

# REPOPULATION OF METROPOLITAN HINTERLAND

Project for a post-pandemic health center,  
in Shandong, Chongqing, China

SUPERVISOR: PROF. MERIGGI MAURIZIO  
STUDENT: ZHENG YOUNAN(951





**POLITECNICO**  
MILANO 1863

# **REPOPULATION OF METROPOLITAN HINTERLAND**

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SCHOOL OF ARCHITECTURE URBAN PLANNING  
CONSTRUCTION ENGINEERING  
MASTER DEGREE - ARCHITECTURE AND URBAN  
DESIGN

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STUDENT: ZHENG YOUNAN(951094)  
ACDAMIC YEAR - 2021/2022

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# ABSTRACT

China's urbanization is to transform various rural landscapes into undifferentiated cities. Under this urbanization, various rural landscapes disappear and rural areas become new urban centers. The expansion of cities has created more jobs while also driving residents from nearby villages out of the countryside. At a certain point in the migration of the population from rural to urban areas, the countryside or the rural-urban fringe will be abandoned and become deserted. The design attempts to change this situation, taking the hinterland of Chongqing metropolitan as an example, to create more employment opportunities, retain the population and attract the population through industry tailored to local conditions. Develop existing township patterns and find sustainable strategies for rural areas. In line with the future urban and rural development balance. That is the urban-rural continuum.

The study area is a forested highland in the center of the city, with abundant mineral and forest resources. In the early days, many factories were attracted here, forming a primary industry and mining industry, and attracting a large number of people to work here. Then the government introduced ecological protection policies and closed factories and mines. It also caused population loss. Agriculture, tourism, and the elderly care industry are now being developed. The project uses this as an opportunity to combine morphological and typological research in the context of population aging and pandemics. Set up village medical stations that combine production and medical treatment in rural areas, and set up a post-pandemic health center in towns, improving the living condition and providing more job opportunities, that finally repopulate this area.

Key words: China, Urbanization, Hinterland, Urban-rural continuum, Medical, Production

## Chapter 1 **Introduction**

1.1 Field location

1.2 Planning and current situation

1.3 Hinterland in the metropolitan

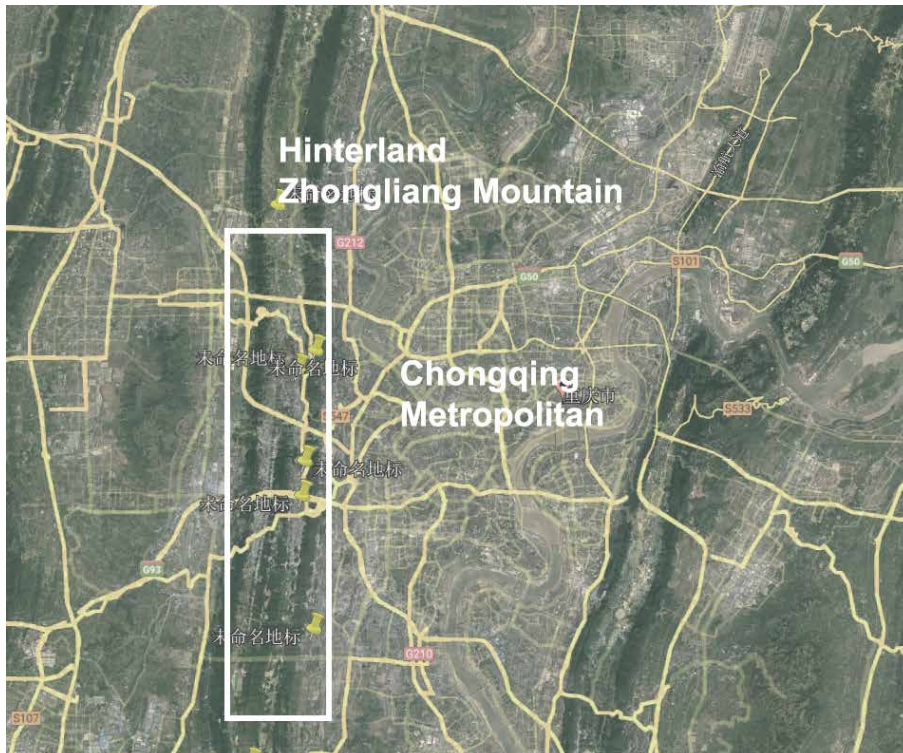
# Chapter 1 Introduction

## 1.1 Field location

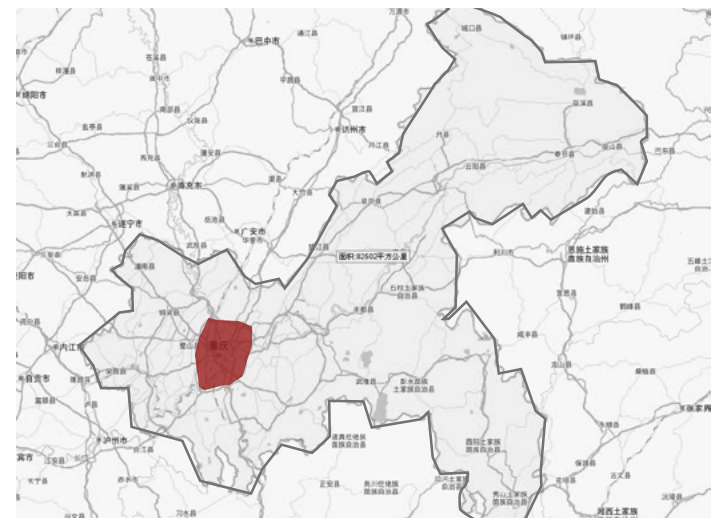
### 1.2 Planning and current situation

### 1.3 Hinterland in the metropolitan

## 1.1 Field location

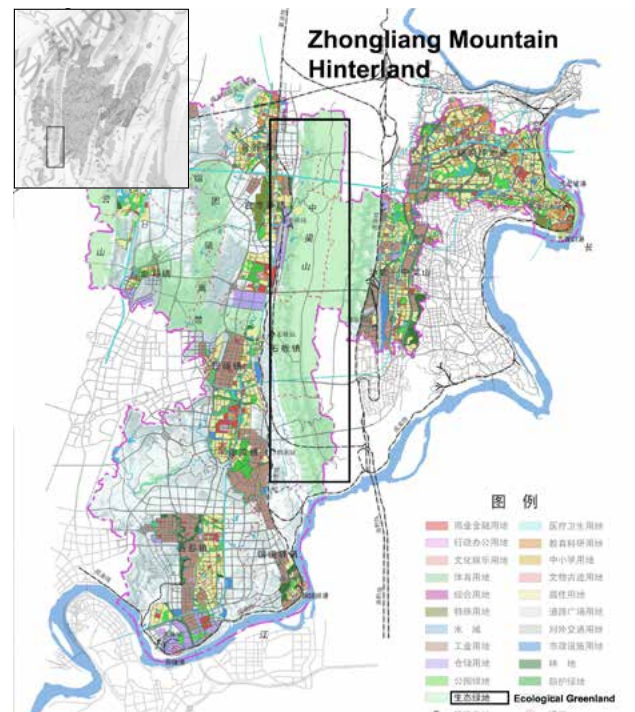
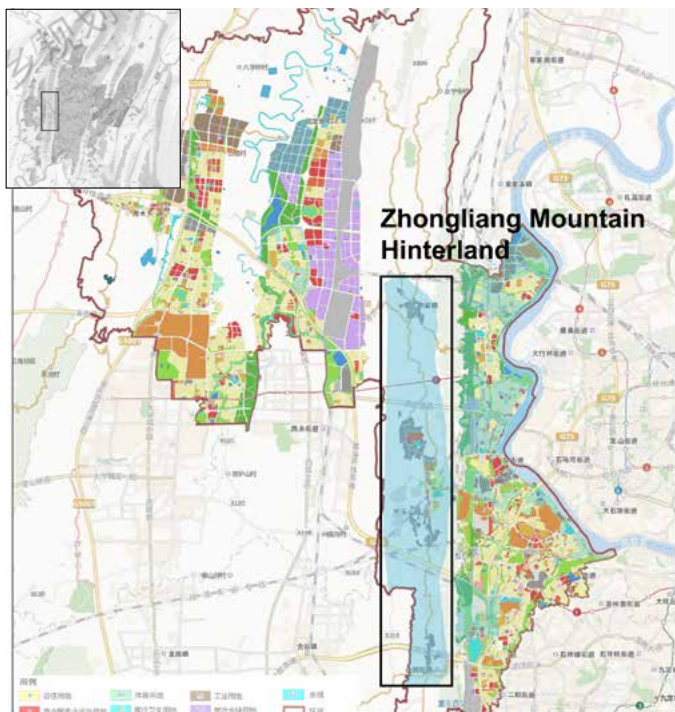
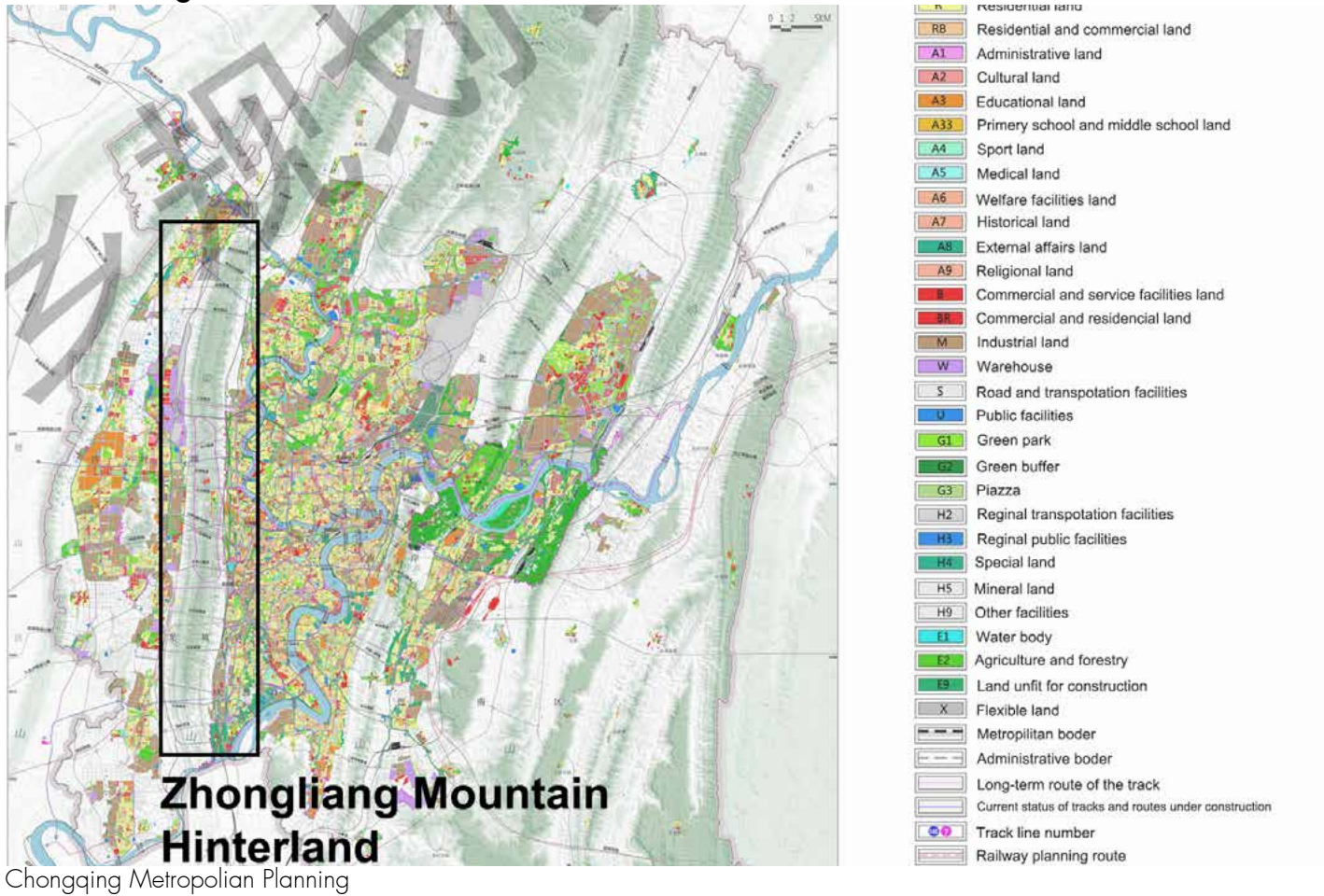


China, Chongqing



Chongqing, Metropolitan

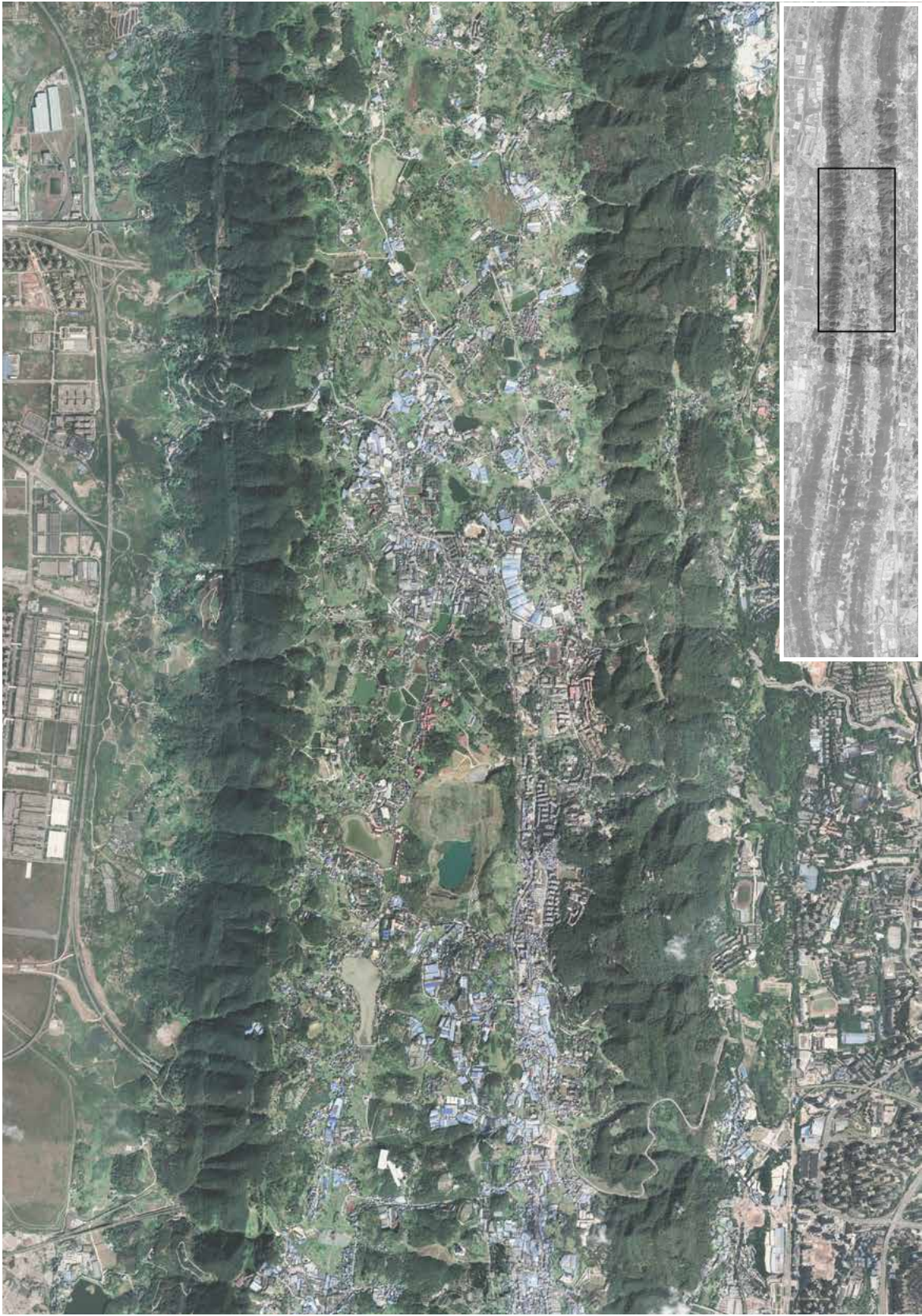
## 1.2 Planning and current situation







Current situation



Current situation



Current situation

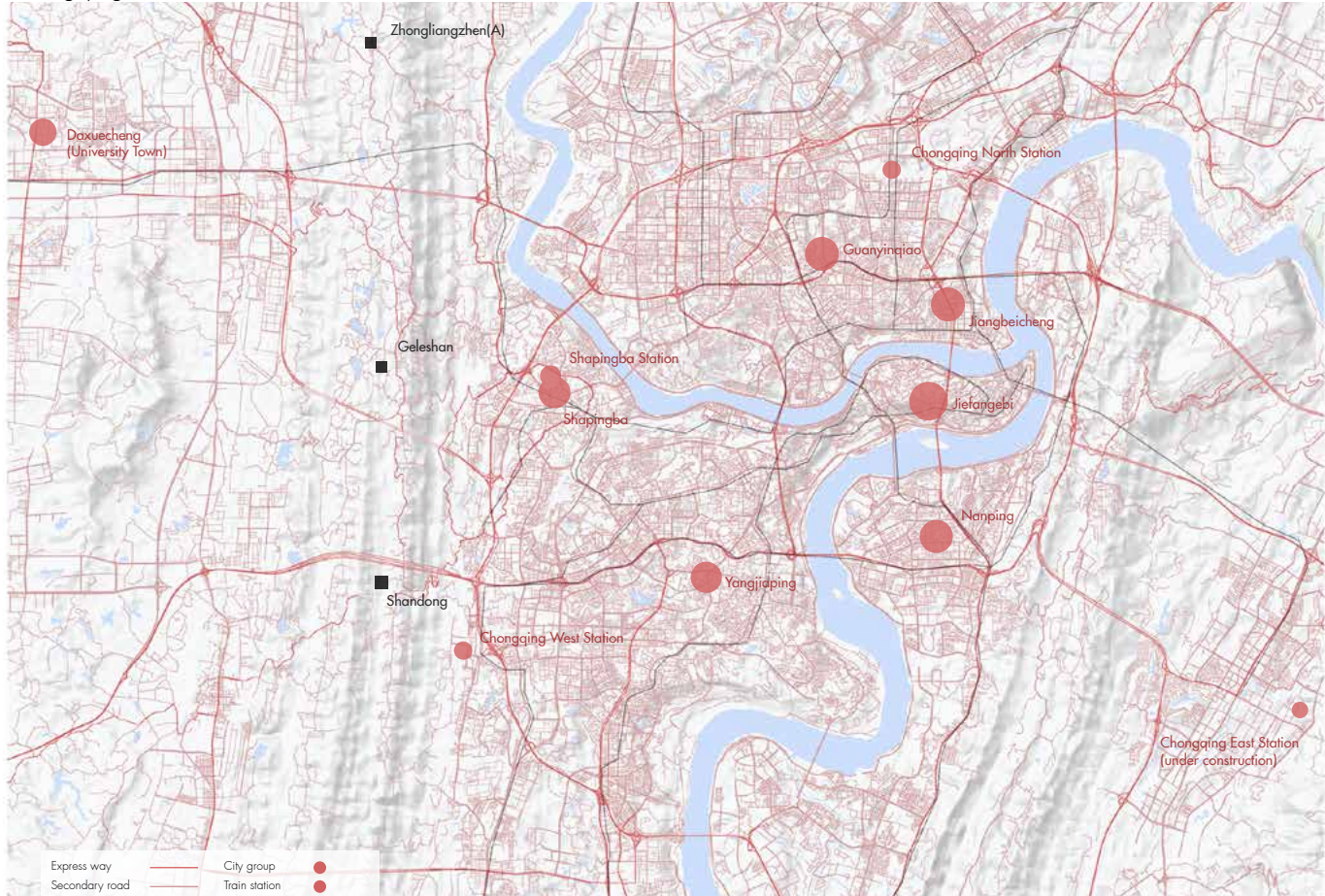


Current situation

### 1.3 Hinterland in the metropolitan

Space distance and time distance

Chongqing traffic network



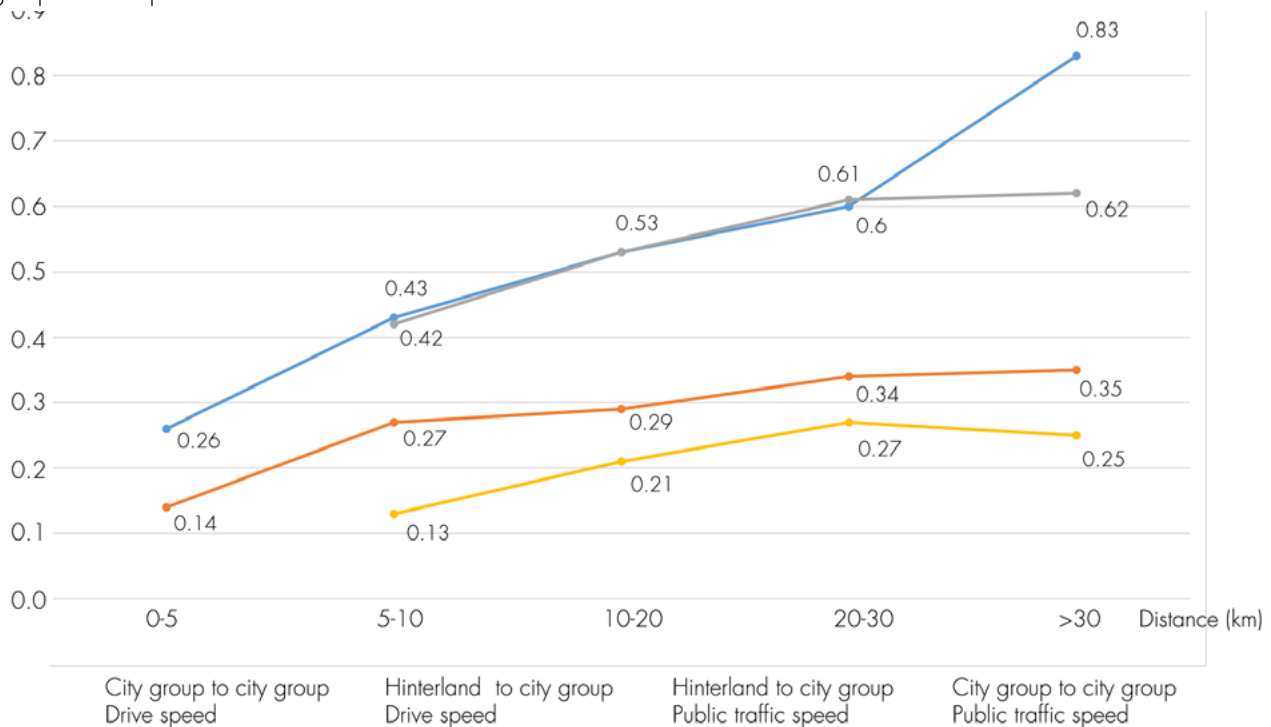
#### From hinterland to city groups

	City group	Daxuecheng (University Town)	Shapingba	Guanyinqiao	Jiangbeicheng	Jiefangbei	Nanping	Yangjiaping	Chongqing North Station	Chongqing West Station	Chongqing East Station (under construction)
<b>Hinterland group</b>											
<b>Zhongliangzhen</b>		18 km	17 km	21 km	24 km	27 km	30 km	27 km	24 km	28 km	47 km
<b>week day,</b>											
<b>rush hour</b>	<b>drive</b>	39 mins	36 mins	45 mins	48 mins	55 mins	1h 6mins	51 mins	46mins	50mins	1h 26mins
	<b>public</b>	1h 21mins	1h 7mins	1h 7mins	1h 37mins	1h 37mins	1h 33mins	1h 38mins	1h 44mins	1h 26mins	2h 45mins
<b>normal hour</b>	<b>drive</b>	33 mins	31 mins	39 mins	40 mins	43 mins	49 mins	42 mins	36 mins	33 mins	1h 5mins
	<b>public</b>	1h 20mins	1h 6mins	1h 6mins	1h 36mins	1h 37mins	1h 32mins	1h 37mins	1h 42mins	1h 24mins	2h 38mins
<b>weekend,</b>											
<b>drive</b>		40 mins	37 mins	45 mins	43 mins	50mins	57mins	47mins	39mins	39mins	39mins
	<b>public</b>	1h 26mins	1h 6mins	1h 6mins	1h 36mins	1h 35mins	1h 32mins	1h 38mins	1h 42mins	1h 24mins	2h 45mins
<b>Geleshan</b>		17 km	8 km	24 km	22 km	22 km	24 km	21 km	22 km	16 km	41 km
<b>week day,</b>											
<b>rush hour</b>	<b>drive</b>	42 mins	26 mins	44 mins	43 mins	40 mins	51 mins	44 mins	49 mins	45 mins	1h 41mins
	<b>public</b>	1h 18mins	51mins	1h 17mins	1h 27mins	1h 21mins	1h 17mins	1h 17mins	1h 28mins	1h 7mins	2h 29mins
<b>normal hour</b>	<b>drive</b>	33 mins	20 mins	34 mins	39 mins	40 mins	39mins	36mins	36mins	28mins	1h 5mins
	<b>public</b>	1h 26mins	53mins	1h 19mins	1h 30mins	1h 27mins	1h 19mins	1h 19mins	1h 27mins	1h 9mins	2h 32mins
<b>weekend,</b>											
<b>drive</b>		37 mins	22 mins	40 mins	46 mins	45 mins	55 mins	44 mins	40 mins	35 mins	39mins
	<b>public</b>	1h 26mins	53mins	1h 19mins	1h 31mins	1h 27mins	1h 19mins	1h 19mins	1h 27mins	1h 27mins	2h 32mins
<b>Shandong</b>		17 km	8 km	19 km	22 km	22 km	20 km	15 km	25 km	9 km	33 km
<b>week day,</b>											
<b>rush hour</b>	<b>drive</b>	42 mins	35 mins	54 mins	56 mins	54 mins	53 mins	40 mins	59mins	19mins	1h 26mins
	<b>public</b>	1h 18mins	56mins	1h 9mins	1h 18mins	1h 37mins	1h 21mins	1h 17mins	1h 23mins	56mins	2h 30mins
<b>normal hour</b>	<b>drive</b>	33 mins	23 mins	40 mins	43 mins	46 mins	39mins	27mins	44mins	18mins	1h 5mins
	<b>public</b>	1h 26mins	1h 23mins	1h 29mins	1h 38mins	1h 46mins	1h 42mins	1h 45mins	1h 43mins	1h 9mins	2h 49mins
<b>weekend,</b>											
<b>drive</b>		37 mins	22 mins	42 mins	43 mins	44 mins	43 mins	28 mins	48mins	19mins	39mins
	<b>public</b>	1h 26mins	1h 23mins	1h 29mins	1h 38mins	1h 46mins	1h 42mins	1h 42mins	1h 42mins	1h 9mins	1h 2mins

## From city group to city group

City group	Daxuecheng (University Town)	Shapingba	Guanyinqiao	Jiangbeicheng	Jiefangebei	Nanping	Yangjiaping	North Station	West Station	East Station (under construction)
<b>Daxuecheng (University Town)</b>		24km 39mins 55mins	29km 48mins 1h 23mins	30km 47mins 1h 30mins	36km 1h 2mins 1h 26mins	36km 1h 1h 23mins	33km 51mins 1h 24mins	29km 47mins 1h 27mins	24km 37mins 1h 9mins	51km 1h 14mins 2h 28mins
<b>Shapingba</b>			12km 23mins 40mins	12km 24mins 46mins	14km 32mins 42mins	15km 29mins 40mins	10km 21mins 40mins	15km 27mins 49mins	11km 16mins 35mins	29km 50mins 1h 56mins
<b>Guanyinqiao</b>				4.3km 15mins 24mins	7.8km 25mins 30mins	9.8km 20mins 24mins	9.4km 19mins 37mins	6.2km 18mins 27mins	17km 36mins 43mins	23km 43mins 1h 34mins
<b>Jiangbeicheng</b>					4.1km 17mins 40mins	8.8km 20mins 41mins	12km 26mins 1h 16mins	7.6km 16mins 29mins	20km 43mins 58mins	19km 34mins 1h 34mins
<b>Jiefangebei</b>						7.7km 19mins 29mins	12km 27mins 36mins	9.9km 24mins 35mins	21km 40mins 48mins	18km 37mins 1h 32mins
<b>Nanping</b>							8.1km 17mins 36mins	14km 23mins 39mins	18km 33mins 43mins	17km 34mins 1h 35mins
<b>Yangjiaping</b>								16km 26mins 56mins	12km 20mins 51mins	20km 37mins 1h 53mins
<b>North Station</b>									23km 44mins 58mins	24km 33mins 1h 34mins
<b>West Station</b>										41km 42mins 1h 53mins
<b>East Station (under construction)</b>										

## Average speed compare



Conclusion: Drive speeds of the hinterland to city group and city group to city group are almost the same. But the gap in public traffic speed is obvious. For instance, in the same distance of 35km, taking public traffic from the city group to the hinterland will cost 26 mins more

Anathor developed hinterland in metropolitan  
Tongluo Mountain hinterland



## Chapter 2 **Methodology: Urban-rural continuum**

2.1 Urbanization In China

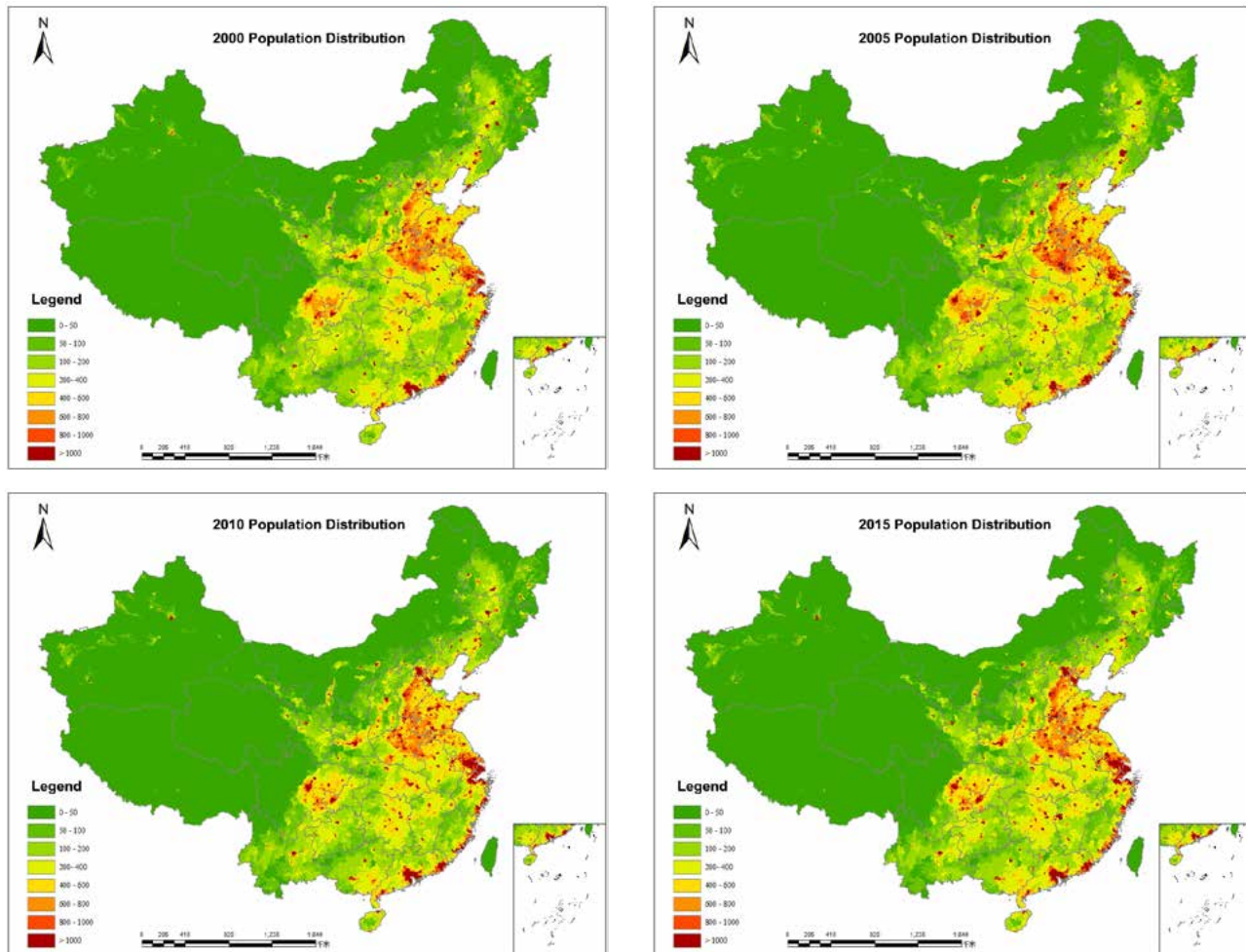
2.2 Chongqing Urban And Rural Structure

2.3 Hinterland and Market model



## 2.2 Urbanization In China

Since China entered the period of rapid urbanization in 1996, the scale of migration population has been increasing, and has become an important driving force and one of the core contents of urbanization and urban scale growth.



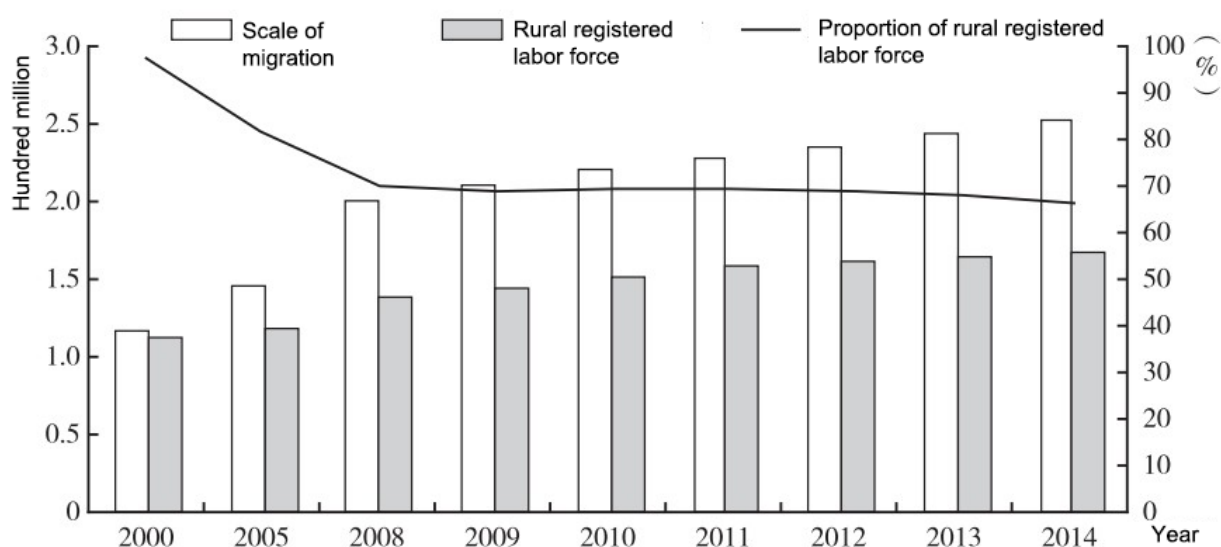
There was a slight increase in the proportion of the total population in the eastern and western regions, while a slight decrease in the central region. In terms of regional proportions, there was a slight increase in eastern and central regions and a slight decrease in western regions. In terms of the growth rate of the migrant population, the western region saw the highest growth rate of 86%, followed by the eastern region, 79%, and the central region, 77%. This shows that the central region and the eastern region are basically the same in terms of attracting migration population, and the western region is more obvious in terms of attracting migration population due to the implementation of China's western development strategy.

In 2015, according to the export places (see Table 2), among the migrant rural workers, the inter-provincial floating population was 77.45 million and the provincial floating population was 91.39 million, accounting for 45.9% and 54.1% of the total migrant labor force respectively. Generally speaking, the eastern region as the main destination of migrant population has not changed. However, as the overall level of urbanization in eastern China is relatively high and will gradually stabilize in the future, the speed of attracting population will decline. There is still a lot of room for improvement in the urbanization level of the central and western regions. In recent years, the rate of attracting rural migrant workers has been growing rapidly. In 2015, the proportion of attracting rural migrant workers in the central region increased by 3.2%, 1% and 3.6% higher than that in the western and eastern regions respectively. It can be said that the central and western regions will be the main driving force for China's urbanization in the future.

**The regional distribution and composition of out-going rural labor force change**

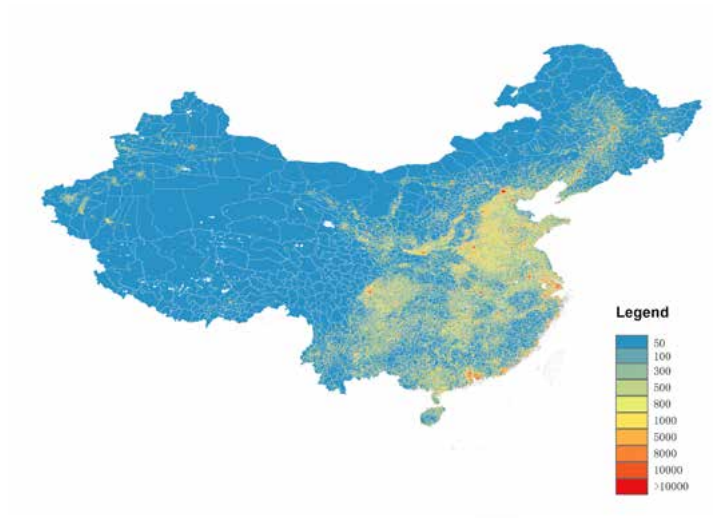
	2009		2015	
	Across the province	In the province	Across the province	In the province
Total	51.20	48.80	45.90	54.10
East	20.40	79.60	17.30	82.70
Middle	69.40	30.60	61.10	38.90
West	59.10	40.90	53.50	46.50

Data source: Data collated according to the National Migrant Workers Monitoring Survey Report (2009, 2015).

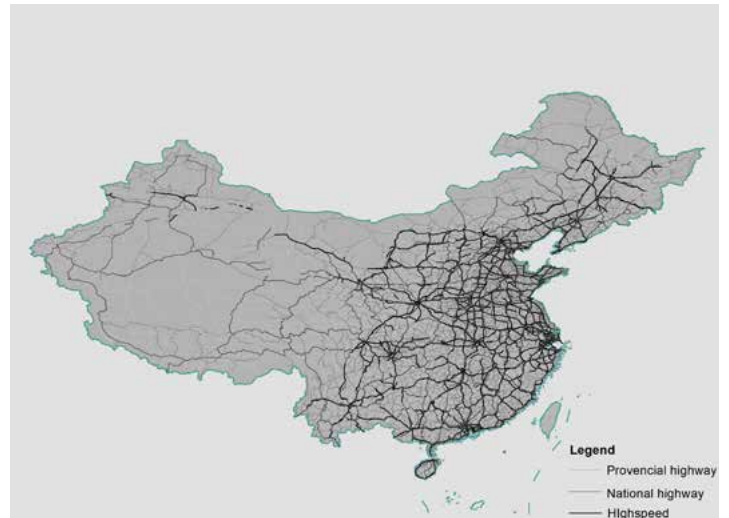
**The scale and composition of China's migration population**

In mid and late 1980s, under the State Council issued the notice about farmers into town settle problem for logo, country to some extent, to relax the control of the rural population into the small and medium-sized towns, for the rural labor flow Created a favorable system environment, and then is given priority to with rural-urban migration of population, China's floating population increased year by year.

According to China's floating population development report forecast, the current household registration system in China under the premise of no significant changes in the 21st century, China's floating population will reach the peak of 300 million people, including the rural household registration of the floating population of 200 million, the national population and family planning committee of the floating population management service, 2012).



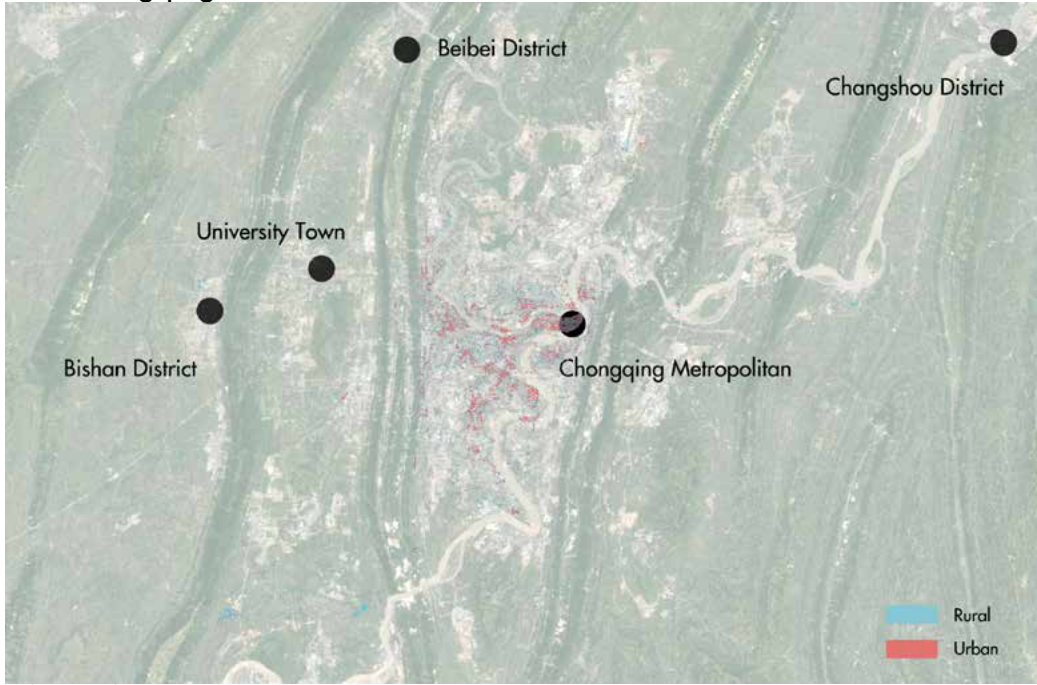
Population distribution in 2020



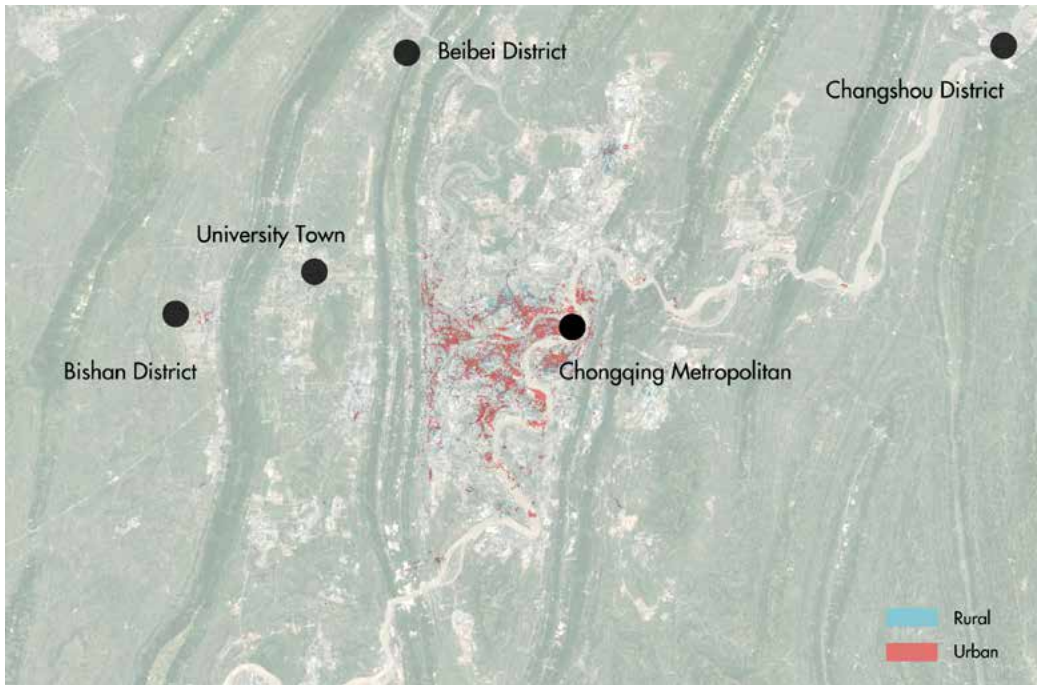
Highway distribution in 2020

Combined with the two GIS analysis charts, it can be seen intuitively that the population density and road density in the coastal areas of North China and southeast China are higher than those in other regions, which can infer the level of urbanization.

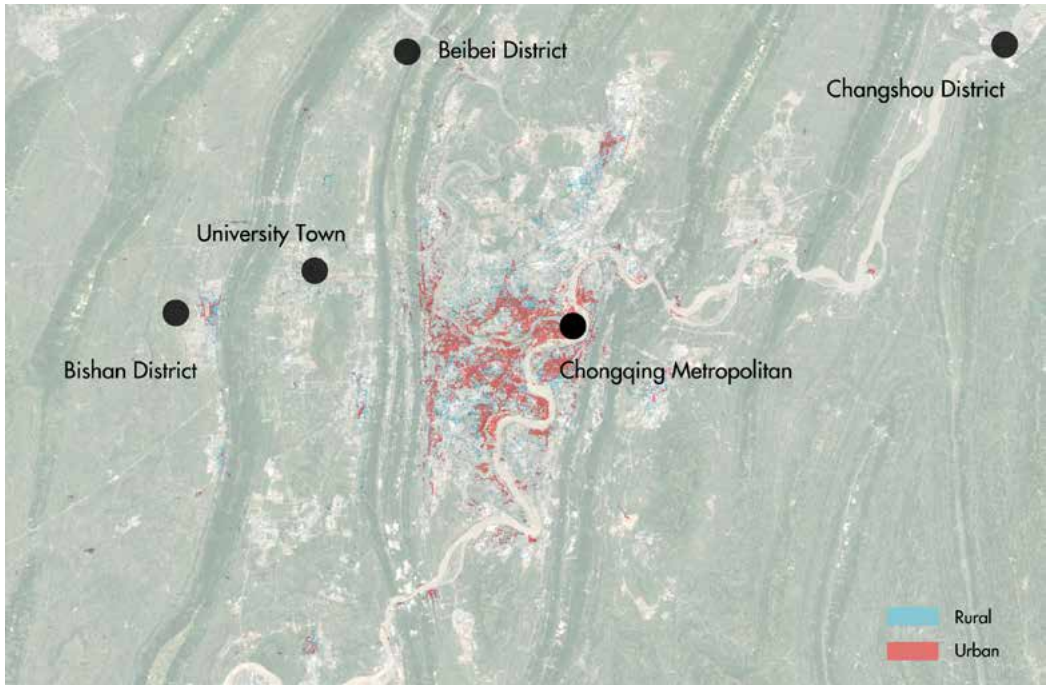
## 2.1 Chongqing Urban And Rural Structure



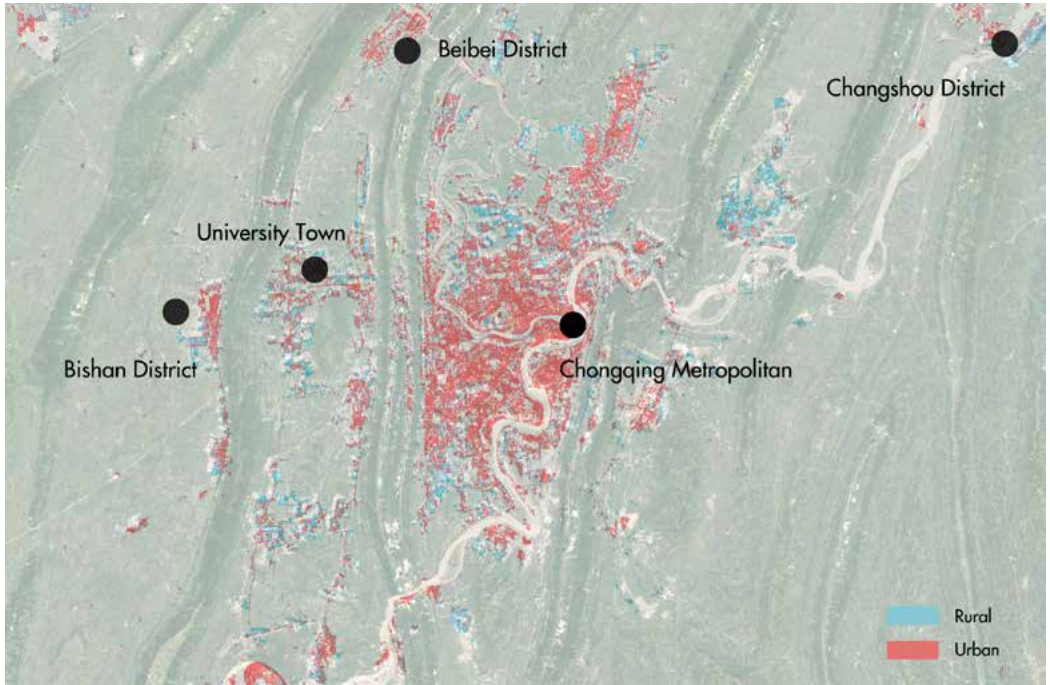
Urban-rual structure in 1985



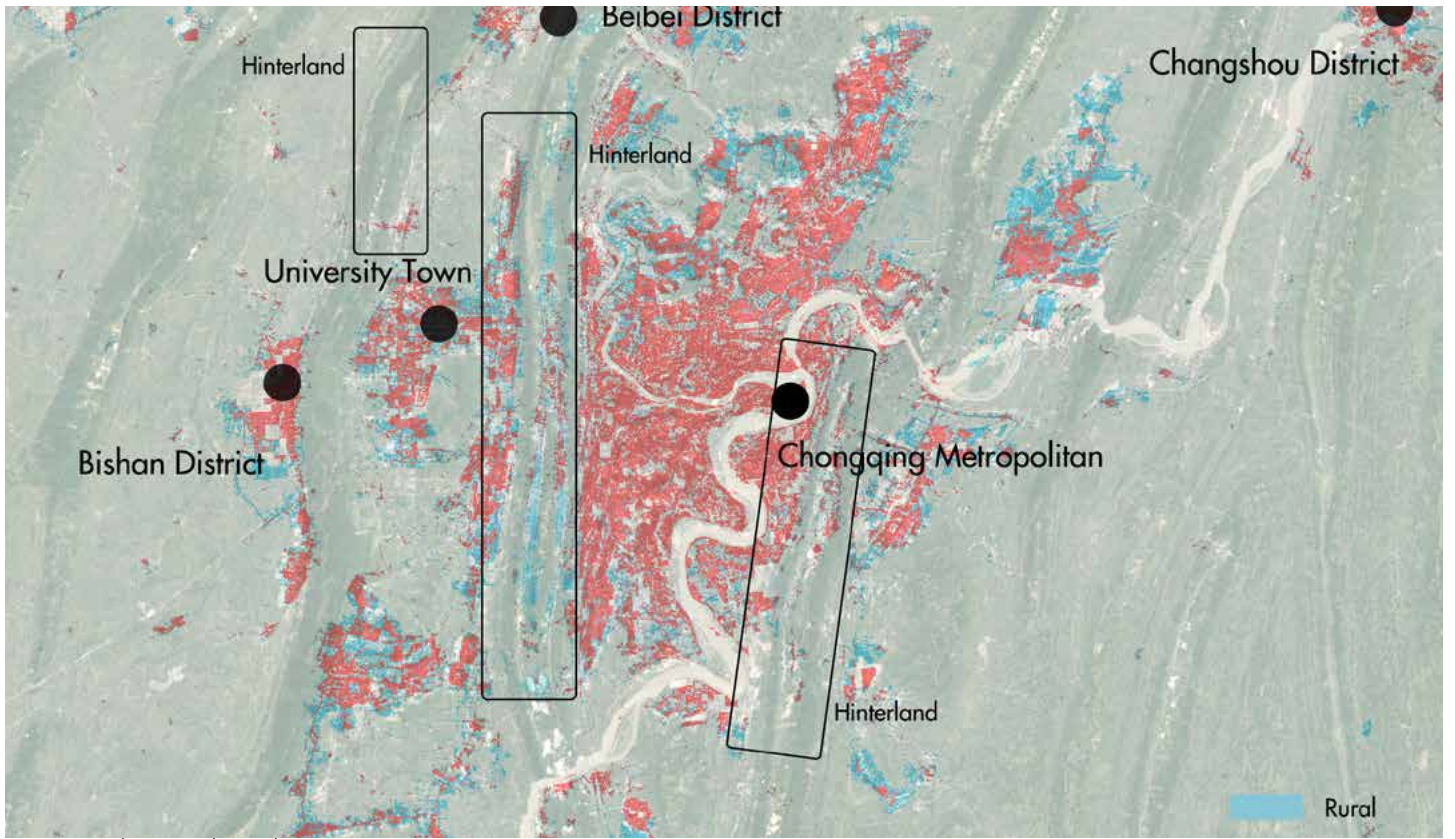
Urban-rual structure in 1990



Urban-rual structure in 2000



Urban-rual structure in 2010



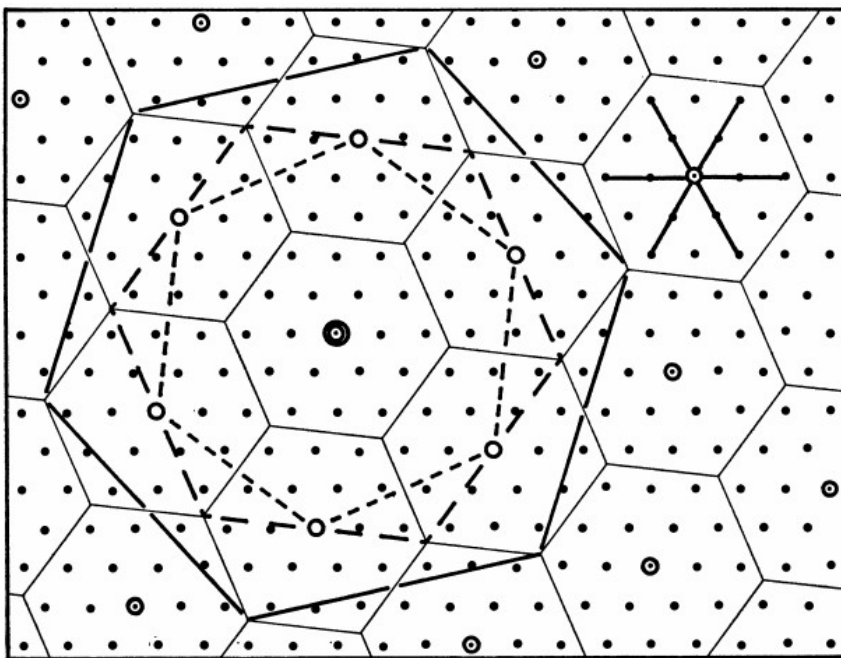
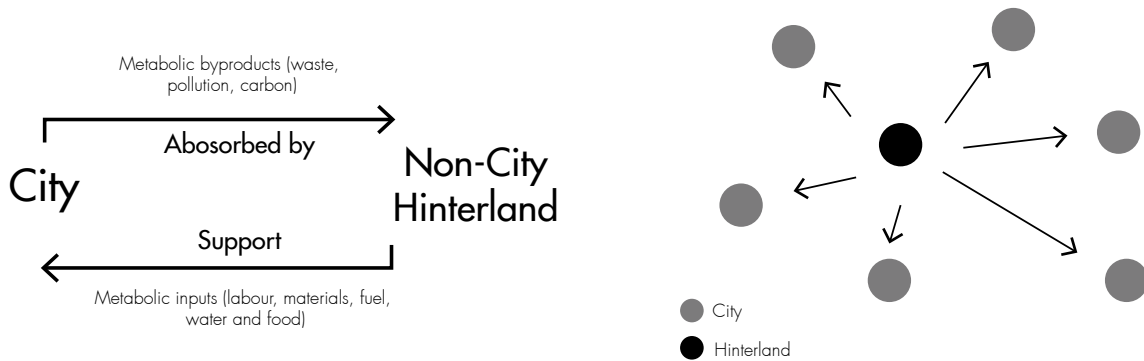
Existing Urban And Rural Structure

### 2.3 Hinterland and Market model

In the mid and late 1980s, the State Council issued a notice about farmers into town settle problem for logo, country to some extent, to relax the control of the rural population in the small and medium-sized towns, for the rural labor flow Created a favorable system environment, and then is given priority to with rural-urban migration of population, China's floating population increased year by year.

According to China's floating population development report forecast, the current household registration system in China under the premise of no significant changes in the 21st century, China's floating population will reach the peak of 300 million people, including the rural household registration of the floating population of 200 million, the national population and family planning committee of the floating population management service, 2012). However, due

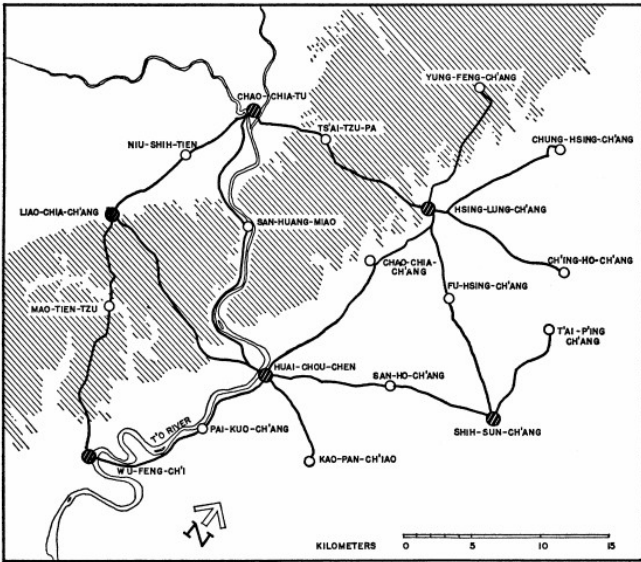
City and hinterland relationship



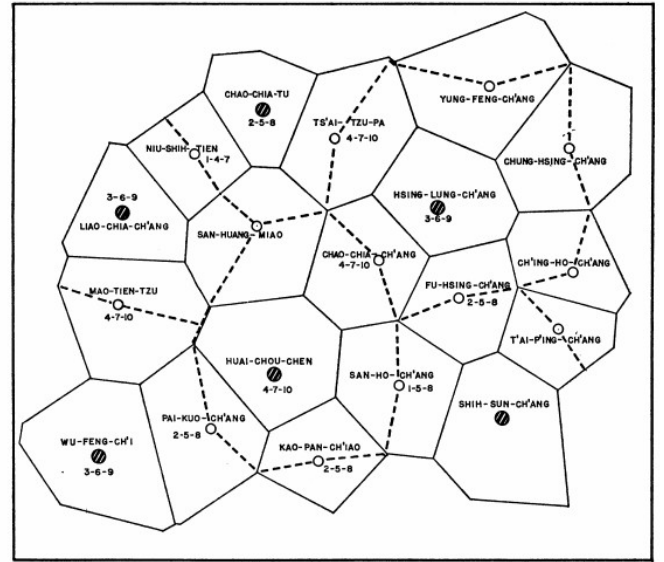
- KEY:**
- VILLAGE
  - STANDARD MARKET TOWN
  - ⊙ INTERMEDIATE MARKET TOWN
  - ⊙ OTHER MARKET TOWN OF VARIABLE STATUS
  - LIMITS OF STANDARD MARKETING AREA
  - THEORETIC POSSIBILITY
  - - - MODEL 'A'
  - - - MODEL 'B'
- } LIMITS OF INTERMEDIATE MARKETING AREAS

G. William Skinner uses the central place theory to describe the urban and rural structure in the agricultural (primary industry) society in China. Through the central place theory, a set of the dynamic urban-rural model is established. This will be the starting point for us to understand the urban-rural structure and develop the design on this basis.

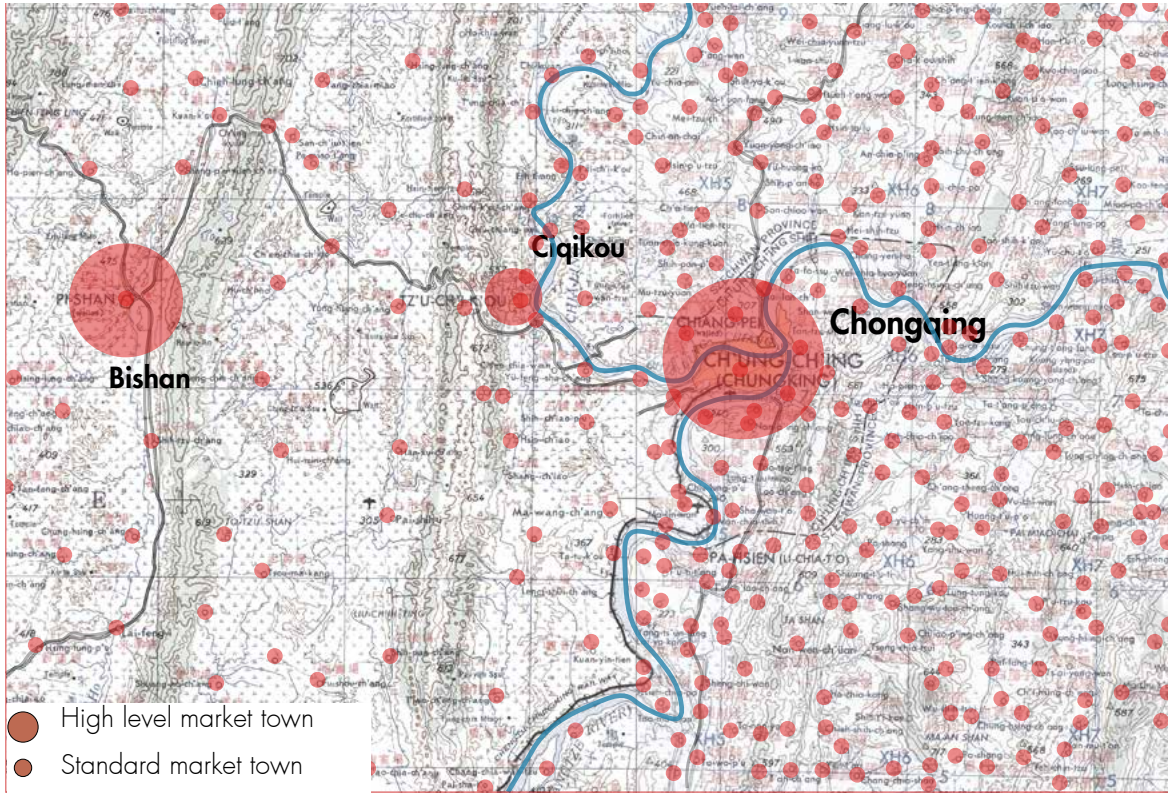
A model of the Chinese standard marketing area as a stable spatial system, together with three possible models of intermediate marketing areas.



The 19 market towns depicted lie between 35 and 60 km. northeast of Chengtu. Five markets (Yung-feng-ch'ang, Chung-hsing-ch'ang, Ch'ing-ho-ch'ang, T'ai-p'ing-ch'ang, and Shih-sun-ch'ang) are in Chung-chiang hsien, the other 14 in Chint'ang hsien. The mountains shown are part of the Lung-ch'ian range. The only roads mapped are those which connect standard to higher-level market towns.

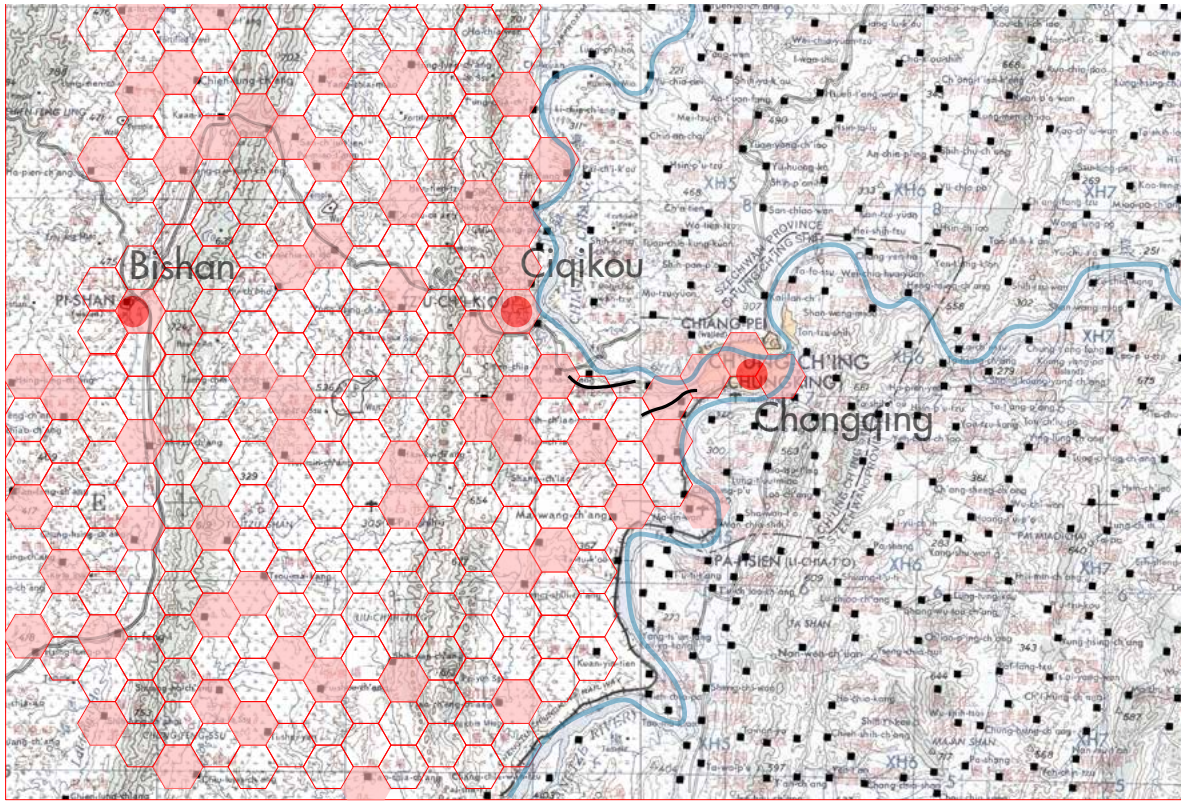


First abstraction of the same landscape showing theoretic standard and intermediate marketing areas.

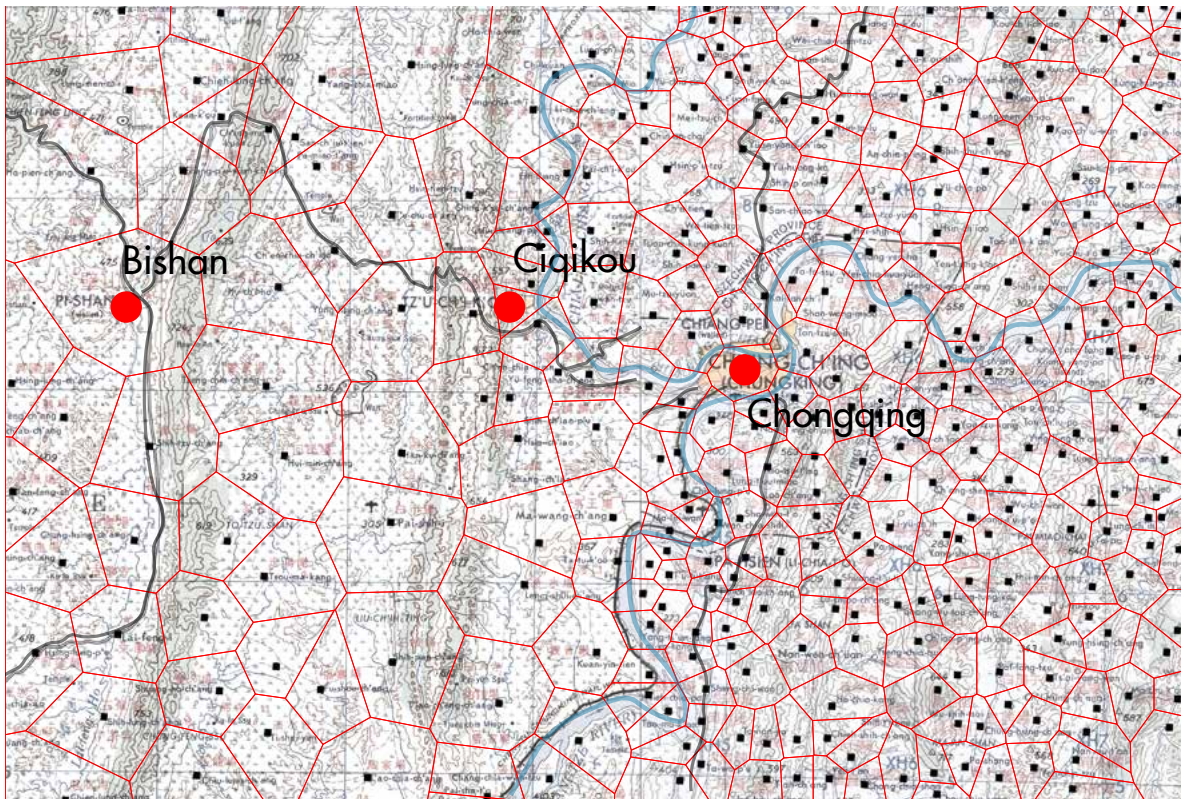


Chongqing urban rural structure in 1960





3 km radiation from the standard market town



● Highest market      — Water

Actual radiation from the standard market town

Chapter 3:

## **Chongqing Morphology study and general development**

3.1 Planning in the mountainous city

3.2 Geography

3.3 Chongqing metropolitan general development

3.4 Mountain city landscape

### 3.1 Planning in mountainous city

The main reference of this section is *Study on the spatial structure evolution of mountain towns -- Mainly mountainous towns in southwest China, by Wu Yong*, 2012. Explaining the planning in a mountainous city in four aspects, which are natural and non-natural factors, development stage, and city morphology. Several supplementary works of literature by *Du Chunlan*.

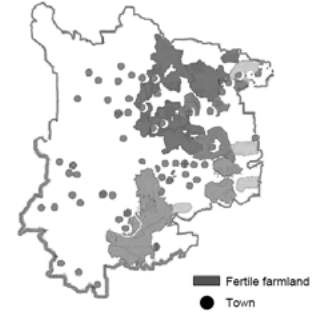
Mountainous city in four phrase

#### Phrase one

The external morphology is characterized by irregular clumps and belts, which are **adapted to the inherent topographic characteristics** of mountain terrain

**Nature factors**  
 Environment capacity  
 Topography  
 Nature resource

Agricultural resources



#### Phrase two

The construction mode according to local conditions, and the urban space organization structure with "**ritual system**" as the ruler

**Feudal and economic factors**  
 Social system  
 Military strategy  
 Religion

Feudal social system

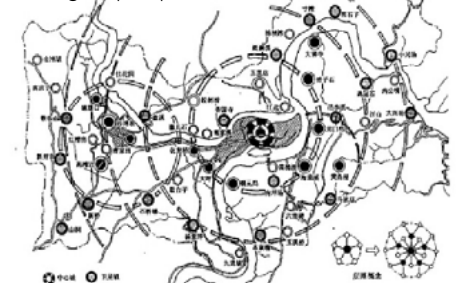


#### Phrase three

Emerging **capitalist functional elements** appear and accumulate in mountain towns to form **functional zones**

**Capitalist economic and cultural factors**  
 New ethos  
 Western culture  
 Commerce  
 Industrial

Multi groups spacail structure



#### Phrase four

**Planned economy and market economy**, The development of urban space has evolved from slow unitary to vigorous pluralism

**Socialist planned market economy factors**  
 Social system  
 Technical progress  
 Policy  
 Industry update

Hongkong skyscraper



Rivers system



Military pass

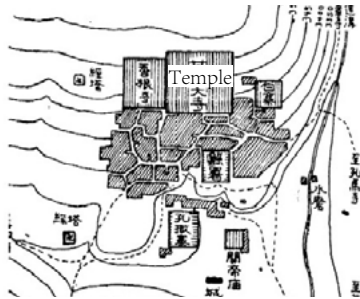


Minerals

Regular text: City  
Bold text: Mine



Tibetan Buddhism



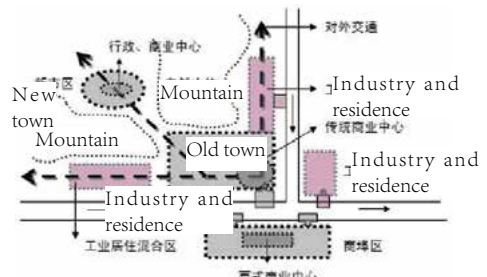
Military strategy



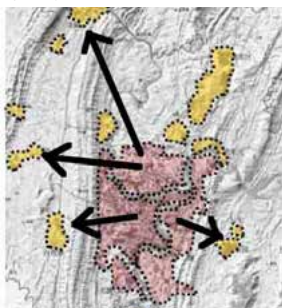
Qingdao master planning under German occupation



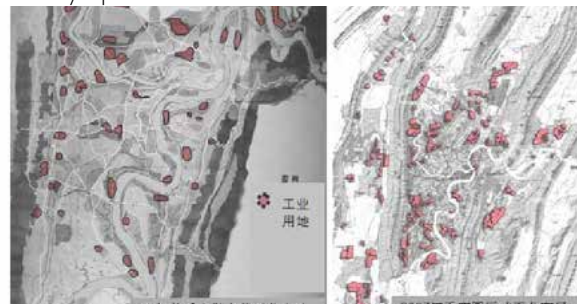
Multi-zone distribution



Technical progress: more tunnel



Industry update

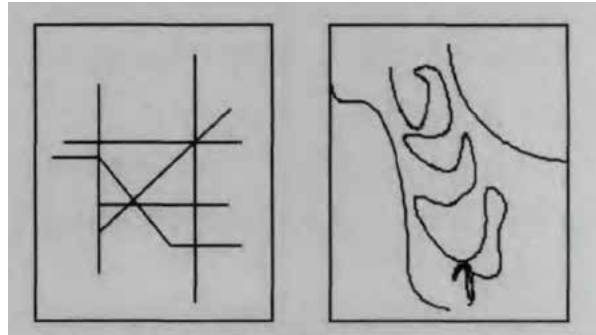


"Axis, core, group and system" in mountainous city

Axis

The axis can be landscape axis, ecological corridor, urban development axis, sight corridor, green axis. For mountain cities, axis, which is a balanced linear benchmark, is more characterized by curvilinear, asymmetrical, multi-level, complex and so on. It is common for the axis and path to overlap in cities and buildings. Generally, urban roads can be considered as the structural network of urban form.

The distinction of axis modality between plain and mountain cities



Group

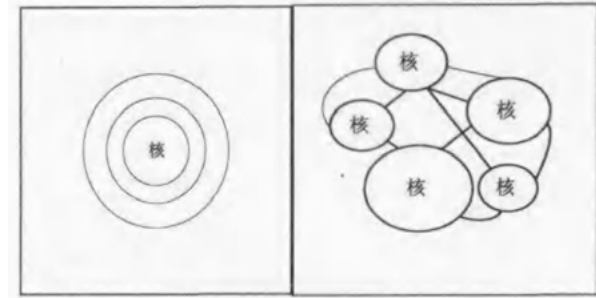
Urban main area and architectural group and complex landscape group. The topographic fluctuation of mountain city has great influence on the urban cluster. Each regional group has its own sense of territory due to its mountain water potential.

Building group at Lingjiang Gate, Chongqing



Core

In modern mountain cities, it is mainly manifested as city squares, street intersections and transportation hubs. Mountain cities are affected by terrain, and the number of nuclei is large, but the scale is small. Basically does not play the role of the regional core. A contrast of a centurms between the plain city and the city with mountain and water.



System

City road system, different land conditions form different road system, and the unique road system plays a role in strengthening the urban morphological characteristics. So roads are the backbone of the city.

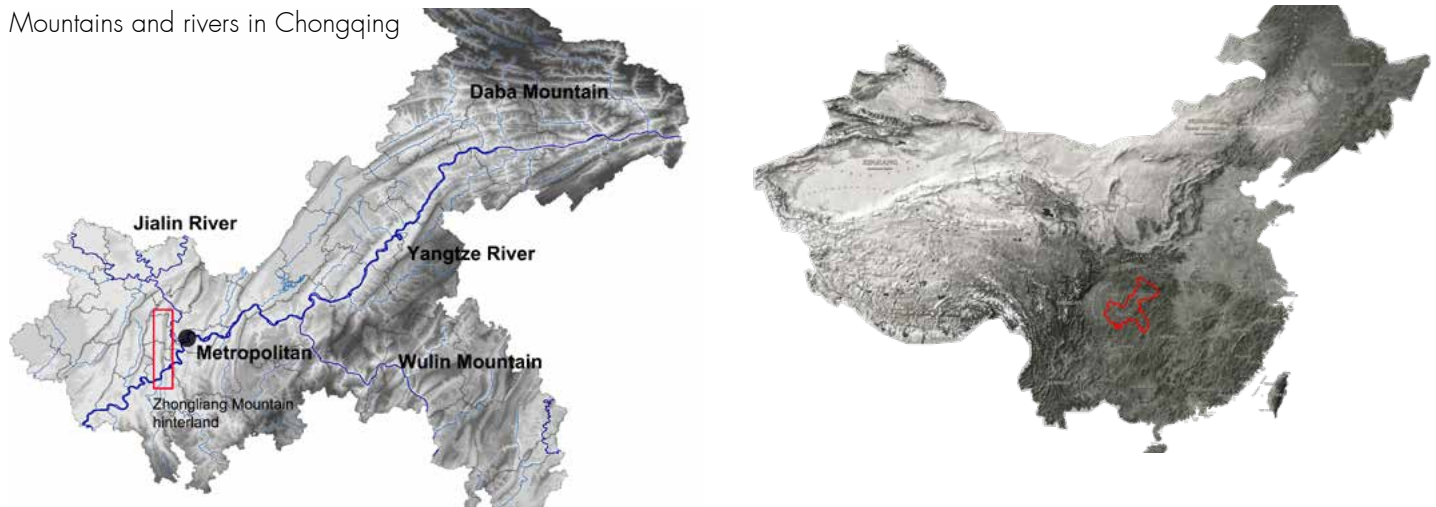
The typical stairway in mountain city



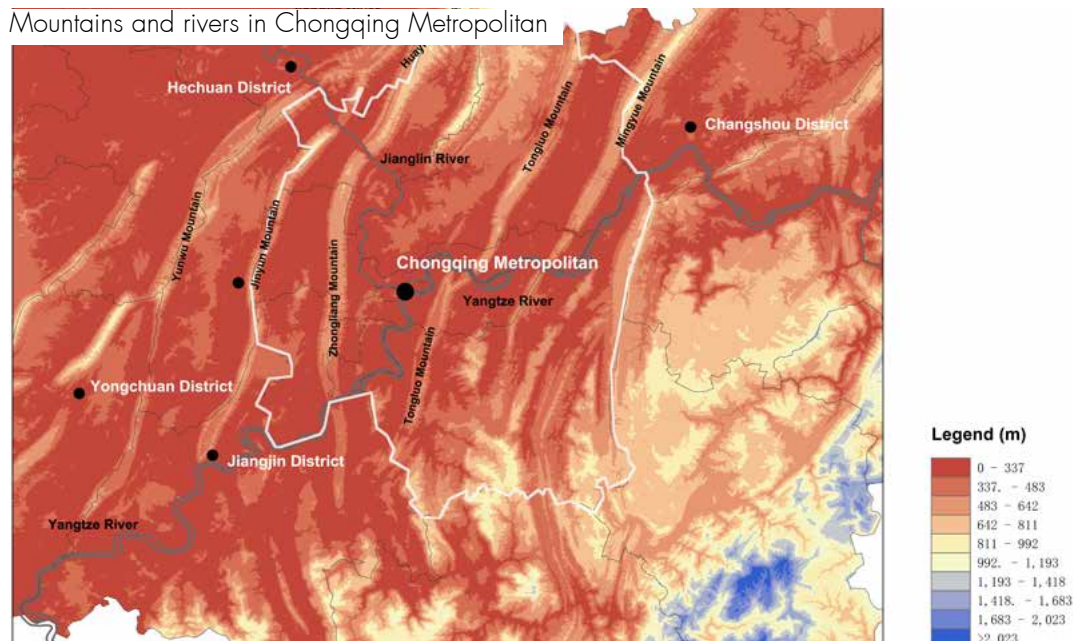
## 3.2 Chongqing Geography

Chongqing is located in southwest China, on the upper reaches of the Yangtze River, in the transition zone between the Qinghai-Tibet Plateau and the plains of the middle and lower reaches of the Yangtze River. The terrain is very undulating, with an average elevation of 400 meters

Mountains and rivers in Chongqing



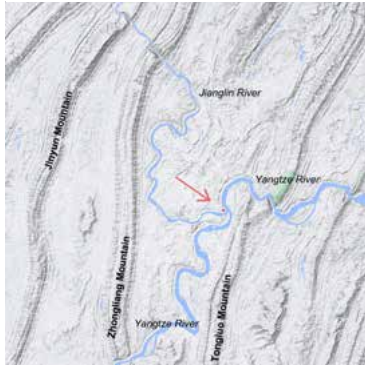
Mountains and rivers in Chongqing Metropolitan



The main city of Chongqing lies in the valley where the Yangtze and Jialing rivers converge. Yuzhong District is mainly mountainous; Yubei District and Jiangbei District to the north of Jialing River are mainly plain; Beibei District in the west of the main city; Huxi and Xiyong district in Shapingba District; Baishi District in Jiulongpo District are mainly plain; Nan'an District and Banan District in the south of the Yangtze River are mainly flat. Chongqing city is located in the eastern Sichuan region, with hills and mountains as the main landform, and the Yangtze River Valley descending from north to south. The slope area is large, so it is known as the "mountain city".

### 3.3 Chongqing metropolitan morphology study

#### Timeline of Chongqing Metropolitan morphology



B.C.316 Qin Dynasty



A.D.1238 Song Dynasty



A.D.1775 Qing Dynasty

Timeline

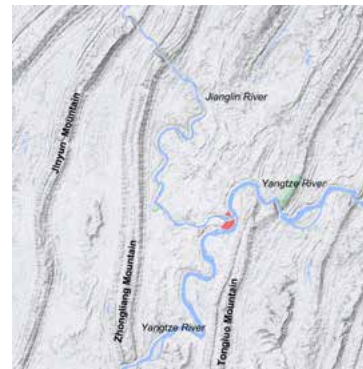
A.D.1876 Chongqing opened the port to foreign countries



A.D.226 Shuhan Dynasty



A.D.1371 Ming Dynasty



A.D.1886 Qing Dynasty



A.D.1925 R.O.C



A.D.1944 R.O.C



A.D.1963 P.R.C

Timeline

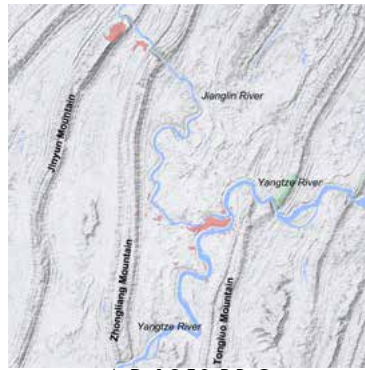
A.D.1937 Chongqing became the capital during the war

A.D.1949 Founding of P.R.C

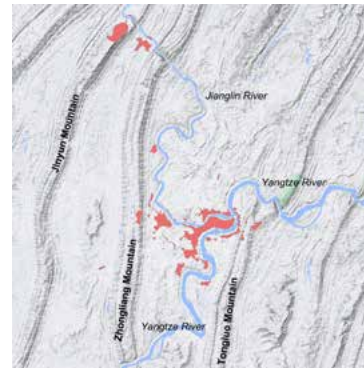
A.D.1965 Heavy industry started moving inland



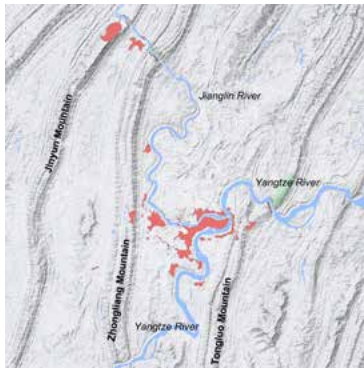
A.D.1937 R.O.C



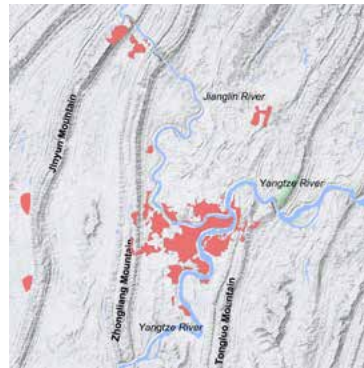
A.D.1953 P.R.C



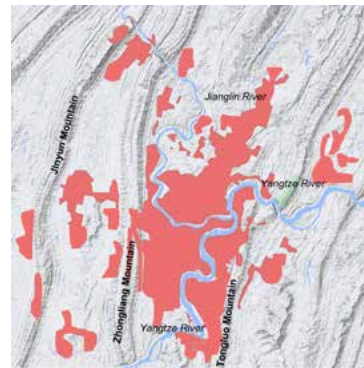
A.D.1971 P.R.C



A.D.1981 P.R.C



A.D.1997 P.R.C

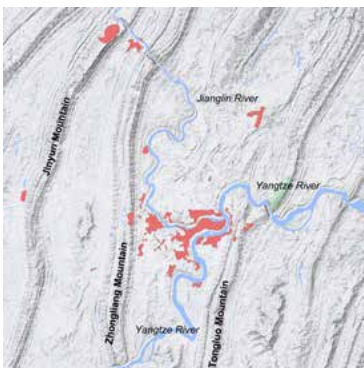


A.D.2012 P.R.C

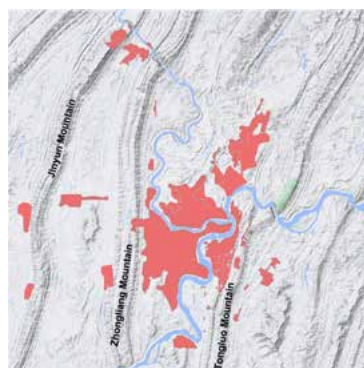
Timeline

A.D.1983 Economic revolution started in Chongqing

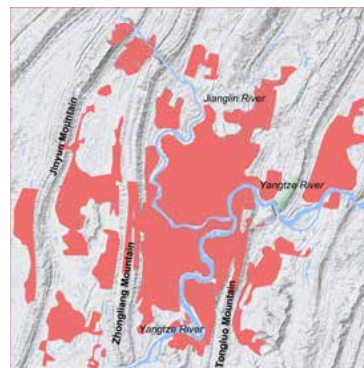
A.D.1997 Establishment of Chongqing Municipality



A.D.1993 P.R.C



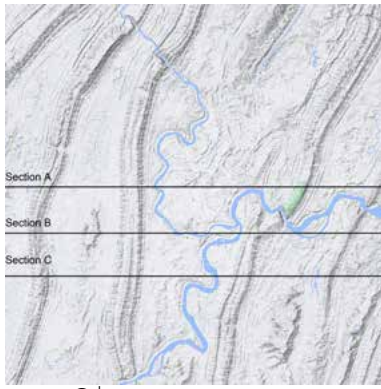
A.D.2005 P.R.C



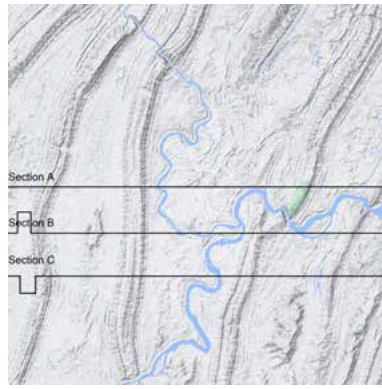
A.D.2020 P.R.C



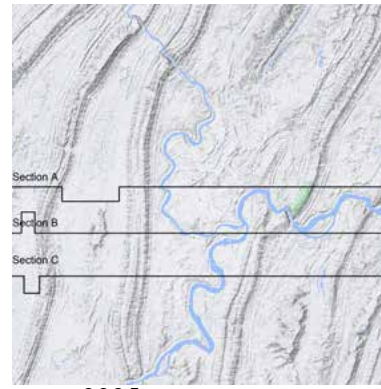
Timeline of mountain and urban section



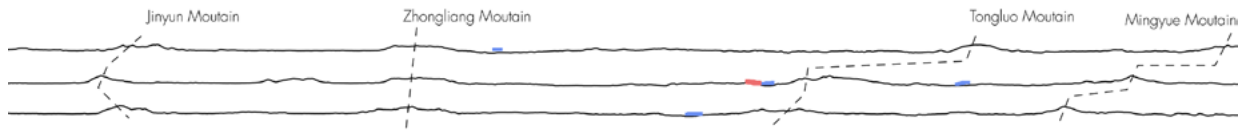
Other sections cut position



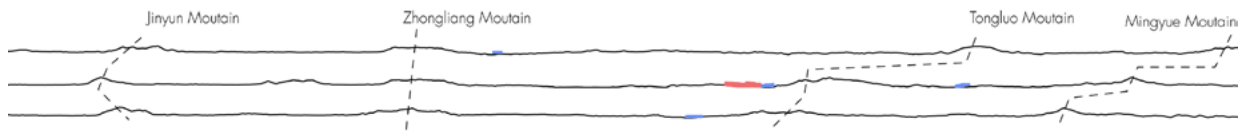
1997 section cut position



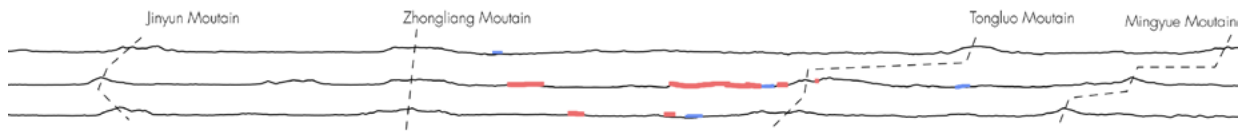
2005 section cut position



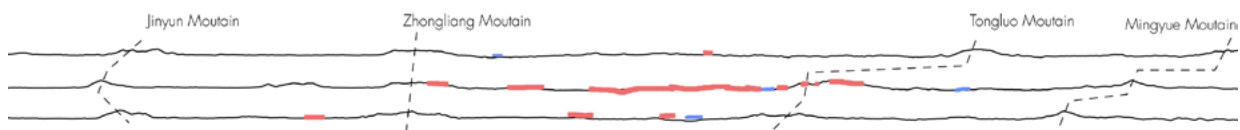
A.D. 226 Shuhan Dynasty



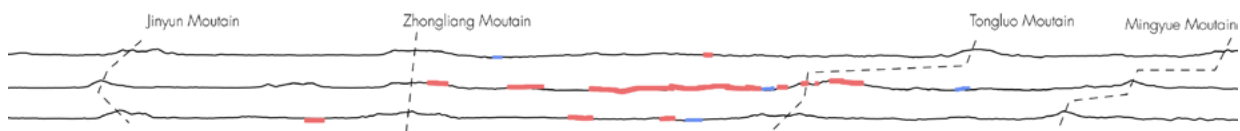
A.D. 1886 Qing Dynasty



A.D. 1944 R.O.C



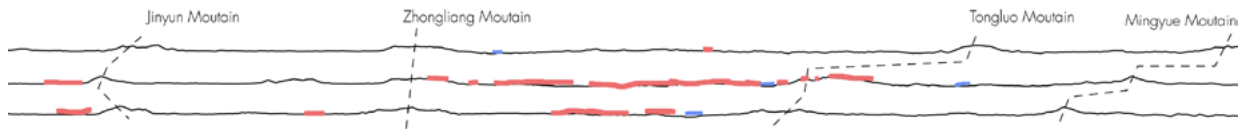
A.D. 1971 P.R.C



A.D. 1981 P.R.C



A.D. 1993 P.R.C



A.D. 1997 P.R.C



A.D. 2005 P.R.C



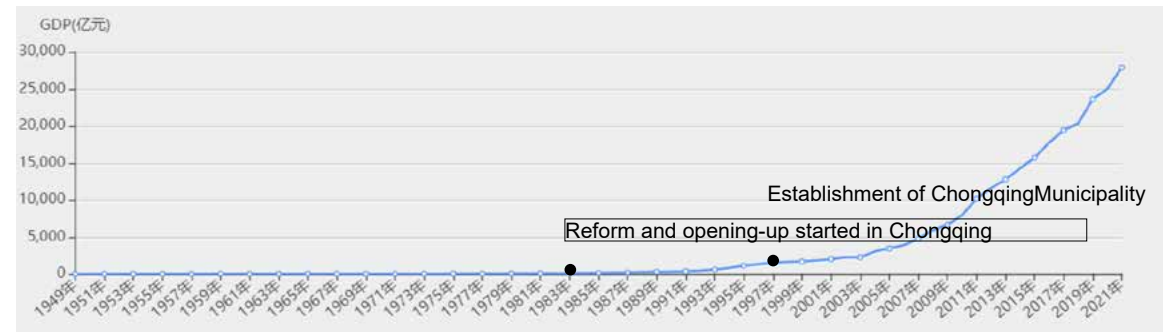
A.D. 2012 P.R.C



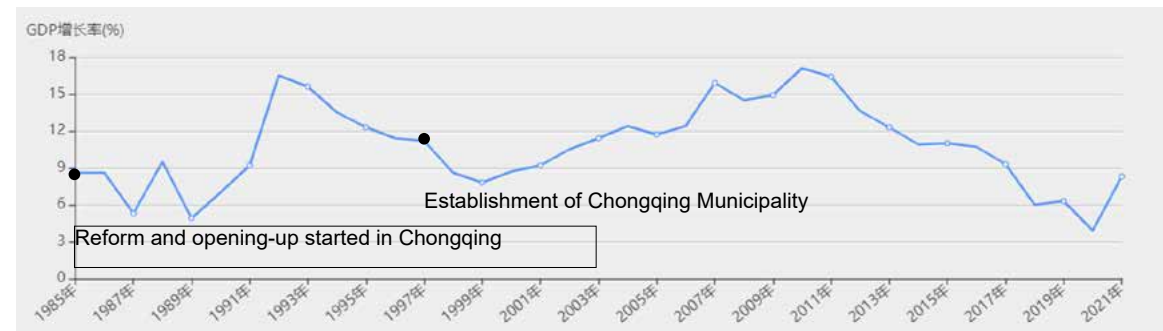
A.D. 2020 P.R.C

## Chongqing urban outline expansion intensity

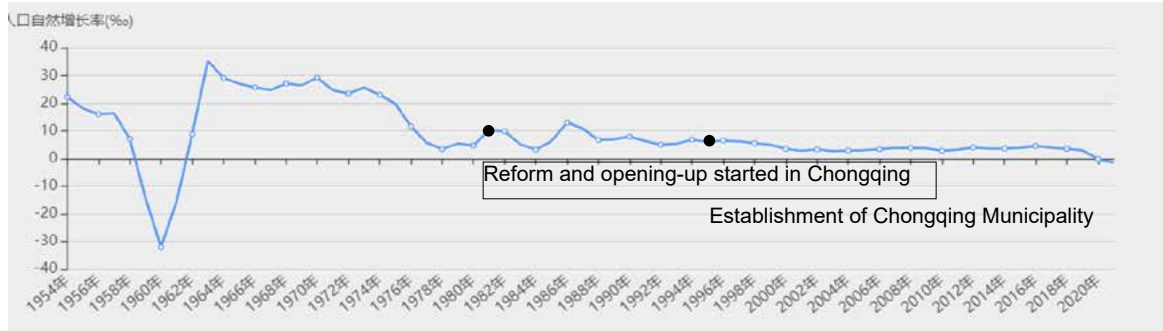
The concept of urbanization expansion intensity index is introduced to show the **expansion intensity** in different periods. The area difference at different times divided by time, divided by the area of the city. For example, during the period of BC.316-AD.226, the urban area of BC.316 is 20ha, while the area of AD.226 is 105ha, and the interval is 542 years,  $a=(105-20)/542/105=0.15$



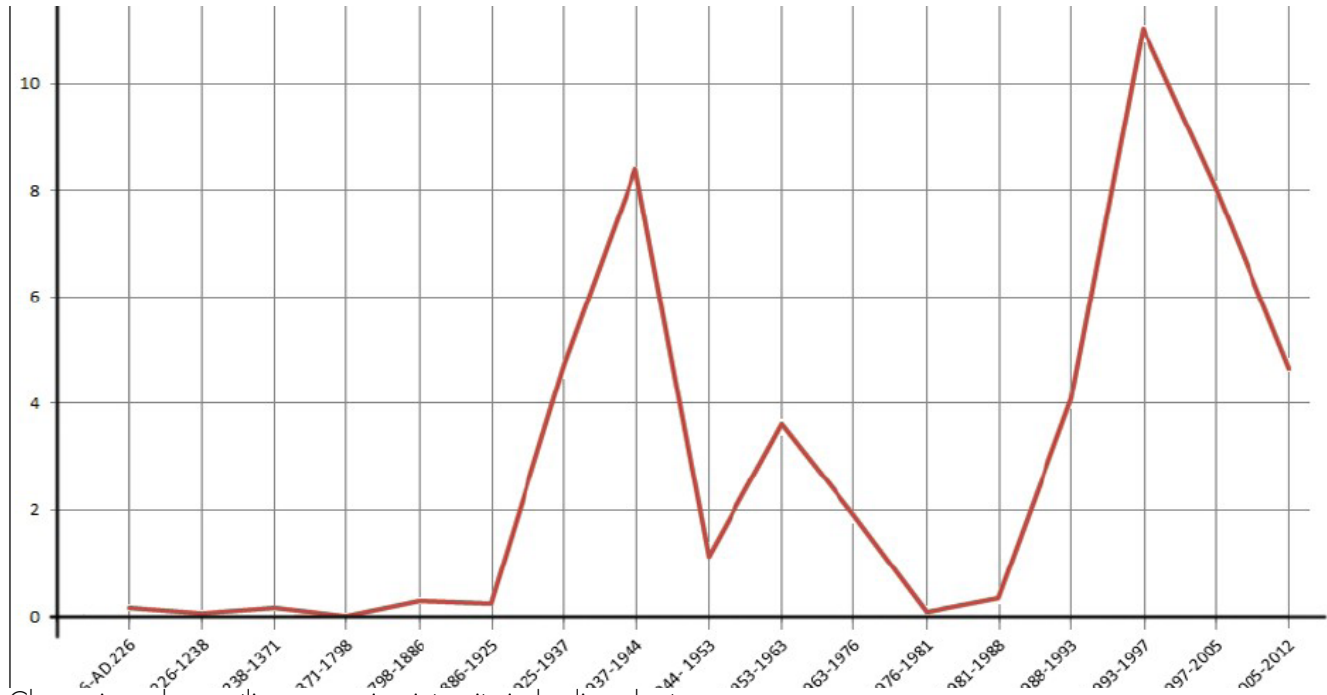
Chongqing GDP from 1949



Chongqing GDP rate of increase from 1985



Chongqing natural population growth rate from 1954



Chongqing urban outline expansion intensity index line chart

The first active period: 1925-1963, the capital during the war and heavy industry moved inland.

The second active period: 1988-2012, Reform and opening-up policy and establishment of the municipality

# Planning



1940 satellite city and town



1983 Chongqing Planning

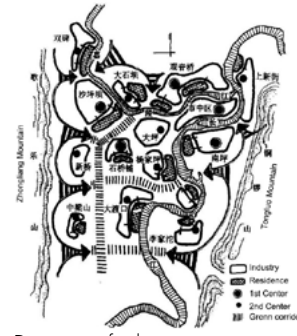


Diagram of urban structure

1940 1949 Founding of P.R.C

1983 1983 Economic revolution started in Chongqing

## Timeline

1960

A.D.1965 Heavy industry started moving inland

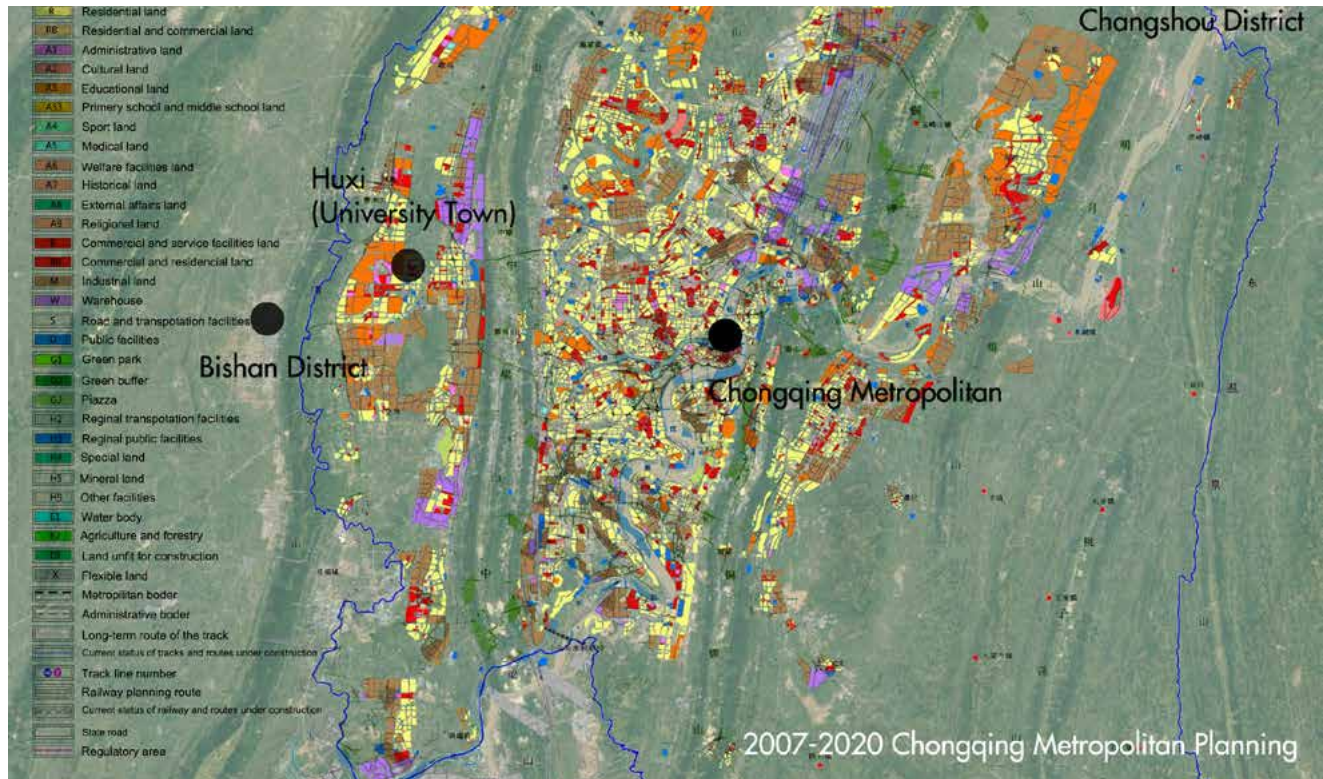
1996



1960 Chongqing Planning



1996 Chongqing Planning

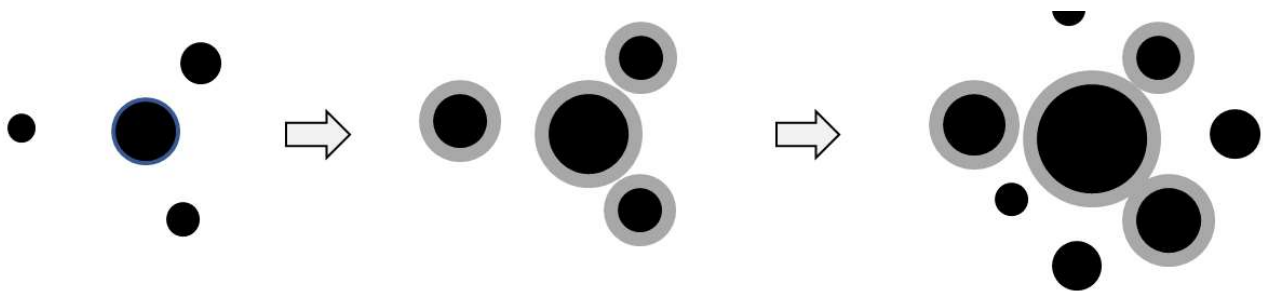


## Conclusion

Chongqing urban outline evolution dynamic mechanism elements table

Time	Major industry	Drives	Organization	Ristriction	Property
BC.316	Agriculture	Government	Passive	Water	Military fortress
AD.226	Agriculture	Government	Voluntary	Water, mountain	Military fortress
AD.900- AD.1238	Agriculture manufacture transpotation	Government organization inhabitans	Voluntary	Water, mountain	Military fortress transfer point
AD.1238- AD.1371	Agriculture manufacture transpotation	Government inhabitans	Voluntary	Water, mountain	Reginal economic and policy center transfer point
AD.1371- AD.1798	Agriculture manufacture transpotation	Government organization inhabitans	Voluntary	Water, mountain	Reginal economic center transfer point
AD.1876	Agriculture manufacture transpotation	Government organization inhabitans	Passive	Water, mountain	Reginal economic center transfer point
AD.1895- AD.1911	Manufacture transpotation	Government organization inhabitans	Passive	Water, mountain	Reginal economic and policy center transfer point
AD.1911-A D.1937	Industry transpotation	Organization inhabitans	Passive	Water, mountain	Reginal synthesis
AD.1937- AD.1945	Industry transpotation	Government organization inhabitans	Passive	Water, mountain	National synthesis
AD.1945- AD.1953	Industry transpotation	Government organization inhabitans	Passive	Water, mountain	Reginal synthesis

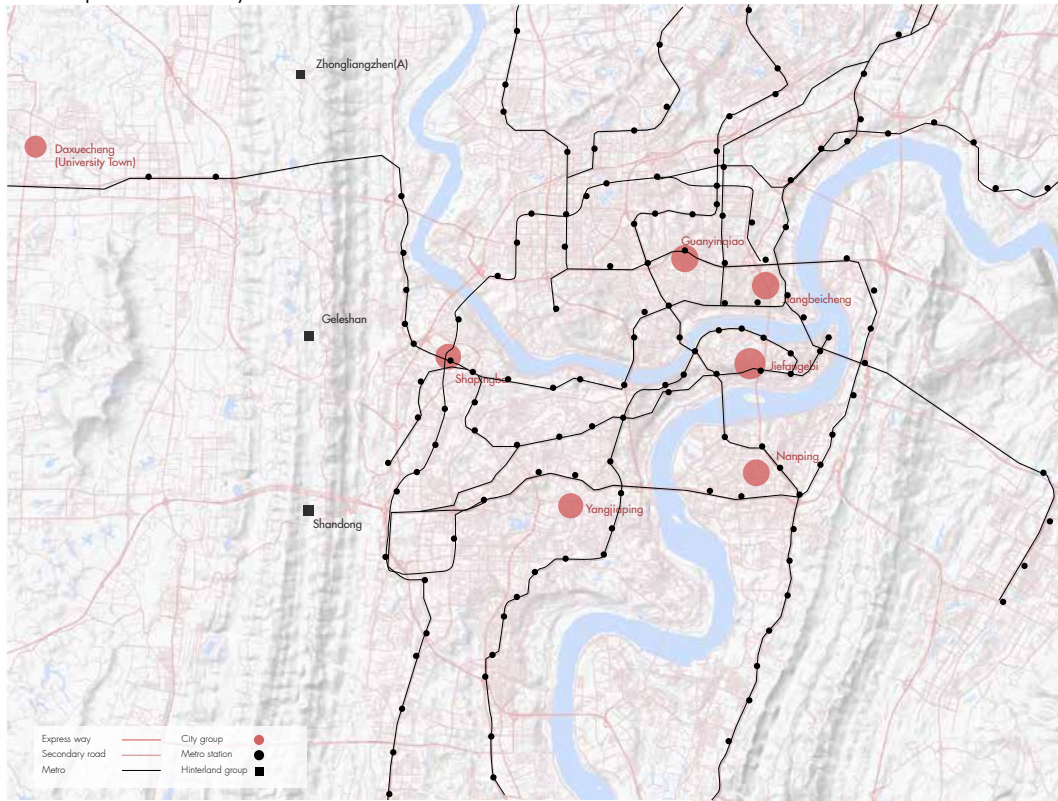
AD.1953- AD.1964	Industry transportation commerce	Government organization inhabitans	Passive	Water	Reginal synthesis
AD.1965- AD.1978	Industry transportation commerce	Government organization inhabitans	Passive	Water, mountain	Industrial city
AD.1978- AD.1990	Industry transportation commerce	Government organization inhabitans	Voluntary	Water, mountain	Industrial city
AD.1990- AD.1997	Industry transportation commerce	Government organization inhabitans	Voluntary	Water, mountain	Industrial city opening-up city
AD.1997- AD.2012	Industry transportation commerce	Government organization inhabitans	Voluntary passive	Mountain	Reginal synthesis



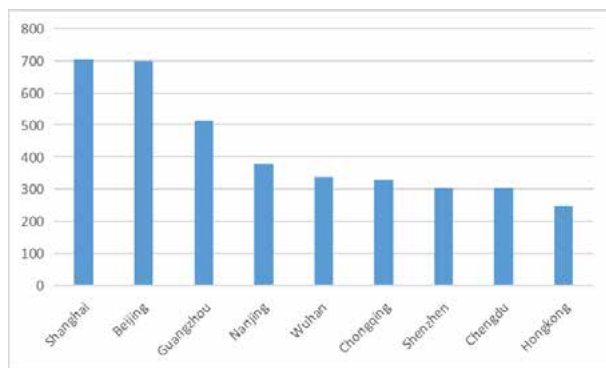
Chongqing metropolitan development model

### 3.4 Mountain city landscape

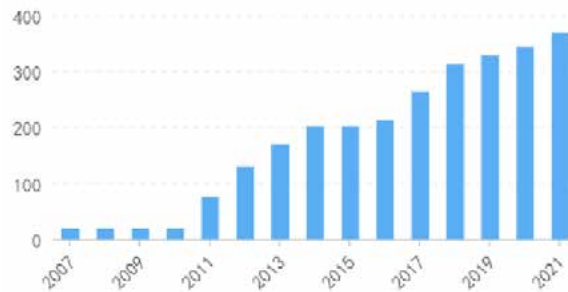
#### Metro transportation system



Chongqing metro map (2022)



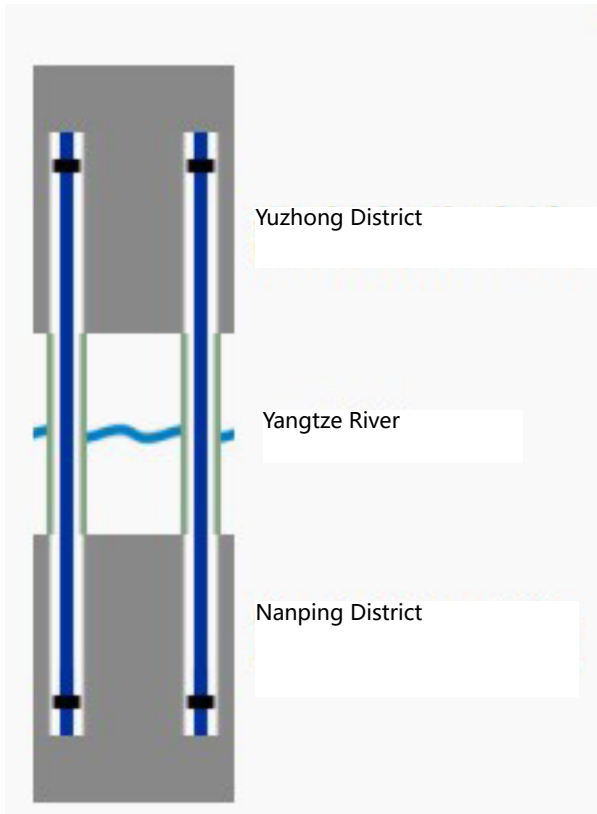
Comparison of metro mileage in China (until 2019)



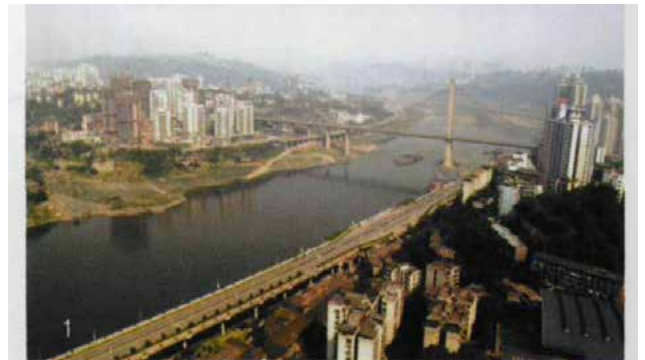
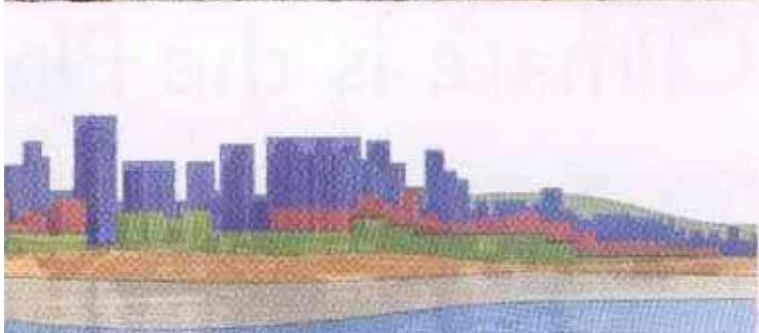
Annually metro mileage in Chongqing



## Cable transportation



## Buildings with landscape





Chapter 4:

**Zhongliang Mountain general development**

4.1 Urban-rural structure

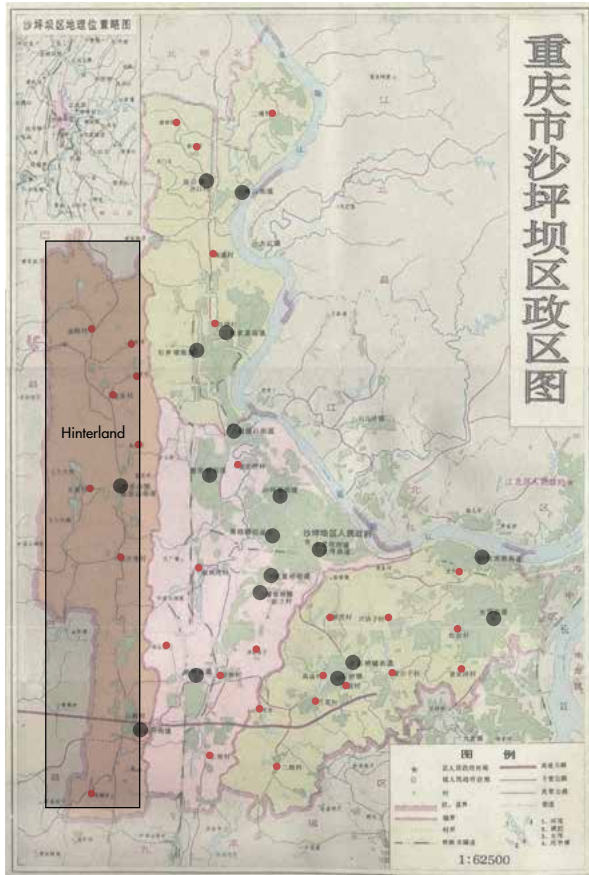
4.2 Social and economy activities

4.3 Public health system report

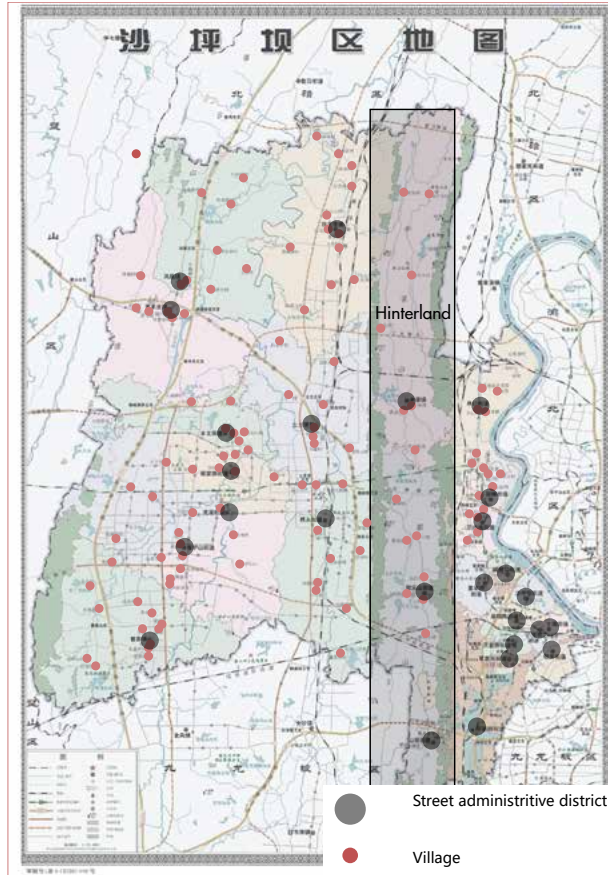
4.4 Field trip report

## 4.1 Shapingba District urban-rural structure

Zhongliangshan Town belongs to Shapingba District. Shapingba District is one of the first administrative districts in Chongqing. According to the statistic in 2019, the total inhabitants number is 884,000. within 788,000 city registered inhabitants and 96,000 rural registered inhabitants. In 1985, Shapingba District established 16 Street administrative districts. In 1995, several towns west of Zhongliang Mountain were placed under Shapingba District. The construction started from 2004, Until 2020, Totally 20 Street administrative districts and 6 Villages are included.

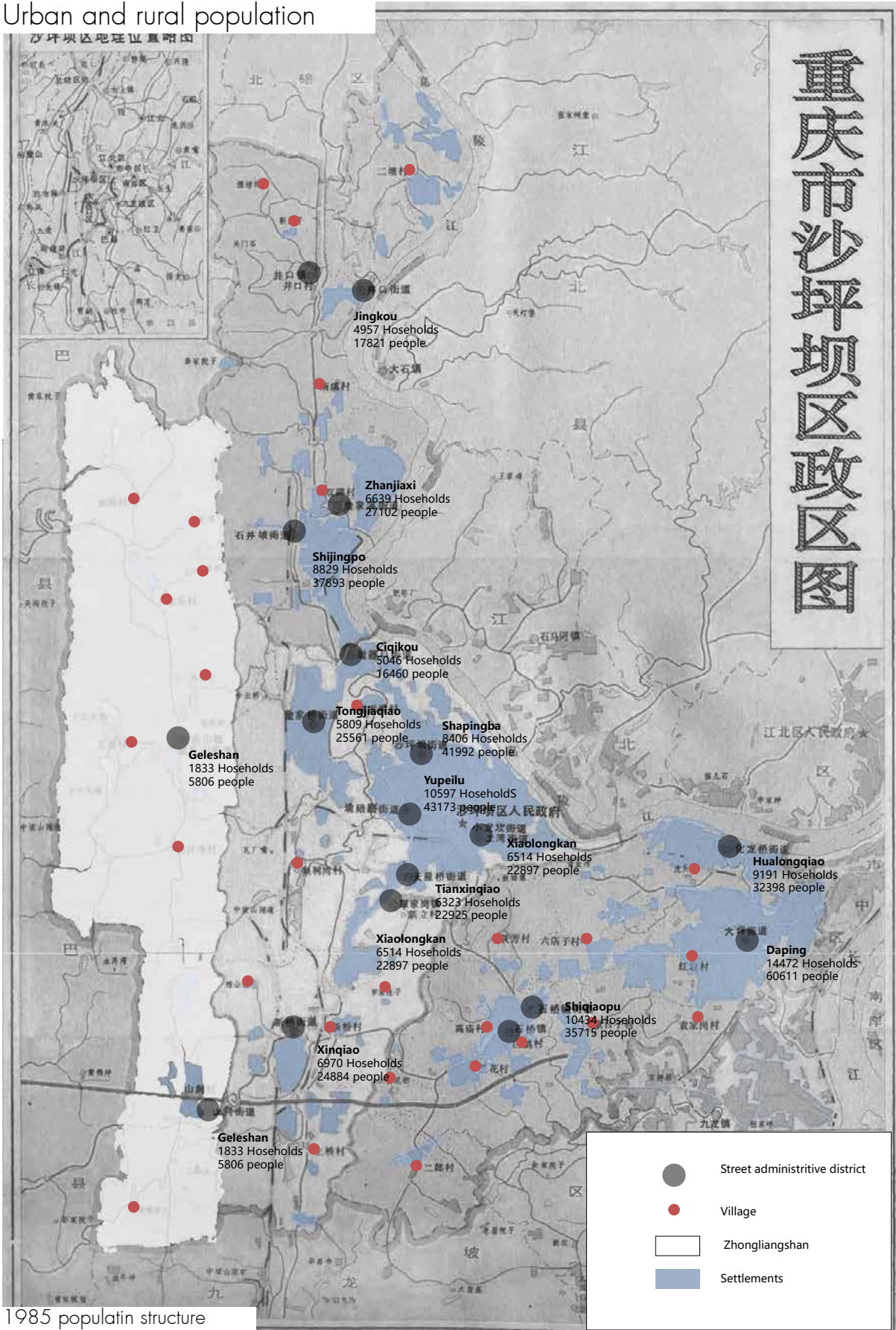


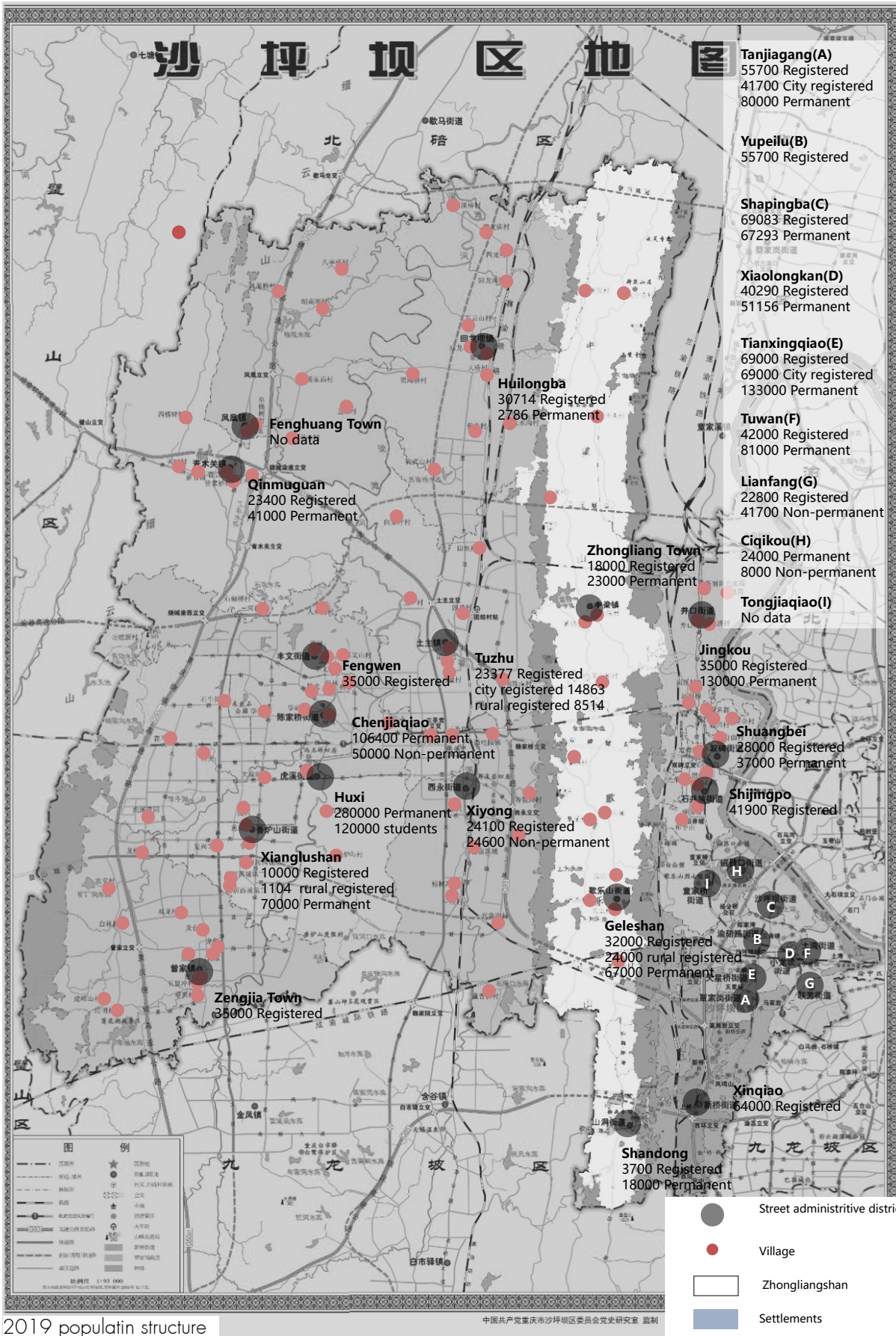
1985 Shapingba District map

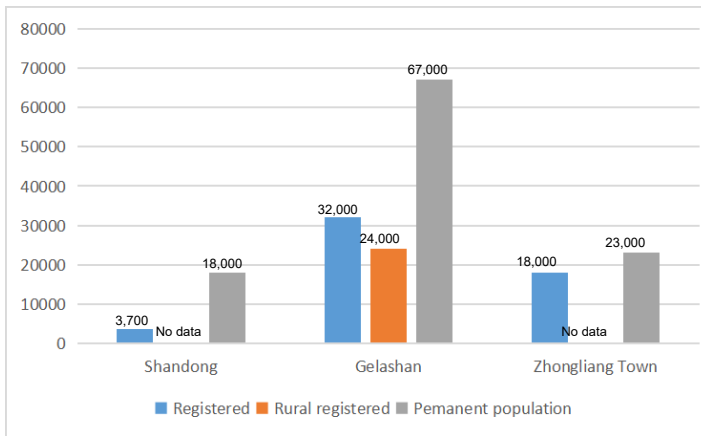


2020 Shapingba District map

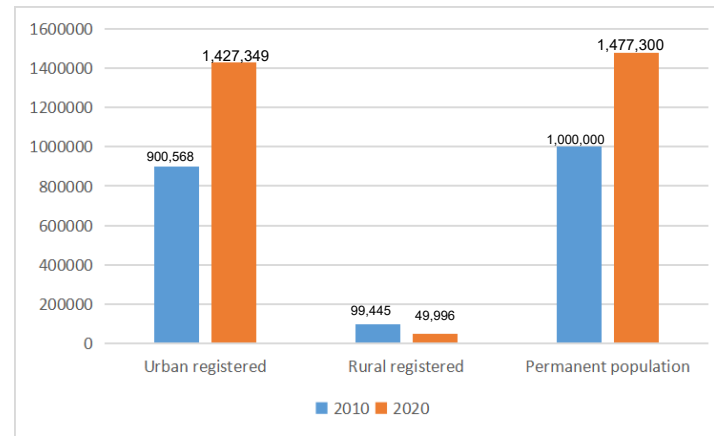
# Urban and rural population





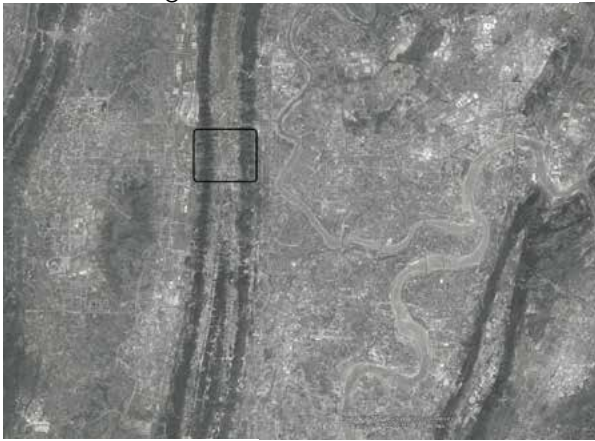


2020 Shapingba District population structure

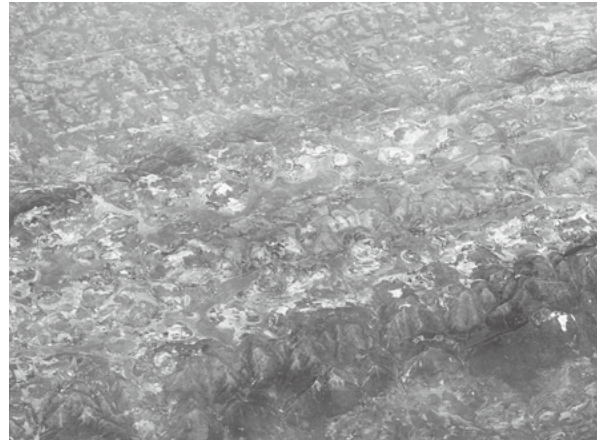


Three Street administrative districts in hinterland population structure

### Satellite images in different time



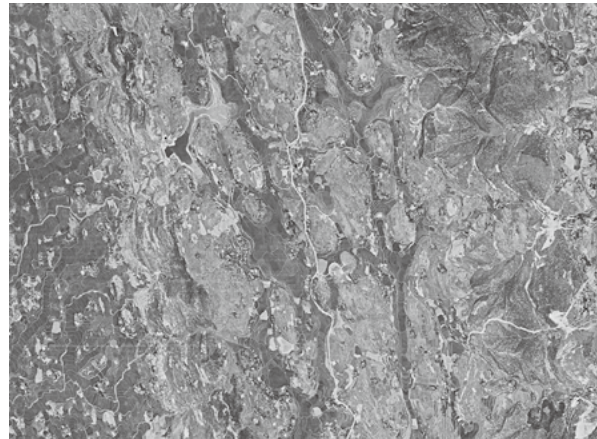
Location



1960



1970



1980



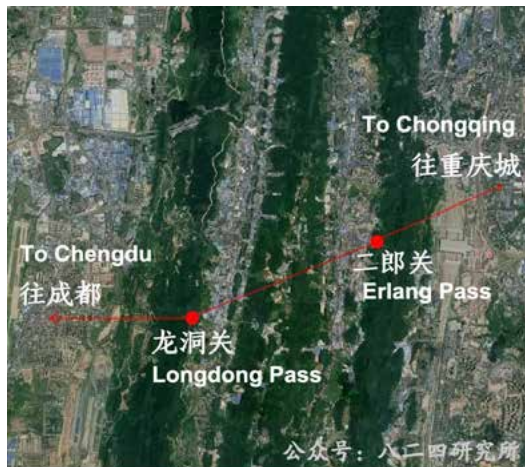
## 4.2 Social and economic activities

### Economic activities development timeline

## Ancient time

### Military time

**Defence fortress and pass.** The ancient city of Chongqing(Yu). The first pass out of the west is the Futu pass above Eling Mountain. It is the vital place in the communication of the east and west land, the north and south of the two rivers. And out of the Futu pass along Chengyu East road to the west. It is the east and west sides of the Zhongliang Mountain, **Erlang, Longdong** two pass. The above three passes are collectively called "Three Passes of Chongqing". It is the key to defend Yu (the ancient name of Chongqing) in history, the military vital importance.



## Morden time

### Industrial time

#### Coal minning

The first coral mining recording was in 1808 Qing Danasty, large scale coal was found in 1931, large scale mining started in 1940. Duringthe Anti-Japanese War, mining is accelarating. In 1949 coal accounts for 97% of Chongqing's resource consumption.

Minners Coal fact

Minners Coal fa

Minners' families

Workers' dormitory

Stores Schools Hos

#### Limestone mining

In addition to rich coal resources, Zhongliang Mountain exposed a large number of limestone rock, quarrying industry with the development of the coal industry, so as to derive the building materials factory and metallurgy factory, which is represented by cement, sand and stone **building materials industry** developed.

Minners Shops

Limestone factories

Metallurgy factory,



Factories expand illeg

Invasion by illegal construction and land

#### Mineral water

Found in 1985, stated to product in 19956, with 15000 tons of mineral water

#### Other industry

According to the government's industrial zoning directive, the area was mainly used for **coal mining and medium machinery manufacturing** from 1960 to 1980. After 1990, **rubber** was added. Because it is close to Dadukou industrial zone, which is mainly based on metallurgy, building materials and steel. The industry of Zhongliang Mountain also has part industry related.

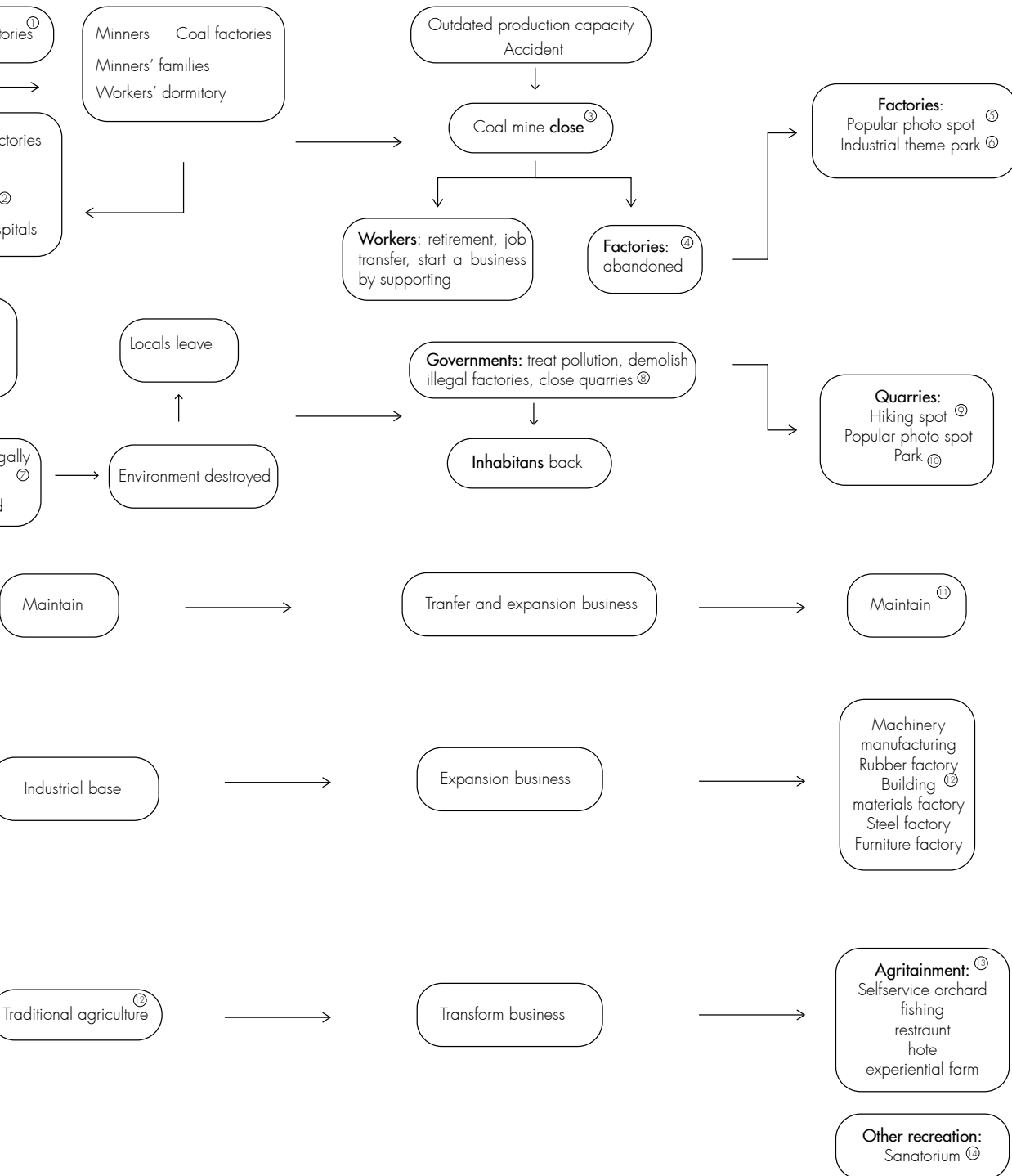
### Agricultural time

The environment and soil conditions are good. The yield and quality of agricultural products are unique, such as millet/radish and cabbage from the northern. **Bueberries, strawberries and Sichuan pepper** from the middle part, citrus from south.

ne

Now time

Ecological recreation time







1. Coal factories



2. Workers' dormitory



3. Coal mine close



4. Factories abandoned



5. Popular photo spot



6. Industrial theme park



7. Factories expand illegally



8. Demolish illegal factories



9. Hiking spot



10.Park



11.Mineral water factory maintain



12.Building materials factory



12.Traditional agriculture



14.Sanatorium



13.Agritainment

Economy activities illustrate

## Nowtime main economic activities

### Agriculture



Small-scale agriculture is also one of the main industries in this area. Mainly rice and fruits and vegetables. There are also some small livestock farms and breeding farms. Mainly distributed in the north.

### Agritainment



Because the natural environment is better, and there are some agricultural foundations. Some farmers have transformed into farmhouses, and in the form of farmhouses have become weekend resorts for the people from city center. These economic activities are scattered across the area.

### Factory

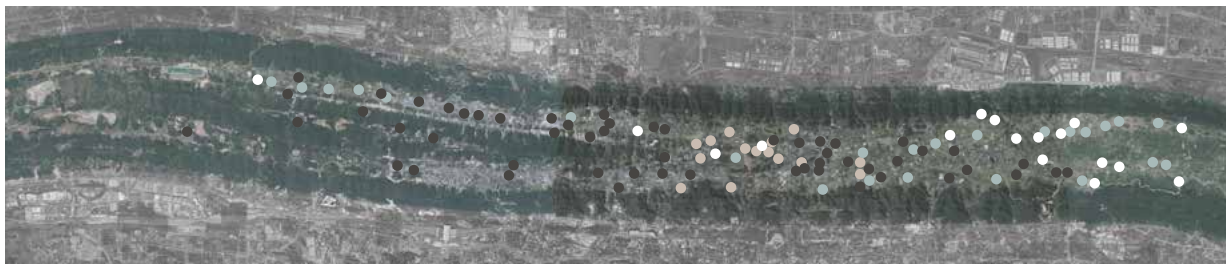


There are many industrial enterprises in this area, almost all of which are small-scale light industries and manufacturing, such as furniture manufacturing plants, door, and window paint manufacturing, wood products, and plastic processing plants. There is also some small industrial estate. Mainly in the south

### Sanatorium



Due to its geographical advantages, greenery and air are better than in urban areas, so it has become the first choice for many nursing homes and elderly apartments. Most of these sanatoriums are scattered on the edge of the town.



○ Agritainment    ● Farm    ● Sanatorium    ● Factory

## 4.3 Public health system report

Chinese public health resource compare with other country

	China	Italy	UK	Japan	USA
Hospital bed density in 1000 population	4.3	3.1	2.5	13	2.9
Physicians in 1000 population	2.23	3.95	3	2.48	2.61
Current health expenditure percentage of GDP	4.4%	8.7%	10.2%	10.7%	16.8%

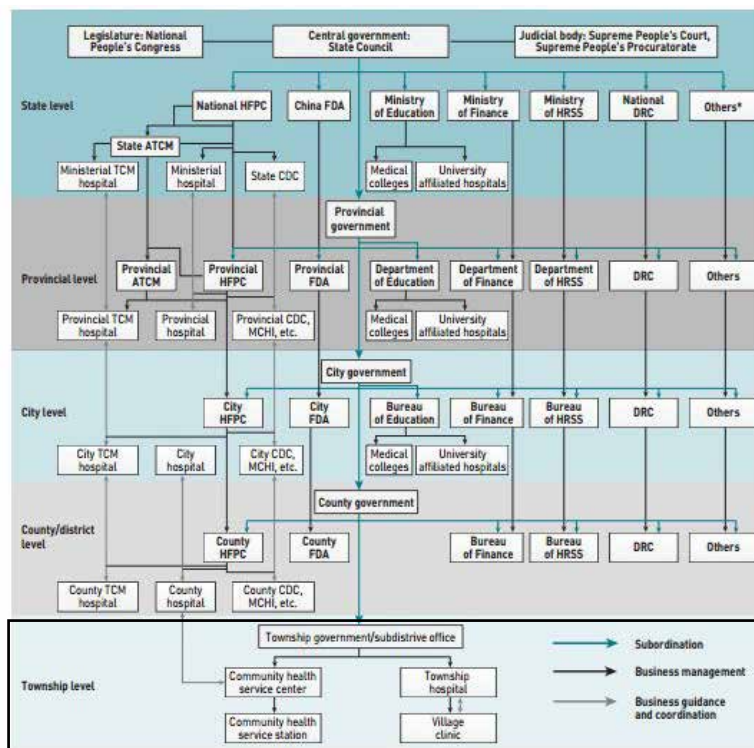
Resource: <https://www.cia.gov/>  
(data in 2019)

### Other comparison information

- Elder health care organization beds in 1000 population: China 31, Australia 51, UK 46
- Alzheimer disease 50% patients living in China.(projection 2050)
- Chronic disease 31% patients living in china.(2016)
- In 2019, there were 176 million people aged 65 years and older, making up 12.6 percent of the population. By 2045, that number is expected to reach 26 percent. (Vienna 1982. On the issue of the old forest, the General Assembly recognized that the proportion of the elderly population aged 60 and above exceeded 10%, which means that they have entered an aging society.)

<https://chinapower.csis.org/>

### Organization of Chinese health system



Community health service center

Community health service station

Township hospital

Village clinic

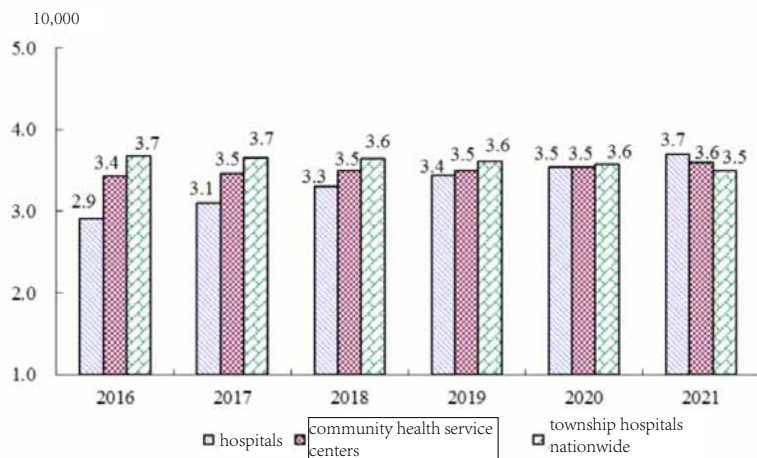
# Chinses health primary data

China health care urban and rural divide (2018)

Resources per 1,000 People	Urban	Rural	National Average
Doctors*	4.01	1.82	2.59
Nurses	5.08	1.80	2.94
Medical Technical Personnel	10.91	4.63	6.83
Beds in Medical Institutions	8.70	4.56	6.02

Source: China Statistical Yearbook

Number of hospitals, community health service centers and township hospitals nationwide



## Reform of the medical service system

Year	医疗服务体系改革	医药供应领域改革	医药保障领域改革
2009	健全基层医疗卫生服务体系, 完成2.9万个社区卫生服务站建设任务	社会基本药物生产、流通、定价、使用和医保报销改革	推进基本医疗保险制度建设, 明确财政补助标准, 适当扩大报销范围
2010	实施城乡基层医疗卫生机构建设规划, 大规模开展适宜人才培养培训, 开展公立医院改革试点, 控制医疗费用	在60%基层医疗卫生机构实施基本药物制度, 其他医疗机构先选用基本药物; 推进基本药物集中采购和统一配送	城镇居民基本医疗保险和新型农村合作医疗, 新农合和城镇居民医保财政补助标准提高至200元
2011	完成农村三级卫生服务网络和城市社区卫生服务机构建设任务, 进一步推进公立医院改革试点	基本药物全面实施国家基本药物制度, 建立向基本药物保障供应体系, 加强药品质量安全, 降低药价	统筹城镇职工、居民医保和新农合参保, 新农合和城镇居民医保财政补助标准提高至240元, 全面推开城镇居民医保, 新农合和城镇居民医保财政补助标准提高至200元
2012	加强基层医疗卫生服务体系建设, 推进公立医院改革	巩固完善基本药物制度, 扶持和促进中医药和民族医药事业发展	居民医保和新农合补助提高到240元, 全面推开城镇居民医保, 新农合和城镇居民医保财政补助标准提高至200元
2013	巩固完善基层医疗卫生机构运行新机制, 加快公立医院改革, 鼓励社会办医	巩固完善基本药物制度	建立重特大疾病保障和救助机制, 开展儿童白血病等20种重大疾病保障试点等工作
2014	健全分级诊疗体系, 加强全科医生培养, 推进远程医疗多点执业, 让群众能够就近享受优质医疗服务	首次提及规范药品流通秩序, 针对药品购销领域中的突出问题开展专项整治	全国推行城乡居民大病保险, 补助标准人均320元
2015	加强全科医生和重症建设, 完善分级诊疗体系, 全面推进公立医院综合改革, 破除以药补医, 紧急处置基层多点执业, 发展社会办医	国家药品供应保障体系管理信息平台上线; 药品采购开始“量价挂钩、分类采购、异地联合采购”	财政补助标准提高到380元, 基本医保居民医保费用纳入总额管理, 逐步推行退休人员医疗费用统筹管理试点, 全面实施城乡居民大病保险制度
2016	加快培养全科医生、儿科医生, 建立符合医疗行业特点的人事薪酬制度, 保护和调动医务人员工作积极性	药用标准药品流通等改革, 深化药品医疗器械集中采购制度改革	大病保险全覆盖, 财政补助提高到420元, 改革医保支付方式, 加快推进基本医疗保险全国联网和异地就医结算
2017	深化公立医院改革, 推进家庭医生签约服务, 医药价格治理, 分级诊疗持续深化, 全面实施药品加成	药品流通采取“两票制”, 深化药品医疗器械集中采购制度改革	财政补助支付方式(按病种付费、按人头付费、按病种付费)等改革
2018	深化公立医院改革, 进一步推进分级诊疗, 加强全科医生队伍建设	国家带量采购, 新版基本药物目录发布, 新版GSP发布, 新版行业法律法规	进一步推进按病种付费方式, 扩大带量采购和异地就医结算范围

2009: improve the community-level health and medical service system and completed the **construction of 29,000 health centers**

2010: We will complete the plan for **building community-level medical care in urban and rural areas**, and launch a large-scale program to train qualified personnel. We will carry out trials to reform public hospitals and control medical expenses.

2011: We will complete the **construction of a three-level rural health service network** and urban community health service institutions.

2012: We will consolidate and improve the operation of community-level health institutions, accelerate the reform of public hospitals, and **encourage private hospitals to run**.

2013: We will improve the **hierarchical medical system, strengthen the training of general physicians**, and encourage doctors to practice in multiple places

2014: We will improve the **hierarchical medical system, strengthen the training of general practitioners**, and encourage doctors to practice in multiple places

2015: We will strengthen the general practitioner system and **improve the hierarchical medical system**. We will carry out comprehensive reform of county-level public hospitals across the country, and encourage doctors to work in community-level hospitals.

2016: Accelerate the training of **general practitioners, pediatricians**


2017: We will promote **contracted services for family doctors**, and continue to promote hierarchical medical treatment.

2018: We will further **promote hierarchical diagnosis and treatment, and strengthen the building of general practitioners**.

# Zhonglangshan public health situation

## Zhongliangshan medical institution

	Community Health Center	Medical Station	village point	clinic
Zhongliang Town	1	2	0	2
Geleshan Town	1	1	1	9
Shandong	0	1	0	6


 2 psychosis hospitals  
 1 chest hospital

## Community Health Center resource

	doctors	nurses	beds	beds ccupancy rate	outpatients	ambulance
Geleshan Town Community Health Center	35	36	48	95%	175	1
Zhongliang Town Community Health Center	18	17	35	42%	172	0

## Zhonglangshan population healthy condition

	Zhongliang Town	Geleshan Town+Shandong
resident population	17,800	53,000+7,000
age 65+ population	4352	8975
Hypertension	1867	4079
Diebetes	649	1715
Home doctors covered population	4600	12046

# Zhongliangshan medical resource demand

## How many beds does Zhongliang Town need?

----According to the data from community health center of Zhongliang town, bed occupancy rate is 42%, that means **Zhongliang Town has enough hospital beds.**

## How many beds do Geleshan and Shandong need?

----Take Zhongliangshan as a reference

### Practically calculation:

Zhongliangshan

total population: 17,800(  $\alpha$  )

65+ years old population: 4,352(  $\beta$  )

Zhongliang Town Community Health Center: Beds 35, occupancy rate 42%, **Beds in use:**  $35 \times 42\% = 15$  beds(  $\zeta$  )

**notes: occupancy rate 42% means Zhongliangshan have enough beds**

1,000 population use beds number in Zhongliangshan

Calculate according to **elder population:**  $\zeta / (\beta / 1,000) = 15 / (4,352 / 1,000) = \mathbf{3.48}$  beds per 1,000 population

**notes: means 3.48 beds for 1,000 elder people are enough**

Calculate according to **total population:**  $\zeta / (\alpha / 1,000) = 15 / (17,800 / 1,000) = \mathbf{0.84}$  beds per 1,000 population

**notes: means 0.84 beds for 1,000 total population are enough**

beds number in Geleshan and Shandong according to data from Zhongliangshan

Calculate according to **elder population:**  $B / 1,000 \times 3.48 = 8,975 / 1,000 \times 3.48 = 31$  beds

Calculate according to **total population:**  $A / 1,000 \times 0.84 = 70,000 / 1,000 \times 0.84 = 59$  beds

Averages beds calculate according to data above :  $(31 + 59) / 2 = \mathbf{40}$  beds

According to Zhongliangshan's situation, 40 beds are enough for Geleshan and Shandong

But Geleshan and Shandong Community Healthy Center have 48 beds and they are always occupied. Which means the bed is not enough in Geleshan and Shandong.

So it is necessary to calculate in **theoretical way**

## Theoretical calculation:

Gelashan and Shandong

total population: 70,000 (A)

65+ years old population: 8,975 (B)

Elder health care organization beds in 1000 population: China 31 ( $\Gamma$ )

Hospital bed density in 1,000 population: 4.3 ( $\Delta$ ), data by Central Intelligence Agency (CIA).

Hospital bed density in 1,000 population: 6.02 ( $E$ ), data by China Statistical Yearbook (CSY)

Average bed density in 1,000 population according to data from CIA and CSY: ( $Z$ )

$(\Delta + E)/2 = (4.3 + 6.02)/2 = 5.15$  beds

beds number in Chinese national average level

Calculate according to **elder population**:  $B/1,000 \times \Gamma = 8,975/1,000 \times 31 = 278$  beds

Calculate according to **total population**:  $A/1,000 \times Z = 70,000/1,000 \times 5.15 = 360$  beds

Average beds calculate according to data above:  $(360 + 278)/2 = \mathbf{319}$  beds

## Synthetically conclusion

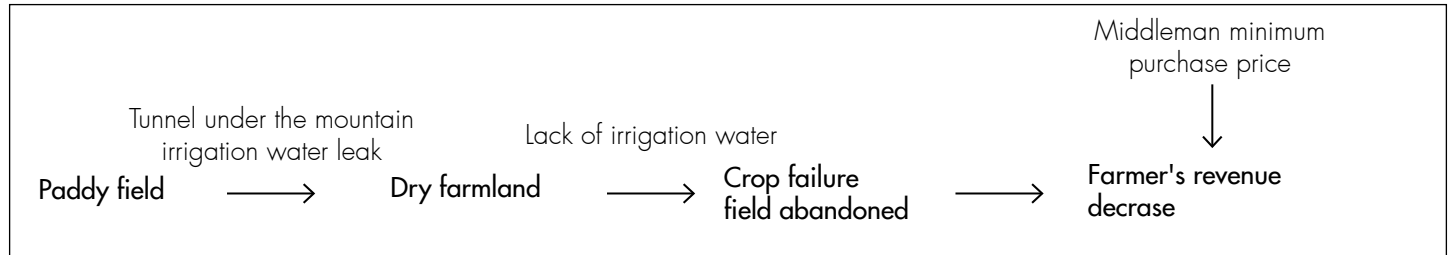
$(\text{practically } 40 \text{ beds} + \text{theoretically } 319 \text{ beds}) / 2 = 180 \text{ beds}$  - existing beds 48 = **132 beds**

Considering the aging of population and population growth by providing jobs and improving living conditions, roughly give 20% more beds out of 132 beds,  $132 \text{ beds} \times (1 + 20\%) = \mathbf{158}$  beds



## 4.3 Field trip report

### Agriculture dilemma: water crisis



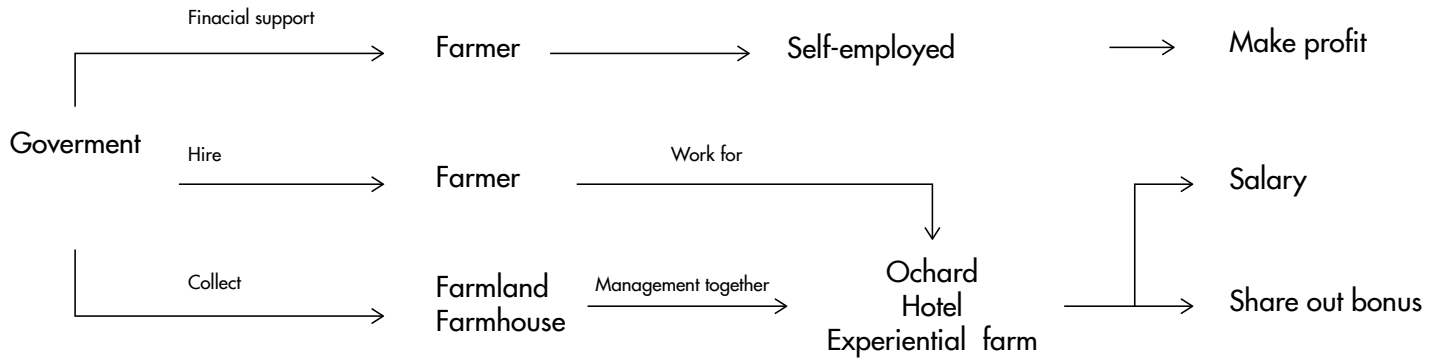
"Permanent farmland preserve"



Irrigation in a primordial way because of water crisis



### Agritainment management model



Yoyun sheep farm (self-employed)



Dipu Ecological Garden (government running)



Feiran Lake (Government running)

### Dipu Ecological Garden (government running)



Chongqing Dipu Ecological Garden is a collection of production, sales of healthy green fruits and vegetables in the suburbs of Chongqing, the base is located in Chongqing Shapingba Zhongliang Town Hehua Villa. Covers an area of 150 acres, complete infrastructure, **rural tourism, parent-child education, farming experience** of large ecological park, the park plant have strawberries (December to may), grape (6 -) in October, pitaya (7-11 months), cherry (4-5 months), watermelon (6 to 8 months), peach (5 to 7 months), **all the year** round with fresh fruit to harvest and experience. Effectively combine agricultural melon and fruit production with rural tourism to realize the organic integration of primary, secondary and tertiary industries.

## Sanatorium

The best two hospitals in Chongqing are just five kilometers away from Gele Mountain, with a national forest park, on the environment and supporting facilities are very suitable for the development of pension industry recovery. Shapingba district more than 90% of the nursing home on Gele Mountain, and became the most concentrated area of the nursing home in the city, "pearls endowment service industry association executive vice President Wang Bing said, Now there are more than 70 nursing homes in Shapingba District, including more than 60 on Gele Mountain alone, with more than 6,000 beds. The largest nursing home has more than 2,000 beds.

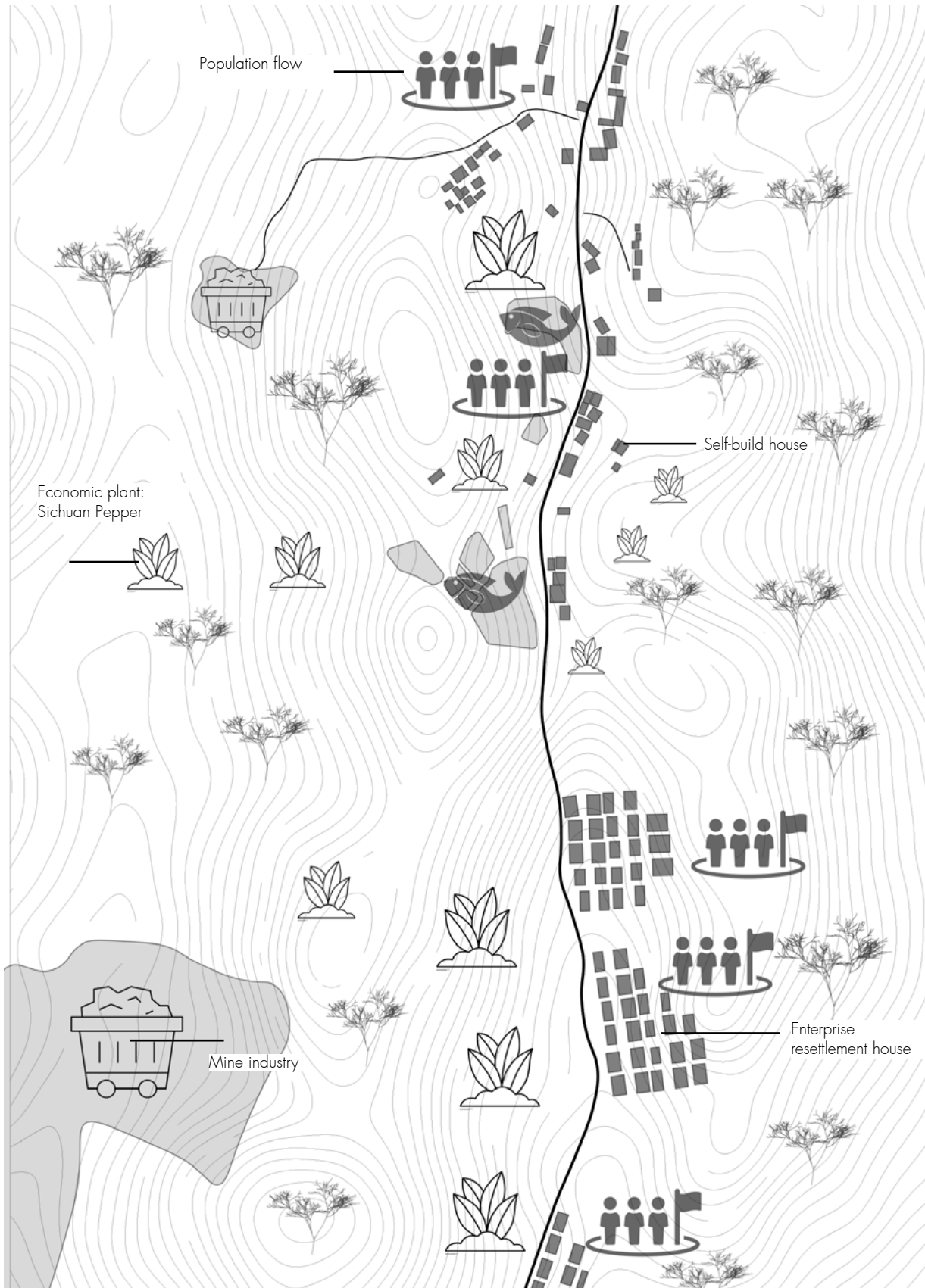


## Hezhan ElderCare

Basic information: 6 hectares, 800 beds, 95% occupancy rate, average age 85, cost 3800rmb per month.



# Xinhe Village as an example redrawing the Xinhe Village context





### Population flow

Young people and children have left the village and live down the mountain, **leaving only the elderly**, unable to go out to work, who have to stay here to farm.



### Economic plant: Sichuan Pepper

Per capita can be divided into one mu of land, the best harvest year has 100,000 yuan, this year because of the epidemic and drought, income is only 30,000 yuan, Sichuan pepper is the **main agricultural products** in our village



### Mine industry

Because of the rich mineral resources, some mining companies came here to develop, but because of environmental problems, the government **closed the mine and restored the mine** into a green park



### Self-built house

It costs 100,000 yuan to build a house like this, and villagers prefer build **another floor** only with roof without wall, which can not only improve the leakage of the roof, but also get more space.



### Enterprise resettlement house

The houses, which were built by the mining company as **compensation for those displaced** from the mine area, range from 60 square meters to 150 square meters.

## Interviews

## Coal community

"At present, most of the old buildings have been demolished. The playground, said to have been the center of activity in the mine, is bustling. There were **few people** left except the **boy**, presumably the son of some miner. There are several residential buildings for works next to the playground. Three **aged people** are standing beside the sports equipment chatting. An elderly woman tends her vegetable garden in a bungalow on a further stretch of railway track, next to the bridge pier for the government-planned Chongqing-Kunming high-speed rail line, which is said to pass through. The family area of the Zhongliangshan coal mine is among the areas to be **demolished**." —Tencent News. 2022



## Original inhabitants

"Ms. Chen, 52, a resident of Xinzheng Village, has been working in the city for years. "In front of my house, there used to be green mountains and clear waters. In recent years, there have been many **illegal factories**, and trucks have been passing by our house continuously. On sunny days, we are covered with dust, and on rainy days, we are covered with mud, which brings inconvenience to our life." Ms Chen's son has now bought a house in Yuqingsi(in city)and moved the family to **live in the city**. But now, as the breach unfolded, the family began to contemplate returning home. "Now the new village environment is good, the air is good, it is also very convenient to go down the mountain, living in Yuqingsi(in city) and living in the new village are almost the same, grandson still have a place to run and jump, good." Chen said she plans to move **back to village** by the end of the year." —Chongqing Evening News, 2020



## Return illegal factories to farmland

In the 1980s and 1990s, companies in industries such as furniture, plastics and food, where pollution was a major problem, accounted for nearly 30 percent of Shapingba's total industrial enterprises. In 2008, planning authorities last year estimated that the industrial park in Geleshan Town had 50 hectares of illegal factories, equivalent to more than 110 football pitches. From 2019 to 2022, after three years of renovation, the key areas where "scattered and dirty" enterprises are demolished, such as Geleshan and Qinjiagang, have basically realized the overall evacuation of small furniture, small plastics and other industries. A total of 3,892 illegal buildings in Geleshan have been renovated or demolished, covering an area of 266.15 hectares.



04.2019



11.2019

## Chapter 5 **Field cartography**

5.1 Field cartography

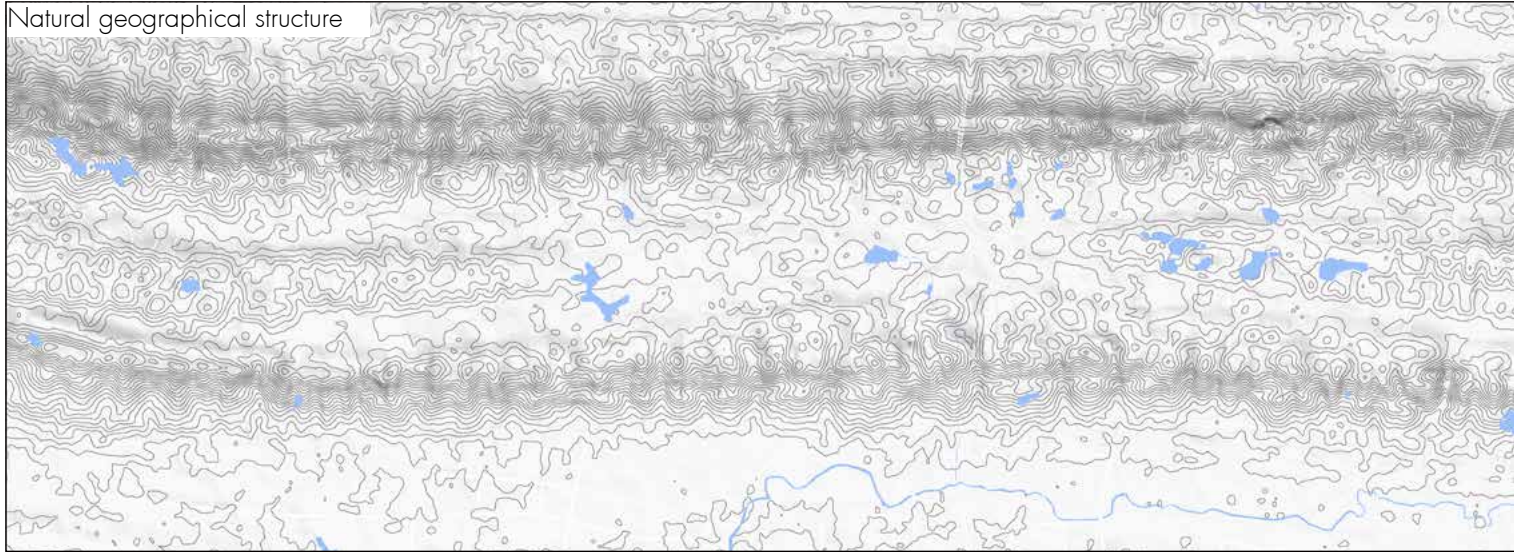
5.2 Hinterland section

5.3 Morphology And Typology Analysis

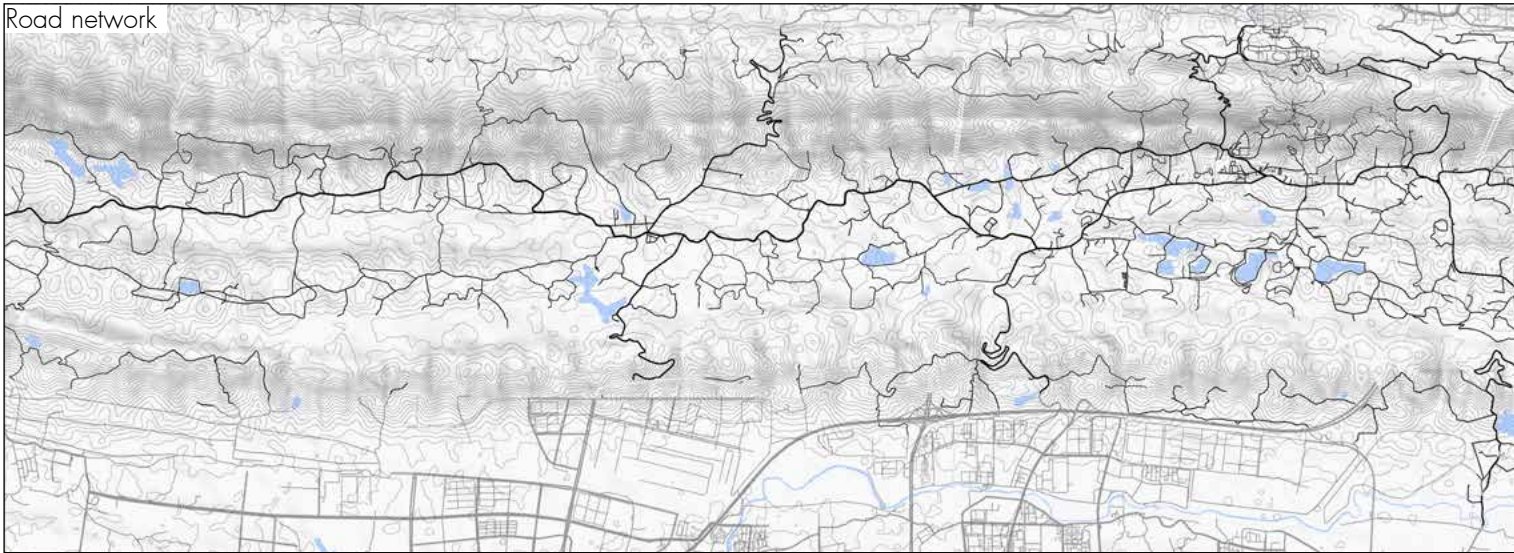


## 5.1 Field cartography

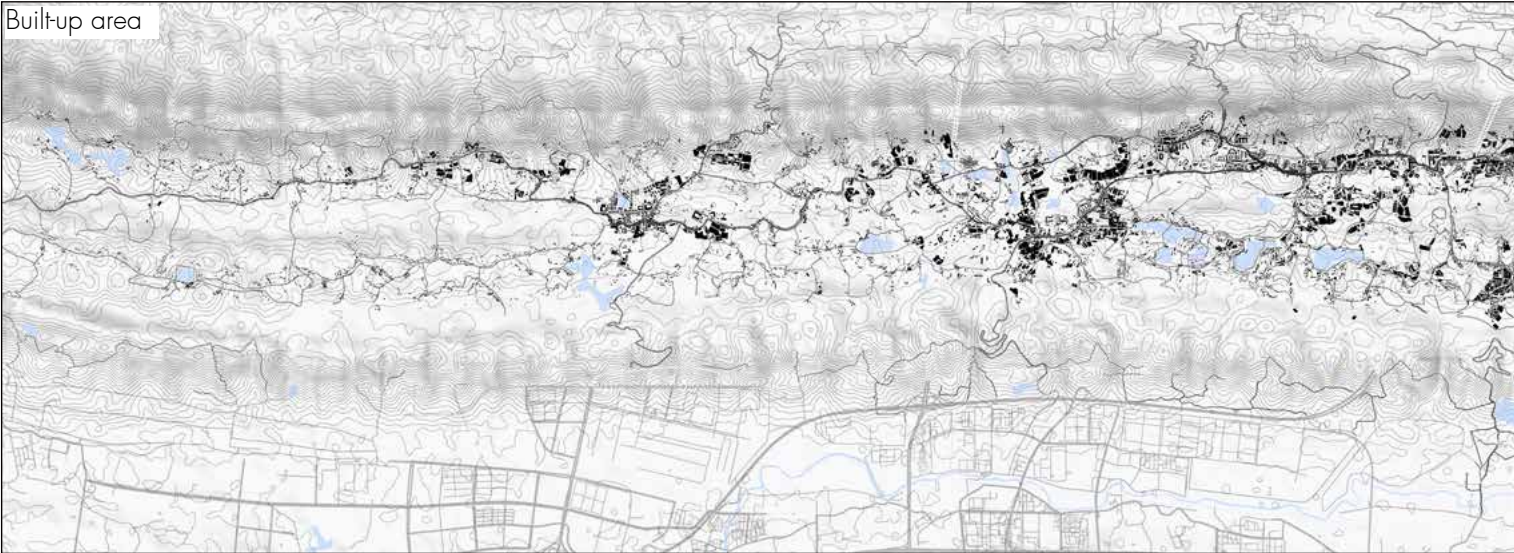
Natural geographical structure

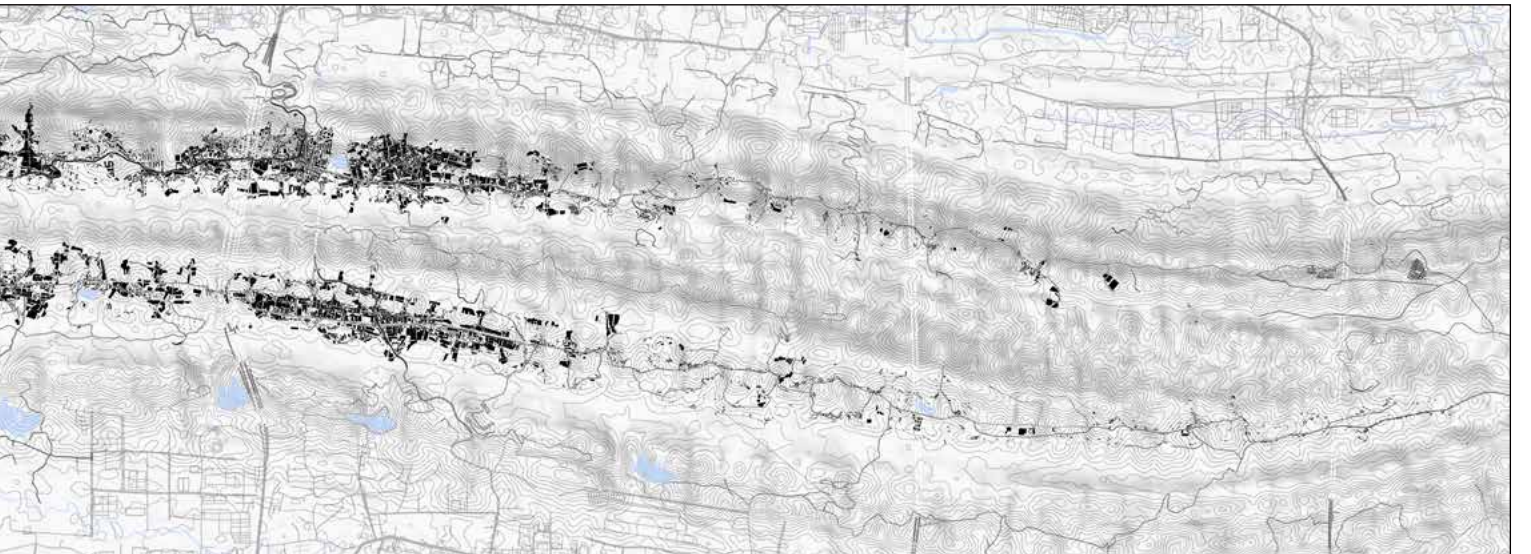
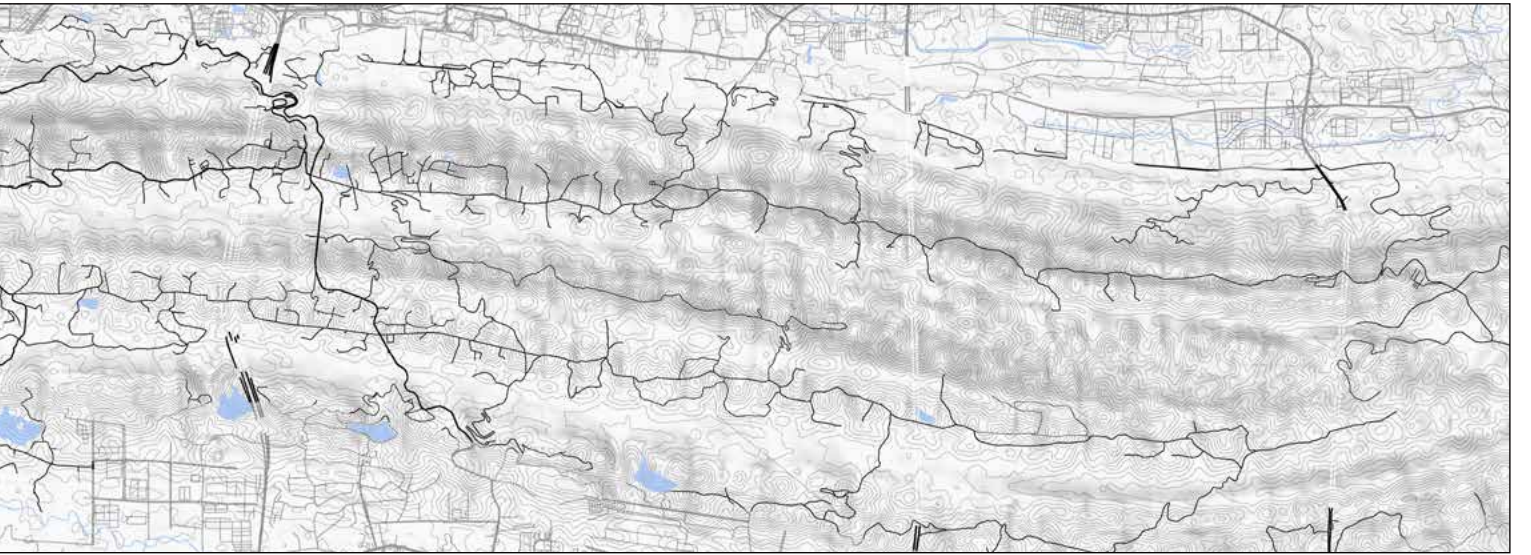
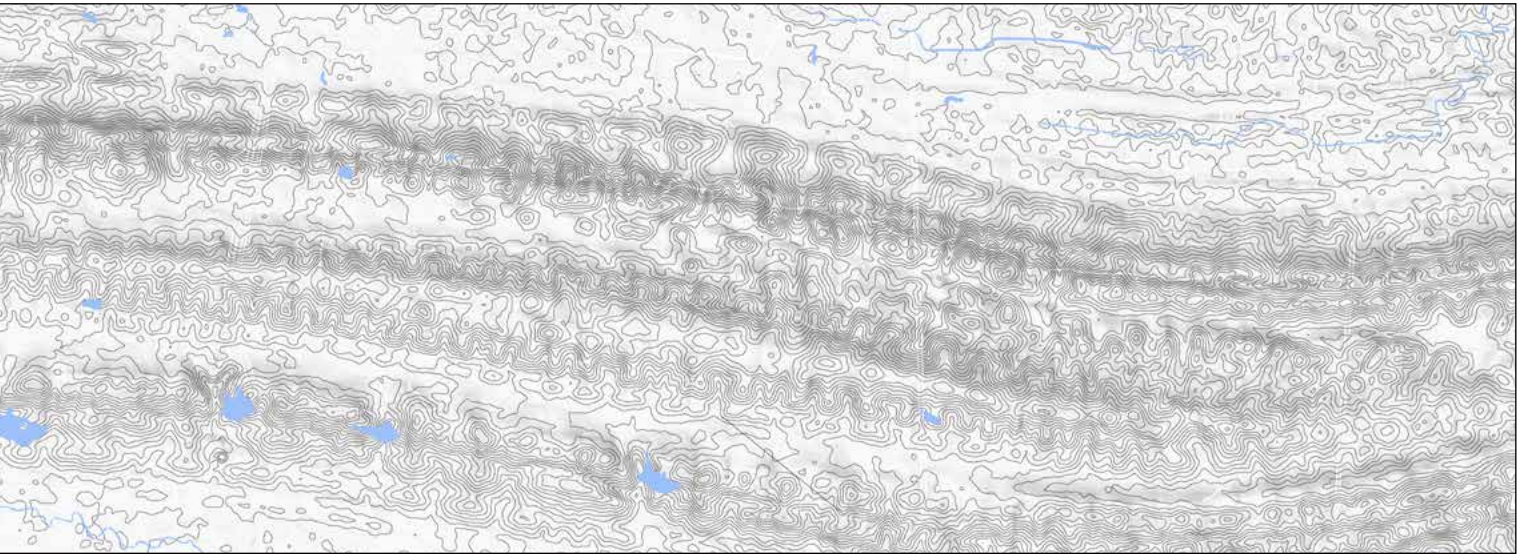


Road network

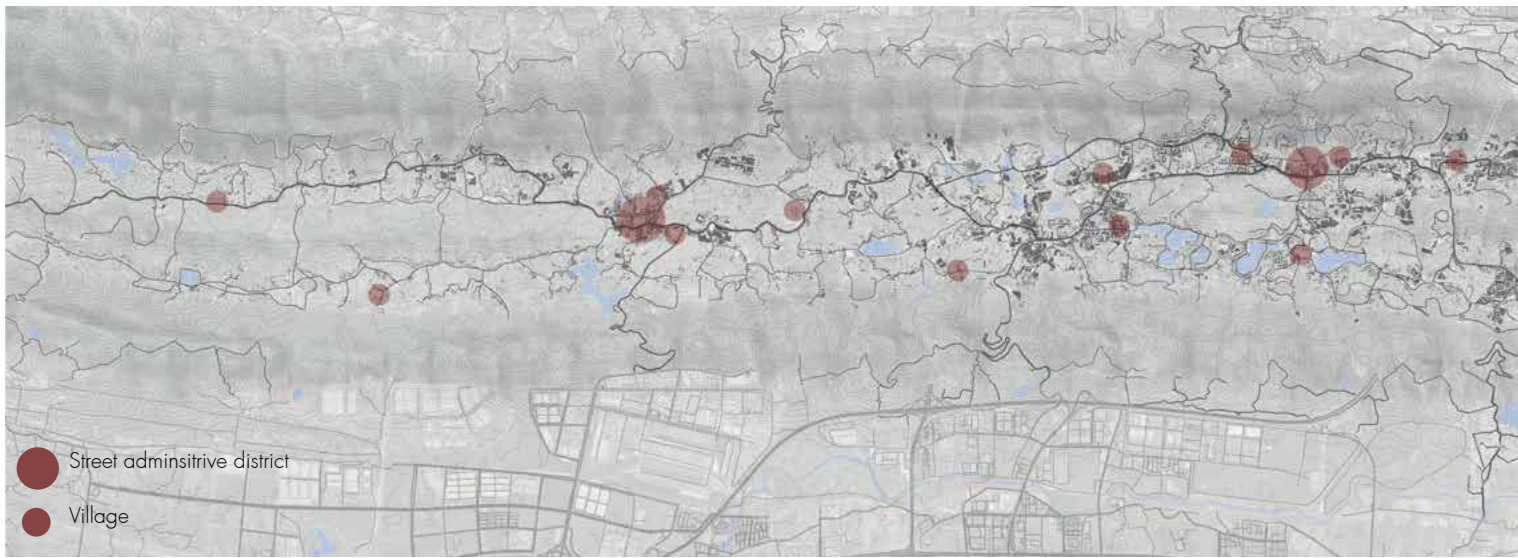
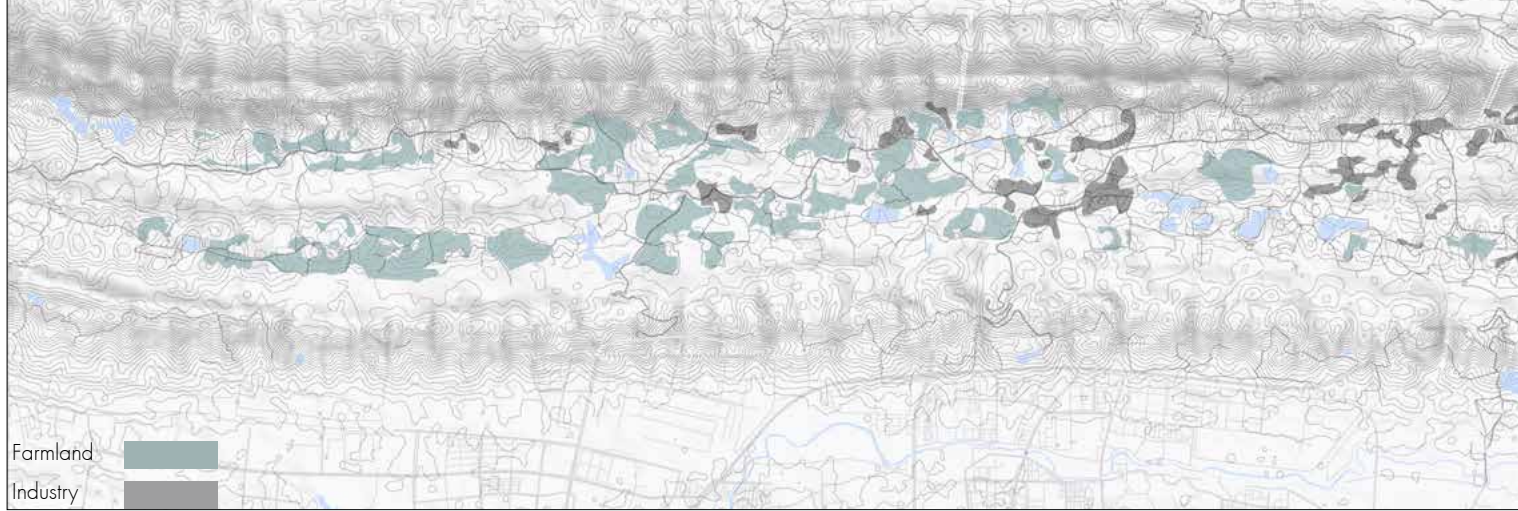


Built-up area

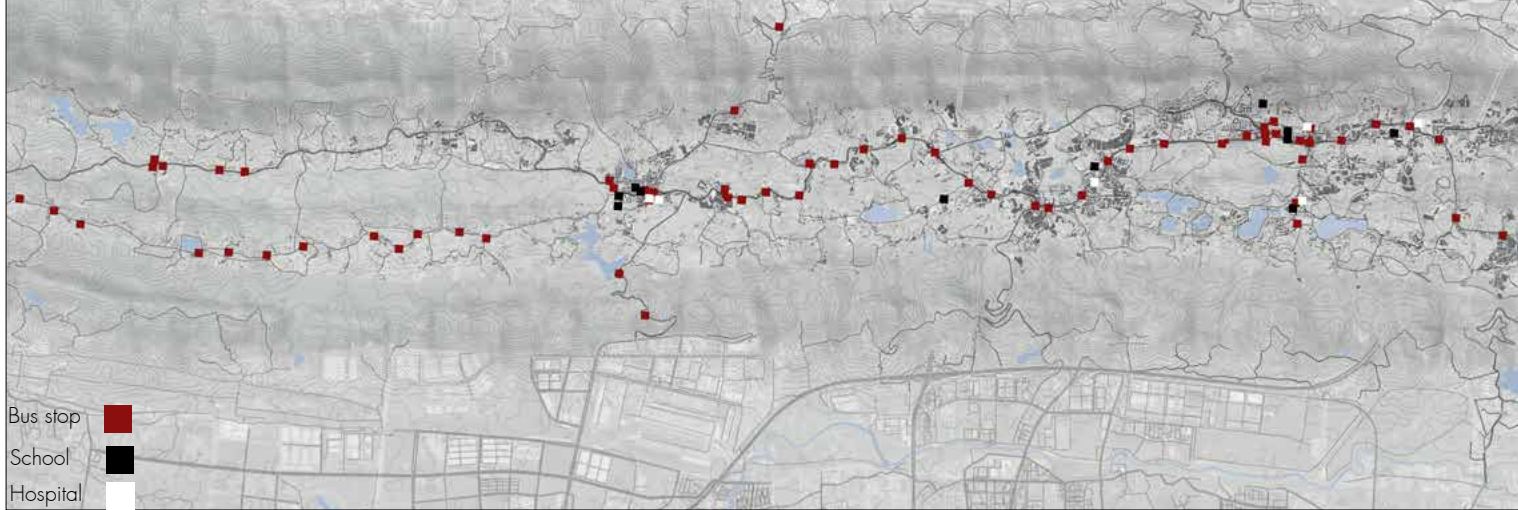


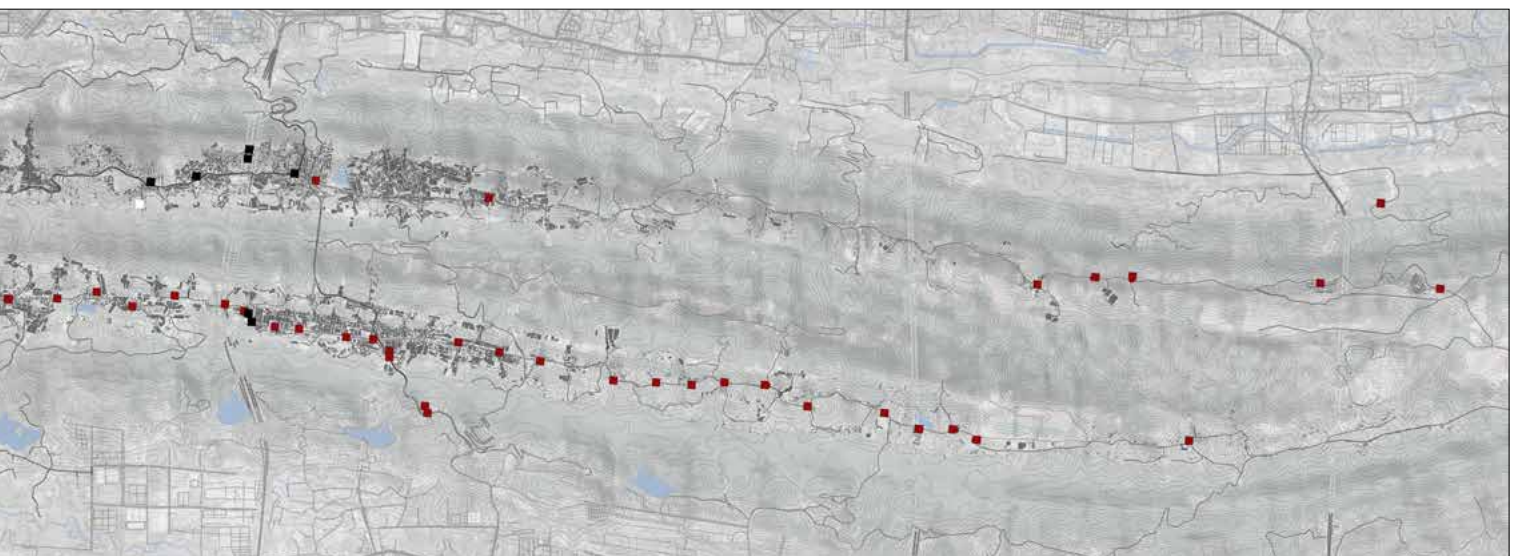
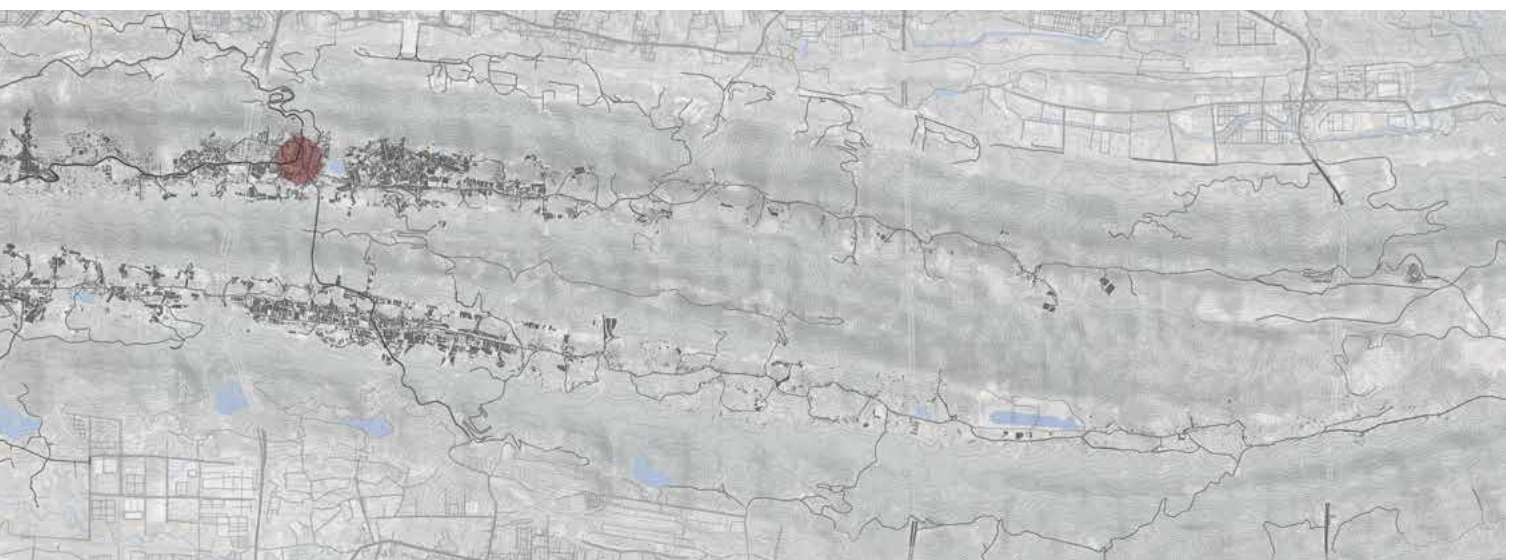
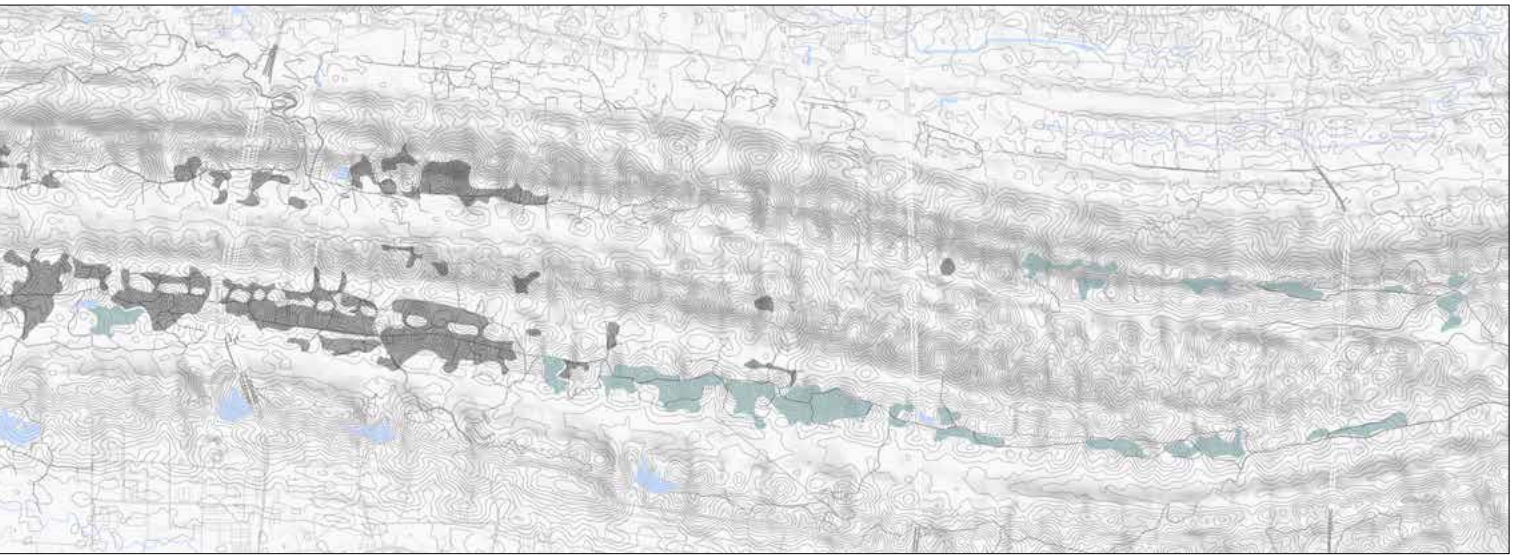


Industry and farmland

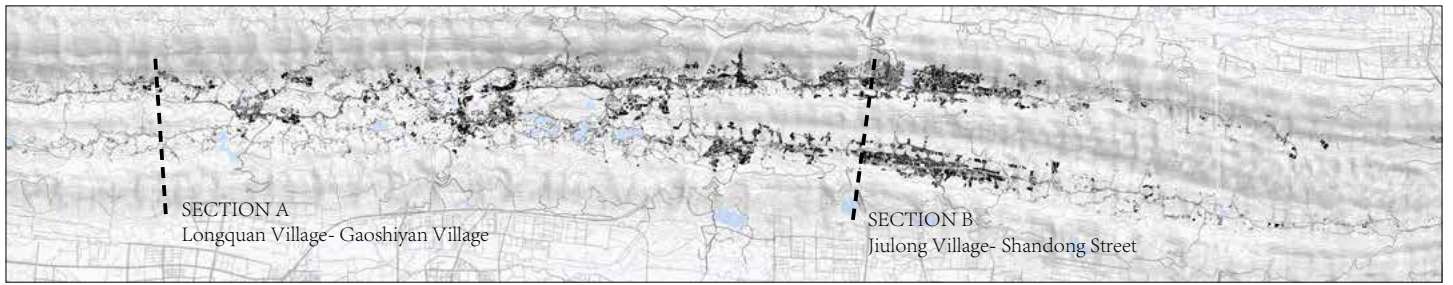


Interesting point





## 5.2 Hinterland section



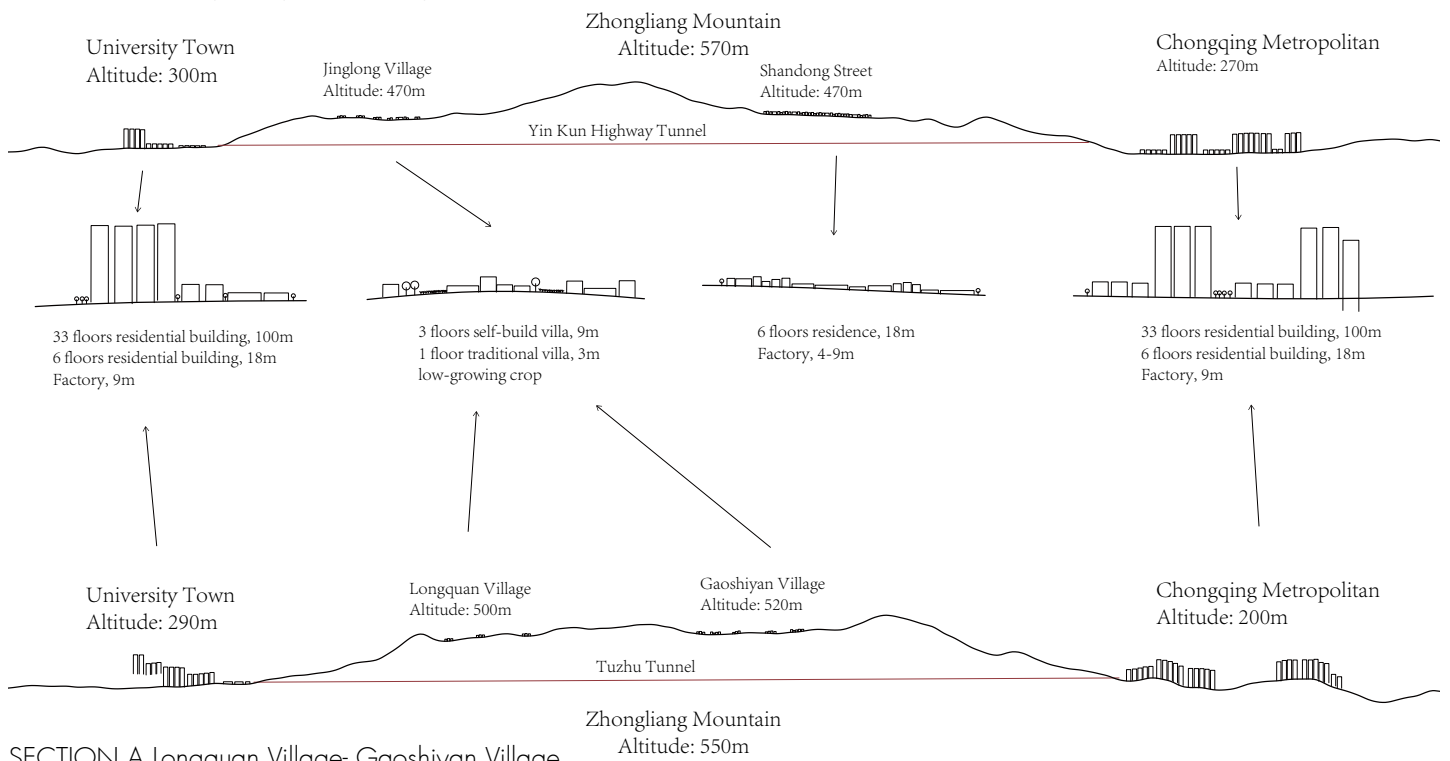
SECTION A Longquan Village- Gaoshiyan Village



SECTION B Jiulong Village- Shandong Street



SECTION B Jiulong Village- Shandong Street



SECTION A Longquan Village- Gaoshiyan Village

### 5.3 Morphology And Typology Analysis

Morphology and typology analysis base on zone scale

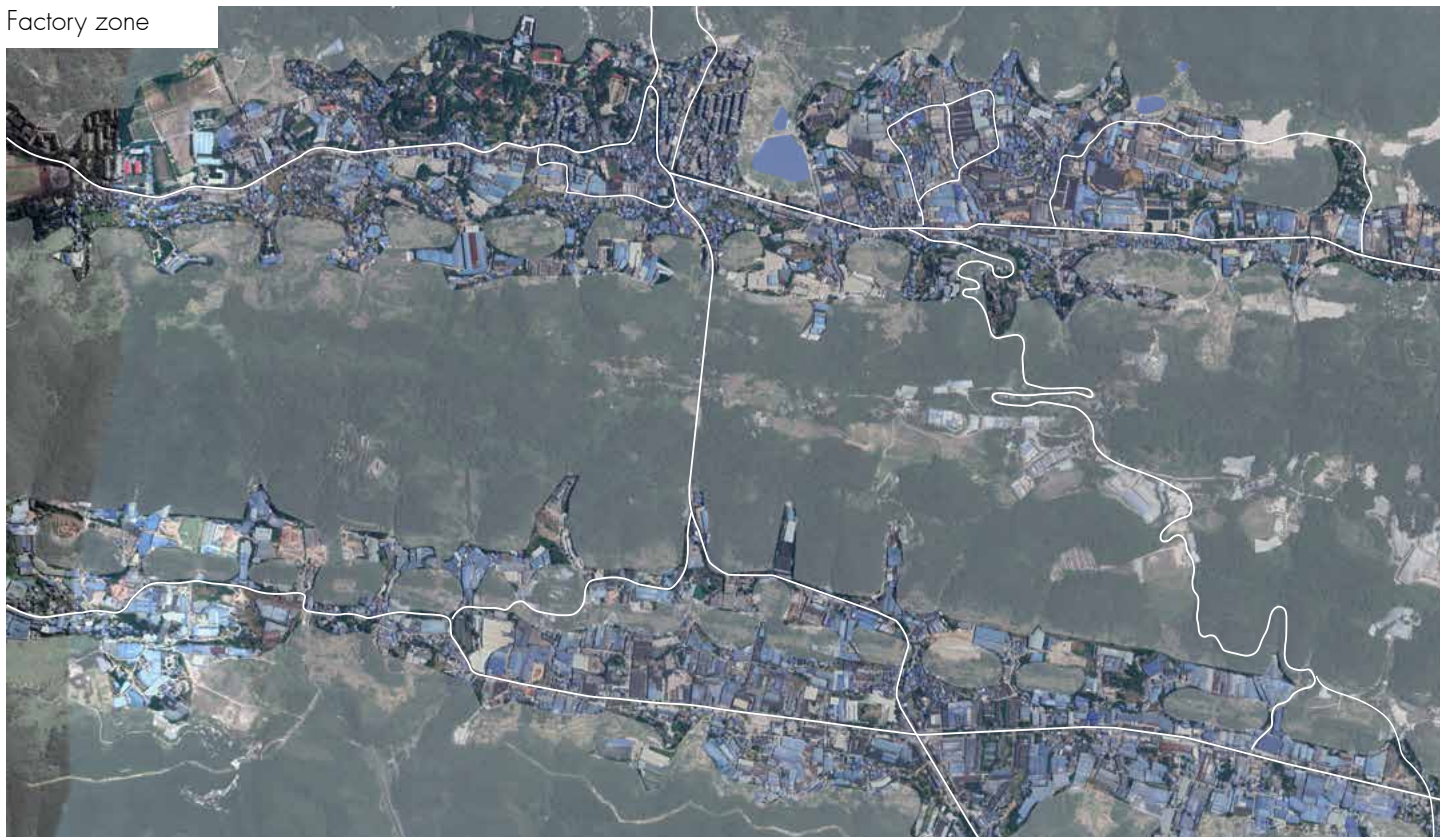
Village zone



Town zone



Factory zone







# Morphology and typology analysis based on settlement scale

Prototype

Residential

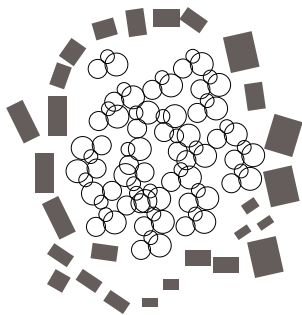
Linear



Scattered



Surrounding



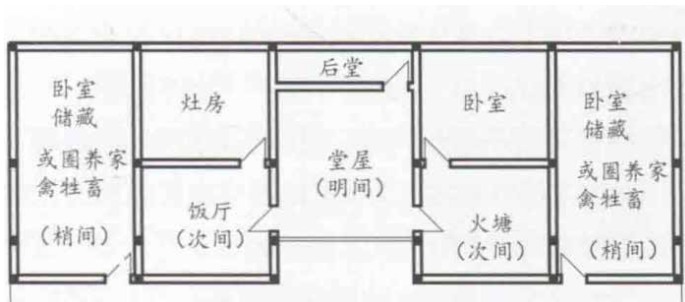
Lumped



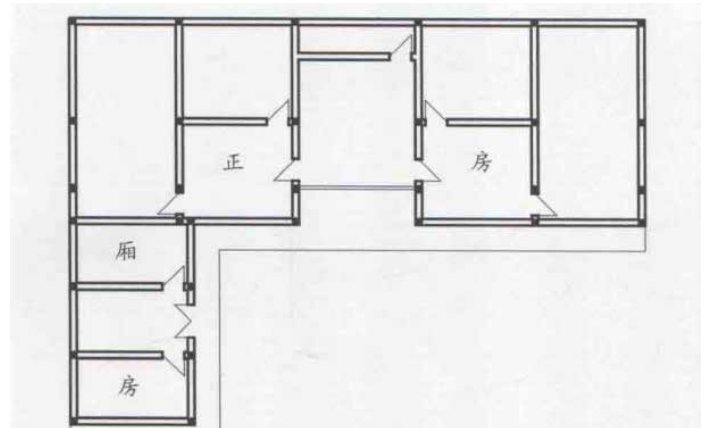


## Morphology and typology analysis of Chongqing traditional dwelling

The most basic form is the prototype of a residential building plane. This form of folk dwelling is flexible, occupy little land, and is easy to build. They are mostly scattered in the mountains and fields and are one family or several adjacent families. Like a cluster, but separate, seen as a group.



It was developed on the basis of the original type. Extend one side of the house. In this way, in front of the main house forming a courtyard. Can be regarded as the prototype of the courtyard.

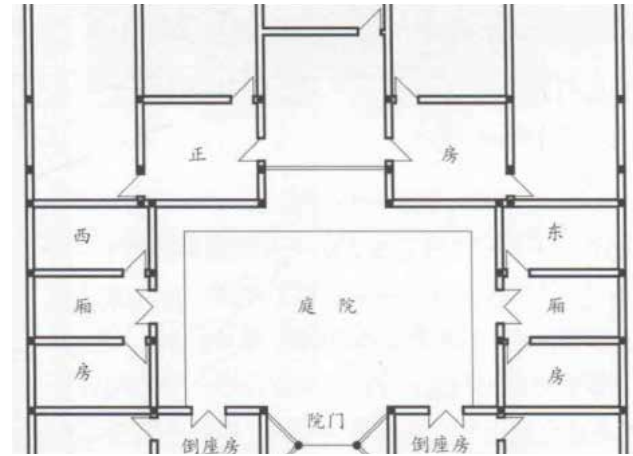
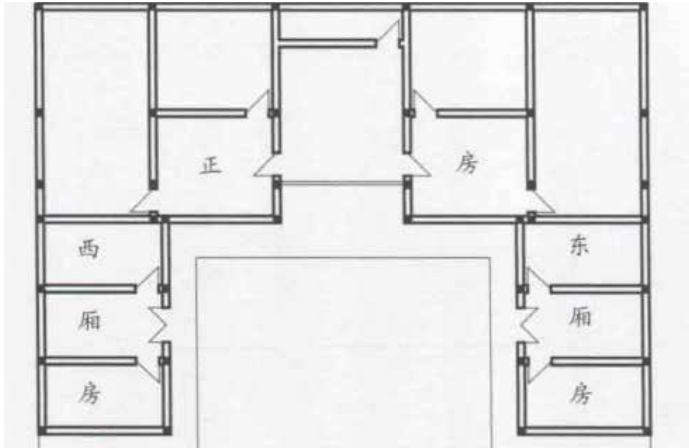




Extend the two sides of the house. It can be called a Sanheyuan (three sides closed courtyard). In the Chongqing area, a door is often added in front of the courtyard..



The most basic form is the prototype of a residential building plane. This form of folk dwelling is flexible, occupy little land, and is easy to build. They are mostly scattered in the mountains and fields and are one family or several adjacent families. Like a cluster, but separate, seen as a group.



## Chapter 6 **Project**

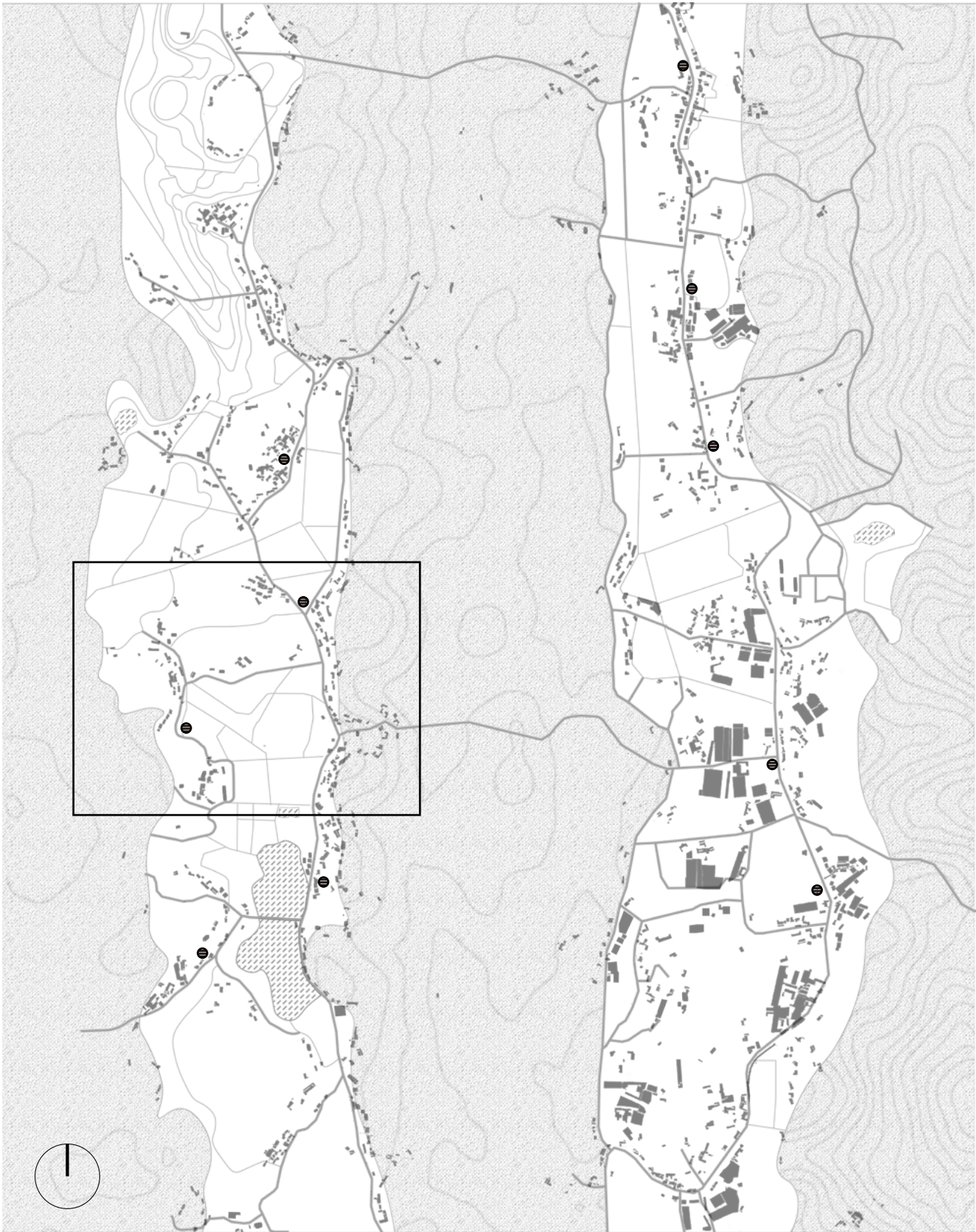
6.1 Village medical station

6.2 post-pandemic health center



## 6.1 Village medical station





● Village medical station

■ Forest

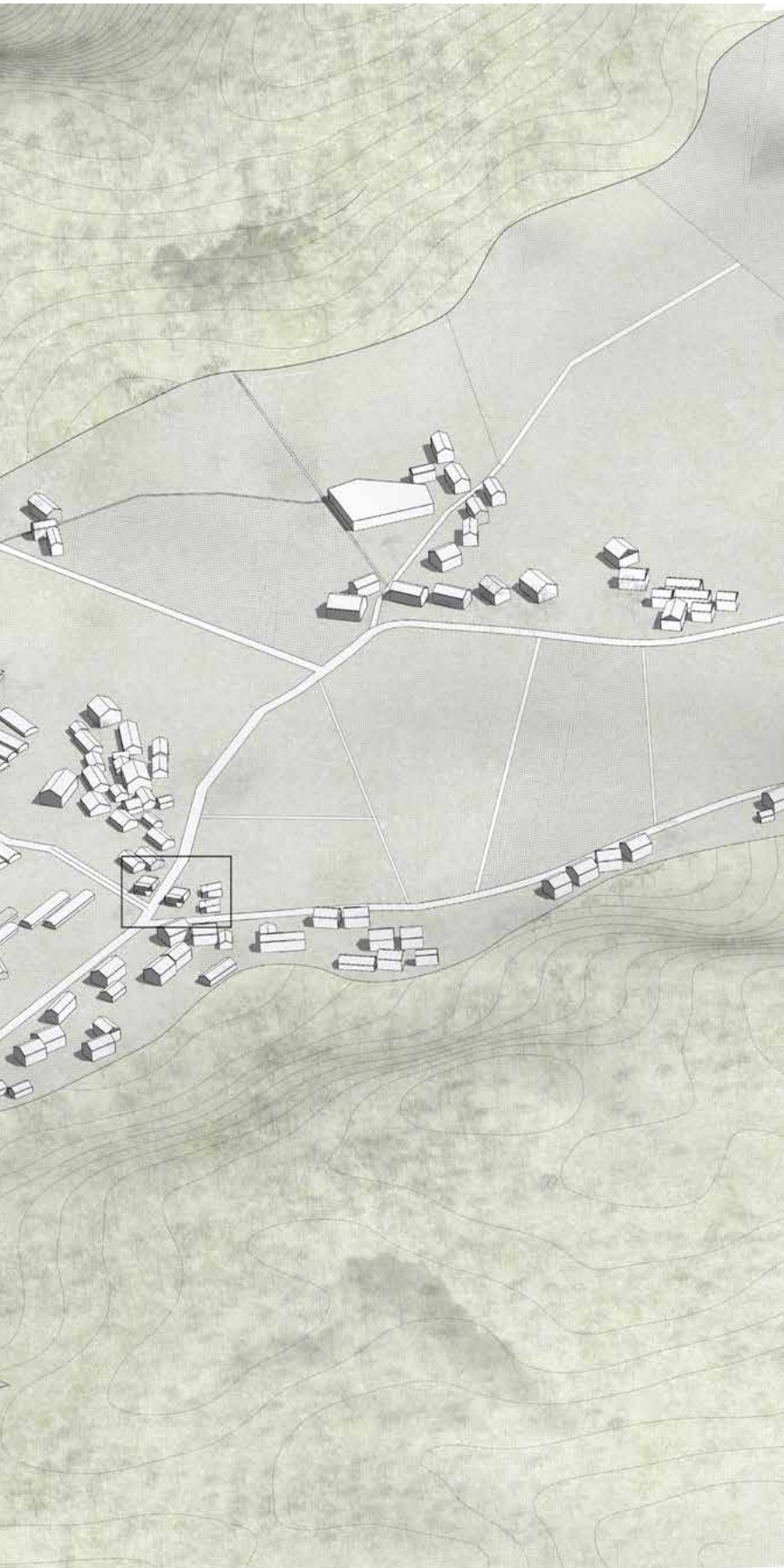
▨ Waterbody







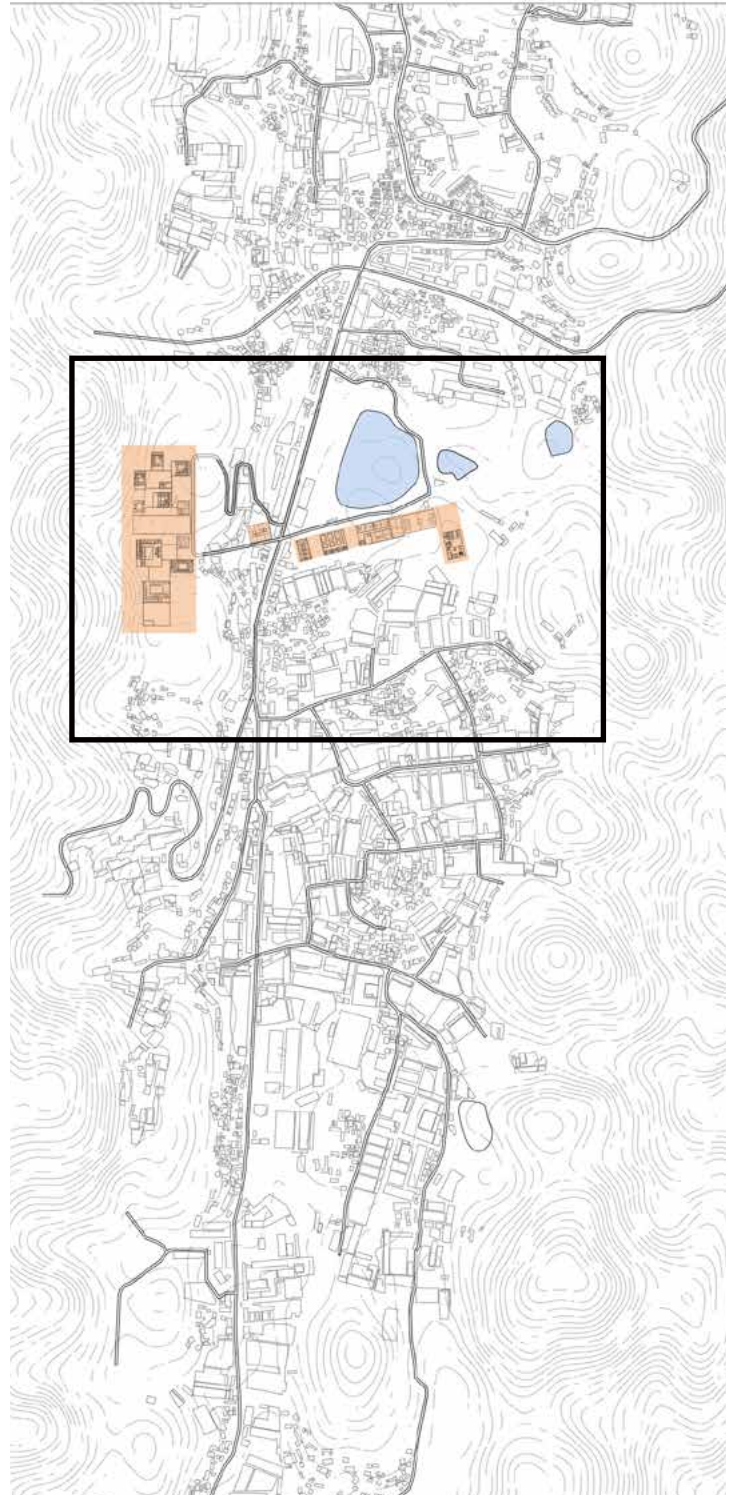






## 6.2 Post-pandemic health center

In Chapter 4.3, the conclusion is that Geleshan and Shandong need 158 beds, and this conclusion will determine the dimension of the project, post-pandemic health center







parking lot

post-pandemic health center

- A elder care center
- B hospital
- C parking lot
- D bus station,
- E market, furniture studio and exhibition
- F sports center
- G library







# PLAN

