SYSTEM OF DOUNAN CLUSTER



village commonity
eco fragile area
westland
public function
builtup area

N
500 0 500 1000m

Figure 7.3 Ecological zone layout of Dounan cluster

The Dounan cluster is located between the hills and Dianchi lake. It is adjacent to the dianchi lake in the east and has low hills in the west. It is a region with a fragile ecological environment.The reserved landscape corridor connects the two ecosystems of Dianchi lake and the mountain, ensuring the continuity of natural ecology and providing high-quality natural environment and landscape for the cluster.

Industry convergency in Dounan cluster

N
500 0 500 1000m

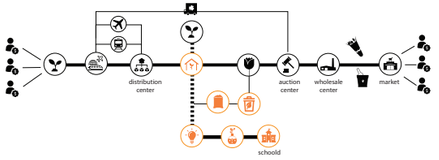


Figure 7.4 Industry connvergency of Dounan cluster

NEIGHBORHOOD AREA OF DOUNAN CLUSTER

Figure 7.5 Neighborhood layout of Dounan cluster

Each village should adopt a relatively concentrated compact space layout. By connecting with the central urban area through traffic networks, the current scattered and disorderly layout of the villages can be improved. According to the previous analysis, each village is controlled within a reasonable scale, that is, the service radius does not exceed 500m (10 minutes' walking distance). Communities are connected by convenient public transport.Each cluster is dominated by a certain type of agriculture or related industries and consists of a dominant community and several general communities.

7 TEST DESIGN

7.2 PLANNING FOR JIANGWEI VILLAGE

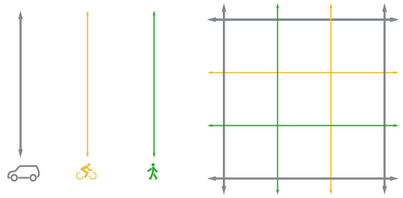
Image 7.1 Jiangwei village

6.1 INTRODUCTION

Jiangwei village is located in the southeast of the Dounan cluster and adjacent to Dianchi lake in the west. It is a historical village and the only administrative village to the east of the lakeside road.These characteristics give Jiangwei village some particularity, such as its unique natural environment and historical and cultural characteristics. At the same time, as a basic research unit, Jiangwei village can reflect implementations paths from four systems of residence, flower industry, nature and knowledge respectively.

Image 7.1 Google map of Jiangwei village

IMPLEMENTATION:
Improve infrustructure and amenity condition



Road system

By providing a variety of road infrastructure to meet the needs of different uses and to bring a variety of spatial qualities to the community.

In the interior of the residential area, streets serves both for pedestrian and vehicle traffic.The construction of motor vehicle roads in farmland can meet the needs of mechanized production, and the arrangement of landscape footpaths along the wetland makes the wetland more accessible and becomes a high-quality public space. The road serving the greenhouses should be widened at the entrance of the greenhouses to facilitate the loading and unloading of goods

Section 1-1
Main motorway

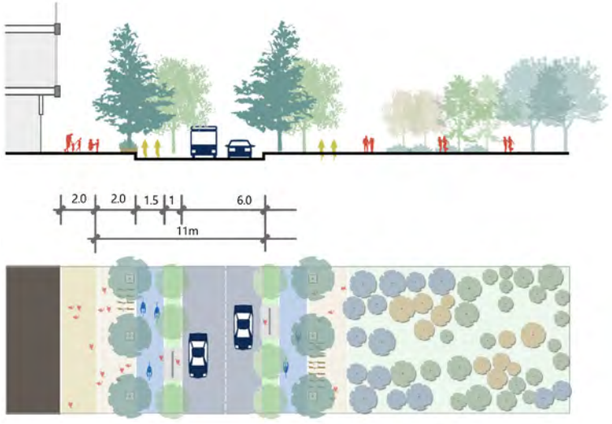


Figure 7.7 main road section diagram

Section 2-2
Bike road

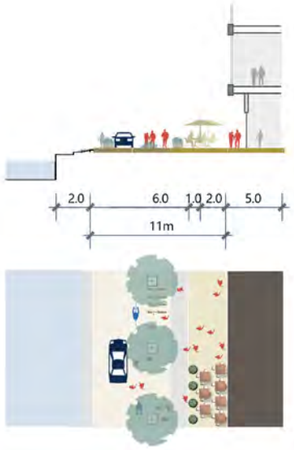


Figure 7.8 Bike road section diagram

Section 3-3
perdestrain way

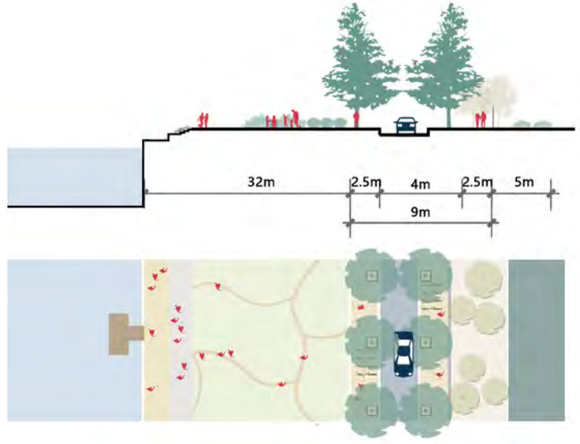


Figure 7.9 perdestrain road section diagram

Figure 7.10 main road map

Figure 7.11 Bike road map

Figure 7.12 perdestrain road map

Road for greenhouse

N

100 0 200

Road

Figure 7.13 road in greenhouse zone

Facility land

N

100 0 200

facility land

Figure 7.14 Facility layout map

section4-4 agriculture road

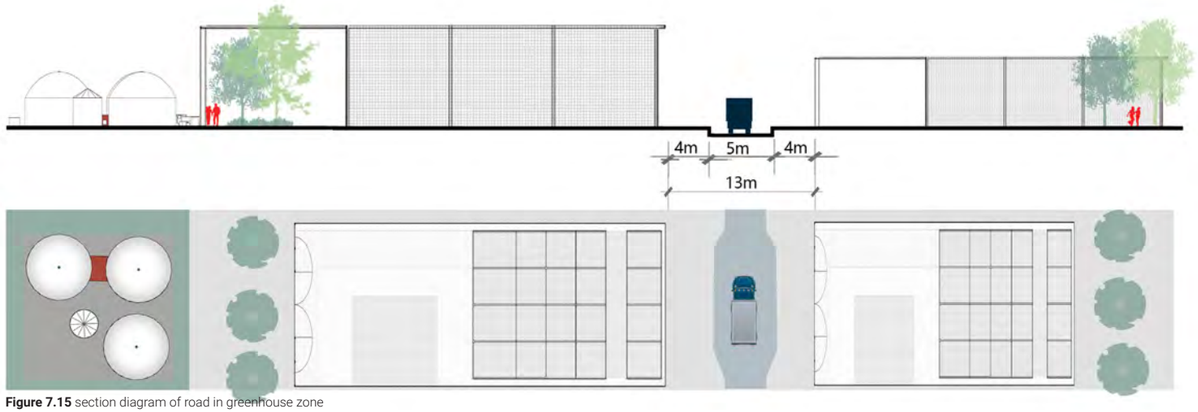


Figure 7.15 section diagram of road in greenhouse zone

Figure 7.16 **View1** Road view of greenhouse field

Figure 7.17 **View2** Street view outside greenhouses area

Multifunctional ecological system

Jiangwei village now has a large area of flower greenhouses around the village, spreading to the wetland area.Such a single agricultural landscape is not conducive to the protection of wetlands and ecological diversity. By creating a buffer between the greenhouse growing area and the wetland area, the green belt acts as an ecological protection, while providing residents and visitors with a variety of different landscapes.

At the same time, there is a community park in the newly-built residential area, and a green ring outside the residential area will separate the production land from the residential area, and provide public service facilities, like the open gym.

wetland

wetland

N

100 0 200

Figure 7.18 wetland layout map

open flower field

open flower field

N

100 0 200

Figure 7.19 open flower field layout map

public open space

public open space

N

100 0 200

Figure 7.20 public open space layout map

neighborhood park

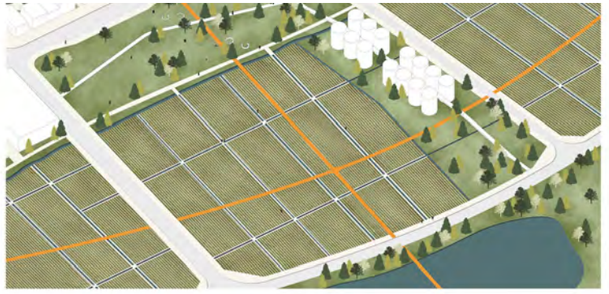
neighborhood park

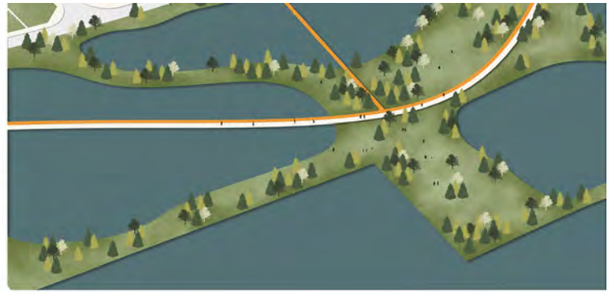
N

100 0 200

Figure 7.21 neighborhood park layout map

IMPLEMENTATION:
water managment and flooding control





LEVEL 1

Porous Paving
Roof drainage
Green space permeating
Rainwater pipeline

To block, and the community as the carrier, using Porous Paving and Green space design, avoid excessive accumulation of rainwater in block garden and Community Garden. Form a level I rainwater collection and management system, collect and transport rainwater through underground pipes to level II Cannal.

LEVEL 2

Cannals
Low elevation greenbelt
Bios-swale

The green space between the production area (greenhouse) and the living area is used as the carrier to construct the natural drainage system combined with the rainwater garden. The natural surface is used to collect surface rainwater into the continuous ecological cannal surrounding the village. Cannal will also receive rainwater from pipes in the community. Undertake regulation and storage function.

LEVEL 3

Channel grid
Flowe field

Large areas of Grid drainage systems combine with flower fields to form accumulative zones, and receive some of the rain from Cannal. The grid channel is used to increase the distance of stormwater runoff and reduce the runoff speed to alleviate the rapid rise of water level caused by huge precipitation. The rainwater is also used to irrigate farmland.

]LEVEL 4

Waterland Ponds
Ecological waterland

Using the wetland topography of the lakeshore to construct a large area of ponds to store most of the rain water, avoid the burden of heavy rainfall on lakes caused by heavy rainfall over short periods of time or prolonged periods of continuous rainfall.

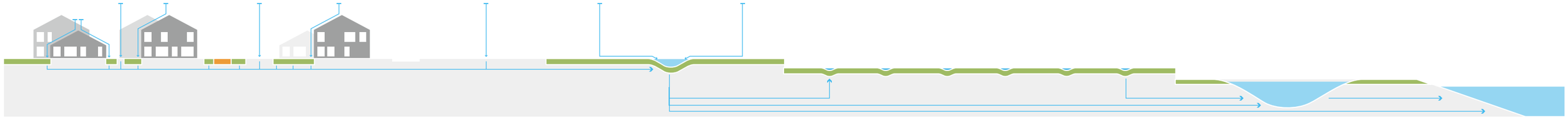
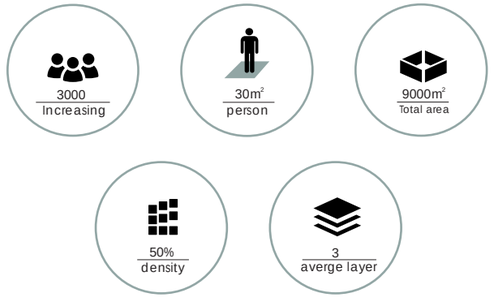


Figure 7.22 Water managment of Jiangwei village

74

What is the size of new community?



Who will live here?

Unpredictable popullation change

Building structure

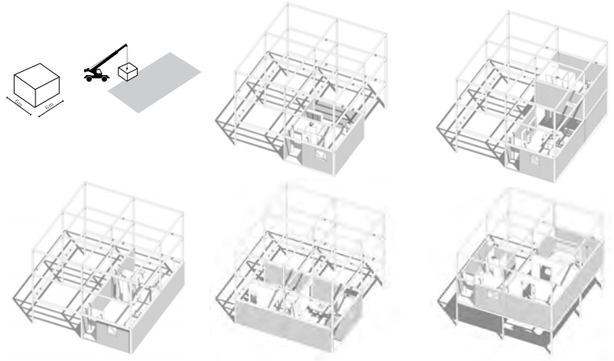


Figure 7.24 Diagram of Building structure

What will your home look like?

apartment with flexibility to increase or decrease space

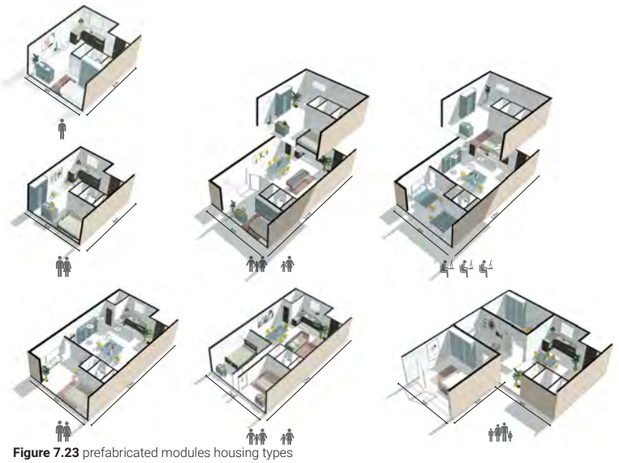


Figure 7.23 prefabricated modules housing types

Prefabricated modules housing

According to the forecast of the future population of Jiangwei Village in the upper planning, the population of Jiangwei Village will increase by 3000 people. The housing area per capita is set as 30 square meters and the floor area ratio is set as 50%.The average height of new houses is calculated to be three storeys.

Due to the unpredictability of population growth structure, Prefabricated modules housing is selected in this plan to organize residential areas in order to face the changes of different social structures as well as the growth and contraction of population.When the population grows, houses can be built according to different families' demands for living conditions.When residents need more space, new Unite can be added to complete the upgrade.This form of living is more flexible and resilient.

Where are the new blocks ?

Figure 7.25 plan map of Jiangwei village

75

TAKE ONE BLOCK AS AN EXAMPLE

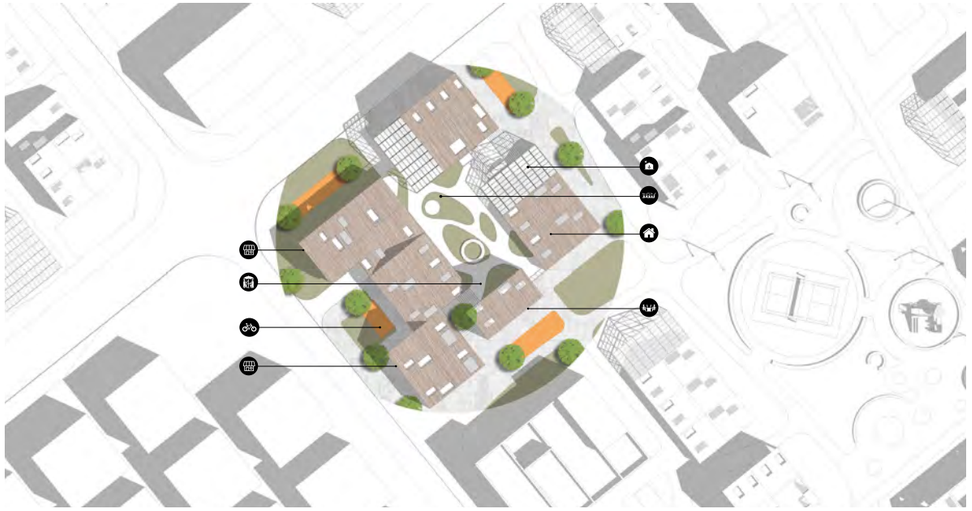
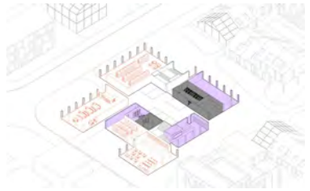


Figure 7.26 plan map of node design

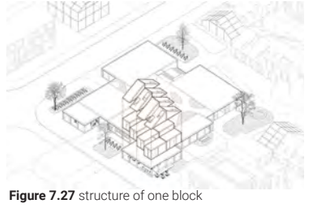
STEP 1 Business space in first floor



STEP 2 green space

STEP 3 roof garden

STEP 4 Housing



STEP 5 Small green house

Figure 7.27 structure of one block

The newly built community is in harmony with the village buildings in terms of scale, with more services functions, providing residents with supermarkets, small commercial services, community gardens and green roof garden.

Figure 7.28 Axonometric drawing of one block

Figure 7.29 View of community garden

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NEIGHBORHOOD

Each neighborhood is enclosed by several blocks. An open space is set in the center of the neighborhood, which can provide residents with functions such as play ground and square, at the smae time it will be a place for residence to communicating and entertainment.

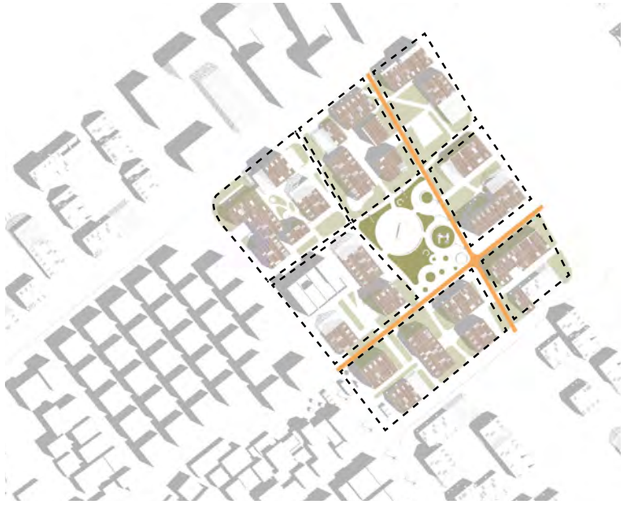

Figure 7.31 plan map of node design

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Figure 7.32 Axonometric drawing of community park

IMPLEMENTATION :
High quality neighborhood with diverse built and social fabric
Provide space for Knowledge and innovation activities

What is the connection between old village and new block?

To improve the accessibility of the community and facilitate the life of the residents by setting up transportation lines at the junction of the old and new communities.Public service functions, such as small businesses and restaurants, can be set up on the ground floor of buildings on both sides of the street to meet residents' daily life service needs.Taking advantage of the location of the center, schools, educational and training institutions can be set up on the side of the new community.

Plan map of the node

Figure 7.33 plan map of node design

Figure 7.34 Axonometric drawing of the node

STREET ELEVATION DRAWING

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Figure 7.35 street elevation drawing

Figure 7.36 Street view

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COMMERCIAL STREET ALONG THE CANAL

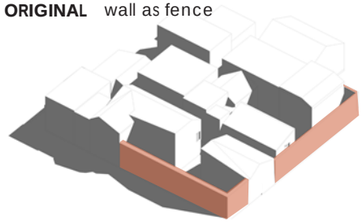
There is big potential for improvement along the Canal bank.This area is an important public space for Jiangwei Village because the main road passes through here and has a good landscape foundation.Through the renewal of the buildings on both sides of canal, private houses were transformed into public buildings, open to the water shore. The waterfront becomes more hydrophilic through landscape design such as steps.

PLAN MAP OF THE NODE

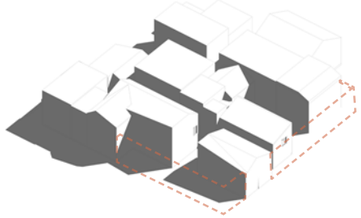
Figure 7.37 plan map of node design

BUILDING RENEWAL PROCESS

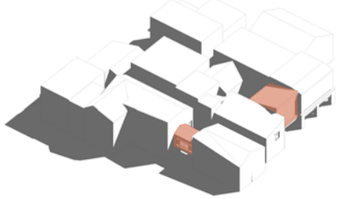
ORIGINAL wall as fence



STEP1 Dismantle the fence



STEP2 Connect the buildings



STEP3 Choose penetrating materials

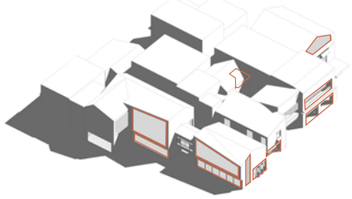


Figure 7.38 Building renewal process

Figure 7.39 Axonometric drawing of the node

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STREET ELEVATION MAP

Figure 7.40 street elevation drawing

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Figure 7.41 view from canalside

Figure 7.42 Design map of Jiangwei village

STAGE 1: The company settled in and the first phase of the greenhouse was gradually established.

STAGE 2: Population growth brought new housing and the first community was built in the south.

STAGE 3: As the population grew, a second community was established, while new public Spaces were created and a second batch of greenhouses were created.

STAGE 4: The greenhouse and living area of the village are basically formed to improve the public activity space

STAGE 5: The population tends to be stable, close to the planning upper limit, and the village basically takes shape.

STAGE 6: According to the need of productivity growth, adjust the size of the greenhouse.

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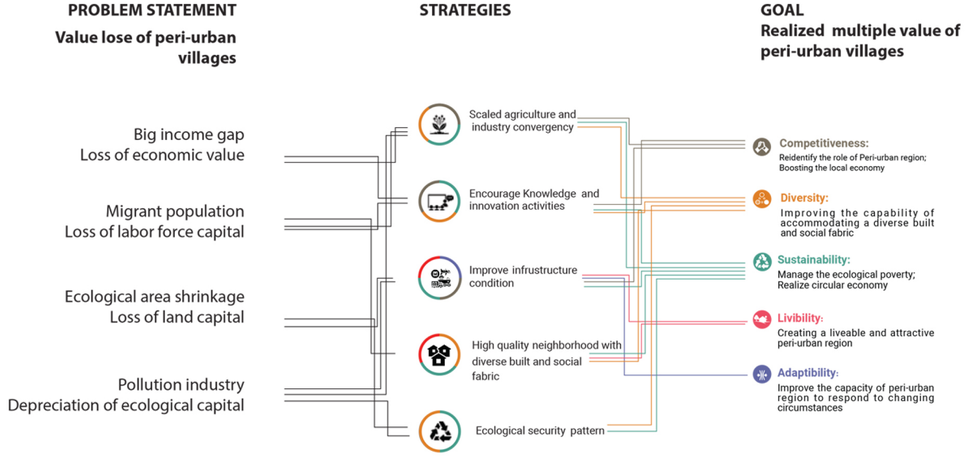
8.CONCLUSION



CONCLUSION:

With the advent of the ecological era, the value of peri-urban area has changed, the economic value of traditional agriculture has continued to decline, and the ecological and social service values for urban development have continued to emerge. This project takes the peri-urban area of the Dianchi Basin in Kunming as an example, analyzes the status quo and causes of its industrial and spatial development, and proposes two basic strategies of knowledge economy and industry upgrading to realize the multiple values of the suburban area-ecological value, social value, economic value.

On the town scale, through the spatial planning, the clusters of modern agricultural industry clusters are formed, which makes the spatial layout of peri-urban villages from decentralized, isolated to integrated and coordinated development, becoming an organic part of urban and rural space. At the village scale, put forward the implementation strategy of village renewal and make spatial planning for the future population growth of the village, increase the adaptability of village.

Conclusion 1: The composition of agricultural multiple value theory and the goals and key points of its realization are explained.

Multiple value of peri-urban agriculture refers to the values generated by the agricultural and rural environment that takes land as the core resource under the background of agricultural transformation and integrated development. It is realized by the three values of economic value, ecological value and social value.

The peri-urban areas have obvious advantages and opportunities in terms of spatial location, land resources, and labor. The focus of the realization of multiple agricultural values is to upgrade traditional agriculture to mechanized large-scale agriculture and enhance the realization of its social and other service values

Conclusion two: knowledge economy, industry agglomeration and convergency are the ideal development countermeasures to realize the multiple values of agriculture.

Modern mechanized agriculture can greatly improve the efficiency of agricultural production, but the use of mechanization will lead to the reduction of jobs in the production sector, besides, mechanized operations require high economic investment in the early stage, it is difficult to promote in rural areas of China.

The introduction of knowledge elements can help industry convergency and the extension of the industry chain, thereby creating more and diversified jobs; Industry agglomeration can reduce the per capita economic investment of farmers through fund raising and cooperation, increase the implementability of mechanized agriculture, and due to the agglomeration effect. The peri-urban towns will become competitive clusters, achieving a positive cycle at the economic level.

Conclusion 3: The indicators of evaluation: whether a region has the base for knowledge economy

The knowledge economy strategy cannot be used everywhere, and its successful realization is based on a certain basis. foundations of the knowledge city, suggested by van den Berg (2005), are presenting some key criteria: knowledge base, economic base, quality of life, accessibility, urban diversity, urban scale and social equity, through which one could analyse cities and their potential for knowledgebase development, their capacity for attracting knowledge workers, creating knowledge, applying knowledge and developing growth clusters.

In this project, based on the analysis of the knowledge economy foundation of the peri-urban area of the Dianchi Lake Basin in Kunming, the base was evaluated on the above-mentioned levels, and the weakness of the peri-urban area of the Dianchi Lake Basin was obtained respectively: Low accessibility, inadequate infrastructure conditions, and fragile ecology; but with the foundation and experience of the flower industry, the existence of numerous companies and university towns provides a medium for the spread and use of knowledge.

Conclusion 4: New spatial model and implementation strategy

According to proposal, a competitive and sustainable cluster should have four connotative characteristics: a space form suitable for mechanized agriculture, a green facility support, a harmonious social relationship, and a reasonable space scale. The realization of this goal should follow the following five strategies: Encourage Knowledge and innovation activities; Improve infrustructure condition;Ecological security pattern; High quality neighborhood with diverse built and social fabric; scaled a g r i c u l t u r e a n d i n d u s t r y convergency.

According to the above strategy proposal, this project takes Dounan cluster and Jiangwei village as examples, and conducts test design on the two scales of town and village. And put forward the time sequence and priority of the implementation of various strategies on different scales.

At the town scale, land consolidation, agriculture facility supplement, transport system for greenhouse and motor way should be implemented first, to lay the foundation for the implementation of the remaining strategies. On this basis, the logistic center, energy landscape and the new agriculture pattern are gradually completed, and eventually a competitivecluster is formed.

At the village scale, the improvement of emission control, supplement of primary school and transportation system is the first step. The renewal of rural buildings, the construction of public spaces, and the placement of vocational training functions have been gradually implemented. The renovated villages have a more livable environment, higher economic income, attract more people to live in, effectively share the pressure of urban land, reduce the outflow of rural population, and achieve rural reinvention.

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SELFT REFLECTION

1.Research and design

The project is an integration of both deign and research. They answered the “what” question, “why” question and “How” question respectively. In the project, the research of multiple value of agriculture theory defined the study scope of problem field, regeneration of peri-urban villages plays an important role in the coordinating urban-rural development, the rural industry transformation is the driving force of it. The research also clarified the connotation and indicators of knowledge economy, agriculture convergency and ecological poverty management, which not only built a framework of evaluation for the site analysis, but also acted as the basis for the strategy framework. Five key indicators of knowledge agriculture are firstly used to evaluate whether the site has the base for knowledge economy, and what are the strengthens and weakness of its current situation, then the design and planning implementations are derived from these five principles. In this way, it answered the question how can the design be implemented to improve the current situation and achieve the planning goals.

2. The thesis topic and the research studio

The project of Reinventing the peri-urban villages is carried out in “Chinese complex cities” topic, which is one of the three focus areas of “Planning complex cities” studio. The research aim of complex cities studio is how to improve sustainability, social and spatial equity by proposing spatial planning and territorial governance schemes, the entry point of the research is the observation of inequality and conflicts in the distribution of resources between territories (complex cities research, 2019. The “Chinese complex cities” is trying to answering the question of how to improve the cities towards a more inclusive.

The problem field of my project is closely related to the research direction of the research group. I focused on the unprecedented challenges faced by Chinese villages, especially those on the edge of cities, in the context of high-speed cities and industrialization in China. In the first chapter, the author explains the causes of China’s long-standing problems in agriculture, rural areas and farmers, theevolution, connotation and shortcomings of China’s regional development strategies. Attempts to put forward the alternative development paradigm, on city scale, think about how to increase the value of the peri-urban village by rural industry transformation in order to form regional new growth pole, which can not only share the pressure of big city, but also reduce the loss of rural capital to urban area (especially the outflow of labour force from rural area to the urban). In chapters 2 to chapter 3, the concept of knowledge agriculture is proposed based on the analysis of the current situation of peri-urban area of Kunming. This is consistent with the problem of "provide new models of city development" concerned by Chinese complex cities. The expected outcome is spatial design principle and planning strategy to achieve the goal of boosting the local economy, improving living quality and managing the environment poverty. This is consistent with the vision of Chinese complex cities group mentioned above.

3. Assess the way of working (approach, used methods, used methodology)

The main logic line of my methodology is: start from motivation, problem context, analysis and statement to research questions. Based on research questions and above problem statement, I proposed the conceptual framework, and try to use various methods approaches to answer the research questions and propose the expected research outcomes.
In my original analytical part, field trip accounts for a large proportion, because the data and resource of rural area in China is not available online. In the field trip, data of population can be gathered, the way people using the space and how is the work flow of flower industry can be observed. But due to the outbreak of coronavirus, field trip had to be cancelled. With the limited data and resources of the site, I changed the analytical method by the scenario planning method to deal with the uncertainty of the future by providing different visions in different situation. The investigation is replaced by case study. By learning how the other flower base in China and how Netherlands’ floriculture developed and operated, to get the information and experience of my site. Then the strategies and implementations are proposed for the different scenarios. The prediction indicators of changing and corresponding measures are proposed to meet the varies situation in the future. The scenario planning could be an alternative planning method when the traditional site visiting cannot happen.

4.Relevance

(1) Scientific relevance

In the face of the long-standing problems concerning agriculture, rural areas and farmers in China, the Chinese government has put forward the strategy of "building a new socialist village" (the state council, 2005) and the "urban-rural integration development strategy" (the state council, 2010), which are the two most important guiding strategies for rural development. Although the important significance of rural areas in China’s social development has been established on the political level, there is no clear explanation on the operational level about what is the new village, how to build the new village and what kind of new village should be built. In the process of dealing with the relationship between urban and rural areas, the implicit thinking behind the model of “promoting agriculture by industry” is that the city is in the absolute dominant position, the active role of the rural area is neglected, and the role of government action is overemphasized. As a result, many local governments are making blind attempts to lead rural development.

In this project, cluster scale between regional scale and community scale is introduced, which is a unit suitable for the development of modern agriculture based on the research on rural economic form and industrial agglomeration effect theory. Planning strategy proposals and detailed spatial principle are proposed on the scale of cluster and the scale of community, such as the family cooperation model of scaled agriculture, the policy adjustment that the government should make to encourage scientific and technological agriculture, and the principle of waste treatment in rural industry. The question of what is attractive and livable rural community is answered by proposing an appropriate scale for the rural community, a form of public space that meets the needs of local people, and an infrastructure that meets the needs of rural industrial activities. In terms of design method, scenario planning can be a valuable contribution to the methods of prediction of the development of rural area and deal with various uncertainties. China’s rapid industrialization and attempts make rural development face many factors that are difficult to determine. Therefore, the research method of scenario planning can effectively improve the resilience of the plan in the face of changes and its ability to respond and adjust.

(2) Social relevance

In this project, rural economic development is the engine and driving force of regional progress. The industrial convergency of flower industry and high-tech industry strengthens the branding of flowers in Kunming, improves the competitiveness of rural areas, and creates diversified social structure through the integration of various social groups from the social aspect. In this process, multiple stakeholders participate, and the beneficiaries are not only flower companies with economic capital and ability, but also the poverty group, such as local farmers with no money or knowledge but only land resources, and people who come to work from more remote areas. Help these groups gain higher levels of productive skills and economic security through affordable and doable planning advice, not only to improve the living standards of local people, but even more broadly to stimulate and encourage rural productivity in more remote areas through the dissemination of knowledge and skills.

(3) Ethical considerations

One of the objectives of the project is improving the competitiveness of peri-urban region by agriculture transformation. The modern

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agriculture is scaled and high-tech agriculture. Take Dounan cluster as example, the wide use of greenhouse and machined planting will efficiently improve the productivity and quality. But in the short term it will decrease the employment positions and cause the lose of job. Some farmers may will in the weak position because of no ability to join the corporation farming, they will face more fierce competition.

In the scenario of Dounan cluster, the population will be increasing in the near future with the development of modern floriculture and auction center. The new housing is suggested to be constructed next to the existing high density village community. The old and new part of one community are connected by the public space and public buildings. This is a reasonable way of expanding the community, taking consideration of living density. But it might lead to the isolation of different social groups, especially those locate in the middle of old communities.

It is difficult to address these two issues in the design process, it might be helpful to combine the village communities in the planning progress. By understanding the real situation of local family and people to provide the targeted way of helping.

5. Transferability

This project aims at reinventing the peri-urban region through knowledge economy. Environmental pollution, the outflow of labor force and the inefficiency of land use are common problems in the remote areas of major cities all over China. Diverse functions, mixed social structure and abundant land resources are also the characteristics of each urban fringe village. Although the analysis of this project is based on the agricultural model of Kunming and the characteristic of local rural community, the land management model, urban-rural structure and regional economic composition of Yunnan and even many other villages in China have similarities with the research base of this project.

These make the project Transferability, especially the planning strategy, the environment restriction, such as cooperative agriculture operation mode and infrastructure construction mode. In addition, since scenario planning is adopted in this project, strategies and visions for different development situations are obtained, which provide more references for the development of rural areas with different knowledge levels and population. The strategy framework can act as The guideline for the regeneration of other peri-urban villages in Dianchi basin, and Dounan cluster, as The leading project of rural reconstruction in Kunming, played a demonstration role for other villages with similar conditions and potentials.

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5.1 KEY LITERATURE READING

1.The Path Choice of the resolution of villages in the process of urbanization in China

Since the reform and opening up, the end of the village in the process of urbanization in China has the characteristics of diversity and graduality. The tough institutional roots of the end of Chinese villages are the dual economic and management systems of urban and rural areas. The end of the village is a process in which rural villages complete urbanization with a series of major events. There are many forms of ending. The end of rural collective economic organizations has become an important symbol of the end of the village.

2.Changes of Village Community Boundaries and Village Transformation

This essay is focused on the geographic, economic, political, identity and cultural boundaries changes of a suburban village under the background of rapid industrialization and urbanization. The changes of village boundaries can also be considered as a transformation symbol of village which reveals the vanishing, transitional or recovering fate of the village community in the future.

3.Research on the Model and the Way of Green Resolution in Basic-level Villages in the Loess Gully Area

The essay focuses on the rural human settlement of the basic-level villages in Northwest China. Based on the actuality of ecological fragility, impoverished and backward of local distinct, low level of urbanization, scattered allocation of the villages, in order to adapt to the developmental situation, that is to reduce the number of basic-level villages of the region, declining population, demolishing dwellings, modern agriculture development, ecological strategy which led the development trend of urbanization.

4.Deconstrction the Country: The disembedding, Transcending and Renaissance of Community

This essay construct a new theortical framework to analyze the rural transition in China Different from the voices of "the village end "and the village conservation advocates, it showed an alternative prospect of rural development. It's believed that considerable amount of villages will not end in the future, or remain static, but evolved with the integration of urban and rural, and the mutual constitutive of globalization and locality, fulfilling its own values and functions.

5.Radical Change: The End of Villages —A Study of Villages in the City

This essay argues that the difficulty of the end of villages in Guangzhou lies not only in the improvement of life, but also in the non-agricultural and industrialized issues, and not simply in the change of the household registration system of urban-rural division, but also in the re-definition of property rights and the restructuring of social network.

6.Informality and the Development and Demolition of Urban Villages in the Chinese Peri-urban Area

The informality in China has been created by the dual urban – rural land market and land management system and by an under provision of migrant housing. The redevelopment of chengzhongcun is an attempt to eliminate this informality and to create more governable spaces through formal land development; but since it fails to tackle the root demand for unregulated living and working space, village redevelopment only leads to the replication of informality in more remote rural villages, in other urban neighbourhoods and, to some extent, in the redeveloped neighbourhoods.

7.Spatio-temporal Evolution of urban Fringe Settlements during Rapid Urbanization

This paper analyzes horizontal and vertical evolution of rural settlements in urban fringe. Based on the spatial location, rural settlements are divided into urban villages, suburban villages and outer suburban villages. Three typies settlements have different characteristics in horizontal and vertical evolution. During the lifespan of rural settlements in the urban fringe, there are homogeneous state, space fragmentation status, urban and rural isolation and integration of urban and rural states.

8.Study on Ecological Poverty and Ecological Capital in Chinese Ecologically Fragile Areas

The most appropriate treatment method for the management of ecological poverty is to carry out ecological anti-poverty by making the rational appreciation of ecological capital. In the absence of appropriate funds, technology, information and other necessary conditions to support, let the poor areas use the extensive and depleting way to develop ecological capital, in exchange for a short-term poverty alleviation and sustainable ecology capital depreciation.

9.Study on Eco-environmental Change and Urban Development of Kunming in Contemporary Dianchi Basin

The relation between the current urban development in Dianchi Lake basin and the ecology system underwent a complex process from artificial destruction and disordered plundering type development to artificial restoration and coordinating relation between ecology and urban development. It must adopt rational action in the urban development in Dianchi Lake basin, and plan the urban development scale under the ecology supporting capacity of the entire Dianchi Lake basin.

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