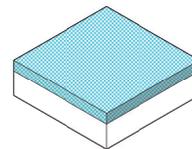
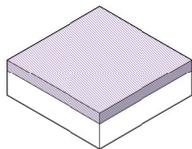
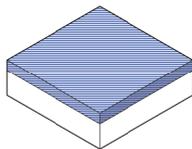


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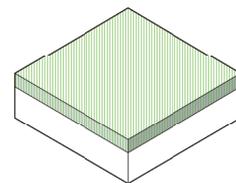
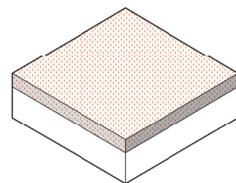
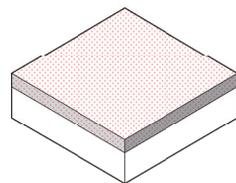
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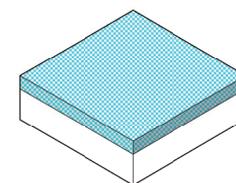
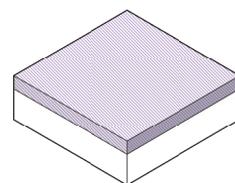
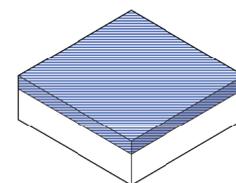


*Fresh wind blowing into Lishui village:  
A sustainable village design based on villages research in Lishui*



Politecnico di Torino  
Master of Science in Architecture for Sustainable Design  
A. A. 2020/2021

*Fresh wind blowing into Lishui village:  
A sustainable village design based on villages research in Lishui*



Supervisor: Michele *Bonino*  
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Candidates: Feng *Zhang*  
Chao *Wang*

## 0 // Abstract

### Part 1

Contemporary Lishui Village Observation

## 1 // Research experience\_Lishui

- 1.1 Survey map
- 1.2 Overview of Lishui Village
- 1.3 Sounds
- 1.4 Initial impression

## 2 // Revitalization of the World Village

- 2.1 Rural development in USA,JAPAN,EU
- 2.2 Case interpretation - Rural Studio of USA
- 2.3 China Rural Revitalization Plan made by government
- 2.4 New vernacular architecture in China
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## 3 // Research in Chenjiapu

### Mapping

- 3.1 Function
- 3.2 Group
- 3.3 Clan
- 3.4 Production
- 3.5 Surroundings
- 3.6 Orography

### House

- 3.7 Space
- 3.8 Material

## 4 // Research in Baiyan

### Mapping

- 4.1 Function
- 4.2 Public space

### House

- 4.3 Space
- 4.4 Material

## 5 // Common Characteristic Consideration

- 5.1 Comparative analysis
- 5.2 Conclusion

### Part 2

Design practice in Lishui Village

## 6 // Rural Revitalization Plan Discussion

- 6.1 Macro perspective
- 6.2 Micro perspective
- 6.3 Masterplan

## 7 // Bibliography

Folk houses are the representative form of Chinese farmers' architectural experience and technology for thousands of years. However, in the current highly capitalized and technological era of China, Chinese rural houses are undergoing a process of being overwhelmed by the rapid and often disorderly expansion of cities. Similar contemporary villages in China have begun to integrate a kind of "purpose" into architecture, function, system, and even value logic and aesthetic concerns. The function becomes the only criterion for rational space has led to the similarity of rural architectural styles and forms, the disappearance of regional architectural characteristics, the decline of local cultural characteristics, and the rupture of historical context.

Regarding the West's gaze on the countryside, the American Rural Studio led by Samuel Mockbee can be used as an important reference. They take the scale and comfort of the building as the basis of their design, and spend more time on the lowest budget materials (discarded tires, hay, waste cardboard) to realize the housing of low-income farmers. In the revitalization plan of the small town of Newbern (a declining cotton planting base with stagnant agriculture and extremely high unemployment), the Rural Studio took the opportunity of establishing its own farm and tried to activate the local paralysis by producing organic food Agricultural industry.

Most of the rural areas in China are due to the influence of the urbanization process, which leads to confusion in the architectural language of the facade and function. This processed in China are more intense and speed than in western country .Therefore, Chinese architects began to pay attention to the "new vernacular architecture" . "Neo-vernacular architecture" refers to those new buildings designed by contemporary architects that are mainly inspired by traditional vernacular architecture. It is a modern interpretation of traditional vernacular architecture.

In the renovation project of Shuangliu Village in Hangzhou, Li Kaisheng preserved the organicity of the original village texture and the growth mechanism of the site, erased the illegible decorative words and chaotic construction details, and restored the pure geometric attributes of the volume. This method is also our design theme for those villages that have been severely eroded by urbanization. Our ultimate intention is to retain the original texture of the historical village while adding the modern functions needed by the villagers to support their normal modern life

Regarding the design strategy this time, we will follow the footsteps of Chinese designers, sort out and dismantle the morphological relationship of the village. An adaptable and sustainable rural model can be obtained, which will become a new model of rural China in the 2030s and even the 2040s in the future.



\*All the images and drawings are made by the author except where it is indicated.

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# 1 // Research experience\_Lishui

- 1.1 Survey map
- 1.2 Overview of Lishui Village
- 1.3 Villager mentality
- 1.4 Initial impression

# ***PART 1***

## **// Contemporary Lishui Village Observation**



Chenjiapu Village



Rhyme of Sidu



Ode of baiyan



Guyan Painting Countryside

# 1.1 // Survey Map

# [ Ten Scenery of Lishui ]

## 丽水十景

### RHYME OF SIDU

Research Scope – 14.76km<sup>2</sup>  
 Core Scope – 4.17km<sup>2</sup>  
 Industrial garden of modern East, ecological silicon valley between green water and green mountains ; Local remote office, business, hotel, residence

7

### LISHUI SMART VALLEY

Research Scope – 61.67km<sup>2</sup>  
 Core Scope – 36hm<sup>2</sup>  
 Science and innovation office, business, education and training, talent apartment, smart residence

8

### THE COLORFUL JIULONG

Research Scope – 6.97km<sup>2</sup>  
 Core Scope – 3.55km<sup>2</sup>  
 Gathering world-class master buildings, immersive interactive experience ecological garden, Wetland tourism and leisure

9

### BIHU FARMING AND LEARNING

Research Scope – 38km<sup>2</sup>  
 Core Scope – 82hm<sup>2</sup>  
 Sightseeing agriculture, theme catering, retail, farm, homestay and holiday residence

10

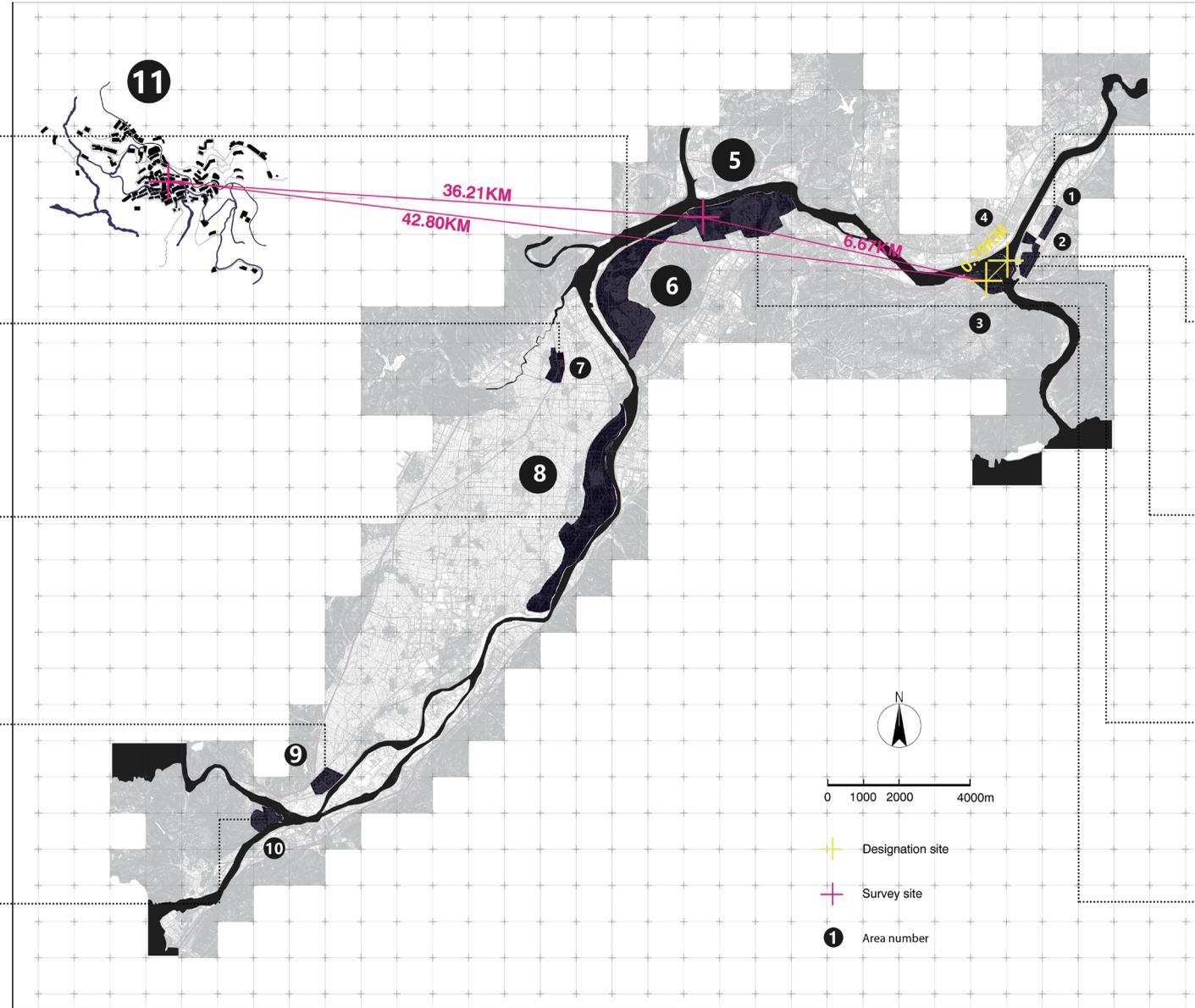
### GUYAN PAINTING COUNTRYSIDE

Research Scope – 3.80km<sup>2</sup>  
 Core Scope – 38hm<sup>2</sup>  
 Theme museum, theater, catering, accommodation, hotel, art training base, theme community

11

### CHENJIAPU VILLAGE

Research Scope – 5.80km<sup>2</sup>  
 Art, tour, agriculture



1 2

### PORTAL OF SHANSHUI

Research Scope – 4.20km<sup>2</sup>  
 Core Scope - 60hm<sup>2</sup>  
 Functions - Tourism distribution, business, commerce, culture and education, housing.

3

### ANCIENT CITY HERITAGE

Research Scope - 2.60km<sup>2</sup>  
 Core Scope - 14hm<sup>2</sup>  
 The cultural complex of nature, architecture and art cultural exhibition, art exhibition, resort hotel, leisure catering.

4

### WIND OF KUOCANG MOUNTAIN

Research Scope – 2.23km<sup>2</sup>  
 Core Scope - 44hm<sup>2</sup>  
 Future architecture Expo Park, highland of architecture research and development  
 Corporate headquarters, cultural exhibition, conference hotel, etc

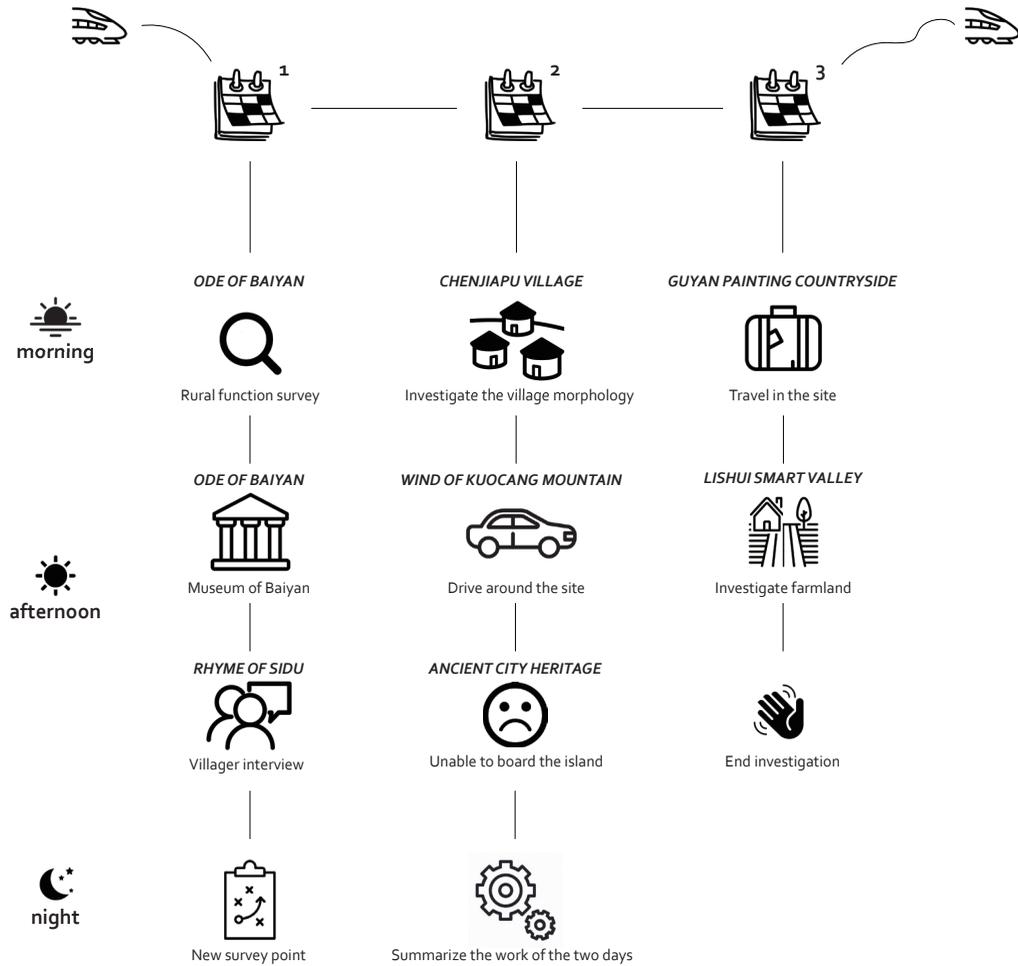
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### ODE OF BAIYAN

Research Scope – 6.54km<sup>2</sup>  
 Design Scope – 2.66km<sup>2</sup>  
 The ideal cultural living space of mountains and rivers, and the self realization of Dayan town Art exhibition hall, property hotel, supporting retail, theme residence

# 1.2 // Overview of Lishui Village

## Timetable of Research



## Different architectural styles

CHENJIAPU VILLAGE



**The original architecture of Lishui**  
The original architectural form of Chenjiapu Village has been completely preserved due to high altitude and backward development.

ODE OF BAIYAN



RHYME OF SIDU



WIND OF KUOCANG MOUNTAIN



**Lishui Contemporary Rural Architecture**  
In contemporary rural buildings, due to the increase in the population of the family unit and the change in cognition, the building volume has become larger, and the villagers will use more expensive facade decoration materials in order to demonstrate their family wealth.

## New functions of the village

HALL OF VILLAGERS



SPORT COURT



GARBAGE COLLECTION



### Villagers' livelihood function

The livelihood function of the village has always been the most important part of supporting the establishment of the village.

PARKING



CLINIC



COMMITTEE



HOTEL



TEAHOUSE



BOOKSTORE



### Tourism function

In Chenjiapu Village, it has a special tourism function, and it drives the village economy through the development of tourism.

## 1.2 // Overview of Lishui Village

### *Original Architecture*

The buildings of Chenjiapu are mainly composed of single buildings, which are affected by the height difference of the terrain. There are no clear distinction between building clusters; there are many different ways to pass through the building, or enter the building. Each building is composed of a volume with different attributes, scattered in several blocks with different functions, they are called clusters. The picture shows the typology of this particular area, which is friendly to intensive crops such as tea.

**CHENJIAPU VILLAGE**



## 1.2 // Overview of Lishui Village

### *Contemporary Architecture*

The overall layout of the houses in Baiyan Village is complex. Most of the old buildings are demolished and new buildings are built on the spot. The layout of each unit is compact, there are few courtyards, and the functions are similar to the building facade. The gates of the residential buildings are mostly open on the road, facing the main building and the lobby, and three more buildings are built. The double slope of the roof reduces rain erosion.

### *ODE OF BAIYAN*



## 1.3 // Sounds

Mr. Li  
Ode of Baiyan  
75 years old  
Farmer



**PROS:**①Developed agricultural technology ②Larger living space

When I was working in the farmland 20 years ago, China's agricultural technology was still underdeveloped and it was very hard to grow crops. Now it is much more convenient. Now the space of the houses where farmers live is much larger, but there is very little sunlight. Now the young people don't stay in the village anymore, they all go to work in big cities.

**CONS:**①Lack of light ②Young people leaving

Mr. Bao  
Chenjiapu Village  
42 years old  
construction worker



**PROS:**①Income increased②young people are returning ③Houses being repaired

The villages that used to be few people suddenly became tourist attractions. Many old houses have been rebuilt and they are much more beautiful. At the same time, income and job opportunities have increased a lot. Young people who did not develop well abroad have returned to the village to engage in tourism-related work. But the village is full of construction sites and dusty.

**CONS:**①Environmental deterioration

Mr. Wang  
Rhyme of Sidu  
81 years old  
Worker



The house I live in is still very shabby, but my family and I are very happy living together. The public facilities in the village are very outdated. I am getting sick a lot at an older age. It is very inconvenient to go to the hospital every time. I very much hope that there will be a small clinic in the village to facilitate my treatment, and there is a kindergarten, my granddaughter does not have to travel far to the kindergarten every day.

**CONS:**①Houses are in poor condition②Lack of public functions

## 1.4 // Initial impression

### 1 Absence of the original facade 原始立面缺失



- Sloping roof
- Low building height
- Front courtyard
- Beige sand surface
- Rough stone foundation

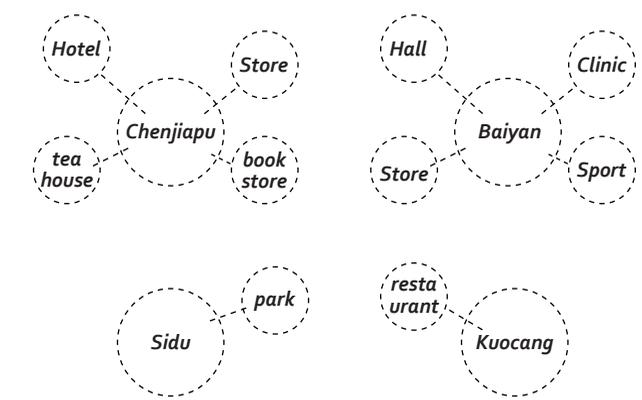
VS



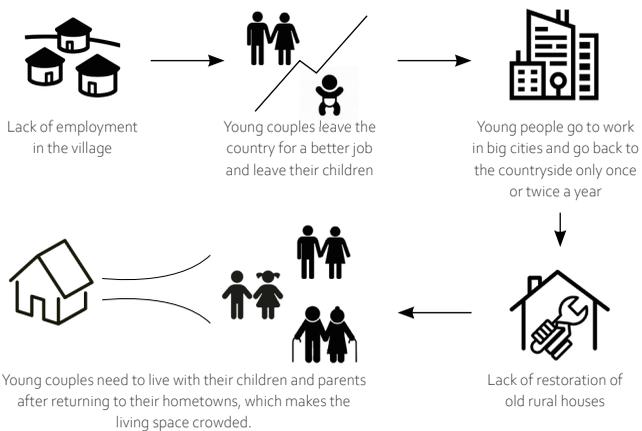
- Unreasonable tile surface
- Rectangular plane
- High building height

Because of the increase in the family population of contemporary villagers and the change in aesthetics, villagers prefer large houses and high floors to satisfy a large family to live in. And they want to show their wealth through the building, so they will choose colorful tiles to decorate the facade. However, the local villages in Lishui will lose their original appearance and become indistinguishable from other villages.

### 2 The different construction level of the villages 村莊建設水平不一



### 3 The village lacks young people 年輕人的缺少



### 4 Agriculture lacks system 農業缺少系統



### 5 Bad environment 糟糕的環境



# 2 // Revitalization of the World Village

- 2.1 Rural development in USA, JAPAN, EU
- 2.2 Case interpretation - Rural Studio of USA
- 2.3 China Rural Revitalization Plan made by government
- 2.4 New vernacular architecture in China
- 2.5 Sato Caspianism



GUYAN PAINTING COUNTRYSIDE

## 2.1 // Rural development in USA, JAPAN, EU



### Existing rural problems ??

- High unemployment rate
- Infrastructure is not yet sound
- Decreased settlement function

### Rural development goals 🎯

- Improve the economy
- Improve the quality of life

### Rural Revitalization Strategies 📋

- Improve infrastructure
- Maximize greening and beautify the rural environment
- Fully respect and carry forward the life traditions of local people
- Appropriately highlight the distinctive features inherent in the countryside



### Existing rural problems ??

- Income gap between urban and rural
- Rural declining birthrate
- Serious environmental pollution

### Rural development goals 🎯

- Stable supply
- Diverse Village
- Sustainable development
- Urban-rural exchange

### Rural Revitalization Strategies 📋

- Legislation first
- Service package
- Planning supporting
- Fund guarantee
- Farmland reform
- Education
- Tertiary industry integration
- Complete infrastructure



### Existing rural problems ??

- Unfavorable development in remote area
- Climate change and sustainability issues
- Single rural industry
- Rising unemployment

### Rural development goals 🎯

- Knowledge innovation
- Climate resilience
- Rural vitality
- Social inclusion
- Industry integration
- Ecological restoration

### Rural Revitalization Strategies 📋

- Industrial counter-urbanization
- EU Common Agricultural Strategy
- Village update
- Complementarity of urban&rural functions
- Specialization of Agricultural Management
- Control of land development rights
- Extension of agricultural scientific research
- Reform the administrative relations between cities and counties

## 2.2 // Case interpretation - Rural Studio of USA

### Hale County

located in the southwestern part of the industrial area outside Birmingham (state capital of Alabama, USA), is a forgotten place, struggling with poverty for a long time, mostly covered by iron-rich red soil. Here, there are abandoned barns, crumbling sheds, and rusty trailers—"ghost buildings", the fragile remnants of a once prosperous agricultural community. Most of the local residents are blacks, with a large proportion of the elderly and children, living conditions are very simple, there are almost no public facilities and communication places. Currently, the poverty rate in this area is close to 40%.

Dilapidated warehouse



A poor family



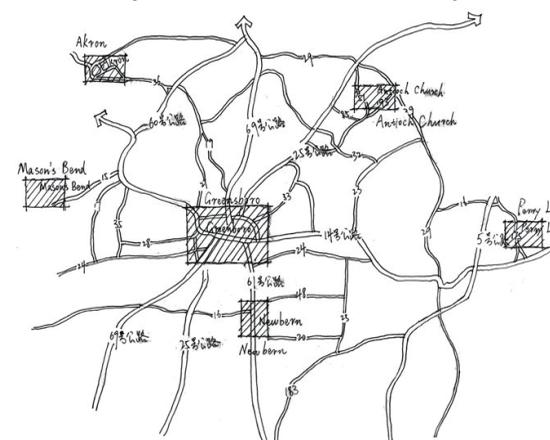
### Samuel Mockbee

**Hale County** deeply attracted the architect Samuel Mockbee (Samuel Mockbee), simple and pure, and set up a rural studio (Rural Studio) on this land. Mockbee, rooted in the southern hinterland, focuses on the design and construction of humble and innovative housing for the poor. In 1992, when he first came to Hale County with 12 architecture students from Auburn University, he just wanted to conduct a one-year architectural education experiment here. Slowly, the Village Studio built a large number of unique buildings in Hale County at a low cost.

Samuel Mockbee



Distribution of Rural Studio's works in Hale County



### Core system

**1.Low cost** The studio has created simple, but creative structures. They are made of cheap, mostly rescued or donated materials, such as dilapidated railway sleepers, old bricks, donated wood, hay bales, and bundles of corrugated. Cardboard, thinned rubber tires, license plates and road signs, etc.  
**2.Student participation** The village studio led the students of Auburn University to participate in the reconstruction process of the village. The students in the village studio are very familiar with the local residents of Hale County and are well received.

Butterfly House



Hero Children's Center



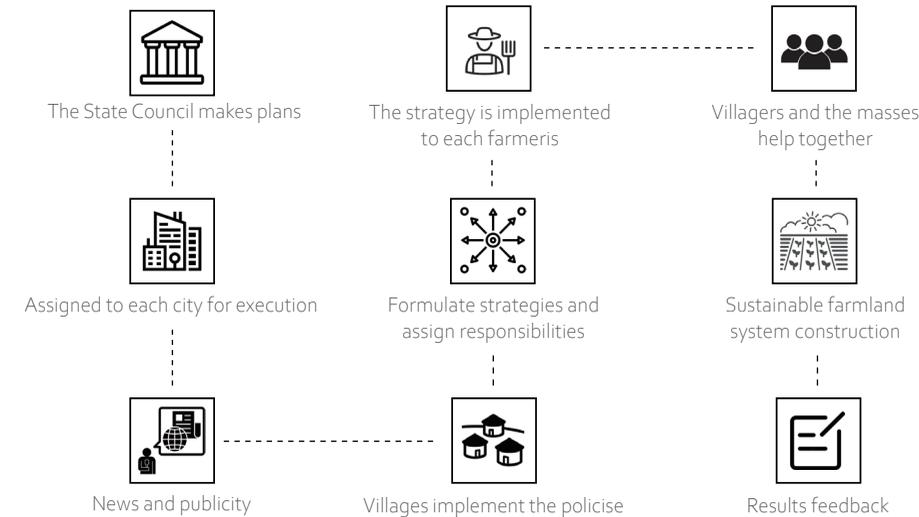
## 2.3 // China Rural Revitalization Plan made by government

### "Rural revitalization Plan"

*in the Fourteenth Five-Year Plan*

**Fourteenth Five-Year Plan:** It is the national plan of the People's Republic of China from 2021 to 2025, and it is also the fourteenth five-year plan for national economic and social development.

**Rural revitalization Plan:** In order to give priority to the development of agricultural and rural areas and comprehensively promote rural revitalization in the new stage of development, the national strategy proposed.



### Main strategies

**Chapter Twenty-Three** — *"Improve agricultural quality, efficiency and competitiveness"*

**Enhance agriculture Comprehensive productivity**



Strict "Cultivated Land Protection"  
Agricultural Science and Technology Innovation System

**Deepen the adjustment of agricultural structure**



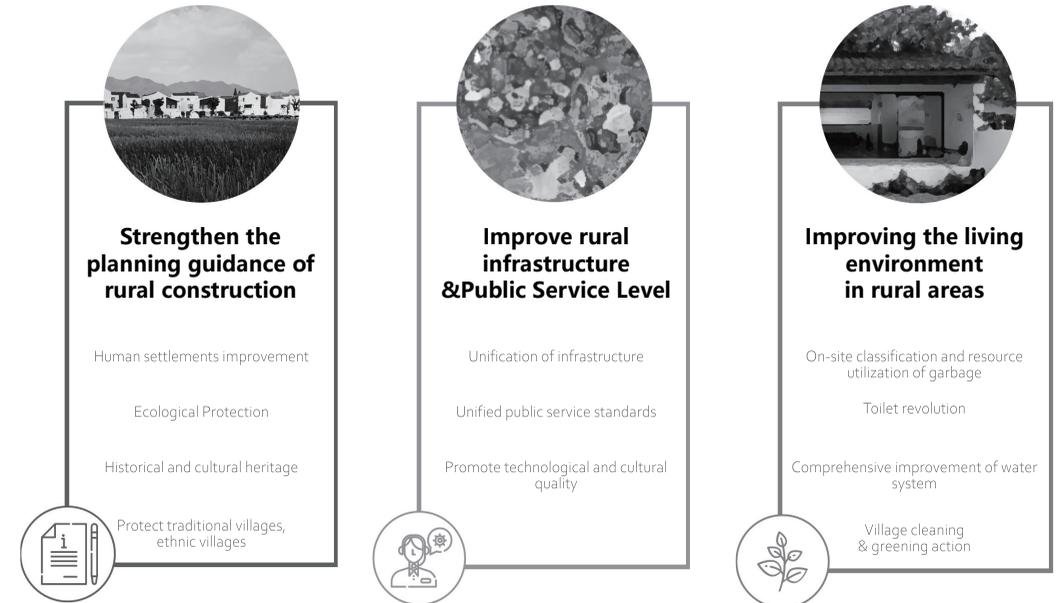
Optimize the layout of agricultural production  
Agricultural Industrial Park

**Enriching the rural economy**



Develop the county economy  
Strengthen the characteristic economy  
Improve the interest linkage mechanism

**Chapter Twenty-Four** — *"Implement rural construction actions"*



## 2.4 // New vernacular architecture in China

### "new-vernacular architecture"

refers to those new buildings designed by contemporary architects and mainly inspired by traditional vernacular architecture. It is a modern interpretation of traditional vernacular dialects.

The advantage of the new vernacular architecture is that while people enjoy the convenience brought by modern technology, they can also experience a strong psychological sympathy, so as to achieve spiritual comfort.



"Indigenous Nest" in South Kunming



Scottish Parliament Building



The Huntington Library



Musée Yves Saint Laurent Marrakech

### Contemporary Strategies of China's New Vernacular Architecture

#### 1 Application and Innovation of Vernacular Architecture Language

New vernacular architecture focuses on the innovation of vernacular languages. At the same time, taking architectural modernization as its foundation, expressing the unique space of the region



Facade and window of China Academy of Art

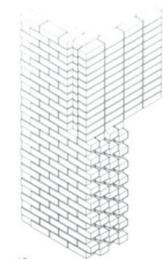


Window of Chinese Jiangnan Folk House

Full-height cedar panels are used on the wall facing the inner courtyard. It is very similar to the wooden walls in Jiangnan folk houses. Fully-opening doors are made on the wooden wall of the platform, which is similar to the verandas in Jiangnan vernacular architecture.

#### 2 Traditional materials change into new forms

Traditional materials have the advantages of being easy to coordinate with the surrounding environment, easy to use traditional crafts and hiring local craftsmen. In the new vernacular architecture, new methods are used to use those new materials.



The new masonry method uses gray bricks of Beijing Tongzhou Art Center

#### 3 Appropriate technology application

Refining the factors that are still applicable to the local technology, combining with architectural design methods and technical means, transforming and upgrading the local construction technology, forming a kind of "appropriate technology"

#### 4 Design combined with nature

On the basis of the original vernacular architecture pattern, combined with the technical means that can be provided today, it is comprehensively considered, the purpose is to better improve the internal environment of the building and provide a sustainable space.

Facade into nature—Tibet Ali Apple Primary School



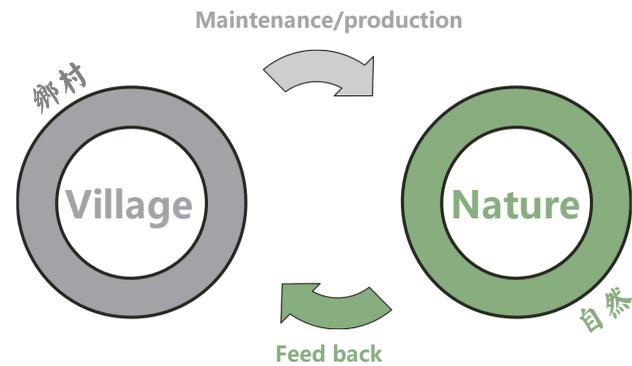
#### 5 Rustic detailed expression

The detailed decoration makes full use of the characteristics of local materials, crafts and technology, and adopts local materials according to local conditions. In addition, the detailed decoration is not only an art, but also related to practicality, and it needs to satisfy the basis of function.

## 2.5 // Sato Caspianism

### 裏山 "Satoyama & Satoumi" 裏海

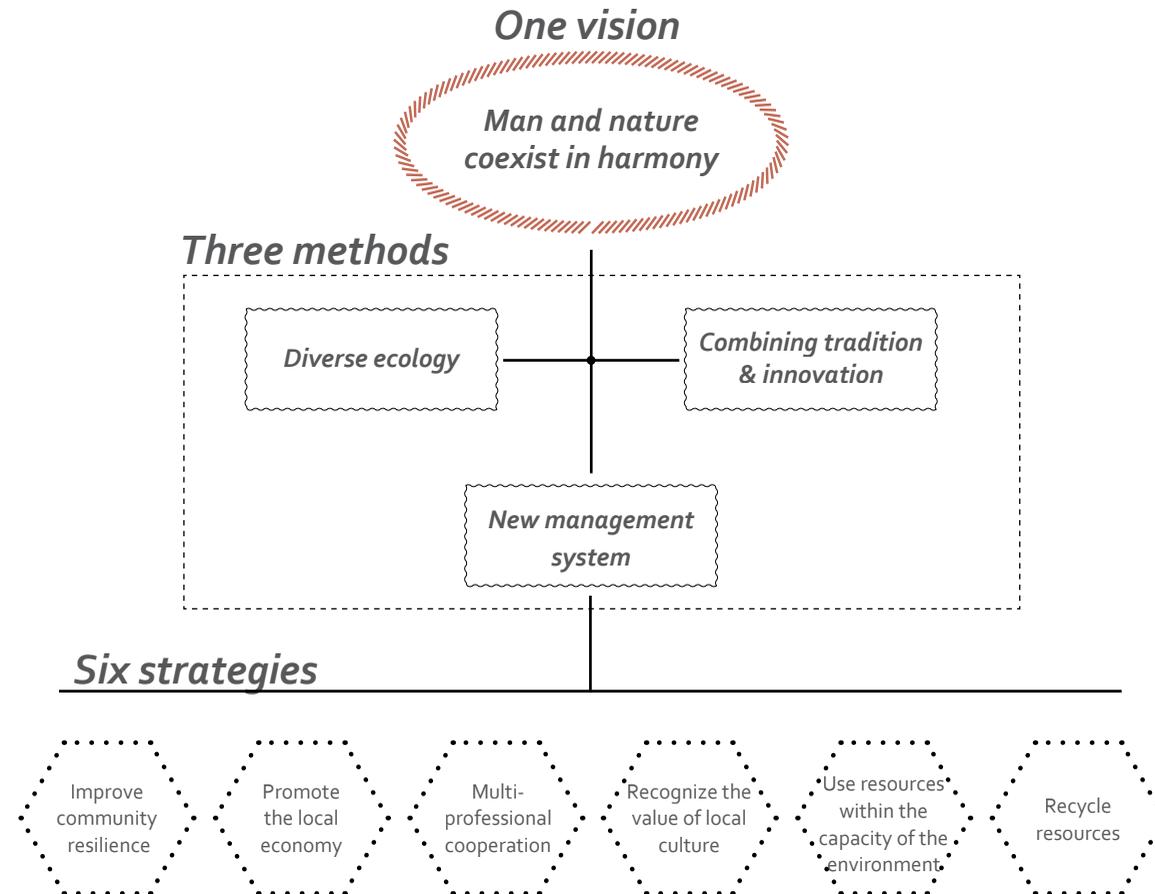
Originated in Japan, it refers to the social ecological system formed by the interaction between the rural settlements on the **mountains** and the **seaside** and the natural environment.



That is a sustainable cycle concept.

A series of agricultural activities carried out in the countryside maintain the harmonious growth of nature, and nature will supply high-quality products to the countryside, thereby prompting the countryside to nurture diverse activities and the environment to attract the flow of people.

### Theoretical system

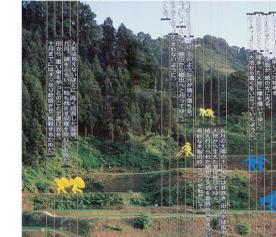


### Results

## "Echigo Tsubasa Art Festival"

A triennial art festival held in the mountain villages, terraces, villages, and abandoned schools of Echigo-Tsumari (the experimental site of the Satoyama Caspian Sea) in Niigata Prefecture. It is a form of local creation using art as a medium.

Summer festival



Winter festival



Tunnel of light by MAD



### Inspiration



# 3 // Research in Chenjiapu

## Mapping

- 3.1 Function
- 3.2 Route
- 3.3 Residential density
- 3.4 Clan
- 3.5 Production
- 3.6 Orography



### The root of the folk house in Lishui

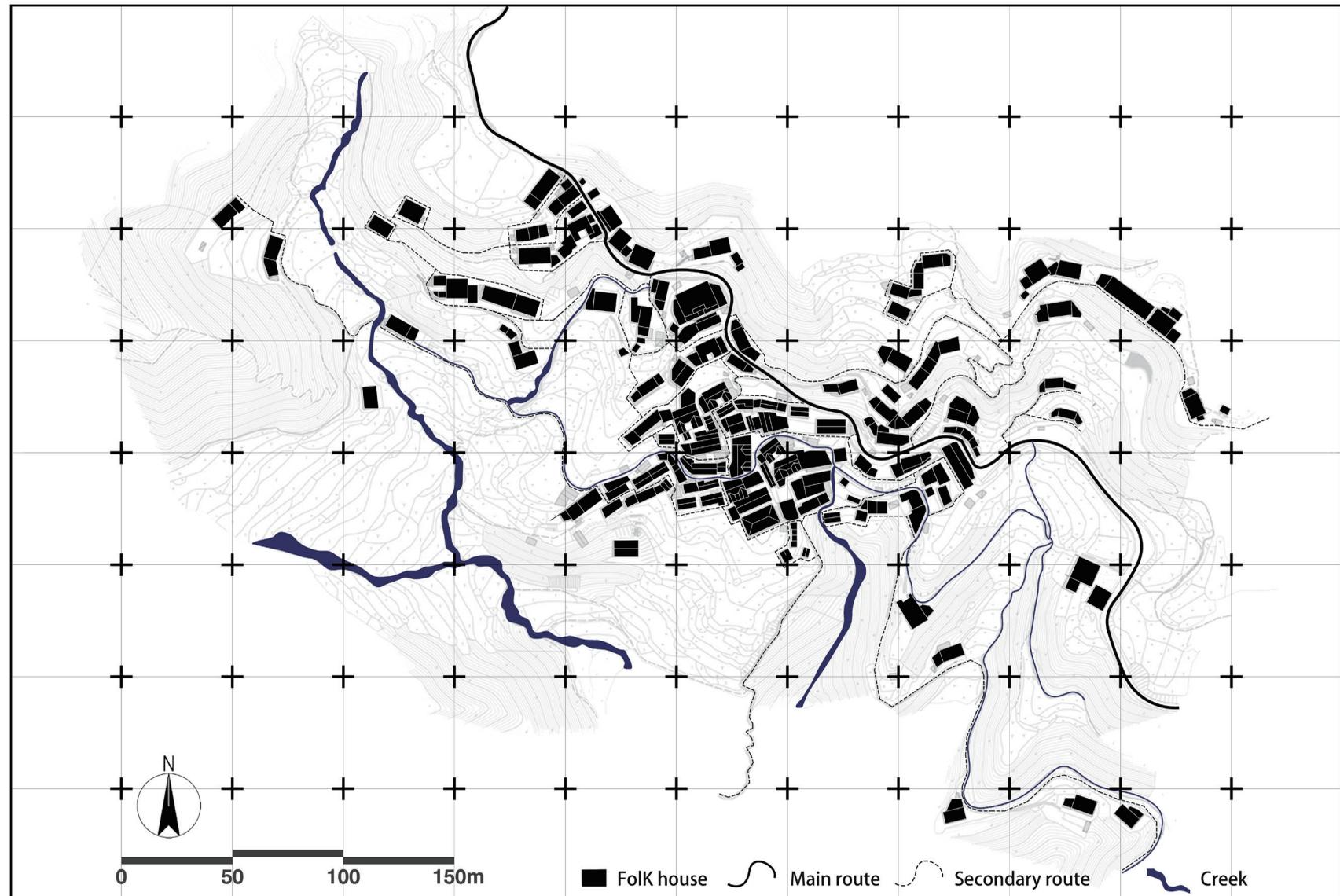
In the depths of Dachang Mountain, 15 kilometers away from Songyang County, the ancient village Chenjiapu hangs on the cliffs, surrounded by mountains on three sides, facing a deep valley, surrounded by clouds, and has a history of more than 600 years. Known as "the last secret place in Jiangnan".

Chenjiapu Village is built on the hillside, distributed along the mountain terraces in steps, with a difference of up and down of more than 200 meters, presenting a typical cliff-dwelling settlement in southwestern Zhejiang as a whole. Nearly one hundred residential buildings are mostly rammed-earth timber buildings, retaining the complete texture of the village space and environment.

Chenjiapu preserves Lishui's original rural housing forms and features. We will analyze the five aspects of the village's functions, roads, clusters, clan, products, and mountains to analyze:

- How the village builds houses on the mountain?
- How to realize village democracy?
- How does the village build a complete income chain?
- What is the future of the village?

After completing the investigation of the village, it is necessary to rub the texture of the village into the new design site to restore the pattern of the Lishui countryside, thereby generating a new rural form in 2020s



### 3.1 // Function 功能



#### How a bookstore changes a village?

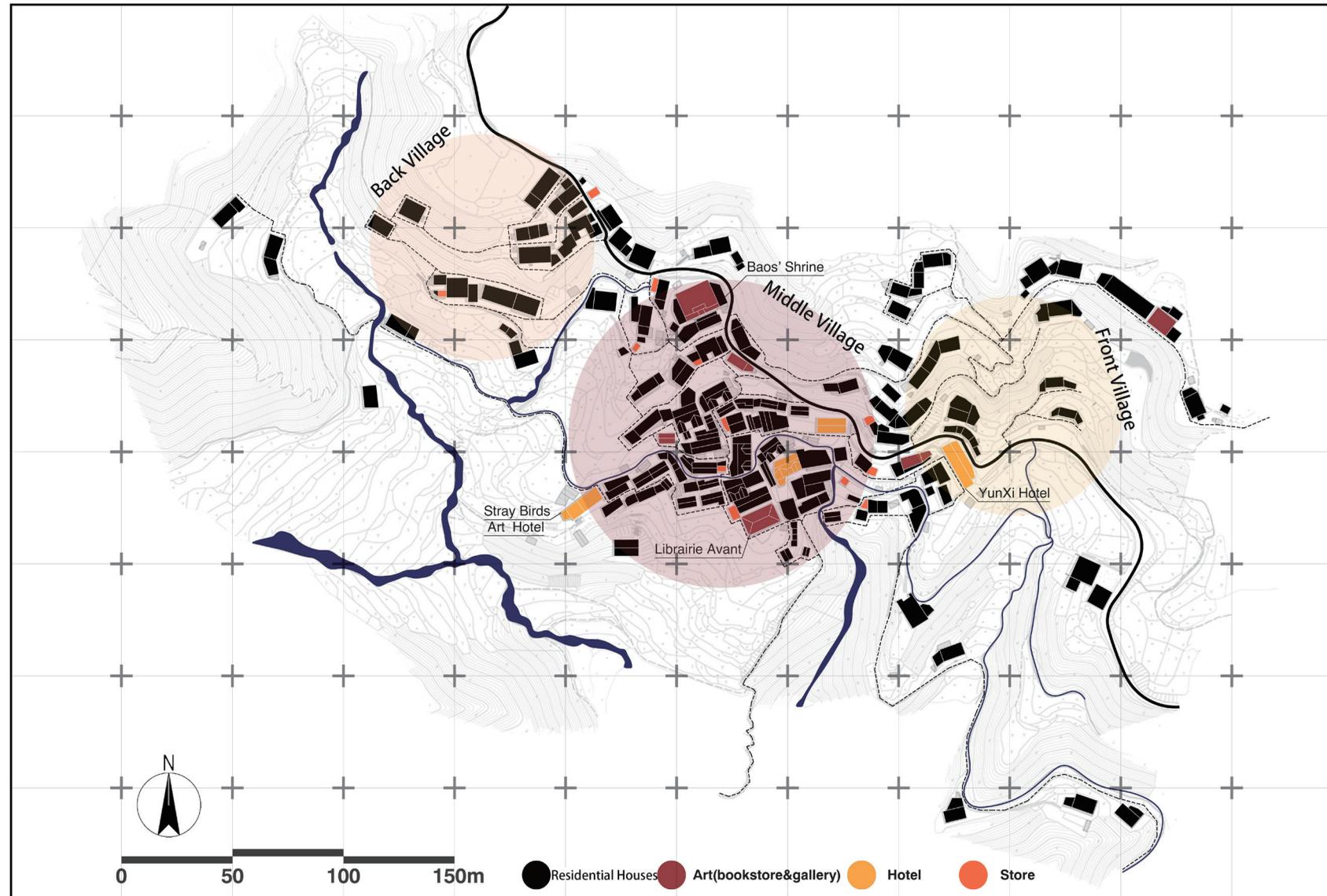
The development of Chenjiapu Village was started by LIBRAIRIE AVANT-GARDE. The reason why its founder Qian Xiaohua chose here was because of the quaint and original architectural form and high-altitude environment of Chenjiapu Village. This unique bookstore suddenly exploded on the Internet, attracting many young people to this ancient and remote village.

LIBRAIRIE AVANT-GARDE also regularly invites famous writers and poets to the bookstore to share. A residential building opposite the bookstore has been transformed into a writer's creation center for them to live in the village. A small renovation project has injected new vitality and impetus into the hollowed Chenjiapu Village, and will definitely change the fate of this remote mountain village, and even Songyang, a remote county in southern Zhejiang.

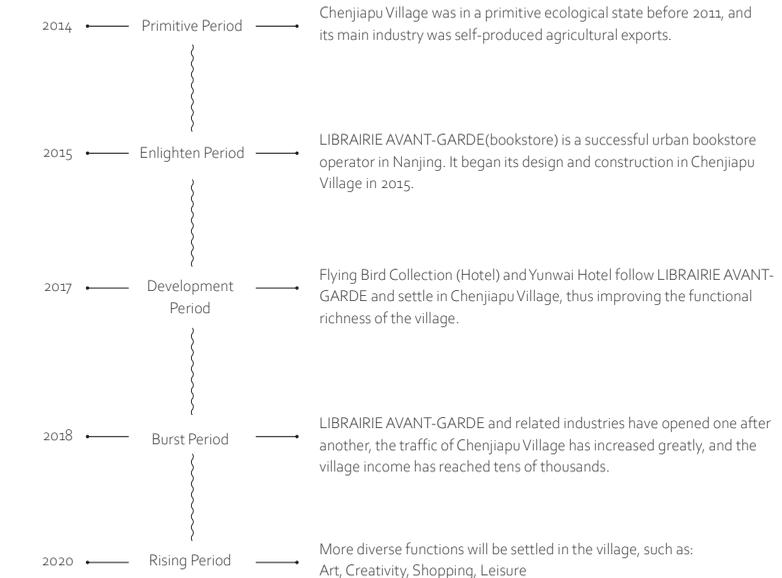
Afterwards, many homestays and hotels were built in the village, and the villagers also opened small shops, restaurants and grocery stores to entertain them. In this way, the village has established a complete cultural industry ecology.

#### Function distribution principle

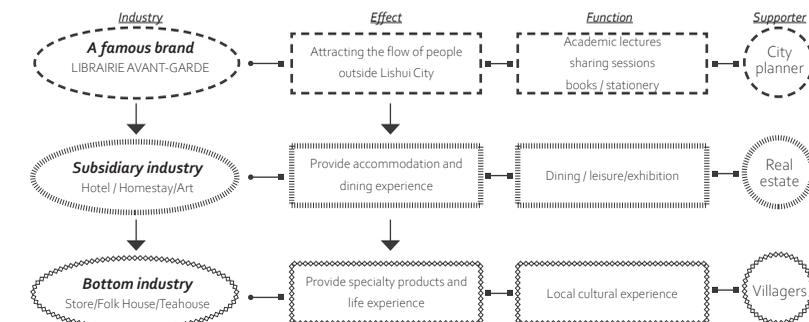
Since Pioneer LIBRAIRIE AVANT-GARDE is located in Middle Village, most of the main service functions are scattered around Middle Village and bookstores, while Front Village is mainly used for leisure functions such as hotels and homestays. The Back Village has fewer functions because it has not yet been fully developed.



#### 1 // Development context of Function



#### 2 // Village Function mode



### 3.2 // Route 道路



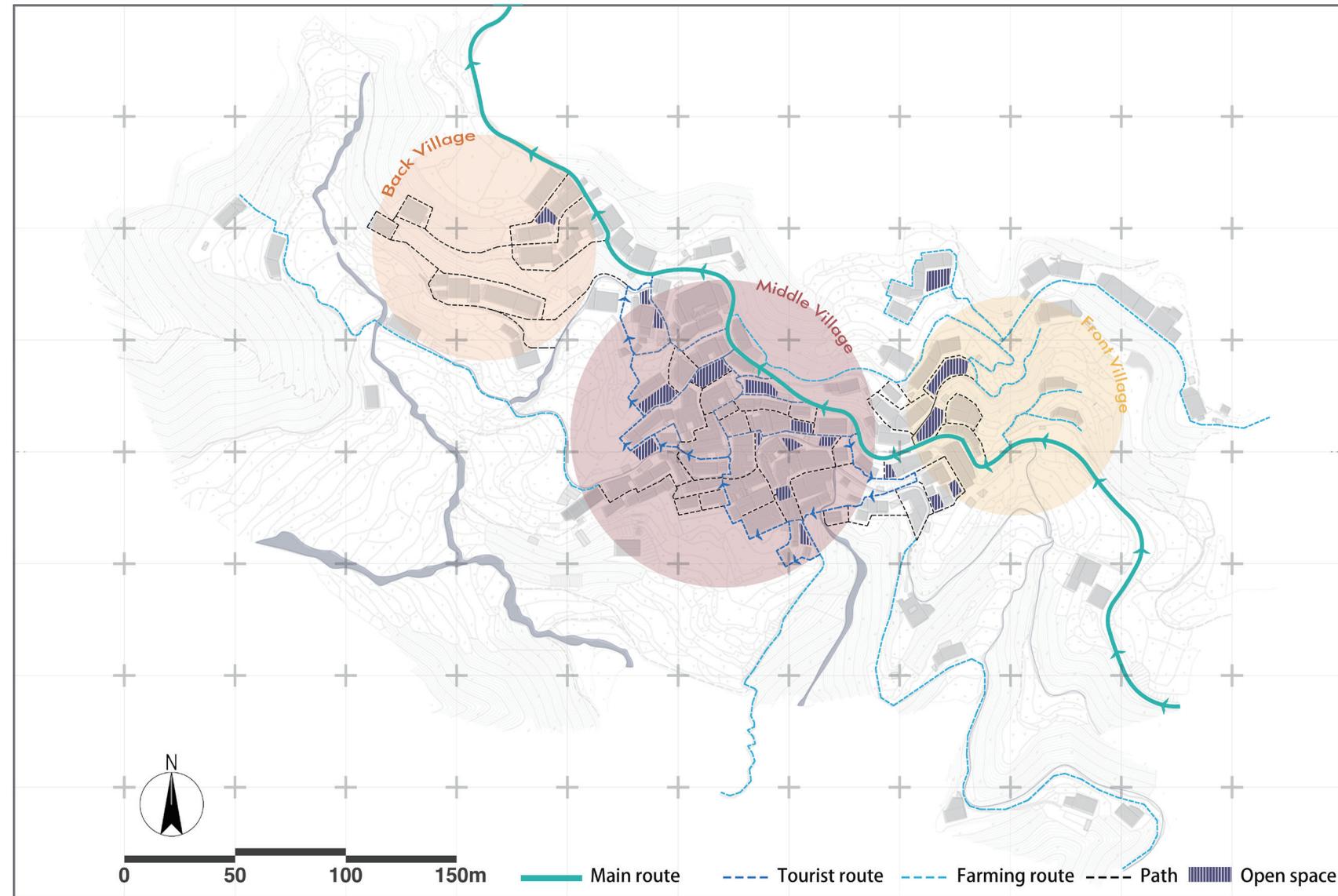
#### Village route attributes

**Main route:** Due to the characteristics of the mountain village, the main route of the village cannot be opened to traffic. But it is also the only route from the mountain village to the foot of the mountain, so it is the only way for freight and purchasing. The route is 8m wide.

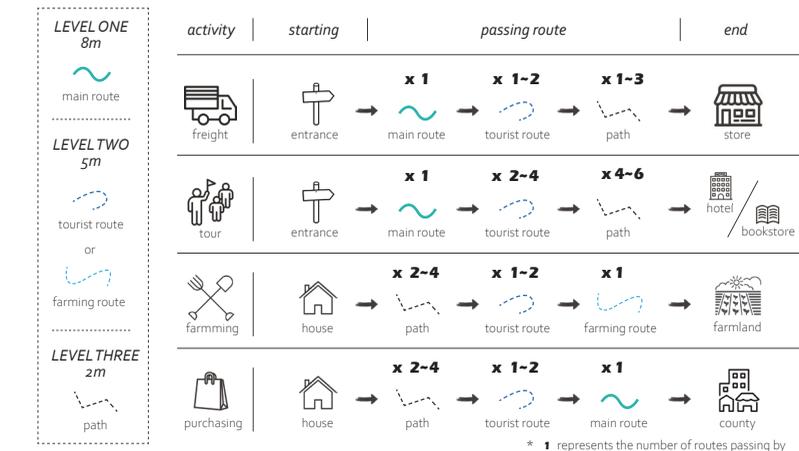
**Tourist route:** The route is concentrated in the middle of the village because most of the shops and viewing spots are there, and the tourist route is connected with many paths, so people will spend more time on it. The route is 5m wide.

**Farming route:** The road extends to farmland and mountain ridges, and is usually not connected with other routes, so the accessibility is weak and the access time is longer. The route is 5m wide.

**Path:** Distributed in the village like capillaries, connecting various roads, usually shorter in length. The route is 3m wide.

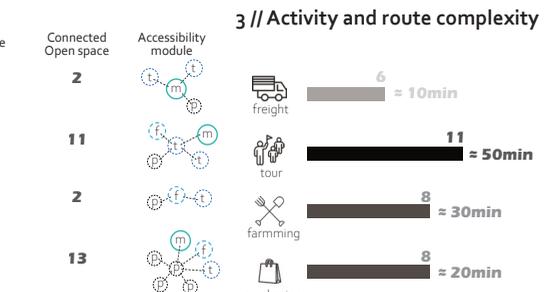


#### 1 // Route structure for different village activities

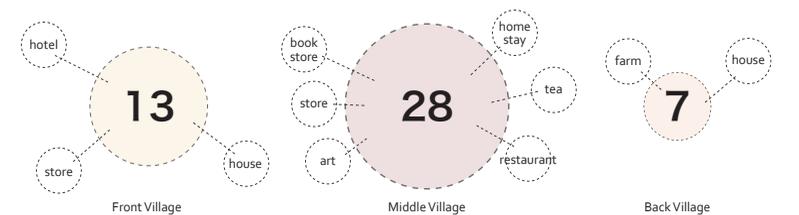


#### 2 // Accessibility

Route Type	Connected route	Connected Open space
main route	13	2
tourist route	27	11
farming route	8	2
path	35	13

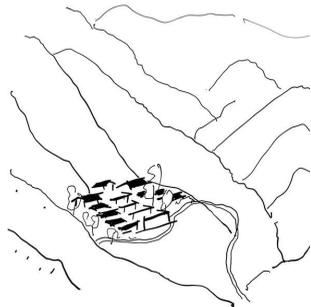


#### 4 // Route amount in three parts in the village



### 3.3 // Residential density

居住密度

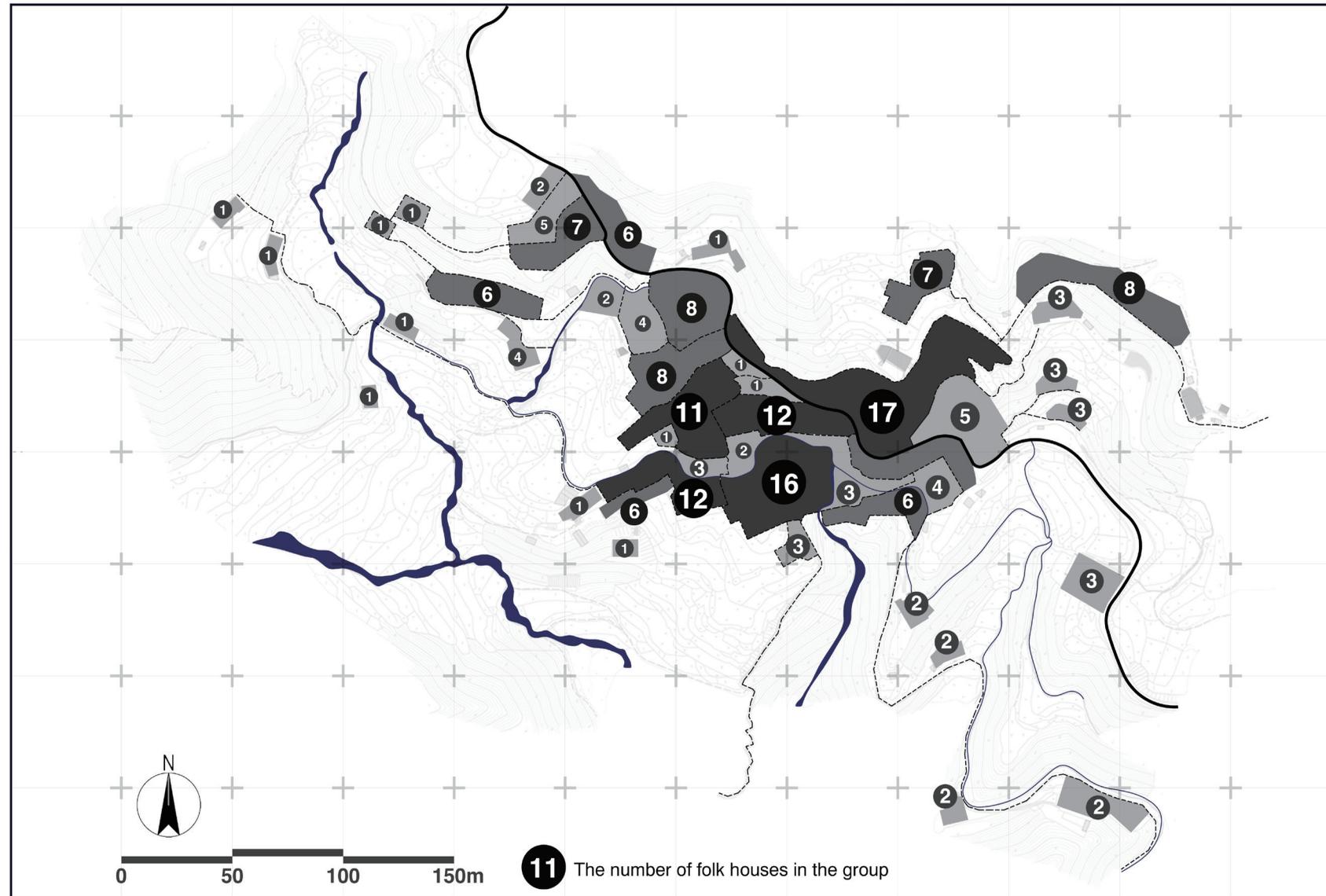


#### Mountain folk house group form

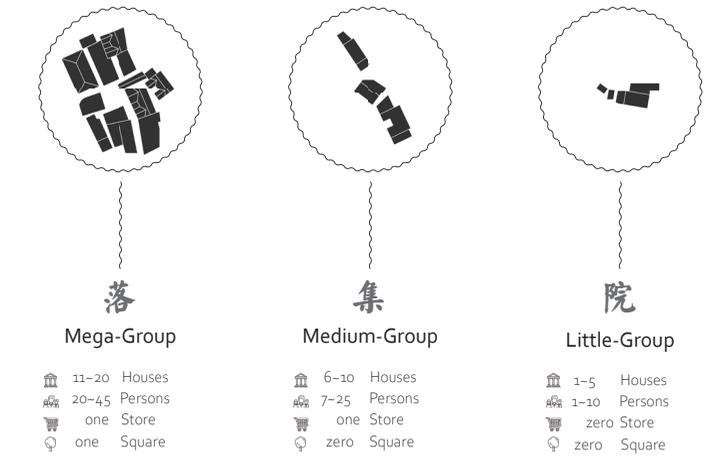
The group division of mountain folk house is mainly composed of terraces of the same elevation. The buildings of the same group are located in the terraces of the same elevation, and are also divided by creeks and roads. Scattered at the end of the road by individual relatively small groups.

The types of groups are divided into three types: large, medium and small according to the number of buildings. Large groups have comprehensive internal functions and can be self-sufficient, such as parking, small farmland, commissary, chicken coop, etc. The middle group and the small group combine with each other to achieve complementary functions.

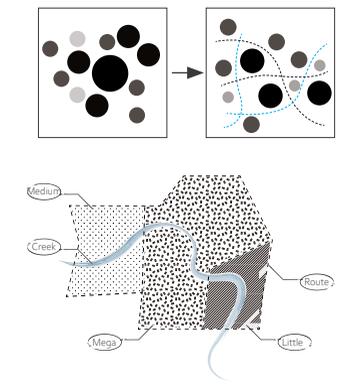
Groups and groups should be connected by roads, with high accessibility, which is convenient for villagers to switch between groups.



#### 1 // Group form

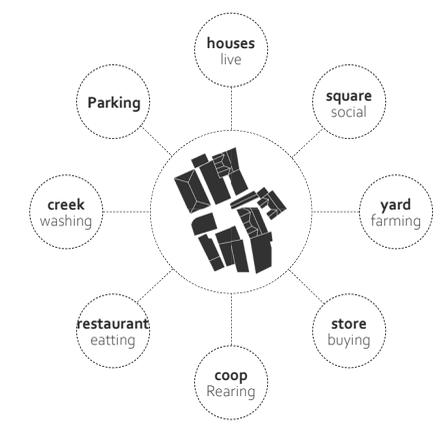


#### 2 // Group division



The group is divided by water system and road

#### 3 // Group function



### 3.4 // Clan 宗族



#### Relationship between clan and village management

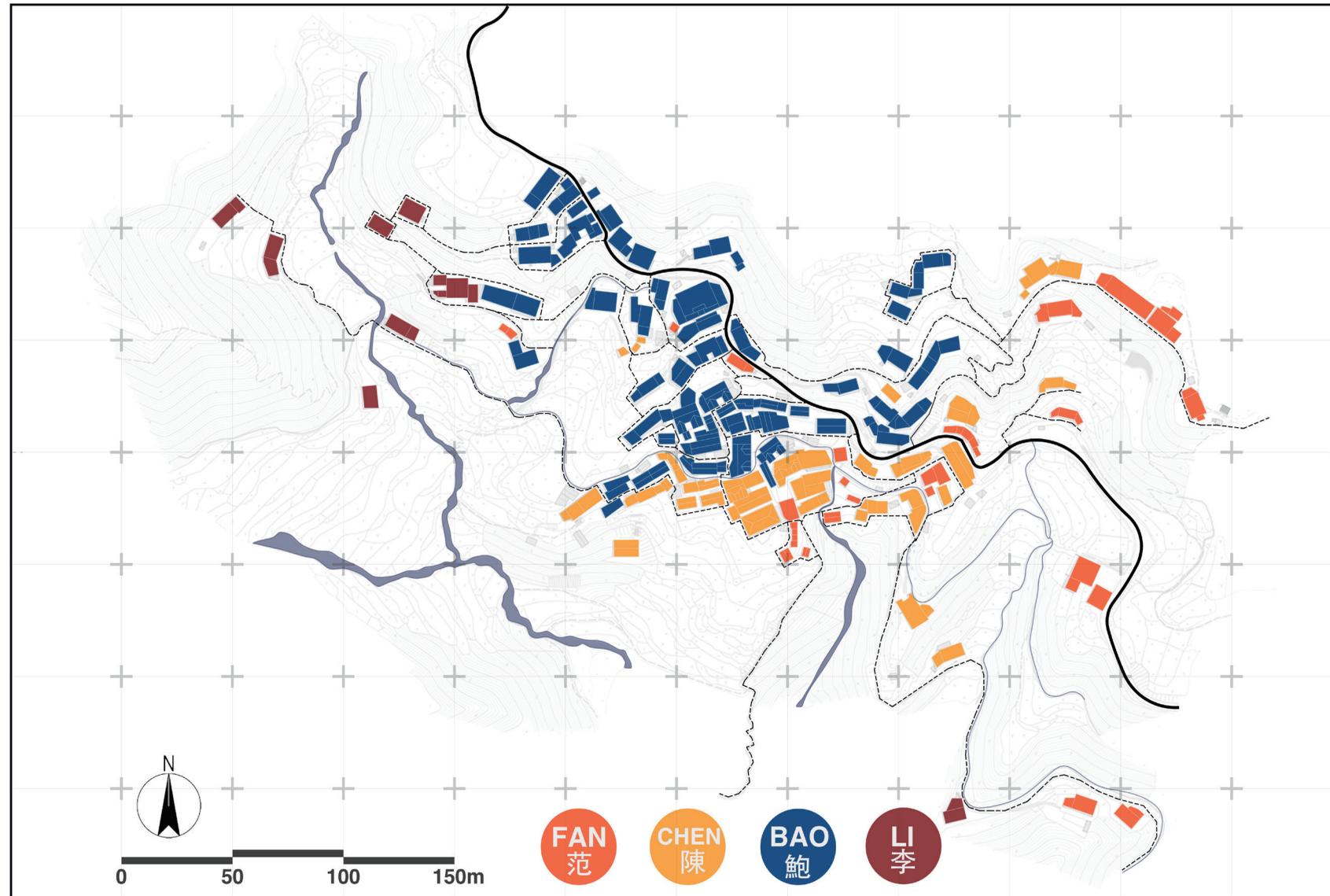
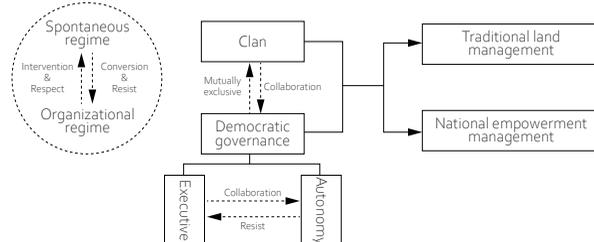
Clan is a blood relationship network that connects social groups in the state of rural natural settlements. The traditional resource allocation model formed by it is realized by constructing villagers' behavioral norms.

In addition, there is a situation that needs to be considered: when the leaders of the village committee belong to the big family of the village, they will have a great management voice in the village, and they will inevitably use the power of the clan to accelerate the implementation of land laws. After the combination of clan rights and administrative power led to the capitalization of the villages and accelerated the economic development of the villages.

An example in Chenjiapu Village is:

Party branch secretary Bao Chao-huo introduced the commercial form of LIBRAIRIE AVANT-GARDE, which opened up a new model for the development of the village: **culture + tourism**.

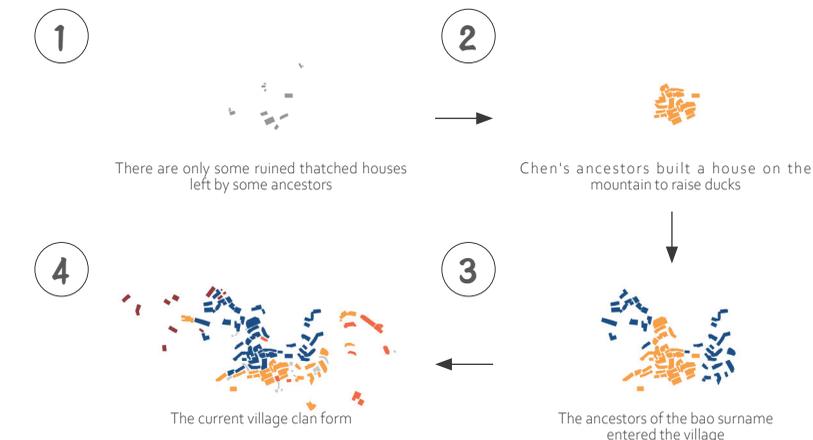
#### Clan management model



#### 1 // Clan change

- ① 1200s  
宋 SONG Dynasty  
Because the village is on the mountain, there is no human settlement, so it is difficult to build
- ② 1270s  
元 YUAN Dynasty  
The ancestors of the Chen family came to settle on the mountain because of avoiding the war, and began to build houses and raise ducks, and thrive here. So far, Chenjiapu Village was established.
- ③ 1550s  
明 MING Dynasty  
The village was founded by Bao's ancestors who bought the fields and houses owned by Chen's ancestors and added houses along the cliffs, so most of the villagers are now called Bao.
- ④ 2000s  
當 Now  
Most Bao villagers live in the center of the village, a few Chen villagers live in the south of the village, and some non-native villagers live scattered throughout the village.

#### 2 // Clan settlement changes



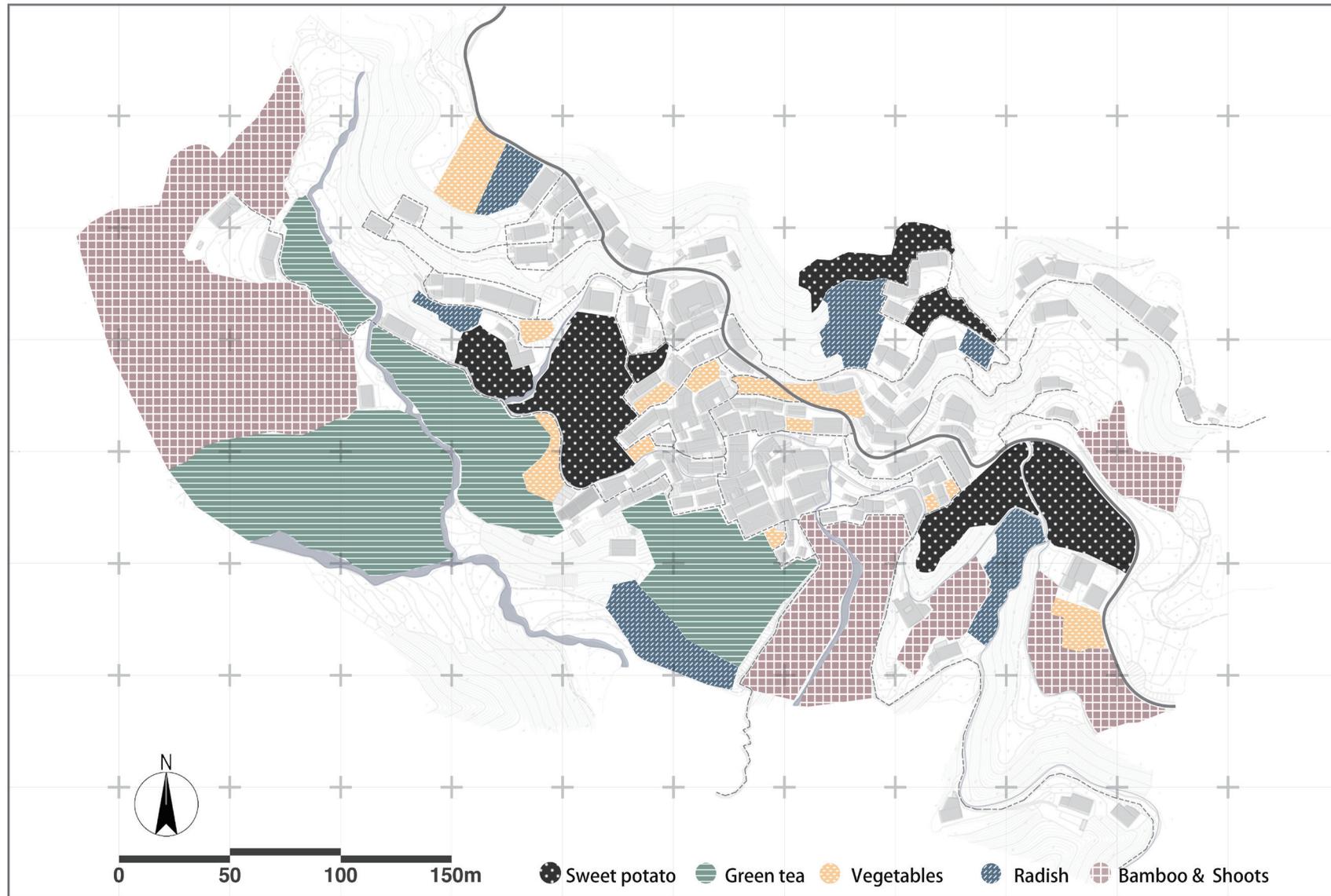
### 3.5 // Production 産物



#### Production income in the village

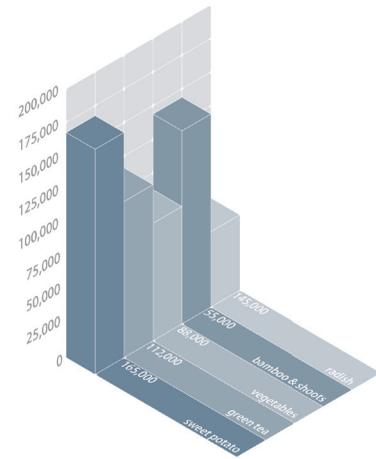
The harvest of agricultural products in Chenjiapu Village is closely related to the village economy throughout the year. Before the village attracted capital from outside the village, the village's product income was only 30,000 per year. However, after the entire village became popular on the Internet, by selling local specialties to tourists or selling them in online stores, the income of the entire village's products increased to 500,000, with an annual growth rate of about 5%.

In the future, the village's product strategy will be more refined, integrating the village's specialty products into various industries (hotels, homestays, teahouses, bookstores, etc.) to further promote the village's product income, which will be used for village development.



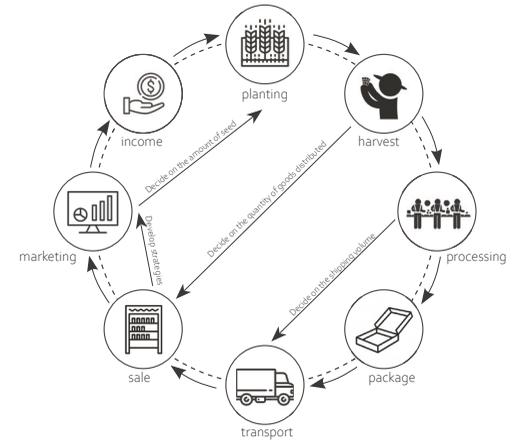
#### 1 // Product production data

- Sweet potato is the main product of Chenjiapu Village, and it often grows in the backyard and nearby areas.
- Green tea is often harvested in spring, mainly planted on slopes with large height differences.
- Vegetables are mainly green vegetables and cabbage, which are grown in small farmland in the village, so the output is small and suitable for the self-sufficiency of the villagers.
- Bamboo and shoots grow in spring and winter. The main planting area is on the hillside of the remote village. They are the main products sold to tourists.
- The growing season of radish is in winter, and the planting area in the village is small, mainly on the flat farmland in the remote village.

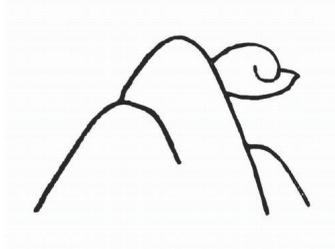


The export value of each product in Chenjiapu Village in 2020 (Unit: CNY)

#### 2 // Production circulation



### 3.6 // Orography 山體



#### The architectural form of Chenjiapu Village is on the mountain

The height difference of the entire Chenjiapu Village is about 150m. Because of the need to adapt to the hillside, many architectural forms have been produced.

**Platform:** It is the most widely used construction strategy for the village to adapt to the mountain. The complex slope land is piled with bricks and rammed earth into a platform on which the villagers can build houses.

**Stair:** Suitable for building farm houses at the end of the road and on uneven slopes. Villagers reach the room through the steps.

**Railing:** It belongs to a variation of the platform type. The lower platform is a colonnade, through which people can pass.

**Span:** A part of the house spans to the upper platform, and the spanned part is a colonnade, through which people can pass.

**Double-platform:** The house spans two platforms, and there are entrances and exits on both platforms.

**Triple-platform:** When the area of the house is large, the house will span a three-story platform, and the house may have three entrances and exits.

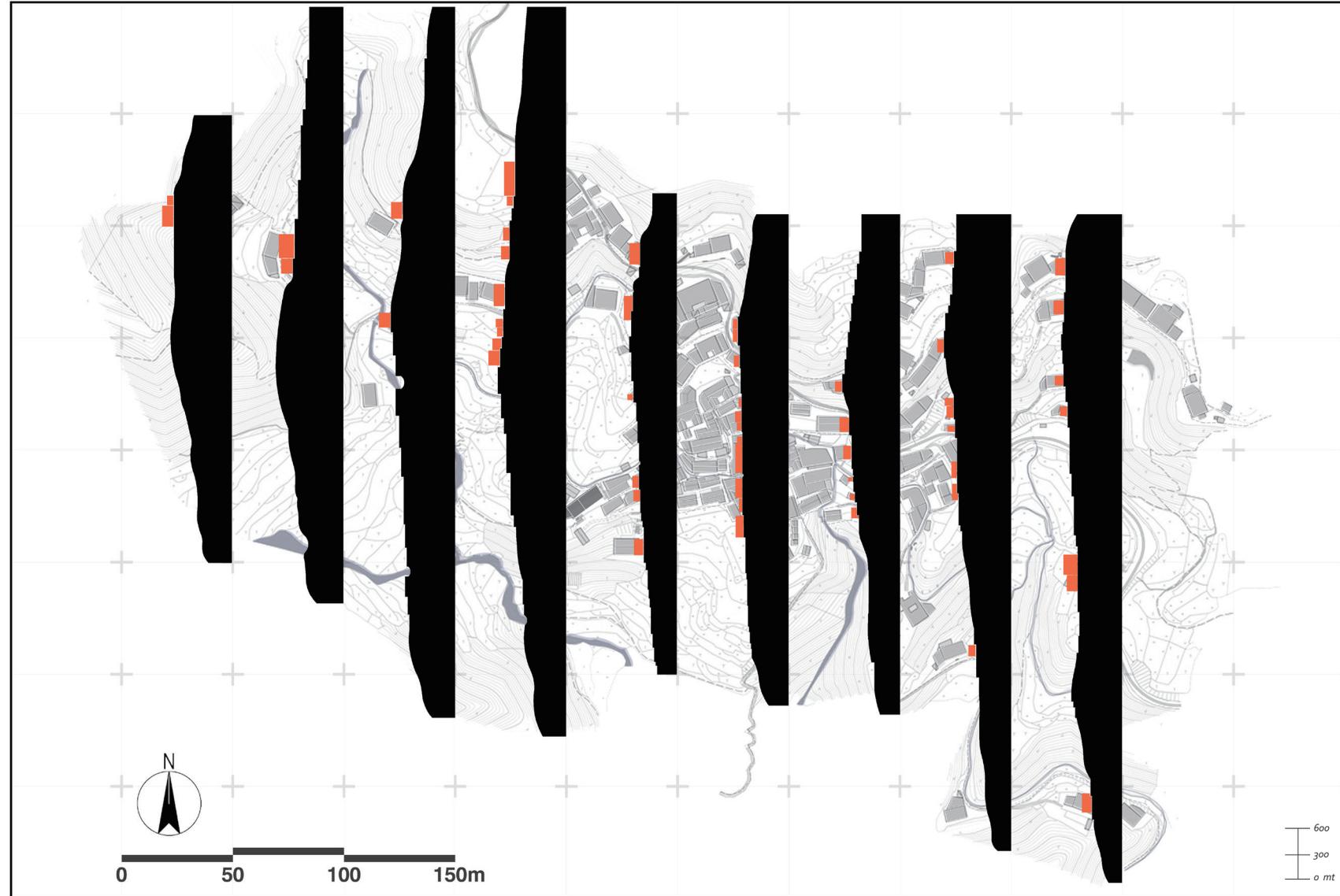
There are several types of building combinations in the village

**Same level:** The houses are all built on the same platform, usually with clan members or close relations, which is convenient for communication.

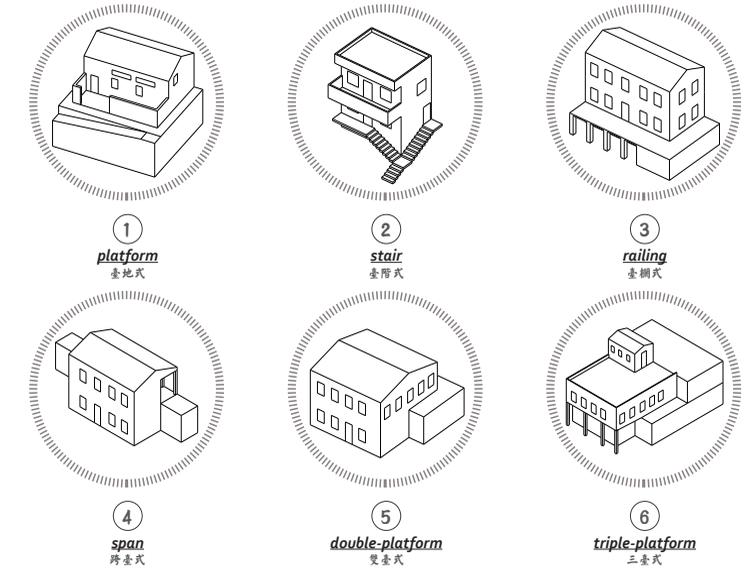
**Mixed level:** The combination method of multiple houses at different heights has the advantage that the village has a good look and feel and is scattered.

**Jointed platform:** Multiple different platforms are connected by roads, increasing the accessibility of the village.

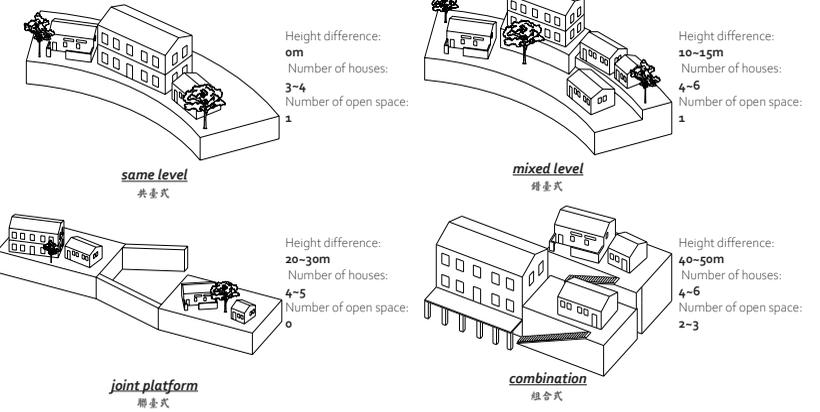
**Combination:** A construction method used to deal with complex terrain is to use steps to connect the platforms, which can achieve large height difference construction in a small space

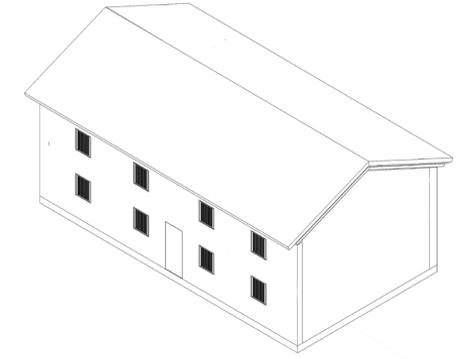
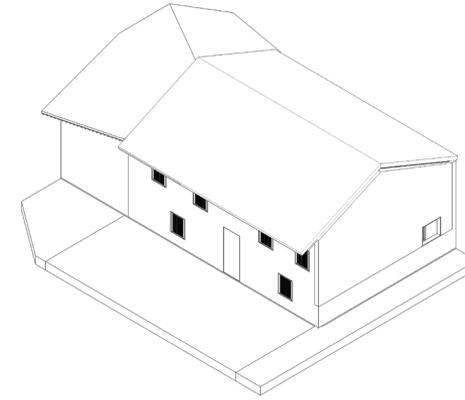
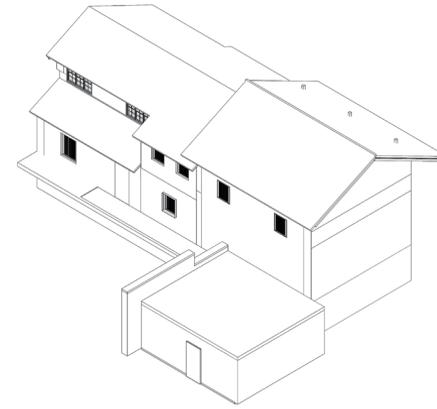


#### 1 // Hillside house form



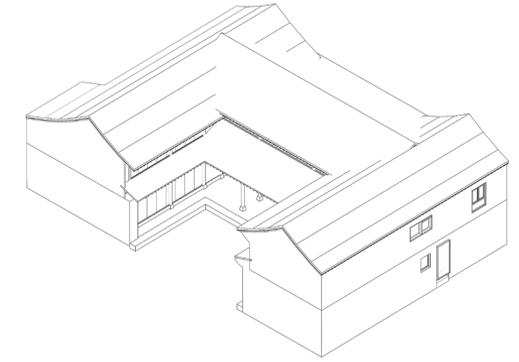
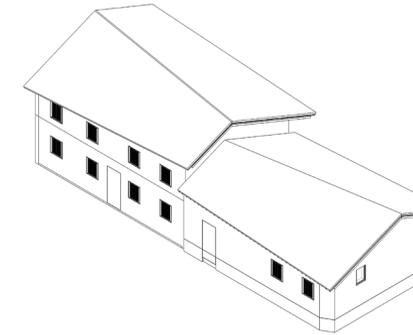
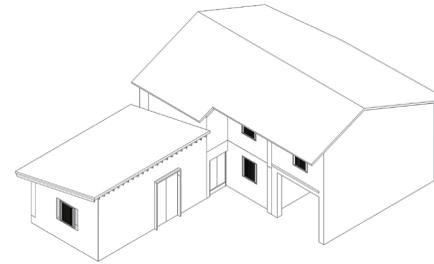
#### 2 // Combination form





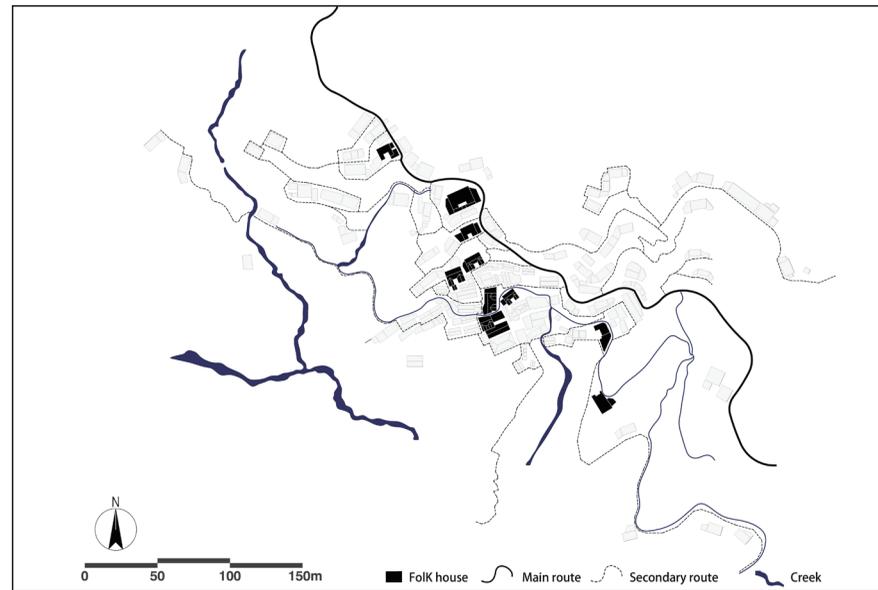
### Architectural features

The general layout of Chenjiapu residences is single, each unit is compactly arranged and there are few courtyards to adapt to the local topography. The gates of residences are mostly open on the road, facing the main building and hall, and two-story buildings are often built. The double slope of the roof reduces rain erosion.



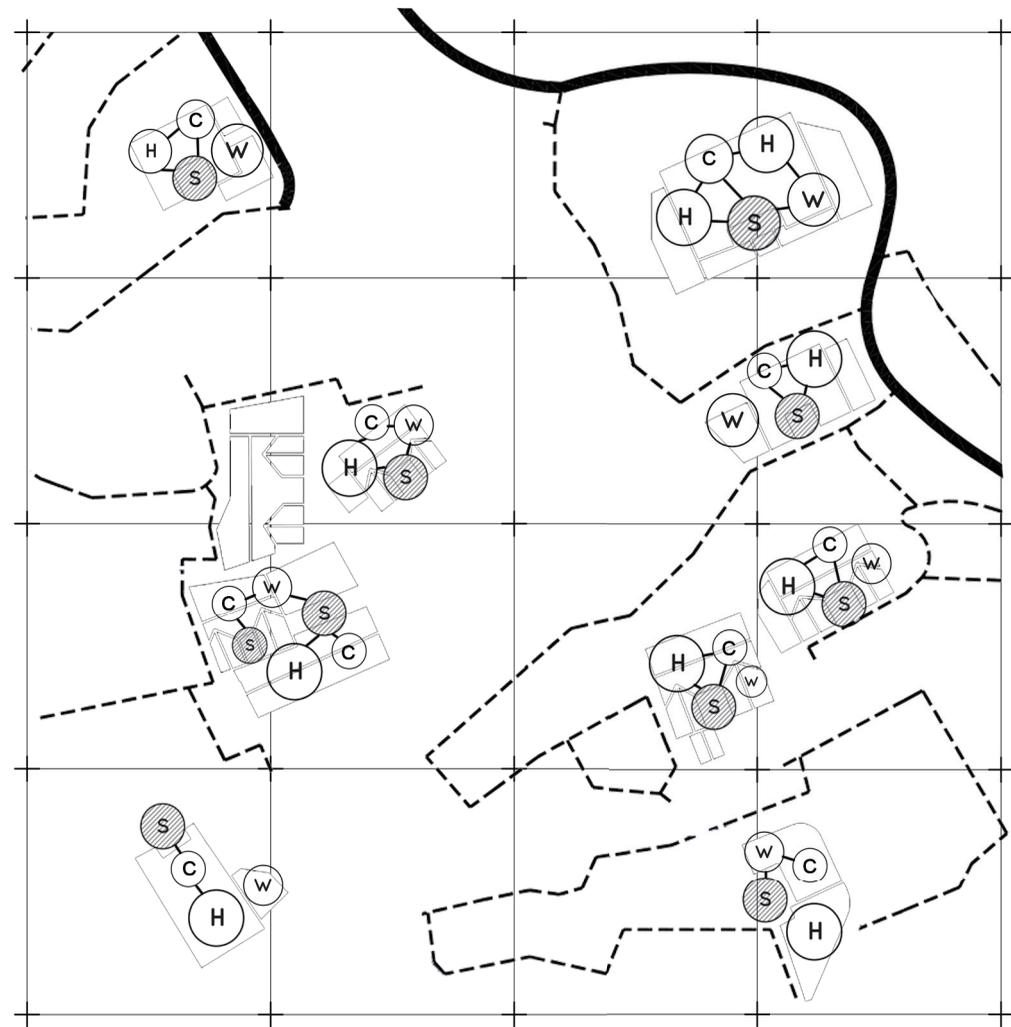
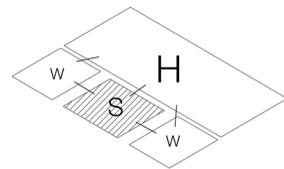
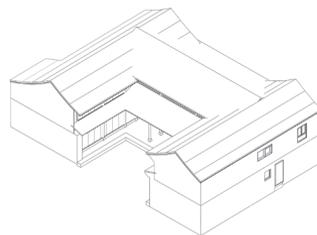
# House

## 3.7 // Space 空間



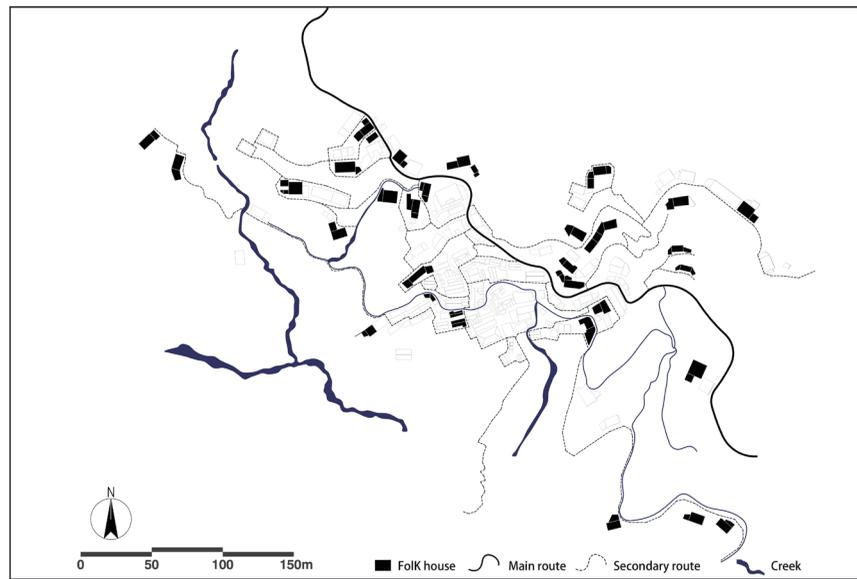
- Relations
- H** House
- W** Ware house
- C** Communication space
- S** Lobby space

### Inner siege



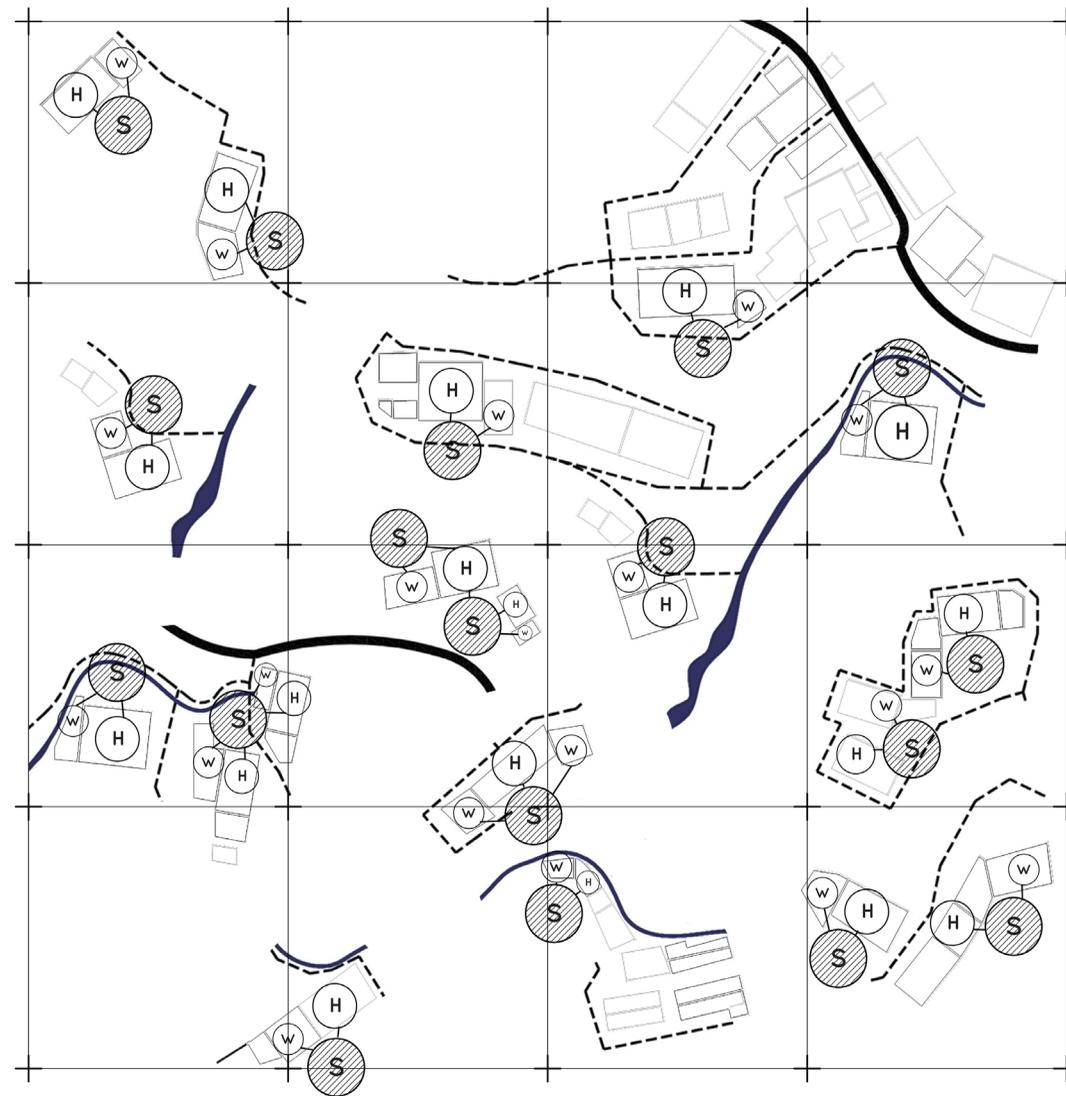
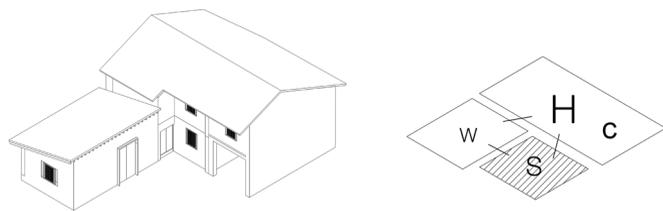
# House

## 3.7 // Space 空間



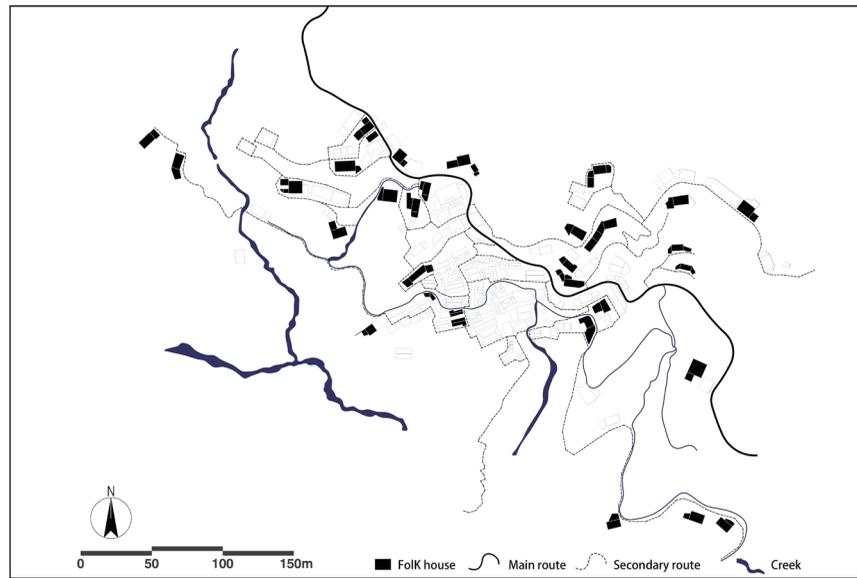
- Relations
- H** House
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### Sorrounded



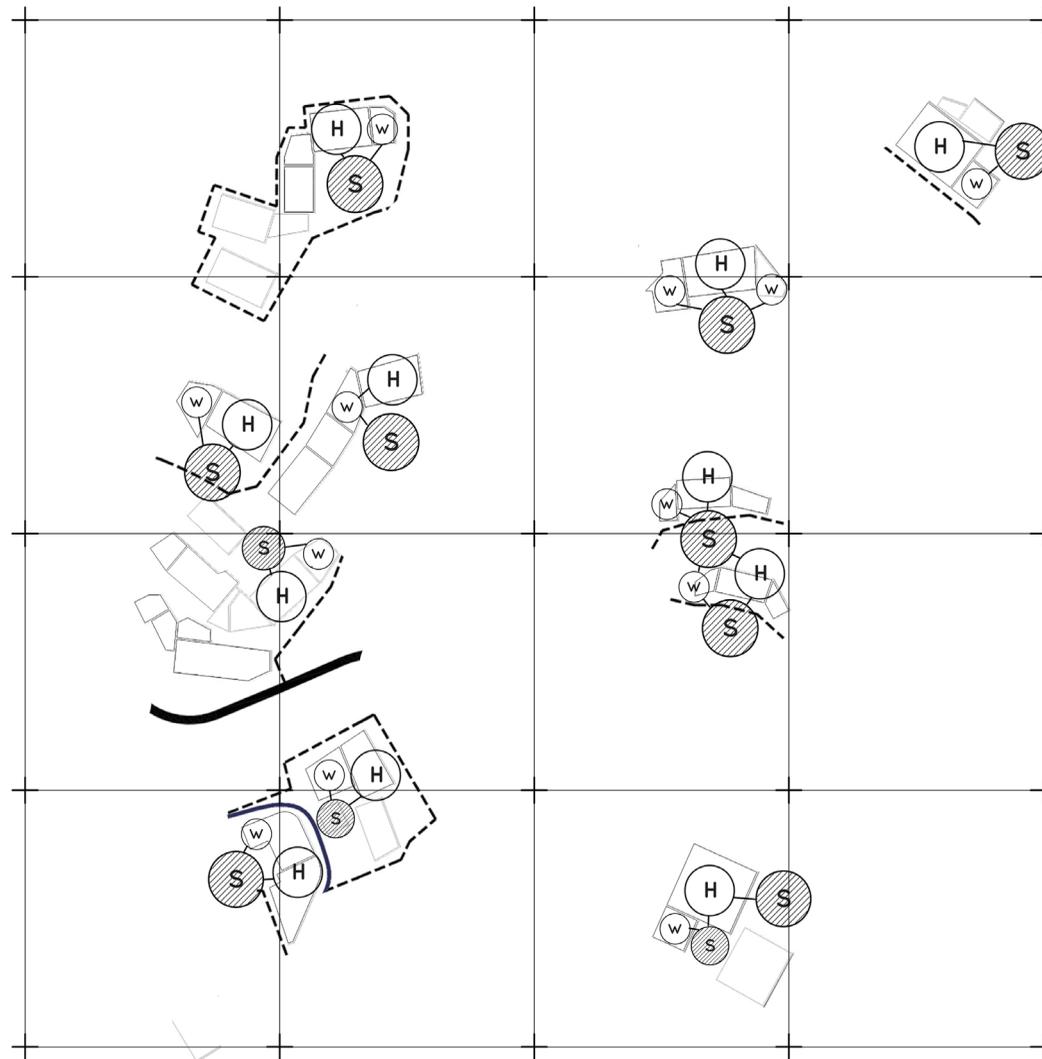
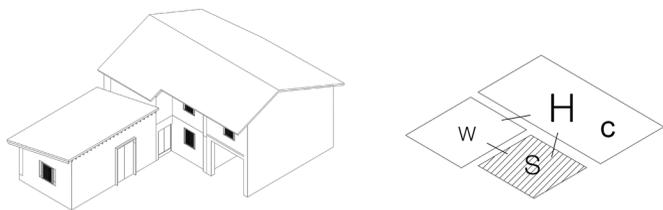
# House

## 3.7 // Space 空間



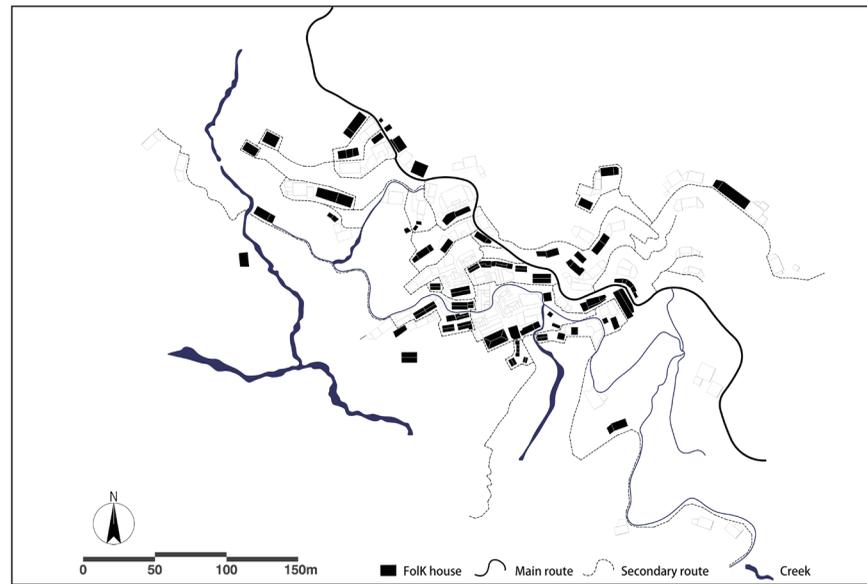
- Relations
- (H) House
- (W) Ware house
- (C) Communication space
- (S) Lobby space

### Sorrounded



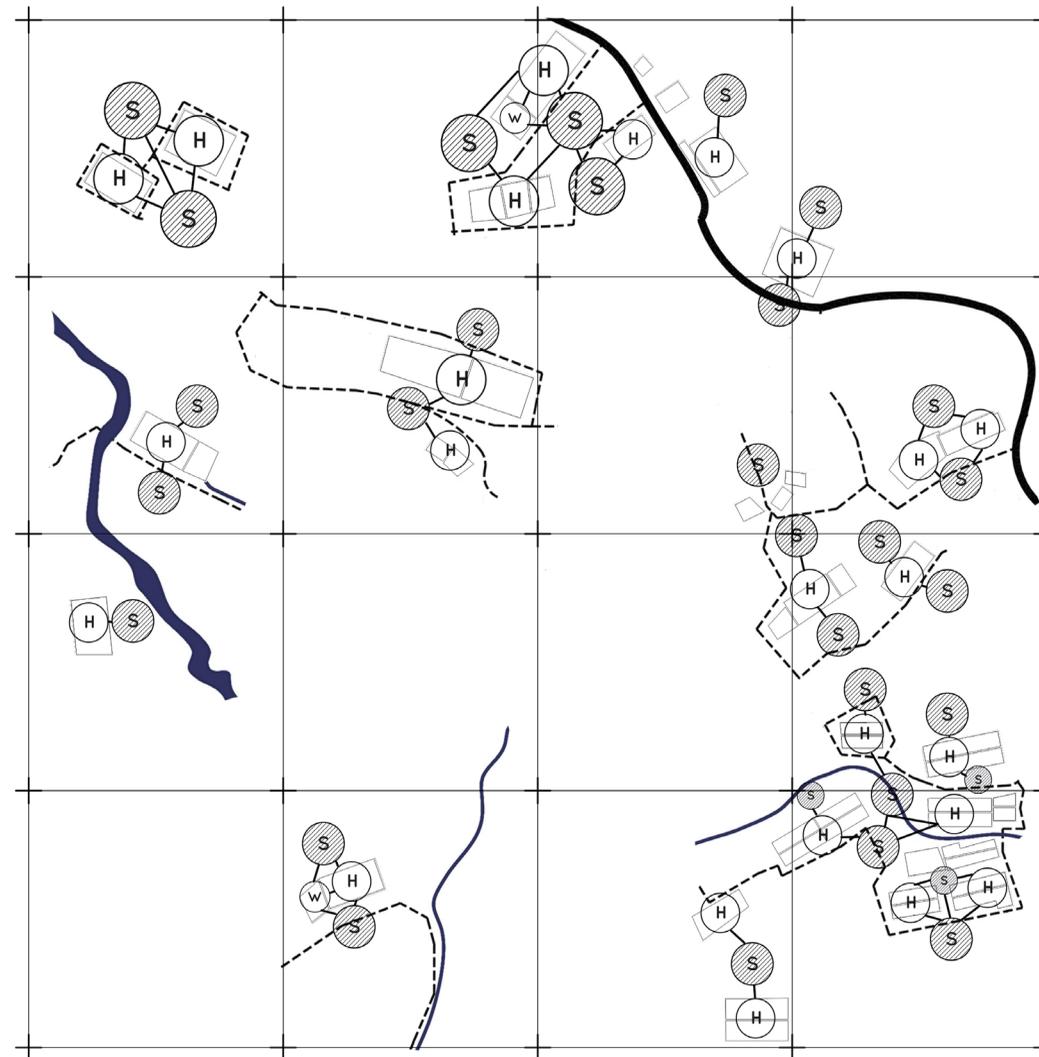
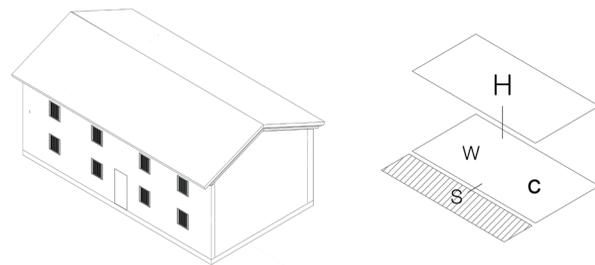
# House

## 3.7 // Space 空間



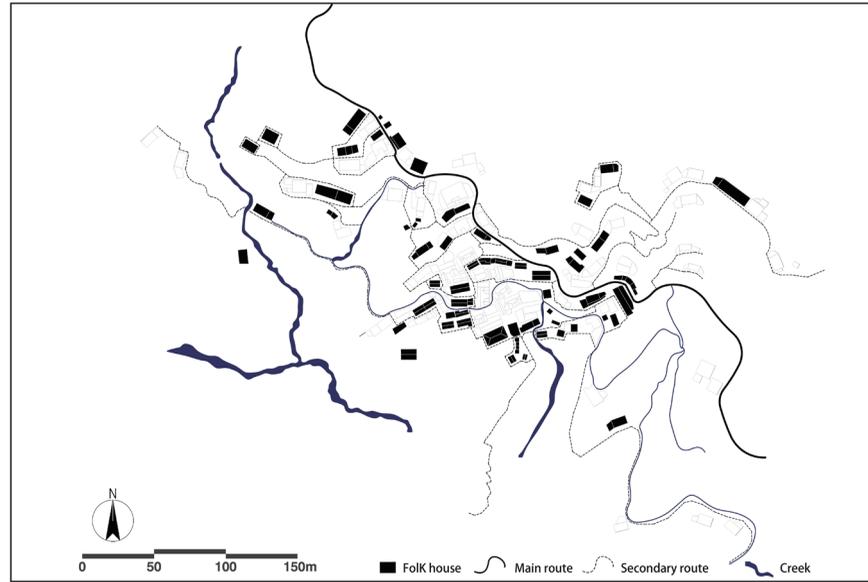
- Relations
- (H) House
- (W) Ware house
- (C) Communication space
- (S) Lobby space

### Front



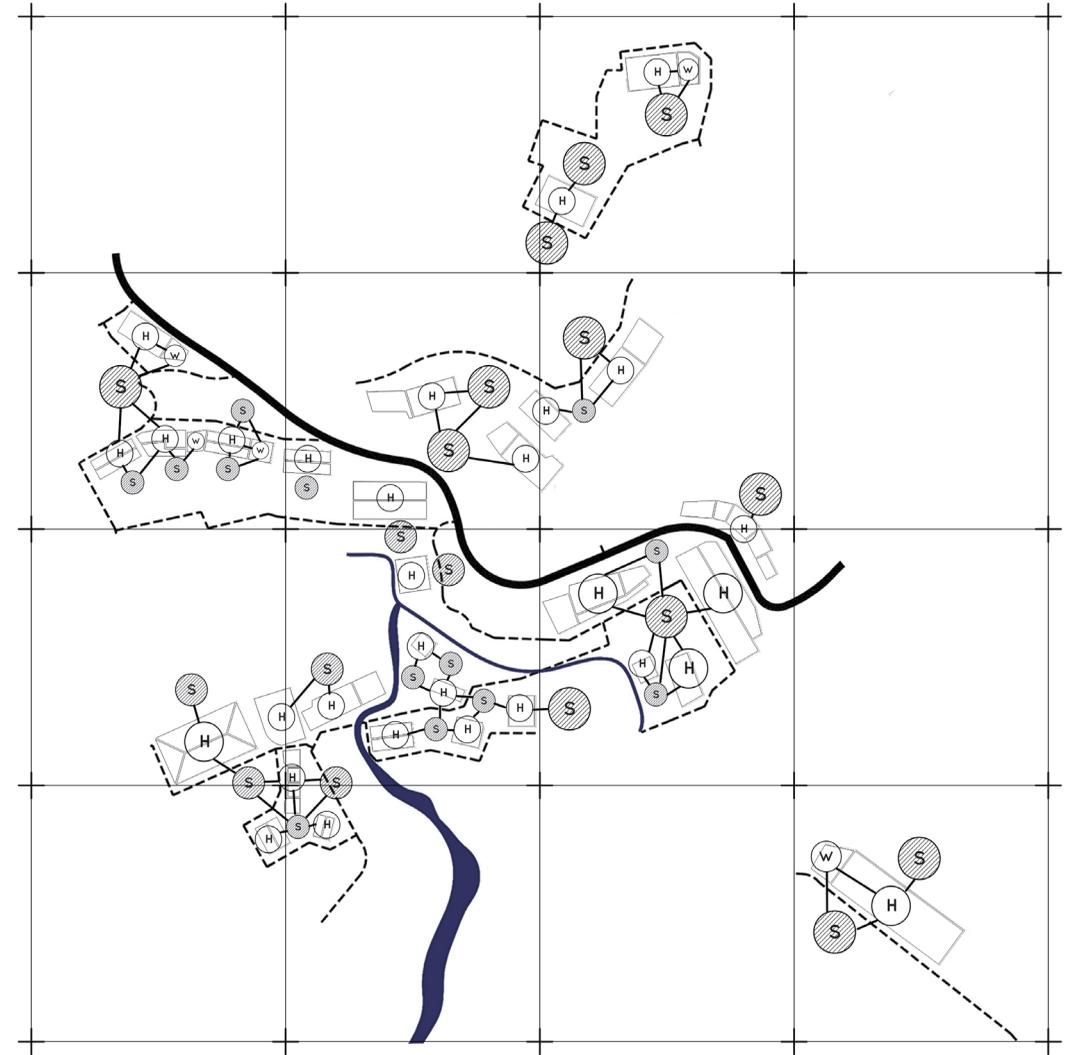
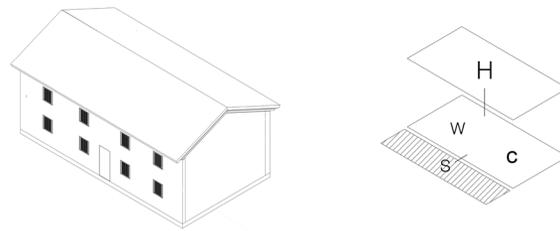
# House

## 3.7 // Space 空間



- Relations
- (H) House
- (W) Ware house
- (C) Communication space
- (S) Lobby space

### Front

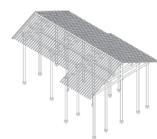


3.8 // Material  
House  
材料



The mountain dwellings of Chenjiapu are surrounded by rammed earth on three sides, one side is close to the rubble retaining wall, and the internal roof truss is traditional wooden structure.

Type 1



**Framework**

Wear bucket wooden frame



**Roof**

Small blue tile roof



**Wall**

Rammed earth wall



**Doors and windows**

Wooden grille, stone gate

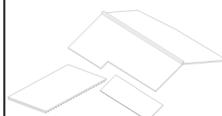


Type 2



**Framework**

Wear bucket wooden frame



**Roof**

Small blue tile roof



**Wall**

Rammed earth wall



**Doors and windows**

Wooden grille, stone gate

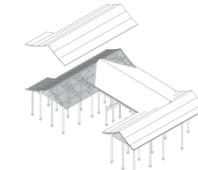


Type 3



**Framework**

Wear bucket wooden frame



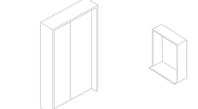
**Roof**

Small blue tile roof



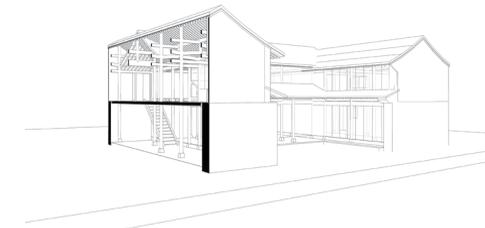
**Wall**

Rammed earth wall



**Doors and windows**

Wooden grille, stone gate



# 4 // Research in Baiyan

## Mapping

- 4.1 Function
- 4.2 Public Space



### High standard of living village in Lishui

Baiyan Village is located on the banks of the Oujiang River, 6.5km from the downtown area of Lishui. Baiyan Village is a highly modern village with well-planned functions, clean and sanitary. There is only one main road in the village, but many small branch roads connect this main road.

The buildings in the village are different from chengjiapu village. Most of the village dwellings were newly built in the past 30 years and did not retain the original architectural form. Most of the village dwellings are square-shaped, with ceramic tiles affixed inside, and very modern plastic-steel windows. The lighting conditions in the houses are not excellent, often dim and damp.



# 4.1 // Function

功能

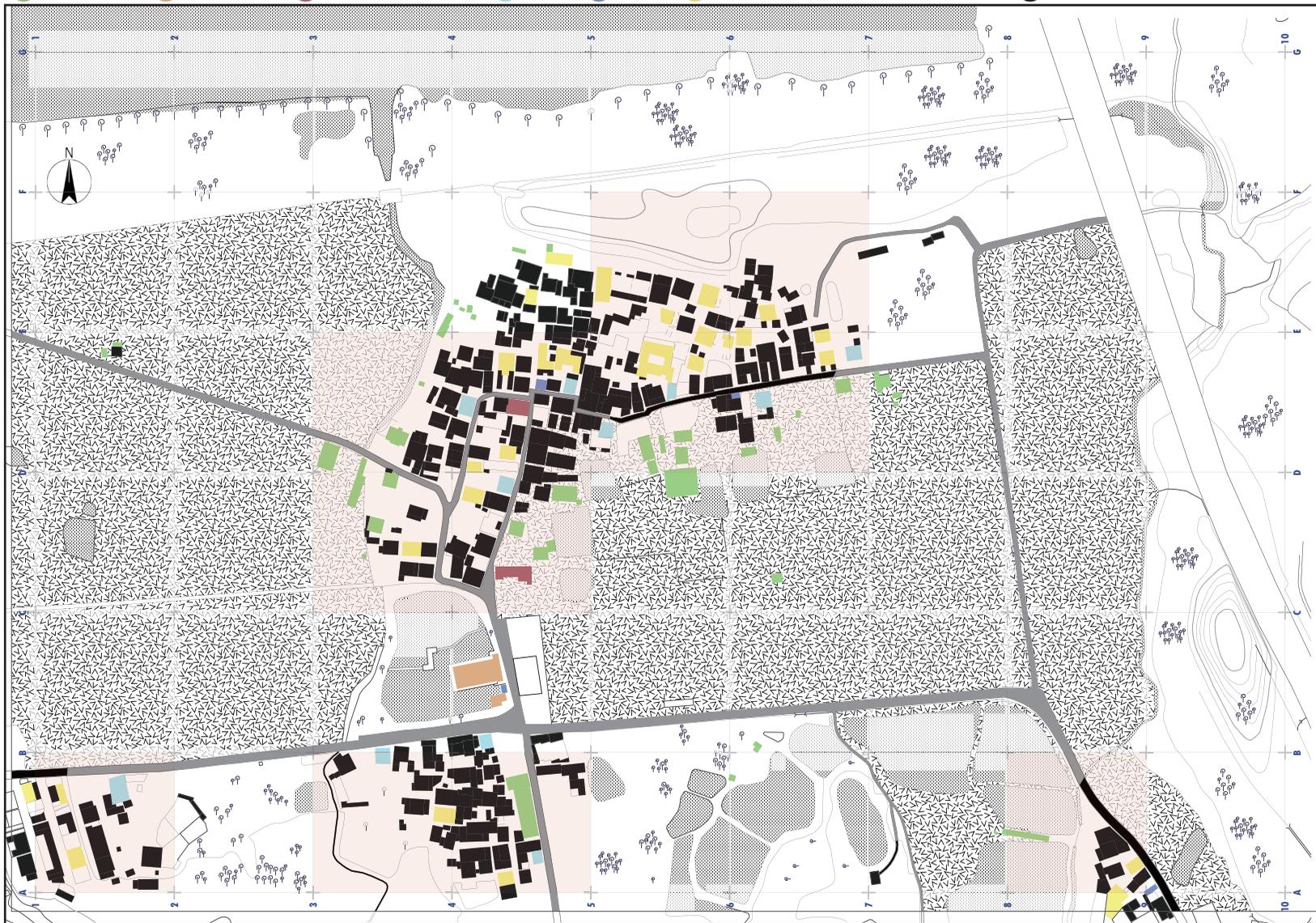


## Modern village template

Most villages in Lishui seem to use Baiyan Village as a development template. They share design plans, facade materials, and even the construction team may come from the same team. Gradually all villages have become the same, but Baiyan Village stands out because of its developed water system, perfect livelihood functions and some surviving old buildings. platforms, which can achieve large height difference construction in a small space.

The livelihood functions of Baiyan Village are very complete. The kindergartens, clinics, and village halls in the village are all concentrated near the village committee. This is a very good model that makes the main functions of the village connected.

● Farm House ● Village Hall ● Community Center ● Store ● Toilet ● Traditional house/Dilapidated house ● New House



# 1 // The status of the old house and the interference



**facade**  
The condition of the façade is good, the stone wall is kept intact, but the original construction of doors and windows has been lost. The building is currently in an uninhabited state and is classified as a "dangerous building" by the professional architecture organization.



**tiles**  
The original terracotta tiles were lost due to heavy rain and snow disasters. In order to prevent further damage inside the building, the building conservation organization repaired the original tiles with modern terracotta tiles in 2019.



**structure**  
The original wooden structure of the building is basically well preserved, but due to disrepair and local humid weather, mold and termites have severely eroded the interior of the wood, resulting in a serious decrease in the rigidity of the wood and the possibility of breakage at any time



**stair**  
Nearly 50% of the internal stairs of the building were damaged, and the wood was severely eroded, making it almost impossible to reach the second floor through the stairs.



**internals**  
The internal components of the building are very intact. The carvings on the beams, the ancestral tablet and the wooden niches are all very important and exquisite decorations, which also reflect the huge wealth of the original owner to support such exquisite interior decoration.

## Completeness

Facade

70%

Structure

60%

Stair

30%

Tiles

10%

Internals

80%

## Repair strategy

Reinstallation of doors and windows

Replace with steel structure

Original wood replacement

Replace with new fired clay tiles

Cleaning and waxing

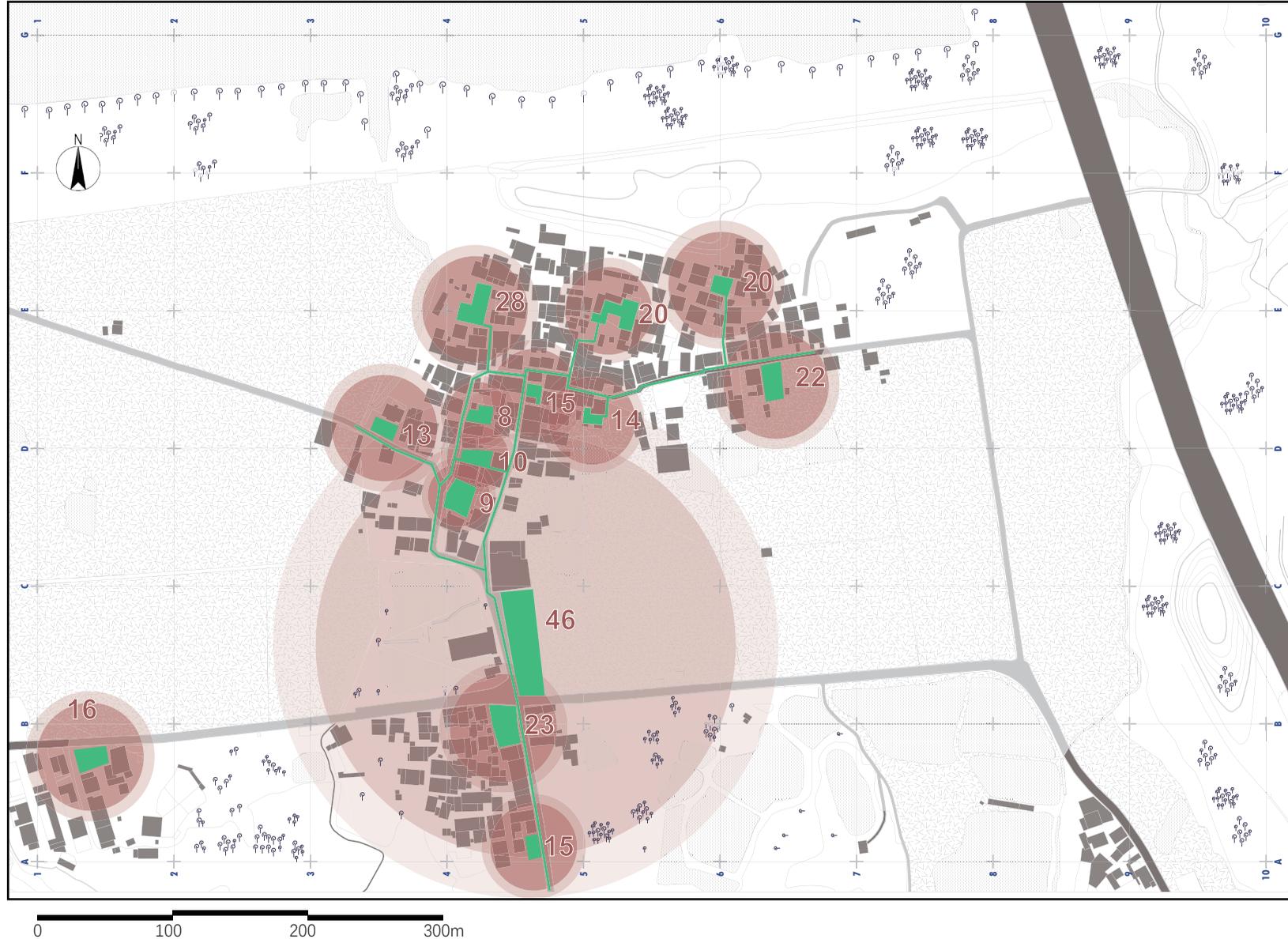
## 4.2 // Public Space 公共空間



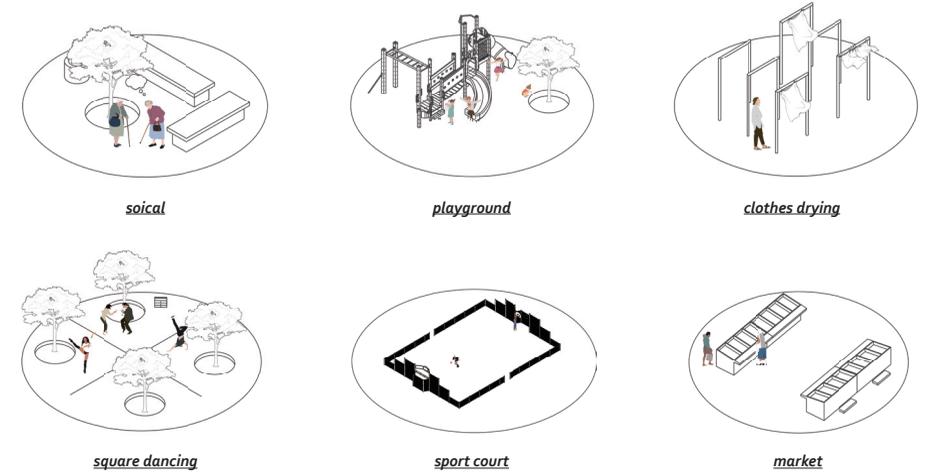
### The relationship between villagers and public space

In the settlement relationship of Baiyan Village, the public space is regarded as the connection between the villagers and the village. All public activities can take place in public spaces. The old people sit in the shade of the trees to communicate, the children play in the playground, and the young people dance and exercise. People of all ages can find their own way of life in public spaces. This constitutes a reasonable circulation system for a village.

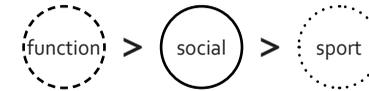
● Public Space — Connecting roads ● Service Area 15 Number of households served



### 1 // Villagers demand



### Spatial tendency



### Age tendency



### 2 // Landmark



Old Tree Plaza

The entrance to the village is a big banyan tree that is five hundred years old.

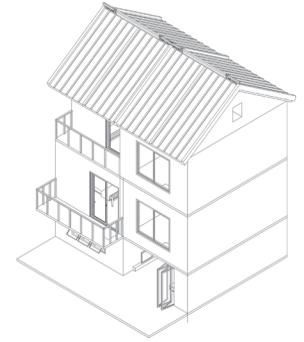
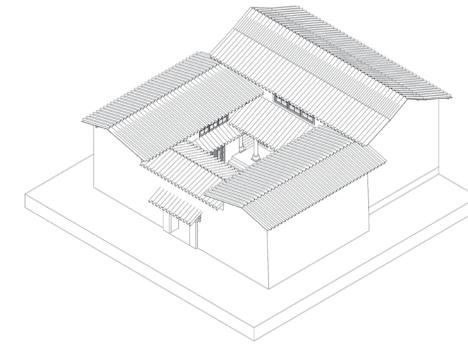
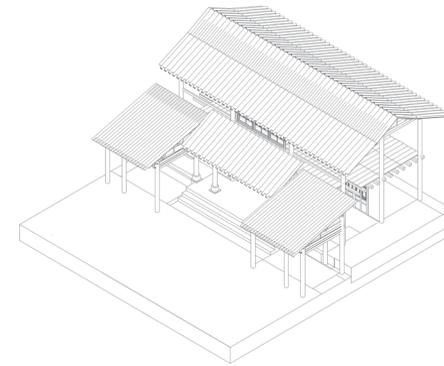
Because it has existed for too long, the villagers trimmed a park around it and believed that the old tree was a god enshrined it.



Village Hall

The villager's auditorium is not a common public facility in ordinary villages.

The main function of the auditorium is festival celebrations, village elections, movie reflections, etc., which greatly enriches the villagers' free time



### Architectural features

The overall layout of the houses in Baiyan Village is complex. Most of the old buildings are demolished and new buildings are built on the spot. The layout of each unit is compact, there are few courtyards, and the functions are similar to the building facade. The gates of the residential buildings are mostly open on the road, facing the main building and the lobby, and three more buildings are built. The double slope of the roof reduces rain erosion.

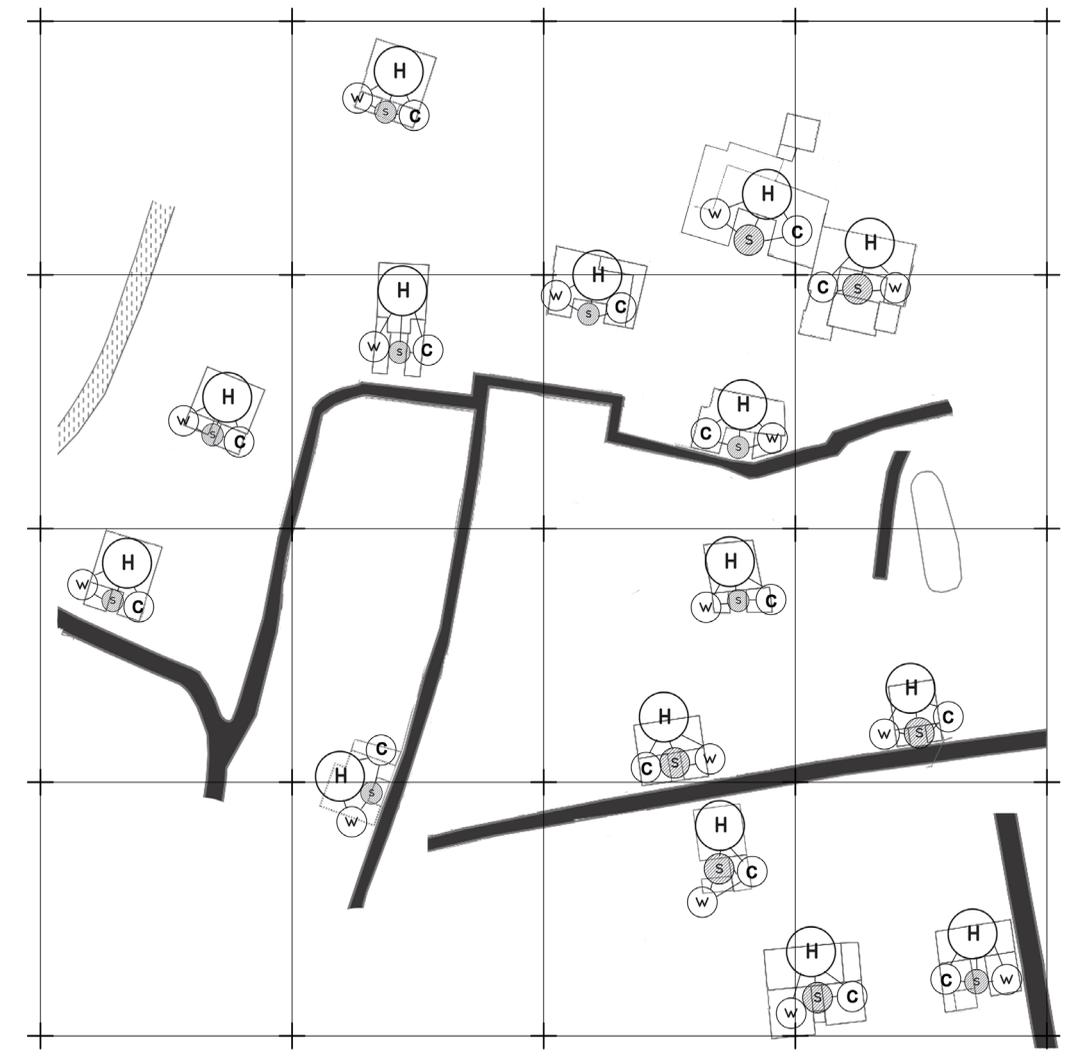
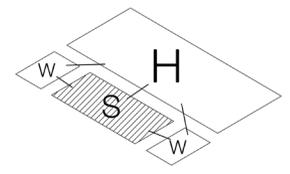
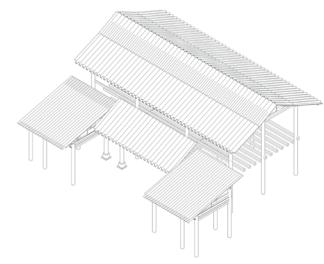
# House

## 4.3 // Space 空間



- Relations
- H** House
- W** Ware house
- C** Communication space
- S** Lobby space

Front



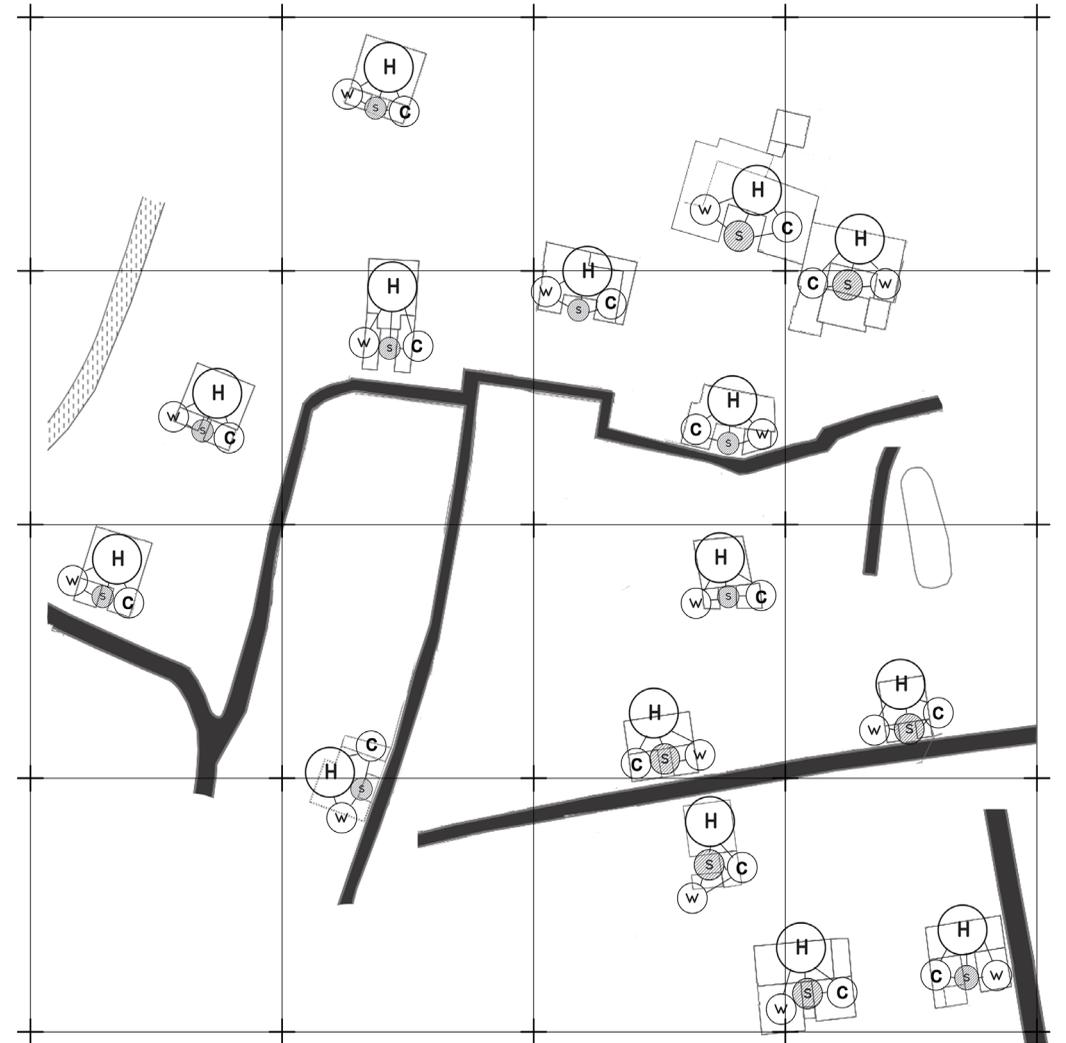
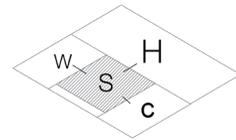
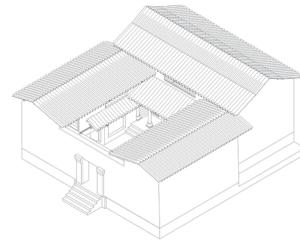
# House

## 4.3 // Space 空間



- Relations
- H** House
- W** Ware house
- C** Communication space
- S** Lobby space

### Inner siege



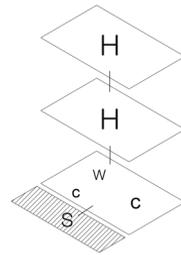
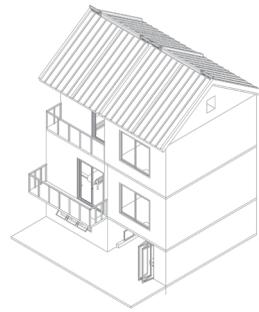
# House

## 4.3 // Space 空間



- Relations
- H** House
- W** Ware house
- C** Communication space
- S** Lobby space

### Front



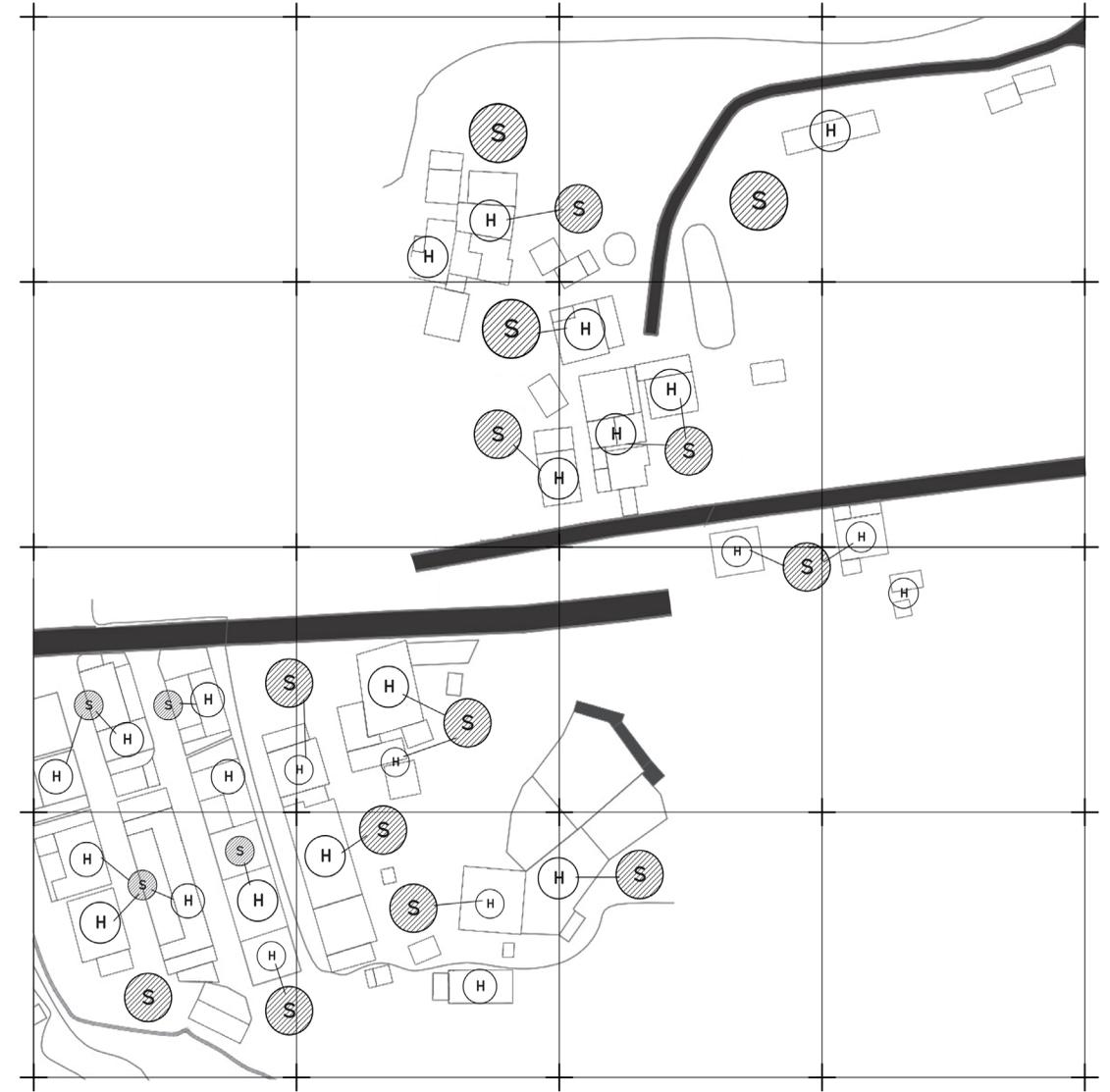
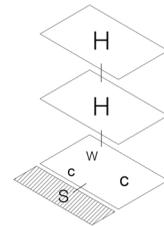
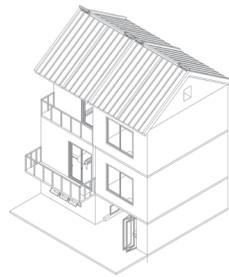
# House

## 4.3 // Space 空間



- Relations
- (H) House
- (W) Ware house
- (C) Communication space
- (S) Lobby space

### Front

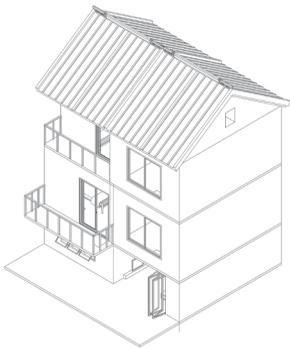


# House

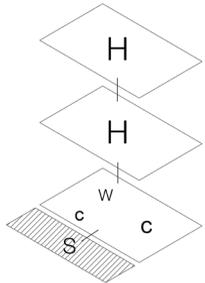
## 4.3 // Space 空間



- Relations
- (H) House
- (W) Ware house
- (C) Communication space
- (S) Lobby space



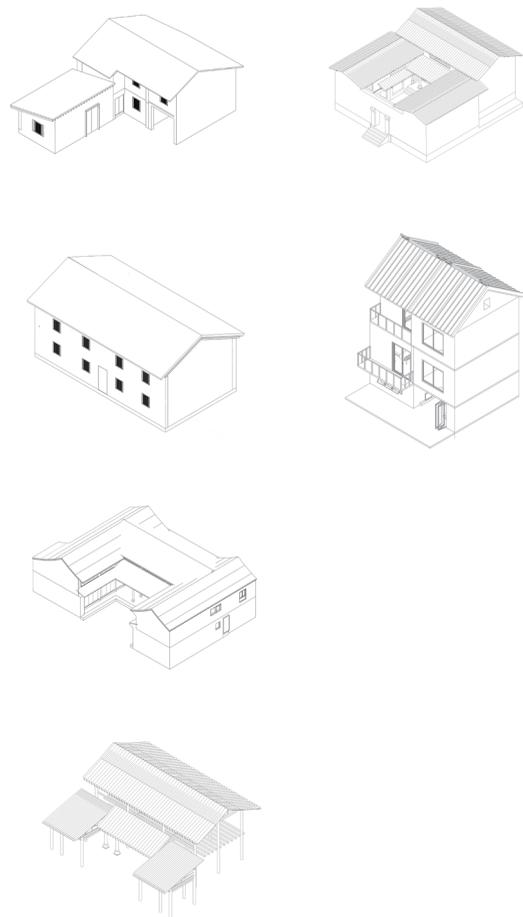
Front



## House

### 4.3 // Space 空間

As shown, the house in the village is composed of multiple parts, forming an inner courtyard or courtyard. This organization relies on physical proximity to connect its spaces to each other. This village is composed of different volume combinations, unified by the expansion space between them. Due to the common production quality of the area, these villages present quite similar aspects, especially in terms of the relationship between space and volume. Domains and clusters consist of different layouts of the main house, warehouses and interconnected spaces between them. The form of the cluster is visually ordered into a coherent, non-hierarchical organization, not only through their proximity to each other, but also through the similarity of their visual attributes, they can also be organized around an entry point or along the movement path of the building. Considering their flexibility, the cluster organization of the form can be organized in the following way: they can be attached to a larger parent form or space as an attachment. They can be connected individually through proximity, expressing and expressing their volume as a single entity, but in the same plot. They can lock their rolls to each other and merge into a single form with different sides.

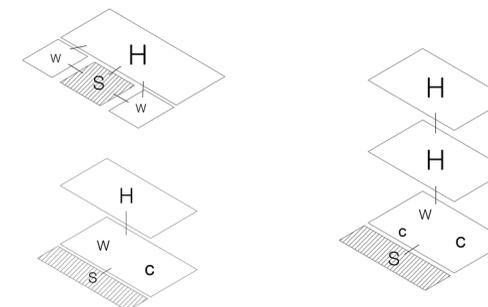


**A.** Place an intermediate area in front of the cluster, the space configuration between the volume and the entrance of the package. It mostly appeared in earlier times or in Songyang County

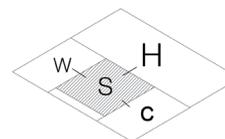
**B.** The internal spaces are mainly private spaces with a certain degree of privacy, and they are connected to the space around them. It exists in abundance in the village. It is the most ideal residence for the locals.

**C.** Intermediate spaces are not located at precise and determined locations: they fill the area between the volumes around them. It exists in abundance in the village. The first main reason is their demand for storage, and there is a dedicated space for their daily needs.

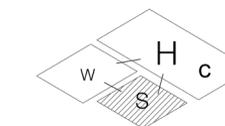
#### Front



#### Inner siege



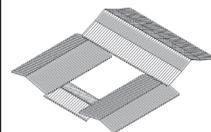
#### Sorrounded



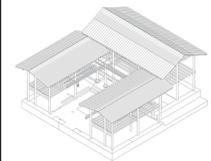


The walls of the houses are relatively high, and the walls are relatively thin, which is conducive to ventilation and heat dissipation. The outer walls use thin empty bucket walls or woven bamboo plaster walls. The bottom of the wall is often laid with rubble, and the indoor floor is also covered with slate to prevent moisture. The interior of the hall is freely separated by traditional covers, wooden high fans, and screen doors according to the different purposes of use.

Type 1

**Roof**

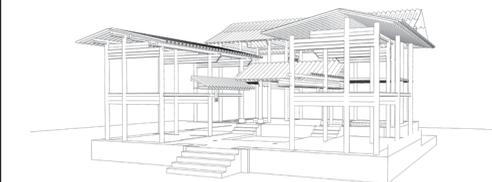
Small blue tile roof

**Framework**

Wear bucket wooden frame

**Wall**Bamboo plastered wall,  
stone wall**Doors and windows**

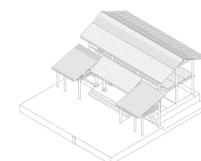
Wooden grille, stone gate



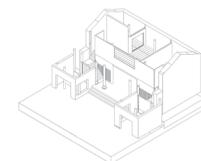
Type 2

**Roof**

Small blue tile roof

**Framework**

Wear bucket wooden frame

**Wall**Bamboo plastered wall,  
stone wall**Doors and windows**

Wooden grille, stone gate



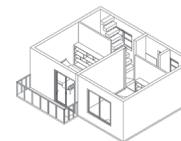
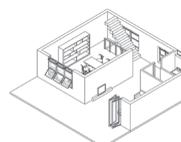
Type 3

**Roof**

Sheet metal

**Framework**

Stone, concrete

**Wall**Bamboo plastered wall,  
stone concrete**Doors and windows**

Alloy, glass



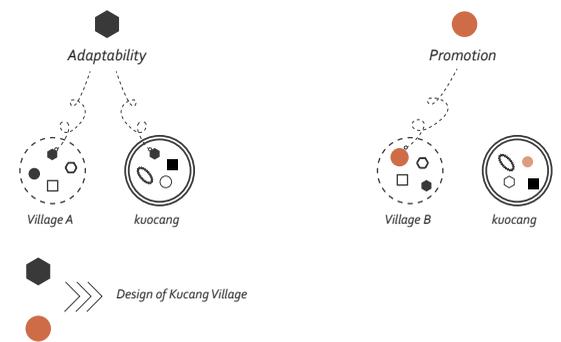
# 5 // Common Characteristic Consideration

## Comparison of the three villages

After completing the investigations in Chenjiapu Village and Baiyan Village, we will focus on our design site-Kuocang Village. The intent of the analysis is to try to find the "Adaptability" and "Promotion" of the village from a macro perspective, and then use the expansion village as an experimental site to realize the new model of Lishui village.

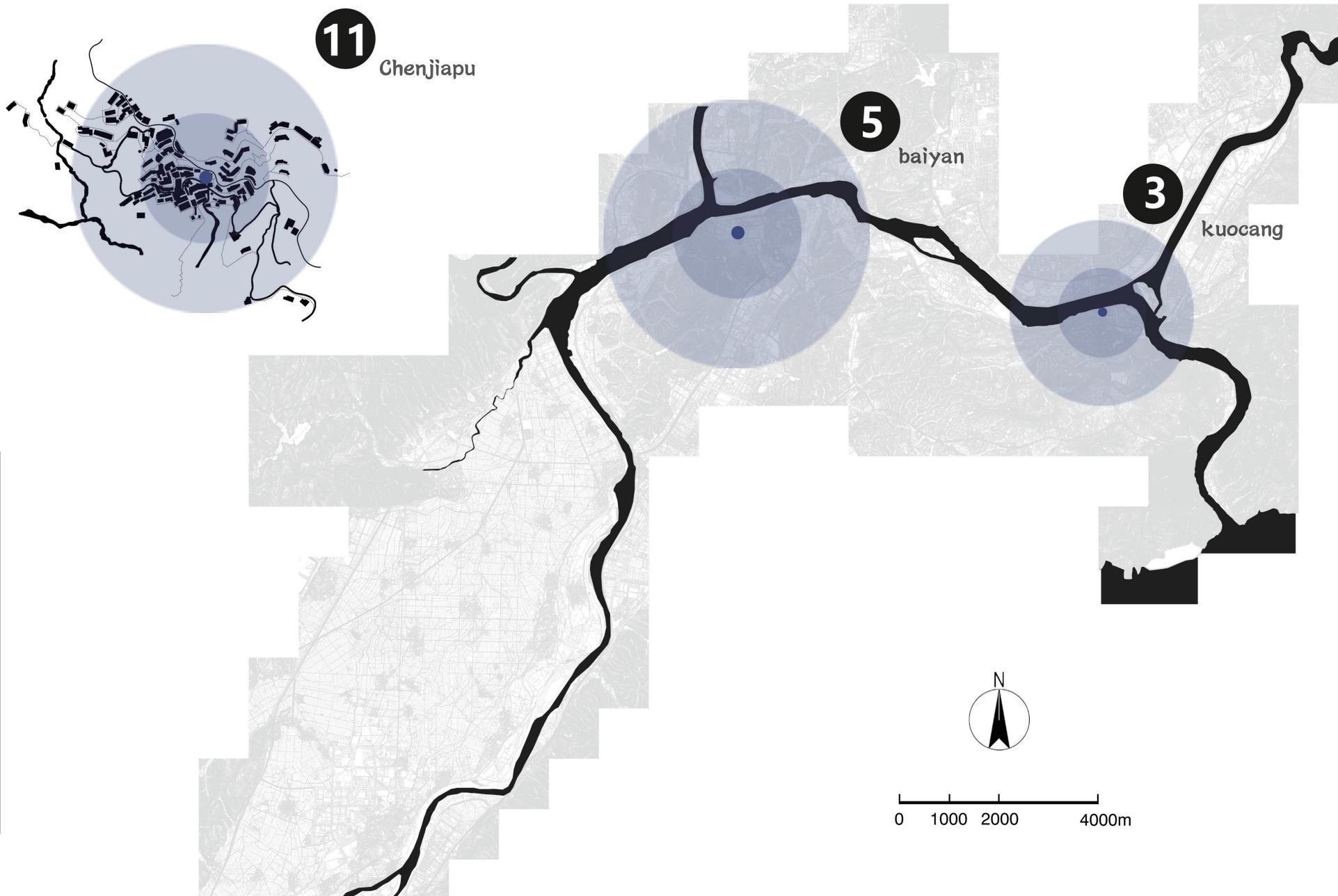
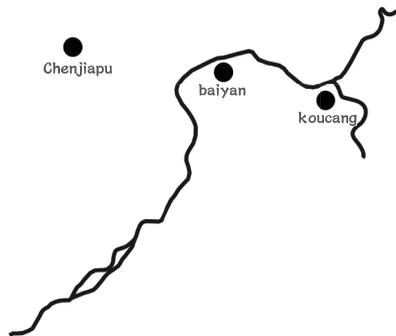
**Adaptability:**It is a common design that exists between villages and is in line with the function or democratic system required by the village. It can be applied in most villages in Lishui.

**"Promotion":**It is the advanced development model or building module of other villages, which can be used as a basis for the transformation and construction of other villages.



## ANALYSIS

- 5.1 Comparative analysis
- 5.2 Conclusion



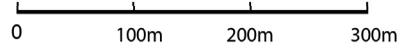
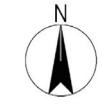
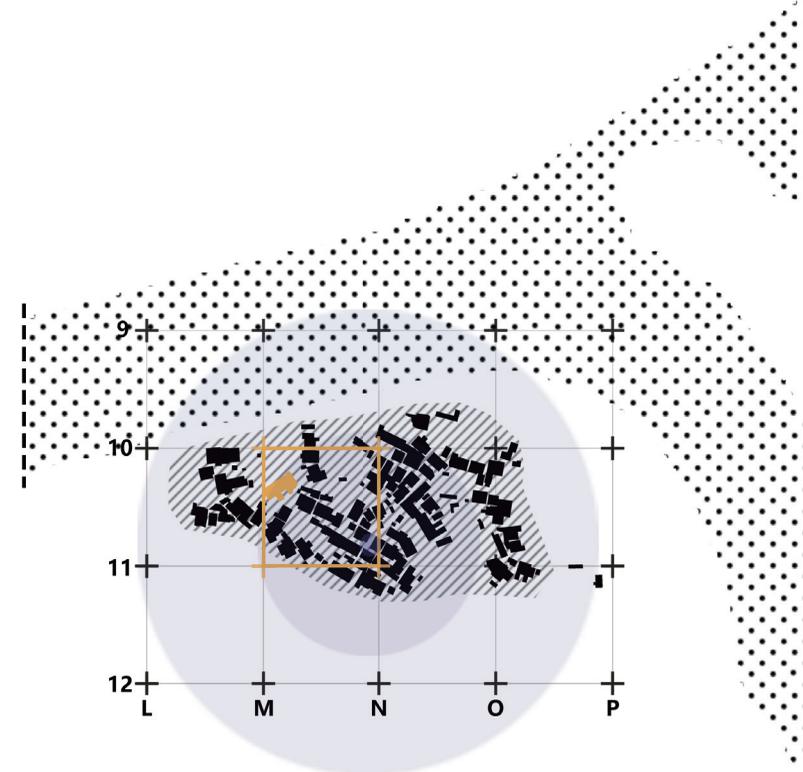
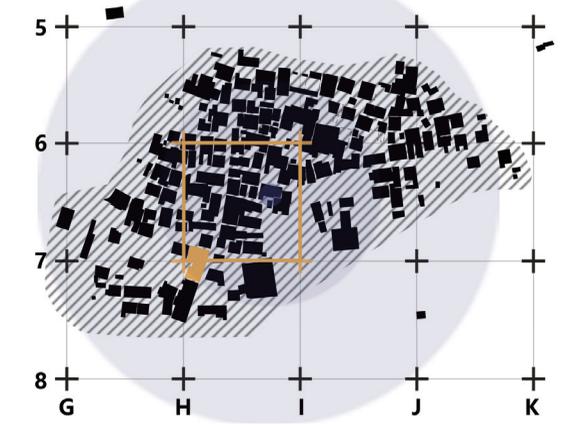
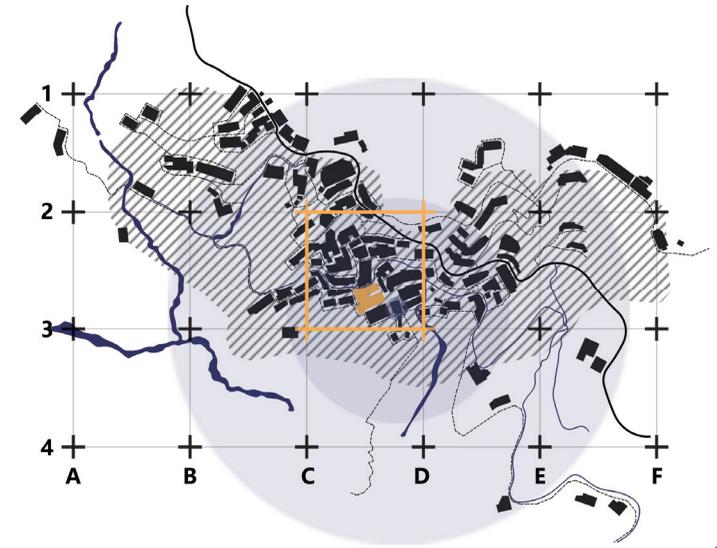
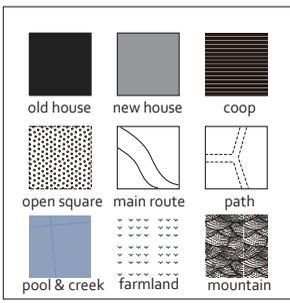
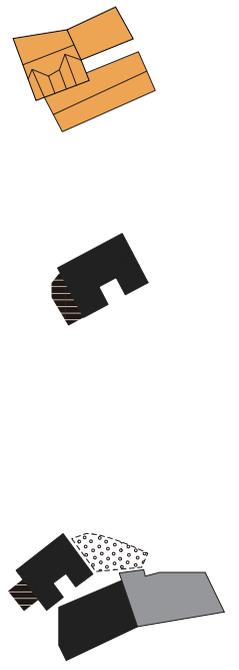
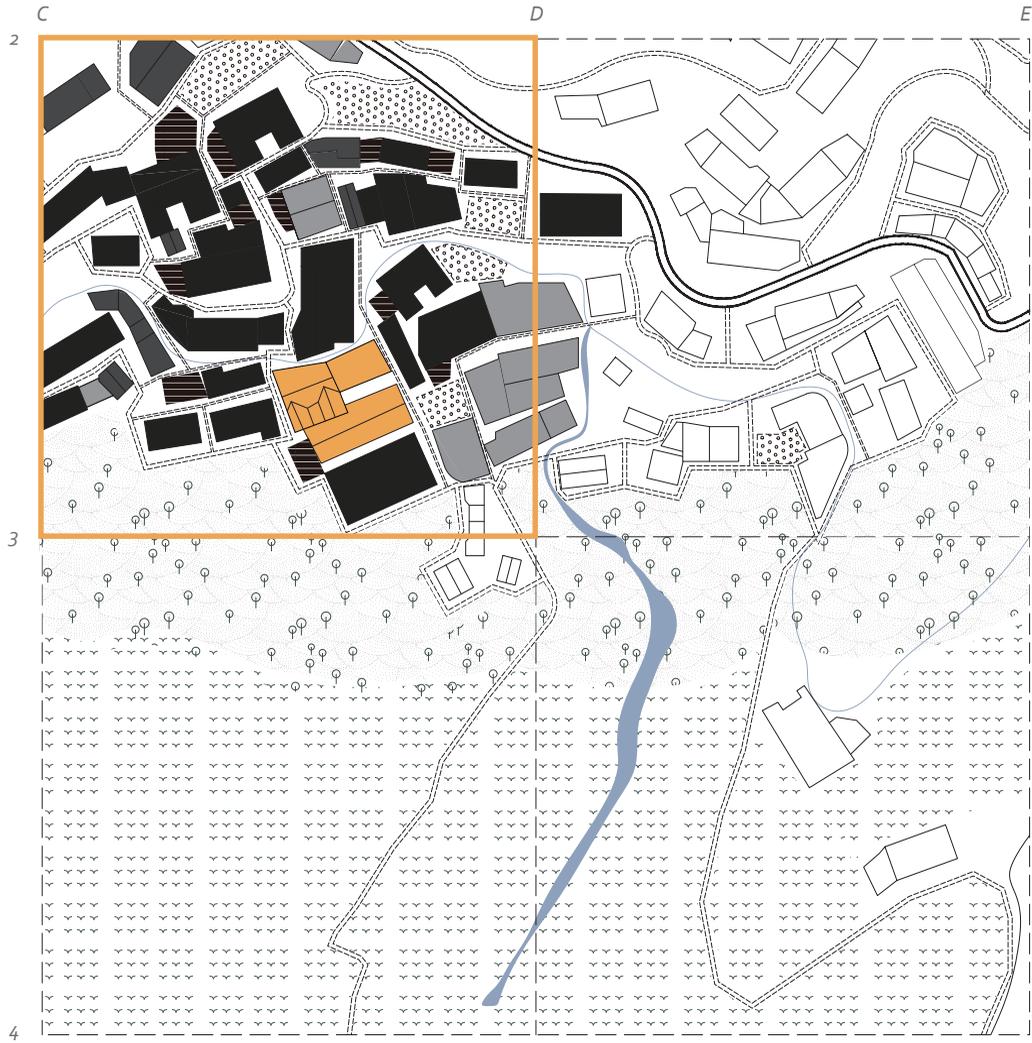
Basic information comparison

	<b>Chenjiapu</b> 陳家鋪	<b>Baiyan</b> 白岩	<b>Kuocang</b> 擴倉
Distance from city	82km 🚗 144min	10km 🚗 27min	4.8km 🚗 15min
Topography	mountain	plain	hill
Height difference	212m	5m	22m
Village area	152,400m <sup>2</sup>	145,100m <sup>2</sup>	81,000m <sup>2</sup>
Number of buildings	🏠 92	🏠 325	🏠 131
Proportion of ancient buildings	82%	11%	24%
Industry	tourism/art/agriculture	agriculture	retail/agriculture
Revenue	CNY 5,814,900	CNY 5,447,000	CNY 926,800

5.1 // Comparative analysis

對比分析

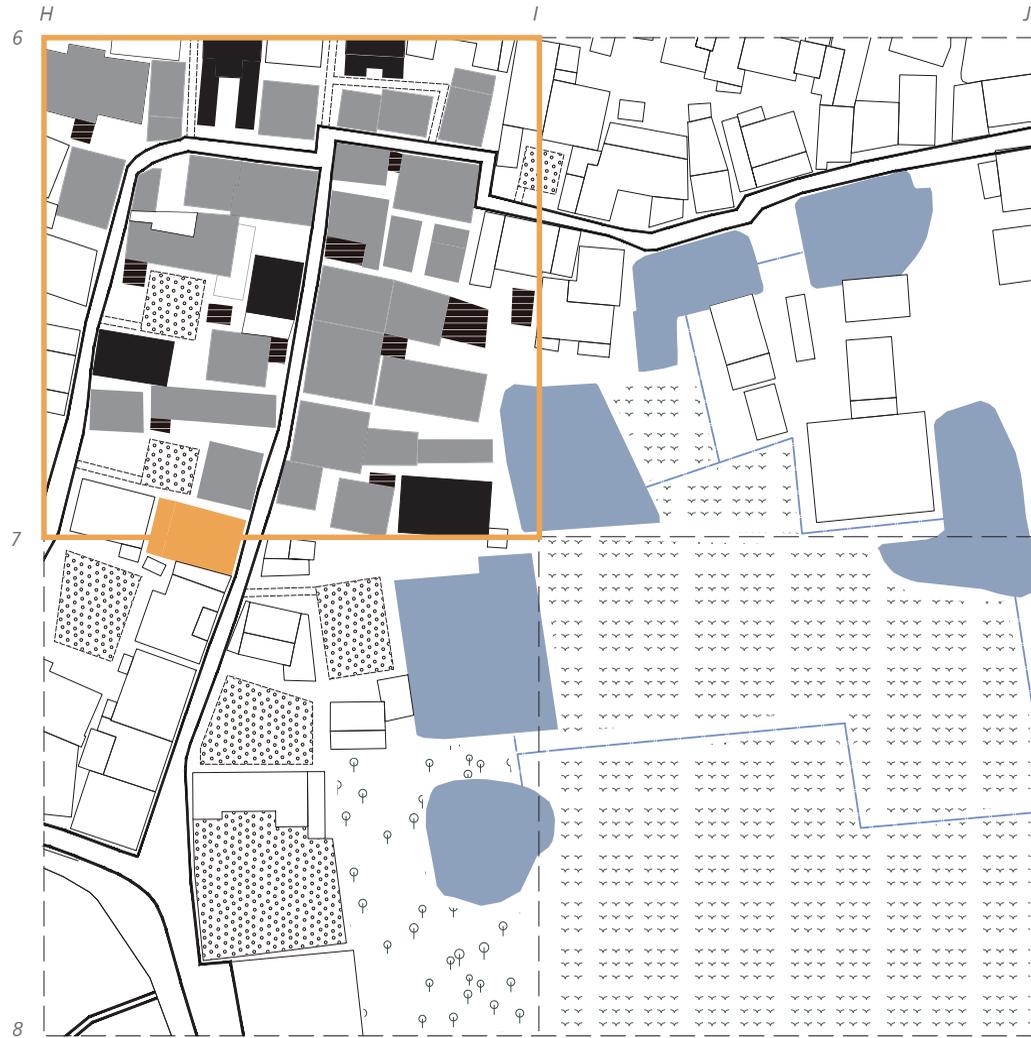
陳  
Chenjiapu  
鋪



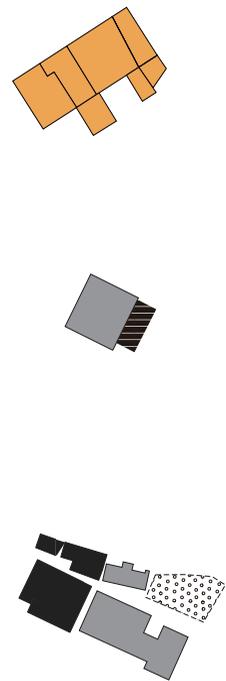
5.1 // Comparative analysis

對比分析

白  
**Baiyan**  
岩



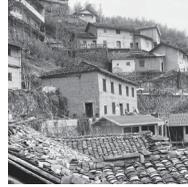
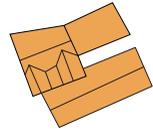
擴  
**Kuocang**  
倉



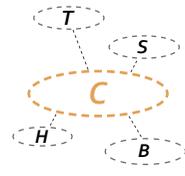
# 5.1 // Comparative analysis

## 對比分析

### Village committee



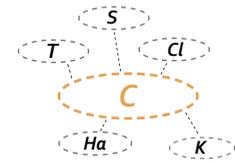
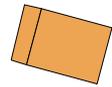
Combination mode



- C -- committee
- T -- public toilet
- S -- store
- H -- hotel
- B -- bookstore

#### For tourism:

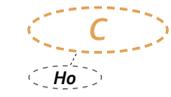
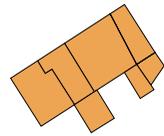
Because of its tourist attributes, Chenjiapu Village's village committee organization model is accompanied by touristic buildings, so tourists can find the functions they need more conveniently.



- C -- committee
- T -- public toilet
- S -- store
- Cl -- clinic
- Ha -- hall
- K -- kindergarten

#### For villagers:

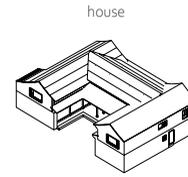
Baiyan Village focuses on grouping the village committee with other livelihood functions. The main public activities of the villagers will be in this group.



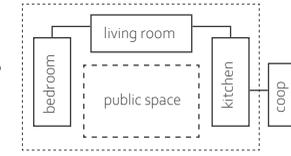
- C -- committee
- Ho -- house

The village committee of Kuocang Village is still in a separate function, and related famous students and tourism functions are very lacking.

### House

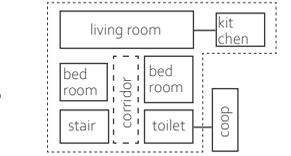
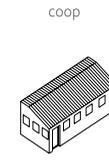
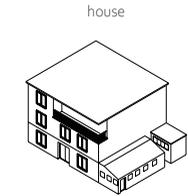


Combination mode



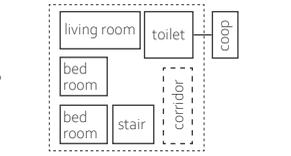
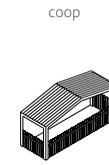
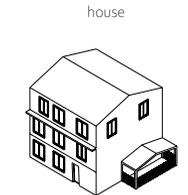
#### historical:

The building is enclosed on three sides, the structural frame is made of wood, the middle of the building is a public space, and the chicken house is arranged on the side of the building.



#### new style:

The building is in the form of a cube, the functions are more compact and the layout is concentrated, the number of floors is also higher, and the living population will be more. The chicken coop is also located on the side of the building.



#### new style:

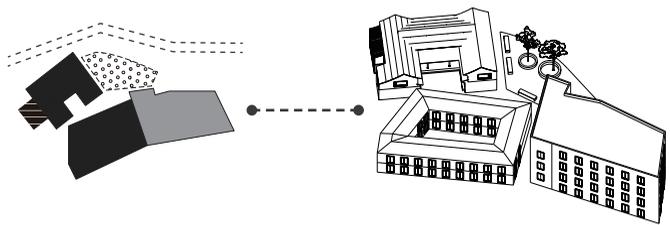
The building form is older, the overall function is not much different from that of Baiyan Village, and the chicken coop is more dilapidated.

5.1 // Comparative analysis

對比分析

Spatial Relations

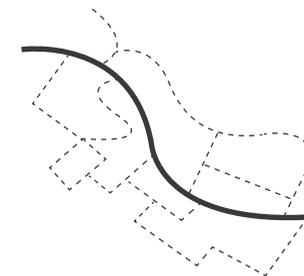
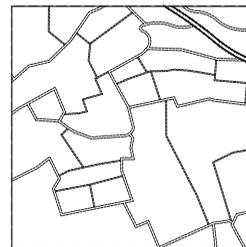
陳  
**Chenjiapu**  
鋪



Building combination form

The residential and public space form a block, and the public space is open and along the path

Route



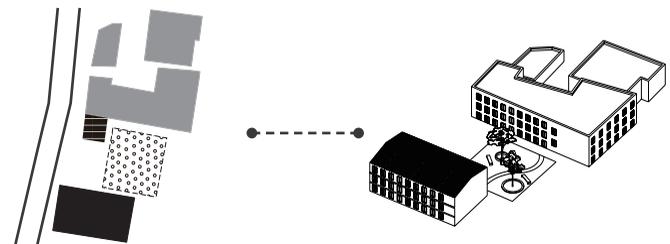
Route composition

main route -- curve  
(one way)

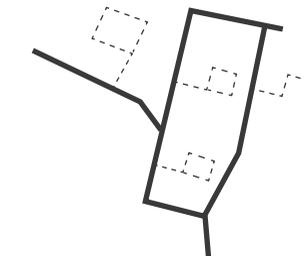
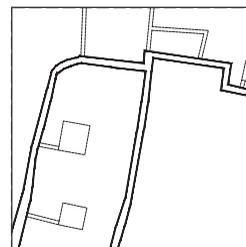
path -- curve + polyline  
(high density)

Due to the natural reasons of the mountain, the main road in Chenjiapu Village cannot form a loop in the village, and the amount of construction is huge, causing the paths to be distributed in the village like capillaries.

白  
**Baiyan**  
岩



The space between the dwellings is a public space, but it is half hidden in the building and it is not easy to find

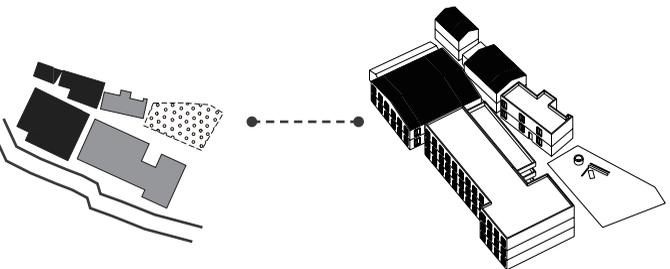


main route -- polyline  
(one way + loop)

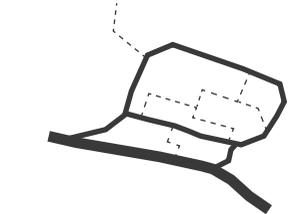
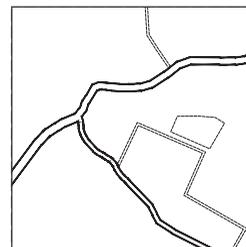
path -- polyline + square  
(low density)

The main route in Baiyan Village forms a closed loop in the village, but there are also many end roads, and there are few paths and most of them are connected to the square.

擴  
**Kuocang**  
倉



The buildings are arranged in strips, and the public space is more private, hidden in a row of buildings.



main route -- polyline  
(loop)

path -- polyline  
(low density)

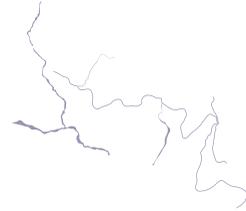
The main route is two closed loops and is connected to the city road. There are fewer paths and connected to the main road, with fewer one-way roads at the end

# 5.1 // Comparative analysis

## 對比分析

### Water system

陳  
**Chenjiapu**  
鋪



Water function

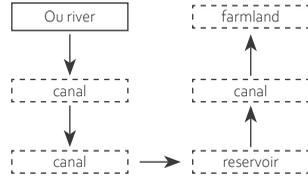


The development of the water system of the village is relatively incomplete, and the water system is far away from the village, so it does not undertake too many functions.

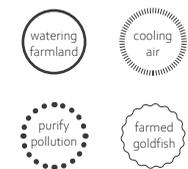
白  
**Baiyan**  
岩



Water connection



Water function



The application of water in Baiyan Village is very complete. Canals were excavated to receive water to multiple reservoirs in the village, and the farmland was continuously irrigated through the canals, and at the same time it was introduced into the village to cool the village and raise goldfish to increase the landscape

擴  
**Kuocang**  
倉



Water function



The water resources of the village are far away from the village, and there is no systematic use of those water resources

### Farmland



Number of products



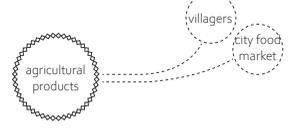
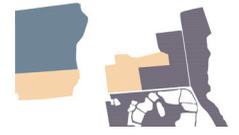
Product revenue



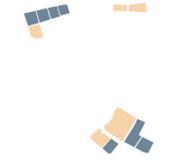
Supply object



Due to the diverse sales channels of agricultural products and products in Chenjiapu Village, the value of a single product can be increased when the product volume is small, so as to obtain higher profits.



Baiyan Village has a vast area of farmland. Although the types of products are small, the output is high. The income from agricultural products accounts for more than 80% of the village's income. The sales targets are mainly urban residents.



The agricultural volume in Kuocang Village is relatively small, and there are fewer agricultural products sales channels, resulting in a lot less income from agricultural products compared to other villages. However, the income from farm products accounts for a very high proportion of the village's income, which reflects the lack of industry diversity.

## 5.2 // Conclusion 結論



Adaptability



### Topography

The topography of Chenjiapu Village and Kuocang Village are both mountainous terrain, but the height difference of Chenjiapu Village is larger, but the way of constructing buildings on the platform and the relationship between the buildings are similar. Therefore, the design needs to consider solving the narrow space of the platform

#### Adaptability strategy

ways to build residential houses on the terraces	coordinating terrace space
--	----------------------------



### Number of buildings

Chenjiapu Village and Koucang Village have similar building volumes, so they have similar design periods and construction periods.

Therefore, we can estimate how much design phase and overall reconstruction budget is needed for the reconstruction of Koucang Village by investigating the data of Chenjiapu Village.

#### Adaptability strategy

estimate design period	estimate construction period & cost
------------------------	-------------------------------------

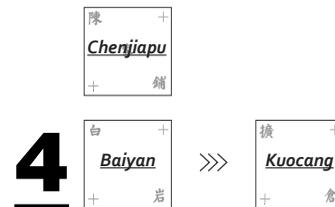


### Industry-agriculture

The three villages all use agriculture as the basic industry, and their agricultural income exceeds more than 50% of the village's entire industry income. Therefore, how to increase agricultural production capacity will be the key to improving the development of the village.

#### Adaptability strategy

promote product category	promote agricultural technology
--------------------------	---------------------------------



### Spatial relations

The relationship between the three villages is similar. The public space is surrounded by residential buildings. The difference is that the public space of Chenjiapu Village is an open space on the side of the road. The public spaces of Baiyan Village and Koucang Village are hidden inside the building and are private spaces. Therefore, we need to determine the attributes of the public space according to the attributes of the block

#### Adaptability strategy

choice of public space attributes	node optimization
-----------------------------------	-------------------



### Route

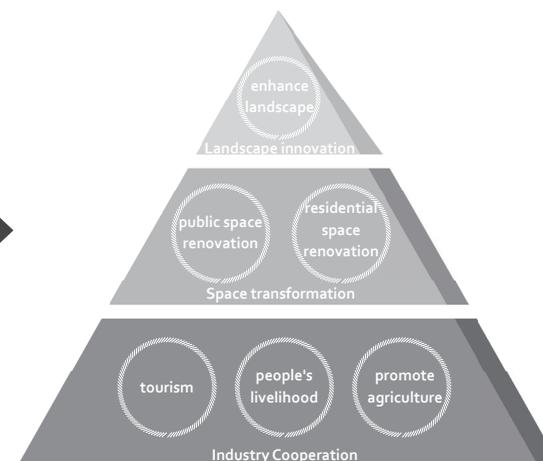
The route structures of Baiyan Village and Koucang Village are similar, with the ring road as the main passage of the village, but the disadvantage is that the low density of the path will lead to poor accessibility in the village.

#### Adaptability strategy

loop optimization	increase path	reduce broken ends
-------------------	---------------	--------------------



**What is the focus of village design?**



Promotion



### Industry chain

The industrial chain of Chenjiapu Village is the reason for their rapid development. In addition to primitive agriculture, the village also cooperates with external capital to develop tourism and art industries. At the same time, tourism, agriculture and art are integrated. The three industries can promote each other and greatly increase the revenue of each industry.

#### Promotion strategy

multi-industry development	promote industry integration
----------------------------	------------------------------



### Village committee

The surrounding buildings of the village committee in Baiyan Village are ordinary residential buildings with a single block function. In Chenjiapu Village, the village committee is adjacent to a number of tourism functions, strengthening the village's tourism attributes. In Baiyan Village, the committee and the people's livelihood function are integrated, which improves the quality of life of the villagers

#### Promotion strategy

integrate with people's livelihood function	add travel function
---	---------------------



### House

The current house in Baiyan Village is mainly composed of newly-built functional integrated houses, but the function connection is rather messy. In the middle of the ancient buildings in Chenjiapu Village is the courtyard, and other functions are arranged around the courtyard, and the functional design is more reasonable.

#### Promotion strategy

add courtyard	functional space reorganization
---------------	---------------------------------



### Water system

The water system of Chenjiapu has fewer functions, mainly landscape functions. The water system in Baiyan Village is more complete. Natural irrigation is achieved by introducing Oujiang water. The river water is connected to the pond and the farmland through a canal. The canals also lead to the interior of the village. In summer, the temperature is lowered and fish can be cultivated.

#### Promotion strategy

establish an irrigation system	lead the canal into the village
--------------------------------	---------------------------------

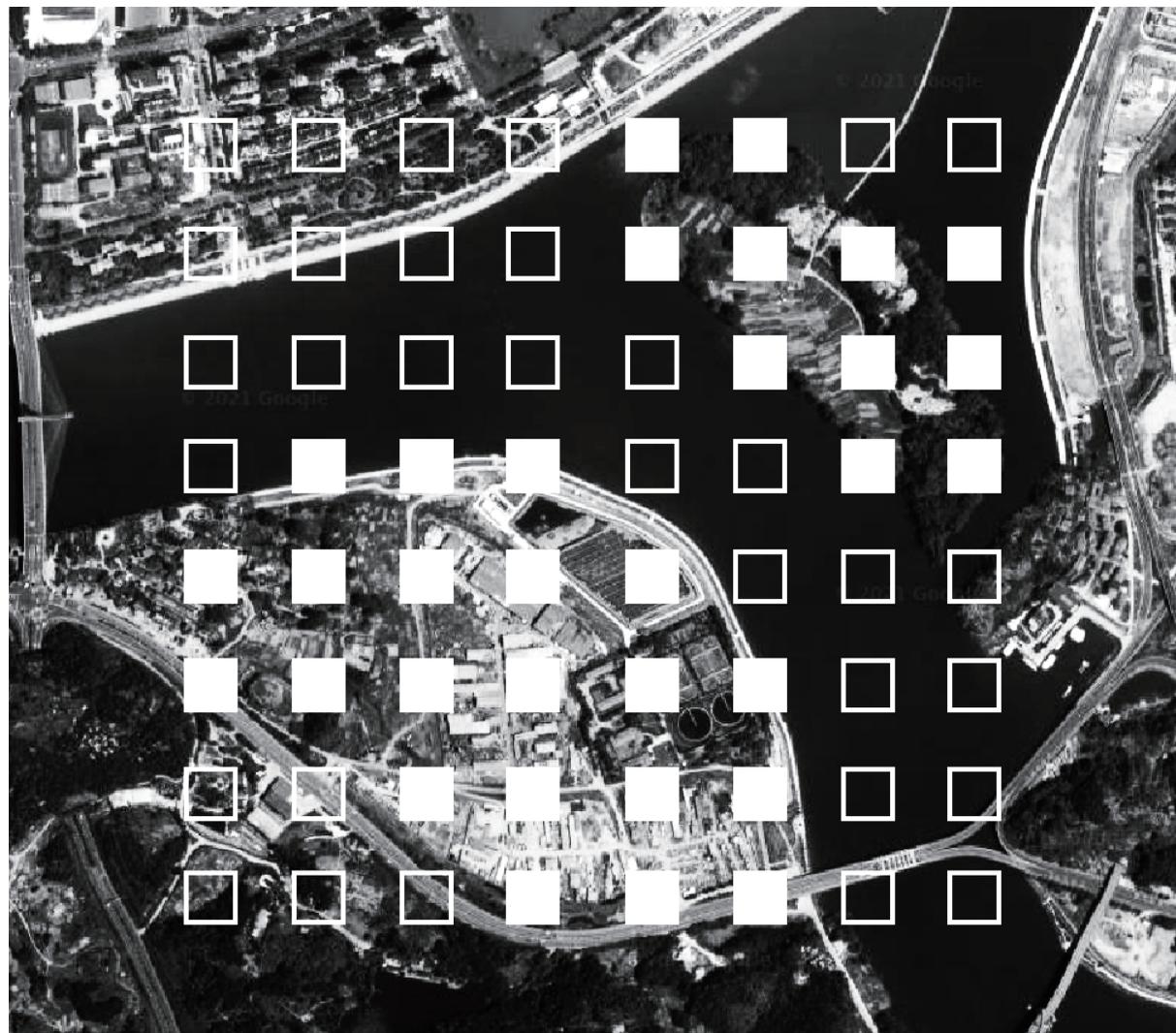


### Farmland

The shortcoming of the farmland in Koucang Village is that it is not only far away from the village area, but also has a small area and a single type of agricultural products. However, the types of agricultural products in Chenjiapu Village are diverse, and the supply objects are also very rich. This has promoted the agricultural development of his village.

#### Promotion strategy

Increase the variety of agricultural products	Increase supply object
---	------------------------

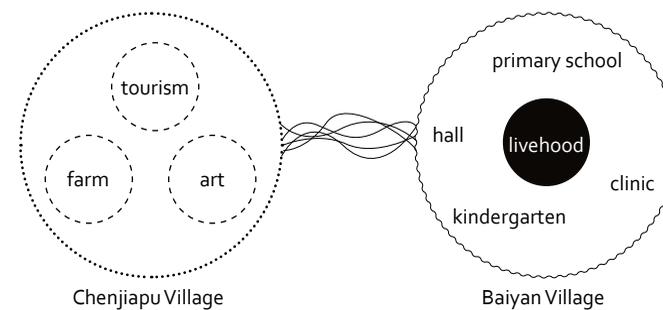


## Part 2

### Design practice in Lishui Village

# 6 // Rural Revitalization Plan Discussion

After the investigation part of the first part, one conclusion can be drawn that is: the village is strong in Lishui. They have a complete tourism-agriculture-art development model or a well-developed people's livelihood system, and they can be completely self-sufficient. This will be a model for village development.



The current situation of Kuocang Village is very different from the previous two villages. Other villages already have a complete system. However, the current situation of Kuocang Village is that although it occupies the location closest to the city center, it does not take advantage of this advantage. There are some restaurants and car repair shops along the road outside the village, which lack iconic signs. However, the internal situation of the village is narrow, and the lack of water system leads to underdeveloped agriculture. The facade of the house does not retain the original features of Lishui, and the building skin is gradually obsolete and partially peeled off.

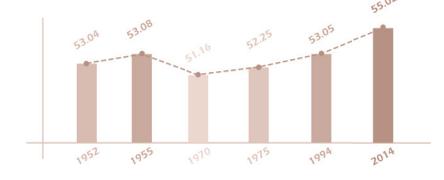
The revitalization strategy of Kuocang Village not only needs to be based on the survey of other excellent villages, but also needs to be analyzed from the macro perspective of the whole Lishui, and the special geographical location of the village needs to make up for the lack of functions in the area.

The status quo in the area outside of Kuocang Village is also imperfect, and there is a large area of undeveloped land in the south. To the east is the sewage treatment station. Because it is an enclosed factory building with security at the entrance, the internal environment of the factory is in good condition. The garbage sorting station in the central part occupies the largest area. The environment in the garbage station is very bad due to improper personnel management and improper handling of the rubbish. This situation is urgently needed to be changed.

## 6.1 // Macro perspective 宏觀視角

### 1 Flood season 汛期

The highest water level of the Oujiang River in each year (during flood disaster period)

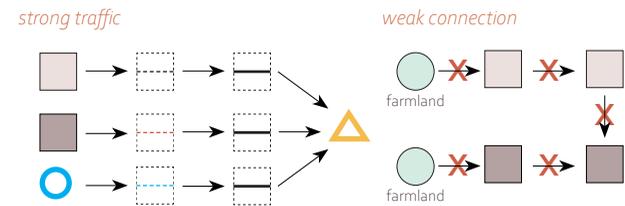


Flood season date  
**first stage 4.16-7.15**  
**second stage 7.16-10.15**  
 Precipitation  
**350-1000mm**  
 Proportion of the whole year  
**20%-50%**

The flood that broke out on the Oujiang River on August 20, 2014 caused huge damage to nine cities and counties in Lishui City. As many as 328,200 people were affected, 604 houses were damaged, 208,200 acres of farmland were damaged, and the economic loss was 10.62 Billion.

The frequent floods in Lishui's rural residences are an important element that affects the villagers' economy and safety. Therefore, the design of disaster prevention needs to take into account the design of the reorganization of the village

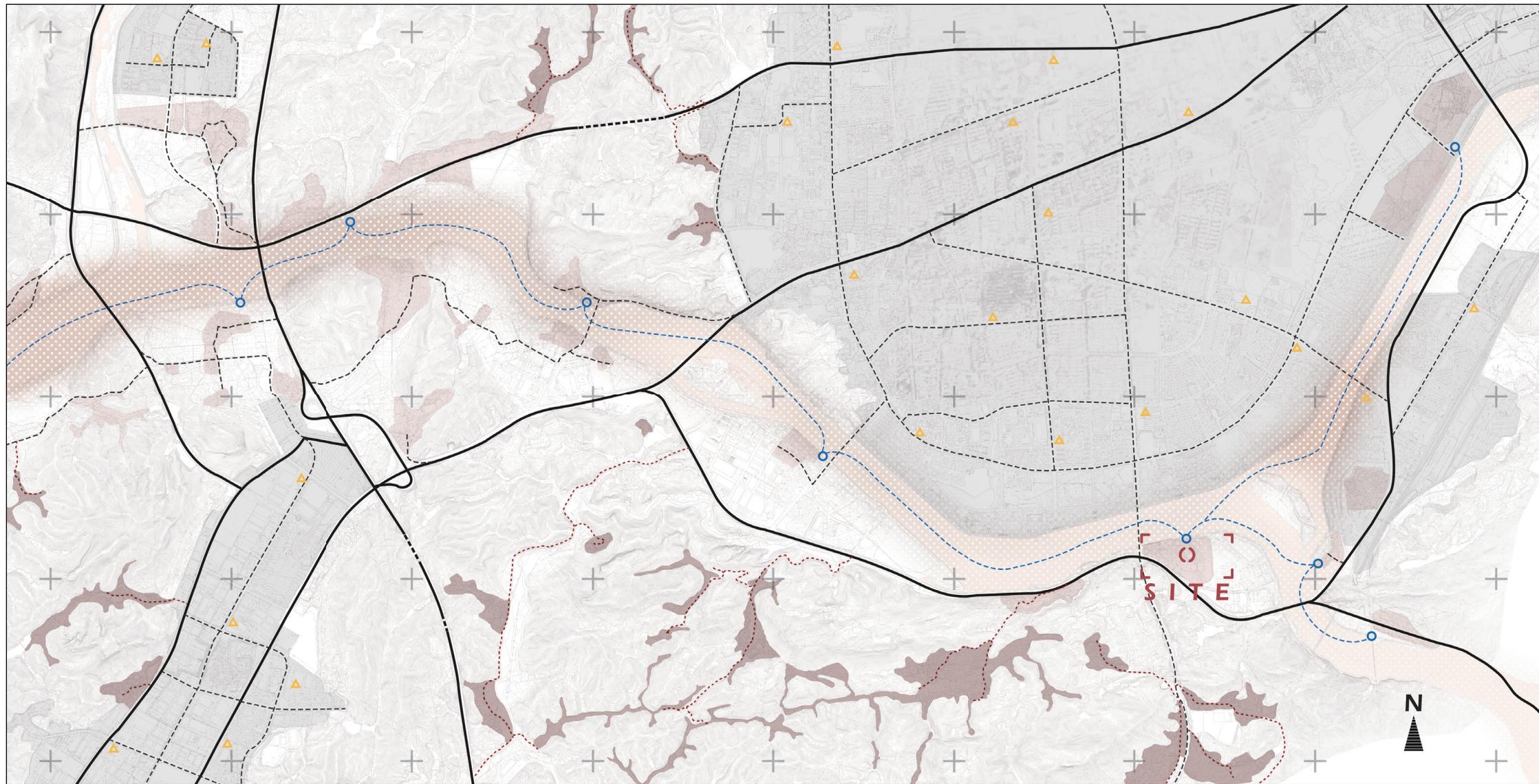
### 2 Strong traffic and weak connection 强交通，弱连接



The transportation in Lishui is very developed. There are roads in rural and mountain villages that lead to the main roads of the city, so as to transport agricultural products to the farmer's market in the city. However, the roads from farmland to villages are in very bad condition, and there is no effective road connection, resulting in lower transportation efficiency. The connection between the villages is also weak. The collection of agricultural products needs to pass through all the villages. Perhaps a centralized agricultural product processing station can be set up to process agricultural products in a district



- AREA**
  - City (grey)
  - Plain village (light brown)
  - Mountain village (dark brown)
  - Flood scope&severity (dotted brown)
- ROAD**
  - Highway (thick solid line)
  - Secondary road (dashed line)
  - Mountain road (dotted line)
- SPECIAL POINT**
  - Vegetable market (yellow triangle)
  - Pier (blue circle)
  - Sailing route (dotted blue line)



## 6.2 // Micro perspective 微觀視角

### 1 Site survey 基地調查



village



water plant



garbage station



Undeveloped land



Lost Island

The current situation of the village has lost the original architectural style, and the space in the village is cramped and damp. The farmland is basically in a semi-abandoned state, and there is no suitable production strategy.

The water plant is in good condition, with dense vegetation inside, but it seems that the odor generated during the purification of the water has caused trouble to the surrounding residents.

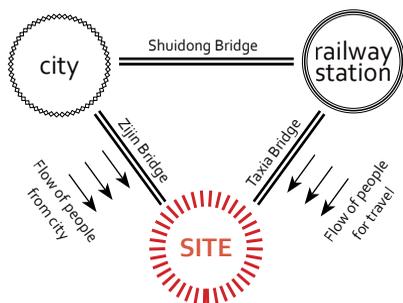
The internal environment is very bad, piles of garbage are piled up at will, the dust is flying, and the living conditions of the people living in it are very poor, and the garbage station needs to be moved away.

This land is full of grass and has no buildings, so it is very suitable for construction. 2-3m higher than other venues need to pay attention to vertical design.

The island is half a mountain and half a plain, with a height difference of 20m. There are no bridges and boats leading to the island, in a state of isolation

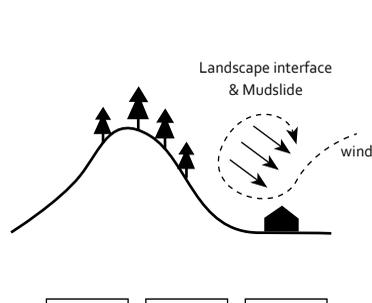
### 2 Surrounding elements 周邊要素

#### Continuous flow of people



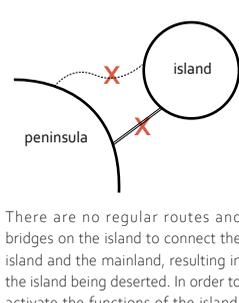
The development of a suitable tourism industry in the base will be able to attract the original urbanites of Lishui and tourists who travel to Lishui

#### Mountain



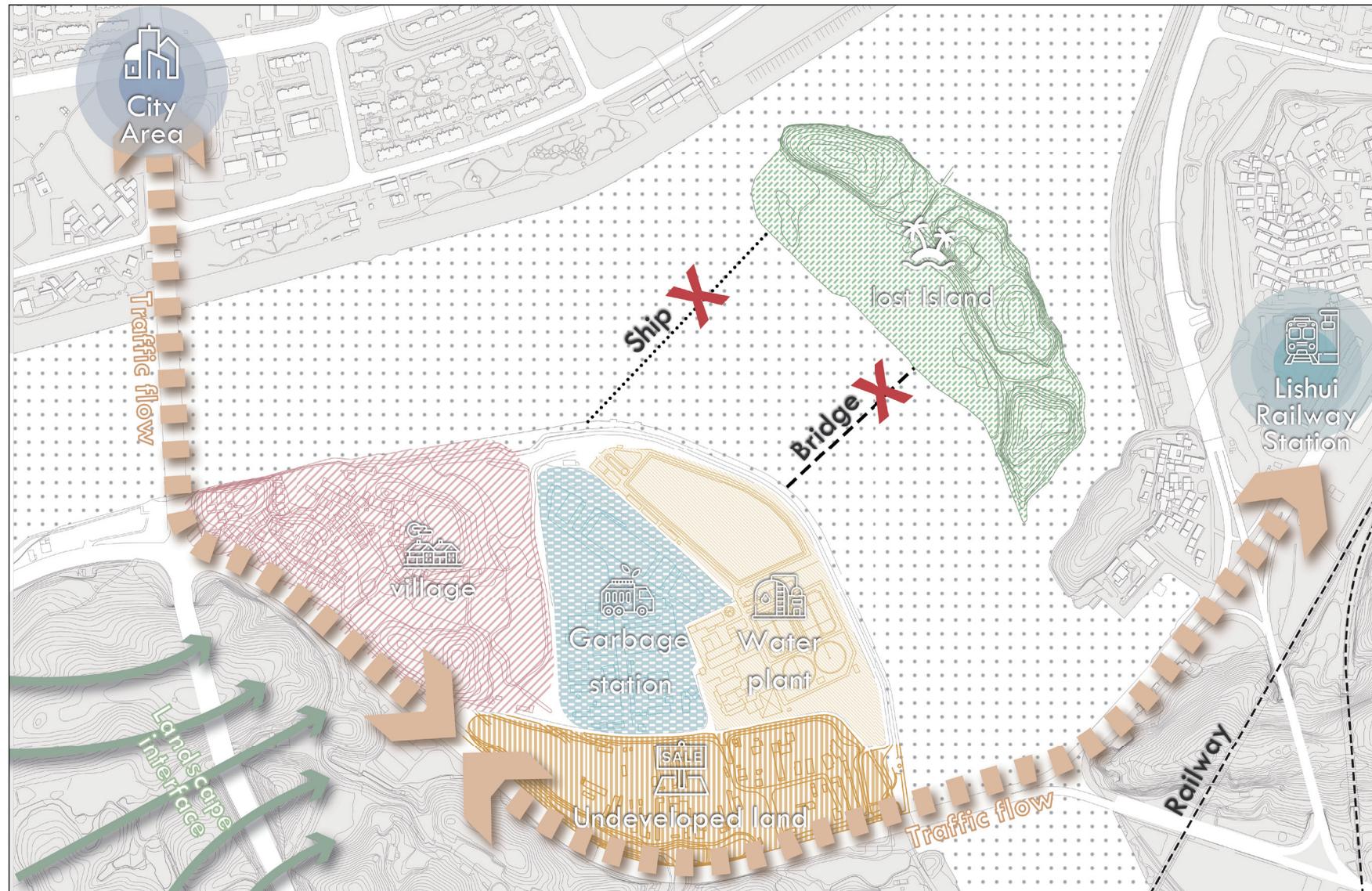
- Use of mountain landscape
- Landslide protection
- Wind protection

#### Isolated plate



There are no regular routes and bridges on the island to connect the island and the mainland, resulting in the island being deserted. In order to activate the functions of the island, bridges and docks need to be built so that cars, trains and people can easily reach the island.

- Develop tourism
- Improve landscape
- Disaster protection
- Strengthen connection



1. Matrix of Folk  
鄉村矩陣



Matrix the community  
&  
Improve the adaptability

2. Island of Art  
藝術之島



Fruits of  
Satoyama Caspianism

3. Renew the old village  
舊村煥新

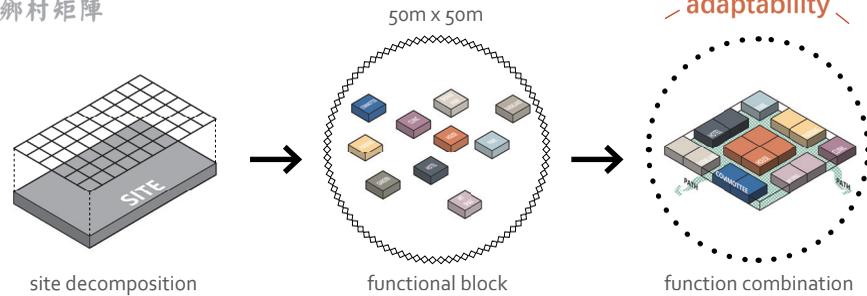


Another cure  
in the old village



# 6.3 // Masterplan 總平設計

## 1 Matrix of Folk 鄉村矩陣



In order to give the new rural model more practicability, the function of the rural community is broken down into unique blocks of 50mx50m, and each block can be merged into larger blocks. Through the combination of blocks and blocks, A community with complete functions and free combination can be achieved

### Matrix List

	Number	Function	Location	Advantages
<b>Residential group</b>	or  or small medium mega	Residential & public space & poultry breeding	-the mega group as the center -the middle group is surrounded by the Mega -the small group is scattered all over the village.	-Living together in the same clan -Self-sufficient living space
<b>Committee group</b>		living or travel	-In the center of the village	-Service radius reaches the entire village -Different functions of each village can complement each other
<b>Farmland group</b>		farming	-In the middle of the village and the village	-Sharing of agricultural resources among villages
<b>Barrier group</b>		disaster prevention & landscape	-On the side of the mountain and along the river	-Effectively reduce the impact of natural disasters

### Village modularity in Lishui

**New Village Group**

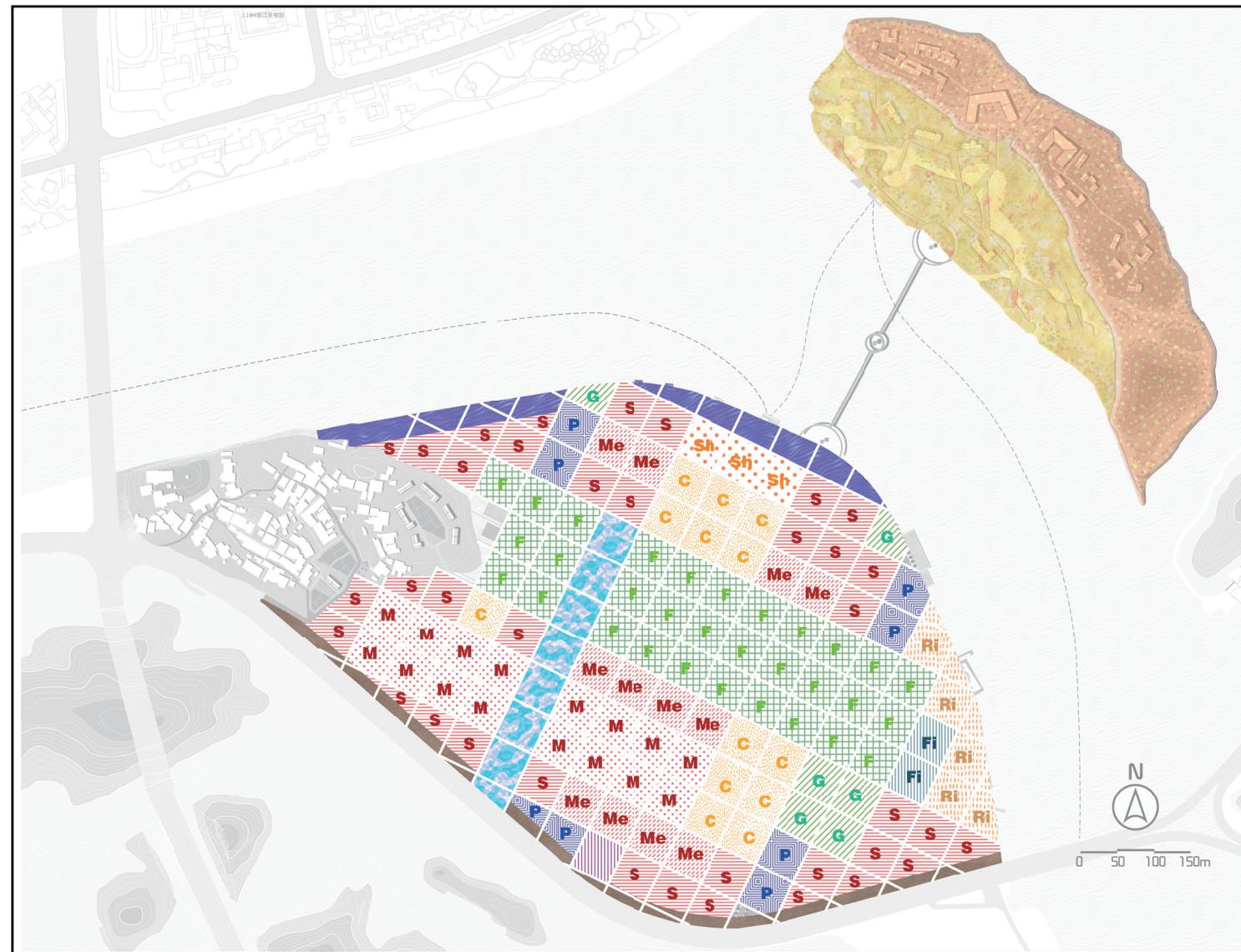
- 50x50m X 1 small group
- 50x50m X 2 medium group
- 50x50m X 4 mega group
- 50x50m X 6 committee group
- 50x50m X 2 parking lot
- 50x50m X 4 public garden
- 50x50m X 3 shopping street
- 50x50m X 1 garbage station

**Farmland Group**

- 50x50m X 6 farmland & water purification system
- 50x50m X 2 Fishery

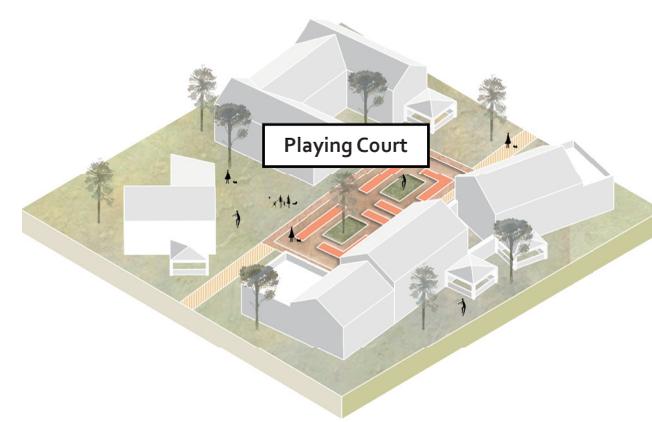
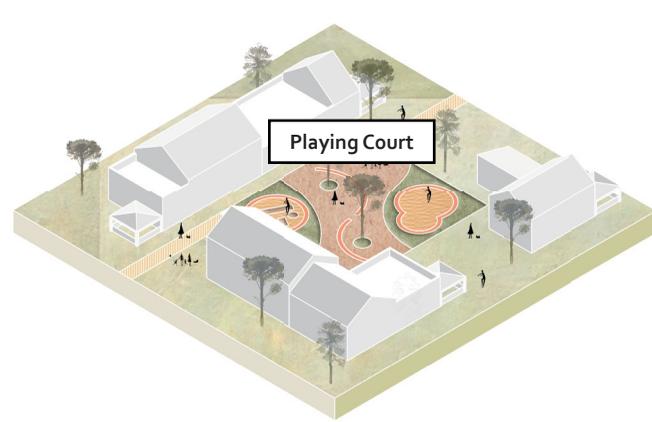
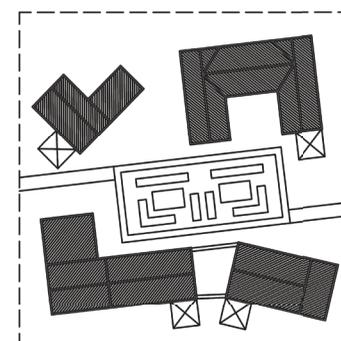
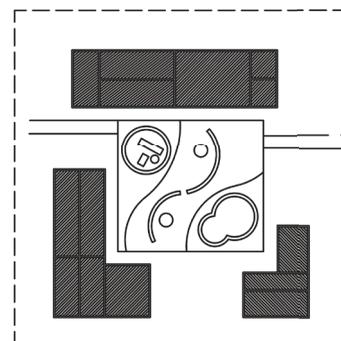
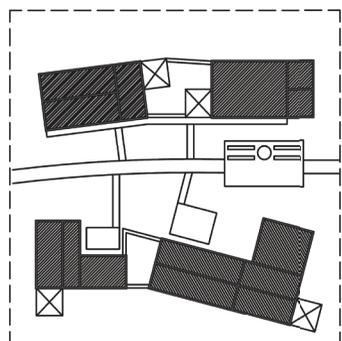
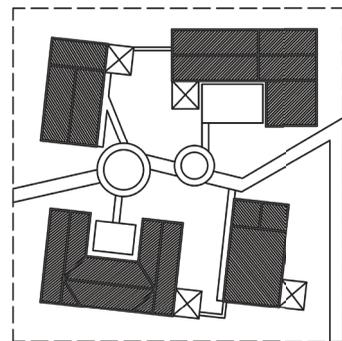
**Natural barrier**

- 50x50m X 2 retaining wall
- 50x50m X 2 sponge park
- riverbank park
- Boulevard
- wetland
- art space



Residential group

small group//50m\*50m

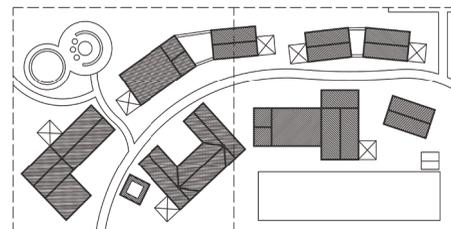


6.3 // Masterplan

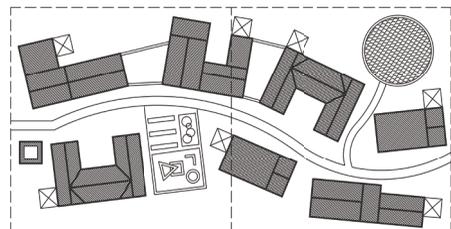
總平設計 | Matrix of Folk  
鄉村矩陣

Residential group

medium group // 50m\*50m\*2

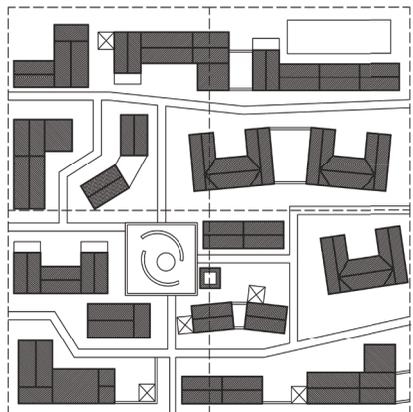
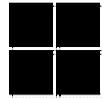


- 3 House x4
- 4 House x3
- 5 House x1
- 6 House x1

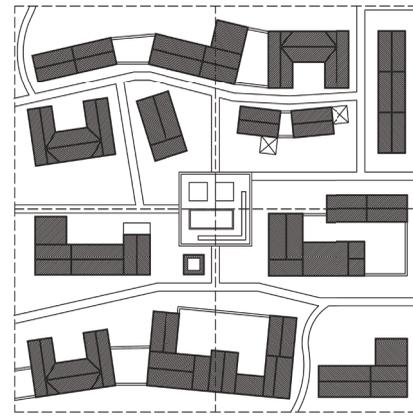


- 3 House x1
- 4 House x5
- 5 House x1
- 6 House x2

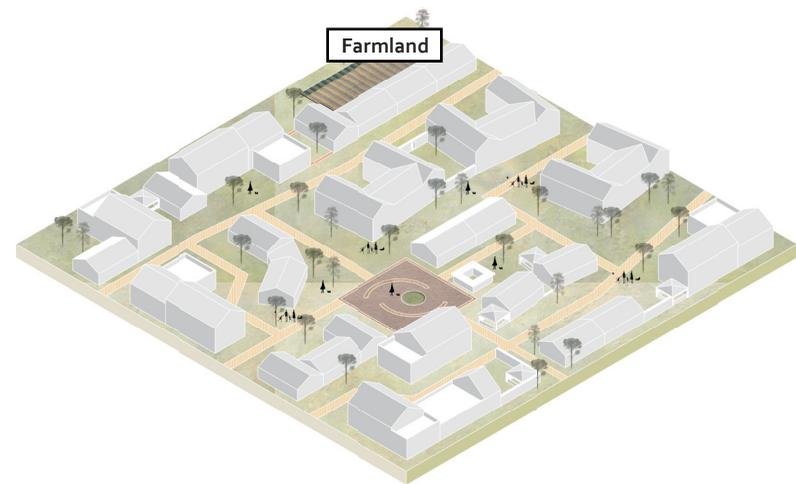
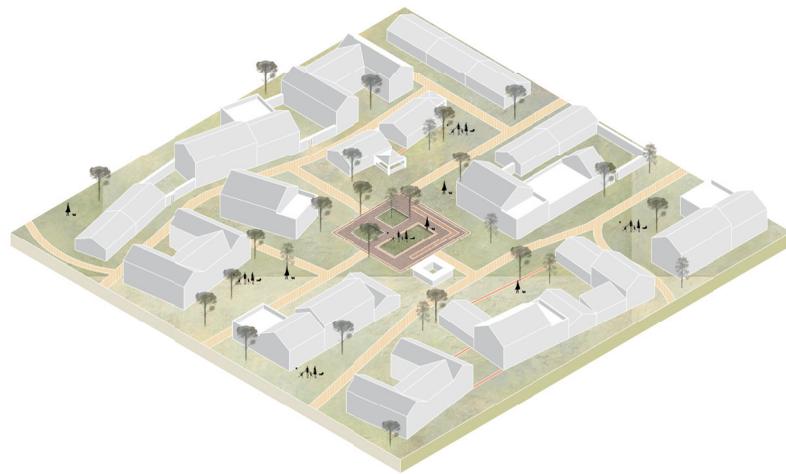
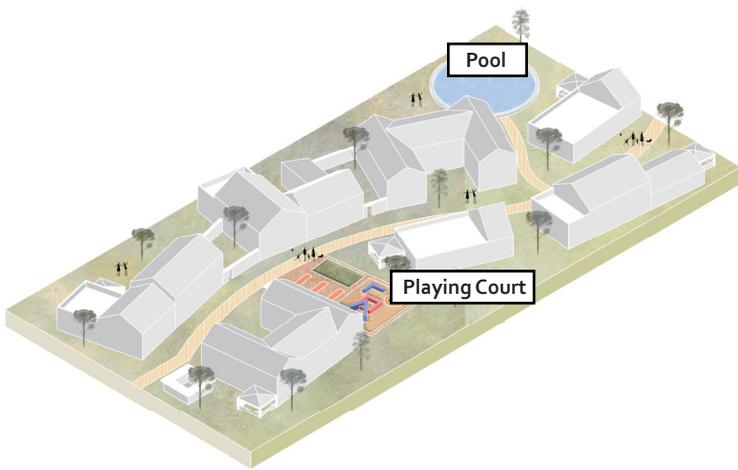
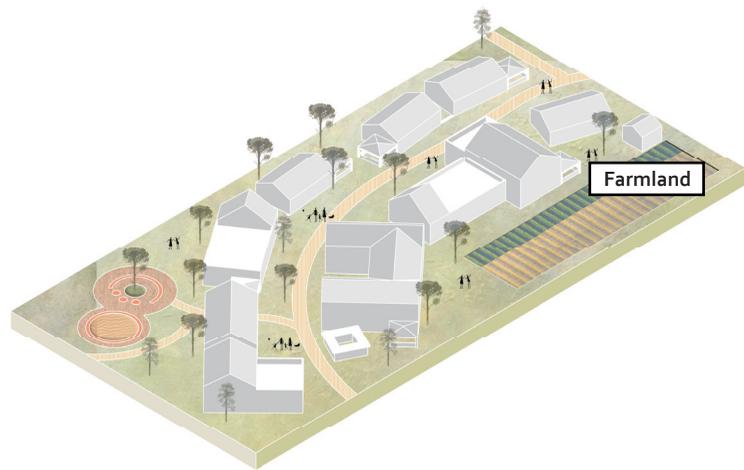
mega group // 50m\*50m\*4



- 3 House x11
- 4 House x7
- 5 House x2
- 6 House x3



- 3 House x11
- 4 House x4
- 5 House x4
- 6 House x2

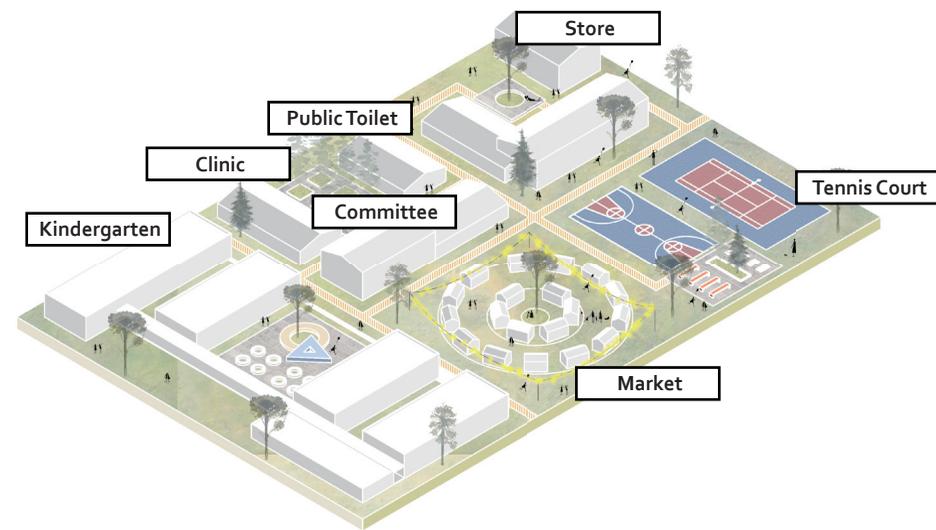
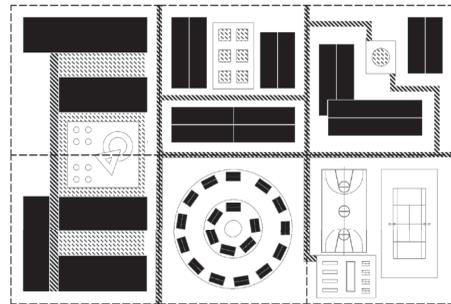
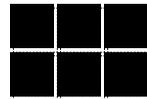


6.3 // Masterplan

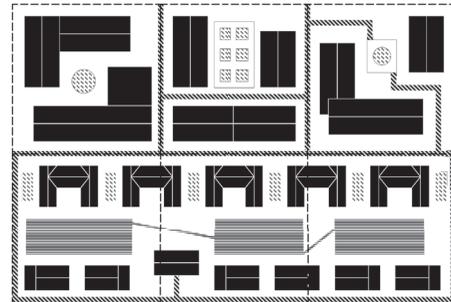
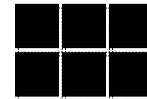
總平設計 | Matrix of Folk  
鄉村矩阵

Committee group

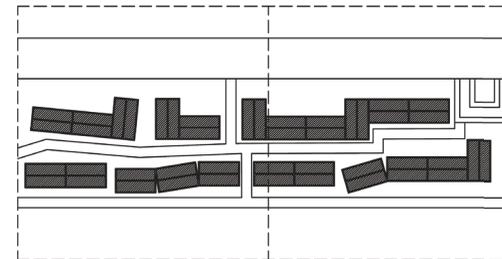
for living // 50m\*50m\*6



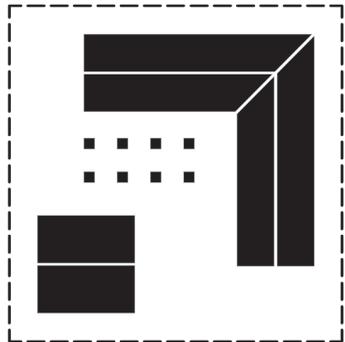
for tour // 50m\*50m\*6



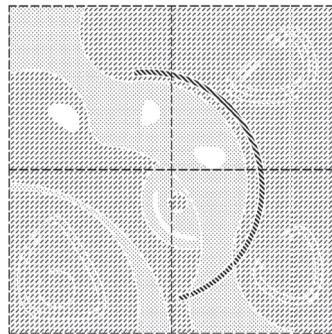
Shopping Street // 50m\*50m\*3



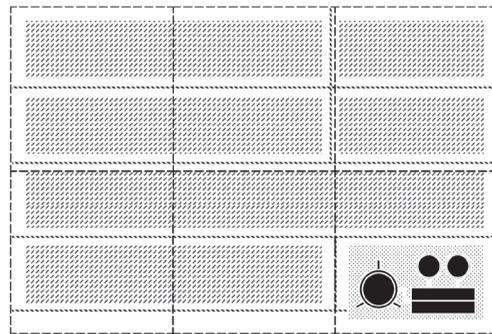
**Garbage collection**  
50m\*50mx1



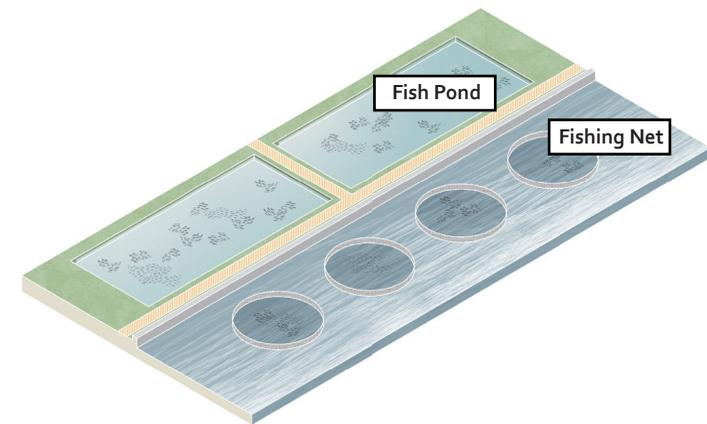
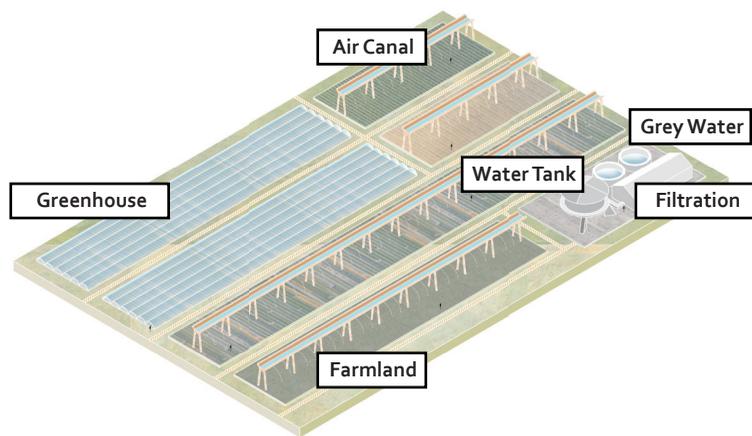
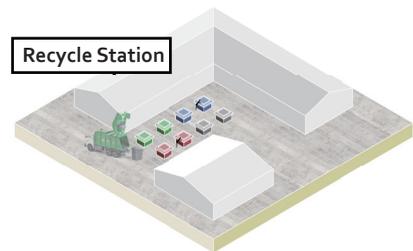
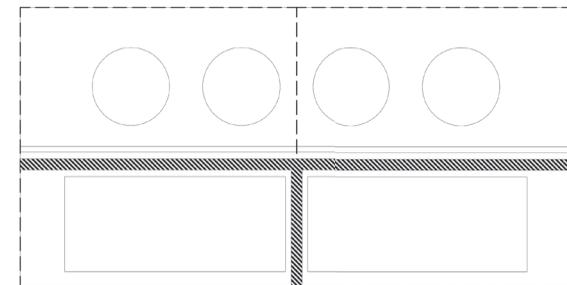
**Public Garden**  
50m\*50mx4



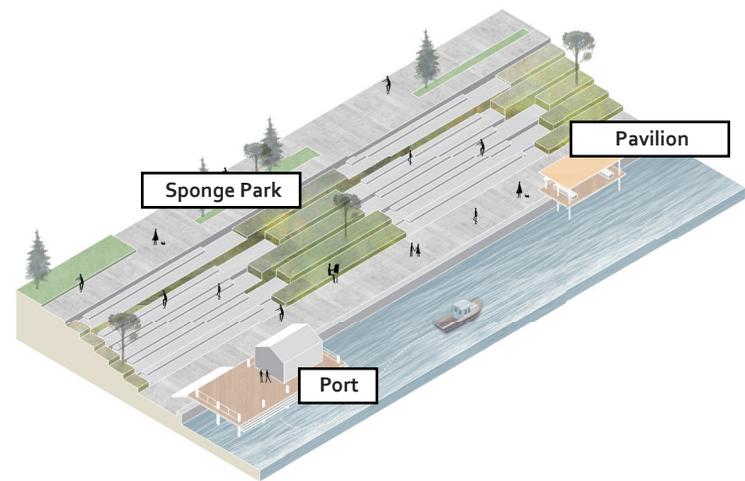
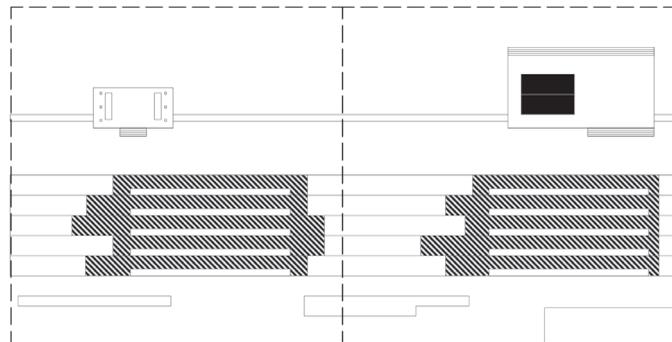
**Farmland**  
50m\*50mx6



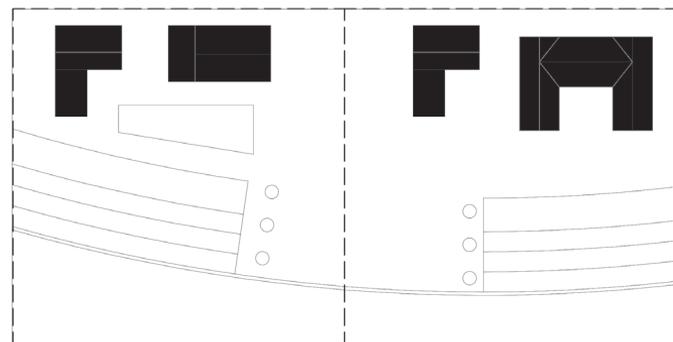
**Fishery**  
50m\*50mx2



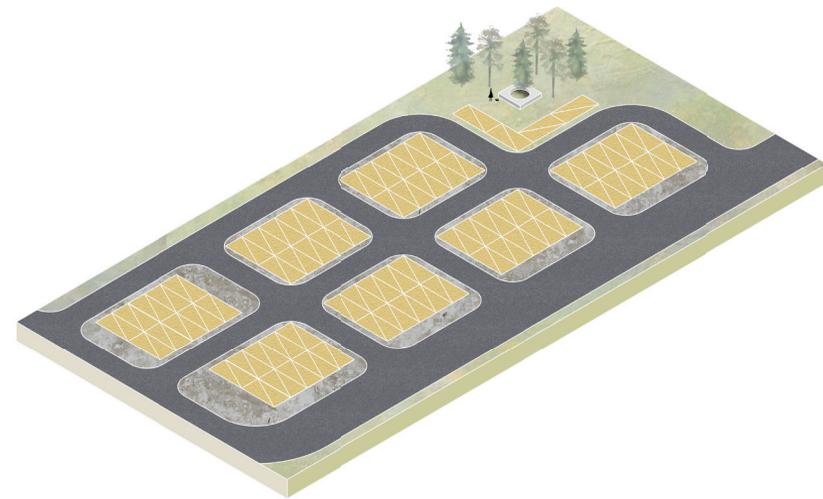
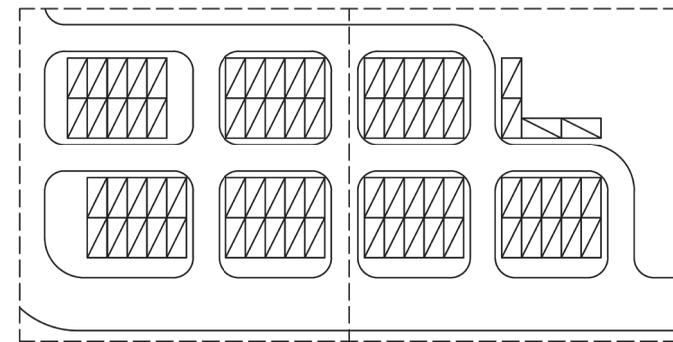
**Sponge Park**  
50m\*50mx2



**Retaining wall**  
50m\*50mx2



**Parking Lot**  
50m\*50mx2



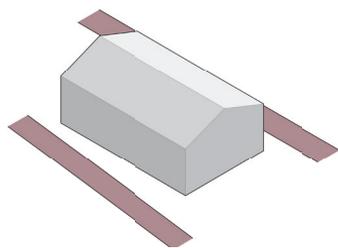
**Route system**

**Dense route network**

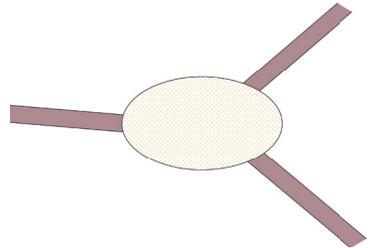
The more complex the road network system is often a symbol of convenience, and people can experience the feeling of an old village, because the old village is like this with dense roads and extending in all directions.



Separate people and cars



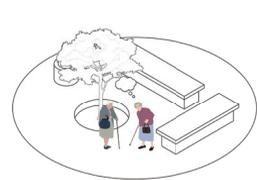
Two-Routes around the house



Roads converge in the square

**Diverse public spaces**

Public space is the most closely related outdoor space for villagers' lives. They need more communication and exercise.



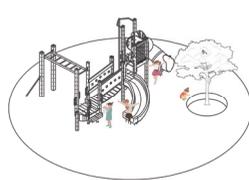
social



clothes drying



square dancing



playground



## Production & Water System

### Agricultural products suitable for the local climate

Lishui is rainy and hot in summer, and dry and rainy in winter. This special climate has created a special agricultural product system in Lishui.

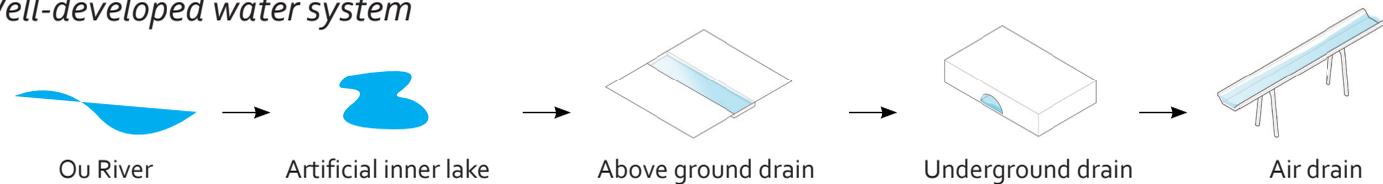
**Rice:** It is the most important local agricultural product, planted in spring and harvested in autumn.

**Bamboo shoots & sweet potatoes:** The planting cycle is short, and there are many subsidiary products, which are high economic products.

**Celery & cabbage:** The most eaten vegetables by villagers, can be harvested all year round which are high economic products.

**Watermelon & strawberry:** watermelon harvested in summer, strawberry harvested dynamically. Both can grow locally in Lishui.

### Well-developed water system



Lishui is rich in water resources, but we need to use them. First, we introduce the Ou River water into the site through manual excavation, and then introduce the river water to the air canal and underground canal through the canal, and then distribute it to various farmlands.



## Sustainable strategies



**Production.**  
Agroforestry can provide a more diverse farm Production and stimulate the whole rural economy, leading to more stable farms and communities.

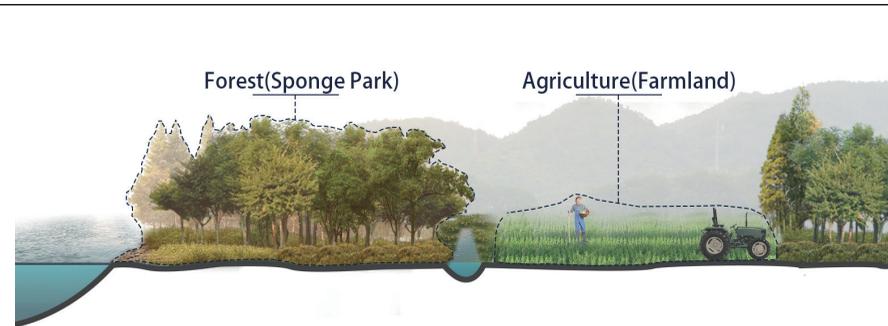
**Agroforestry Systems**  
More Productive  
More Sustainable

**Temperature.**  
They can control runoff and soil erosion, thereby reducing losses of water, soil material, organic matter and nutrients. To increase the vegetation area and slow down the increase of the greenhouse effect.

**Soil.**  
Agroforestry also works towards land protection and conservation through more effective protection of stock, control of soil erosion, salinity and water tables and a higher quality control of timber.

**Fire.**  
They can control runoff and soil erosion, thereby reducing losses of water, soil material, organic matter and nutrients. To increase the vegetation area and slow down the increase of the greenhouse effect.

**Society.**  
which is an opportunity to give a new possibility of job to the people. It can provide occupations such as Forest keeper, farmers, etc.



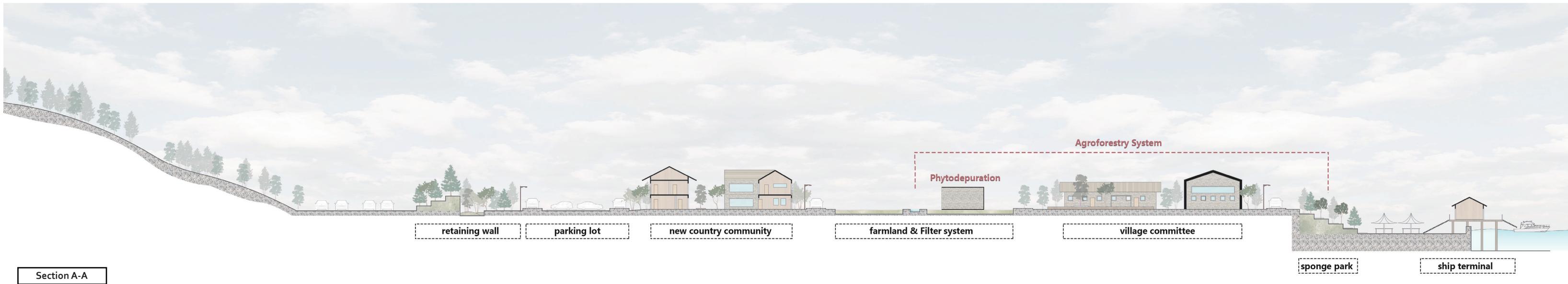
### Phytodepuration

Microbial water purification system

**Phytodepuration** is a natural treatment technique that reproduces natural purification processes in a controlled environment. The macrophytes can be floating, flooded or emerging. The systems can have superficial or sub-superficial streams and the sub-superficial stream can be horizontally or vertically oriented. Superficial streams support all the types of macrophytes, sub-superficial one only the emerging macrophytes.

**Subsurface Flow systems (SSF)**  
The purification efficiency is nearly the same during the whole year, because high thermal excursion is avoided by the presence of the medium. On the other side the positive effect of the solar radiation is not present and the oxygen exchange with the ambient air is blocked. To avoid the substrate occlusion a pre-treatment of the wastewater is needed. The frequency of vegetable mass substitution is low, thus avoiding a high biomass disposal.

**Sub superficial horizontal flow systems (H-SSF)**  
In these systems wastewater is uniformly distributed on the whole length of the basin through a pipe disposed on the ground at the entrance of the basin. The filter medium is made of inert material of constant size. Filtration and biological degradation processes, carried out both by anaerobic and aerobic microorganisms, remove organic matter. Nitrogen is removed by nitrification, denitrification, ammonia volatilization and root adsorption.



Section A-A

### Problems of Present Folk House

#### Loss of the original facade



Newly built Folk House in Baiyan Village



- \_ Tile veneer or white plaster facade
- \_ Simple plastic canopy
- \_ Three floors
- \_ All square plan
- \_ Masonry structure

&

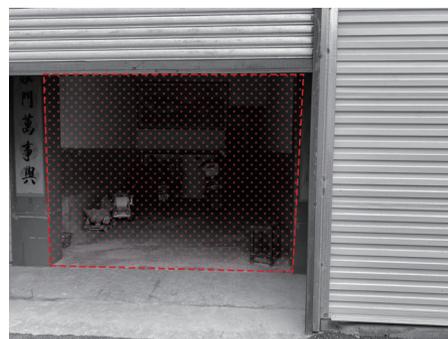
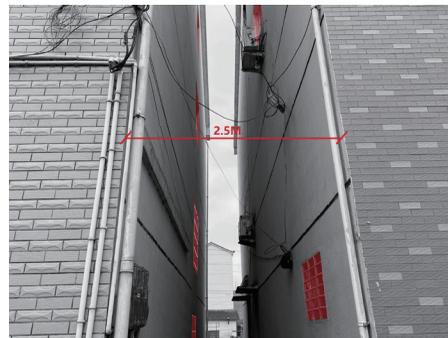


Traditional Folk House in Baiyan Village



- \_ Rubble facade
- \_ Black tile roof
- \_ Two floors
- \_ Diverse plan
- \_ Wood structure

#### Extremely lack of sunshine



The distance between the buildings is only 2.5M, and the size of the windows is also very small. As a result, the room on the side of the building can hardly get enough sunlight.

### The needs of the villagers

#### More open space



Most of the newly-built farm houses have designed terrace space, which will be a gathering space for villagers' families, and it is very important.

#### Relatively simple facade



Although we don't want the traditional facade to be completely lost, the modernist profile facade is more suitable for modern life and aesthetics. So what we have to do is to make some modern designs while retaining the traditional system.

#### Larger window



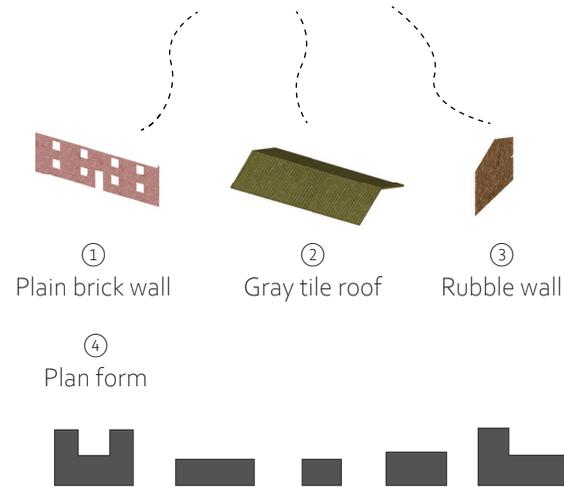
Most of the newly built villages are aware of the importance of sunshine and ventilation, and they prefer larger windows to get a better indoor environment

Folk House promotion policies

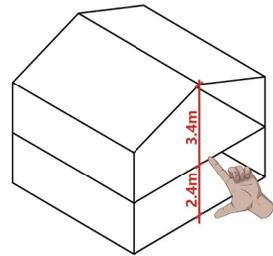
1 Preserve the traditional architectural form



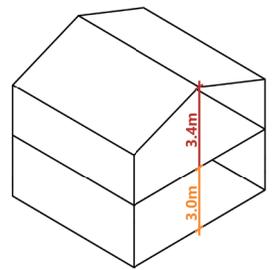
Traditional architecture in Chenjiapu Village



2 Raise floor height

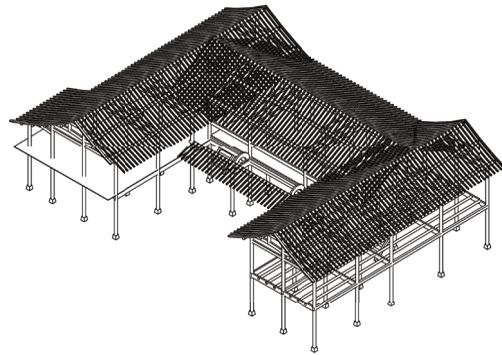


Traditional village houses are very inconvenient for people to live indoors because the floor height is too low.

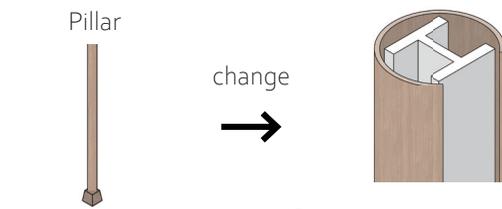


Modern interiors require more electronic equipment, so higher floor heights are needed. A floor height of 3.0 is appropriate.

3 Structure changed

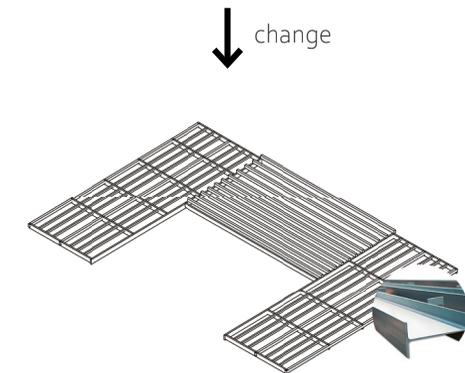
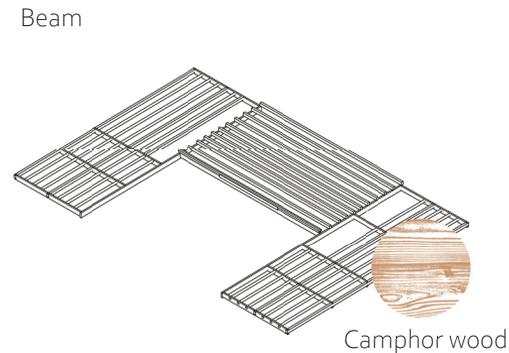


The structure of traditional buildings is made of camphor wood, which is abundant in the area. Although it is strong and fire-resistant, it has a greater potential for disrepair.



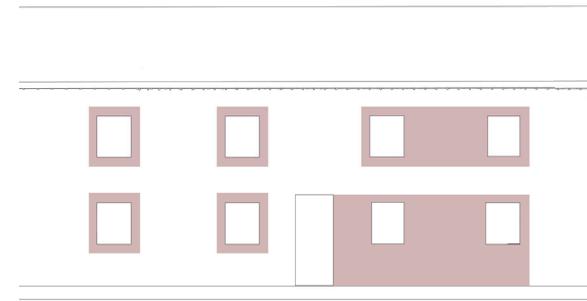
Camphor wood

Steel structure outsourcing camphor wood veneer



The new Folk House will all use steel beams as the main structural components

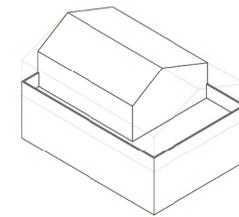
4 Increase window size



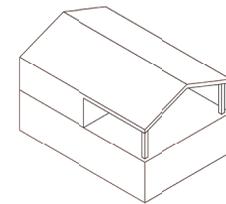
Enlarged window

Increasing the window size is to allow more sunlight indoors, and also to improve ventilation

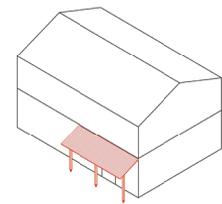
5 Create open space



balcony (open space)



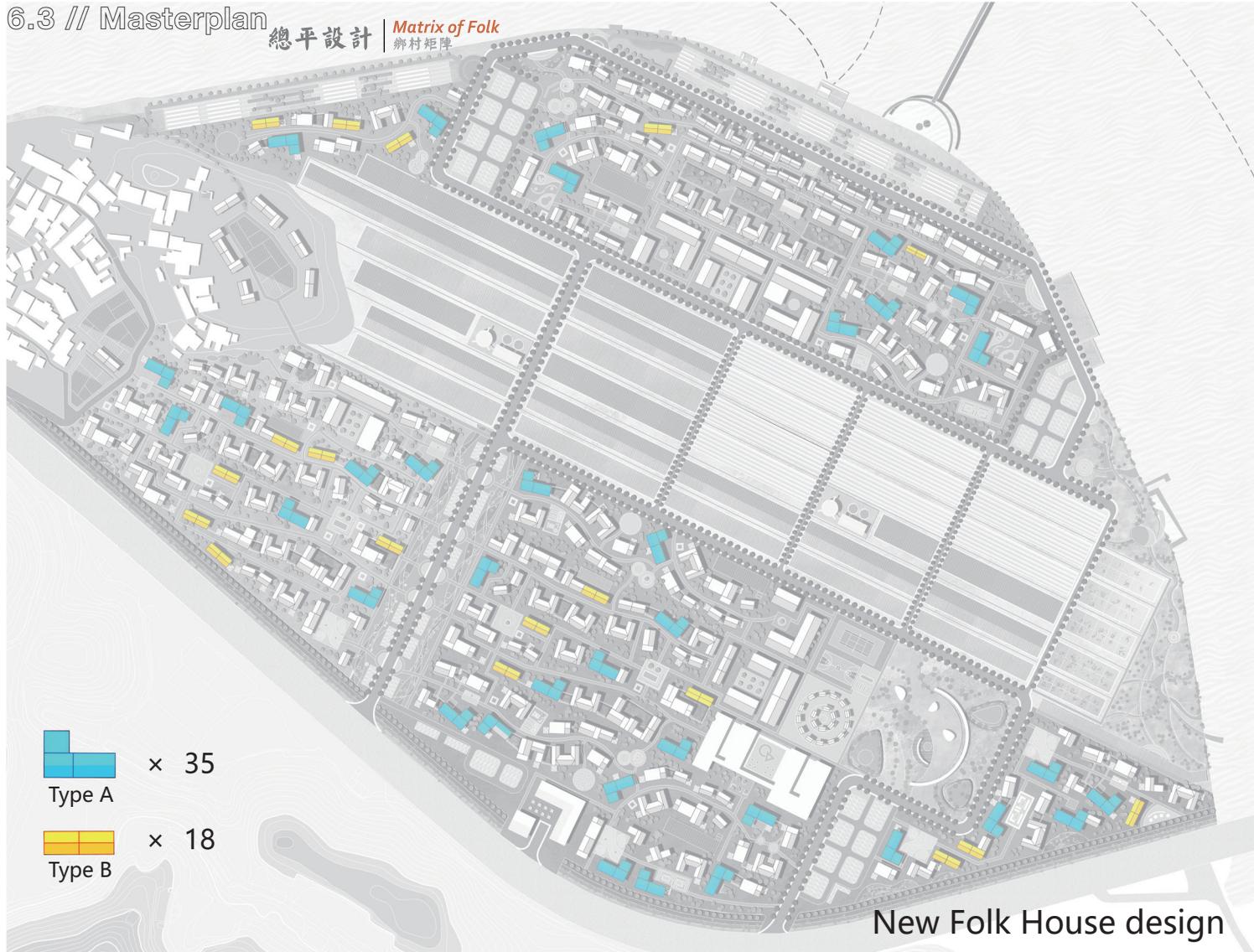
terrace (Semi-open space)



canopy (Entrance gray space)

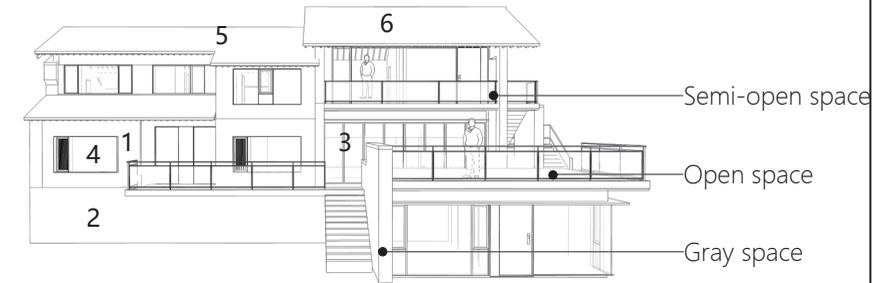
6.3 // Masterplan

總平設計 | Matrix of Folk  
鄉村矩陣



New Folk House design

Type A



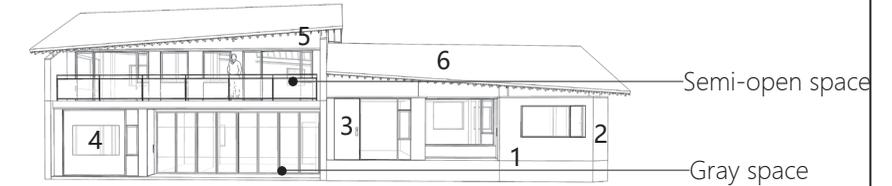
 Total area:280 m<sup>2</sup>  
 Semi-open space area:22 m<sup>2</sup>  
 Gray space area:35 m<sup>2</sup>  
 Open space area:36 m<sup>2</sup>

-  1.Rammed earth
- 2.Stone
- 3.wood
- 4.Plexiglass
- 5.Lightweight steel
- 6.Tiles

 6 people living together

- 1.Increase balcony (outdoor activity space)
- 2.Increase the window area, get better ventilation and daylighting

Type B



 Total area:280 m<sup>2</sup>  
 Semi-open space area:15 m<sup>2</sup>  
 Gray space area:7 m<sup>2</sup>

-  1.Rammed earth
- 2.Stone
- 3.wood
- 4.Plexiglass
- 5.Lightweight steel
- 6.Tiles

 6 people living together

- 1.Increase balcony (outdoor activity space)
- 2.Increase the window area, get better ventilation and daylighting

6.3 // Masterplan

總平設計 | Matrix of Folk  
鄉村矩陣



 × 18

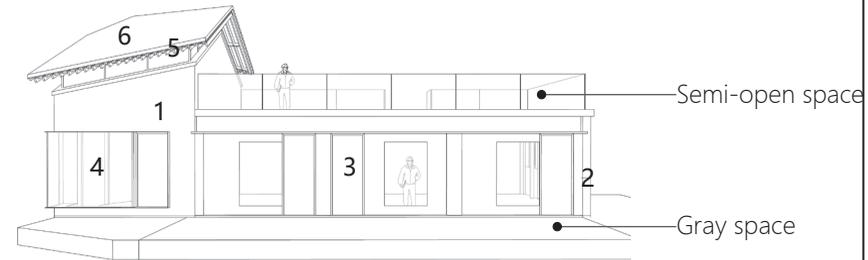
Type C

 × 37

Type D

New Folk House design

Type C



Total area:240 m<sup>2</sup>  
Semi-open space area:88 m<sup>2</sup>  
Gray space area:11 m<sup>2</sup>



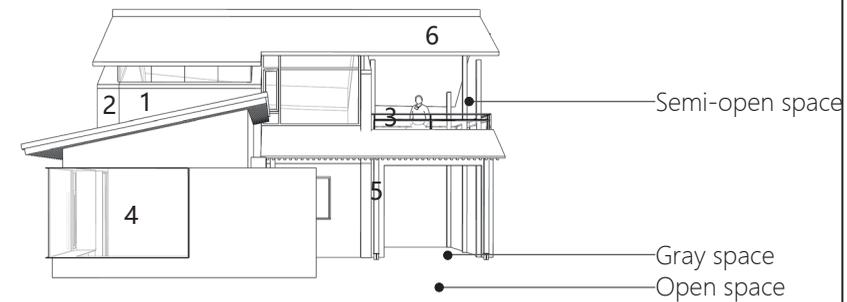
1.Rammed earth  
2.Stone  
3.wood  
4.Plexiglass  
5.Lightweight steel  
6.Tiles



4 people living together

1.Increase the window area, get better ventilation and daylighting  
2.Due to the low second floor of the original building, the second floor roof was directly removed. Floor reinforcement. Get new outdoor space

Type D



Total area:150 m<sup>2</sup>  
Semi-open space area:20 m<sup>2</sup>  
Gray space area:12 m<sup>2</sup>  
Open space area:41 m<sup>2</sup>



1.Rammed earth  
2.Stone  
3.wood  
4.Plexiglass  
5.Lightweight steel  
6.Tiles

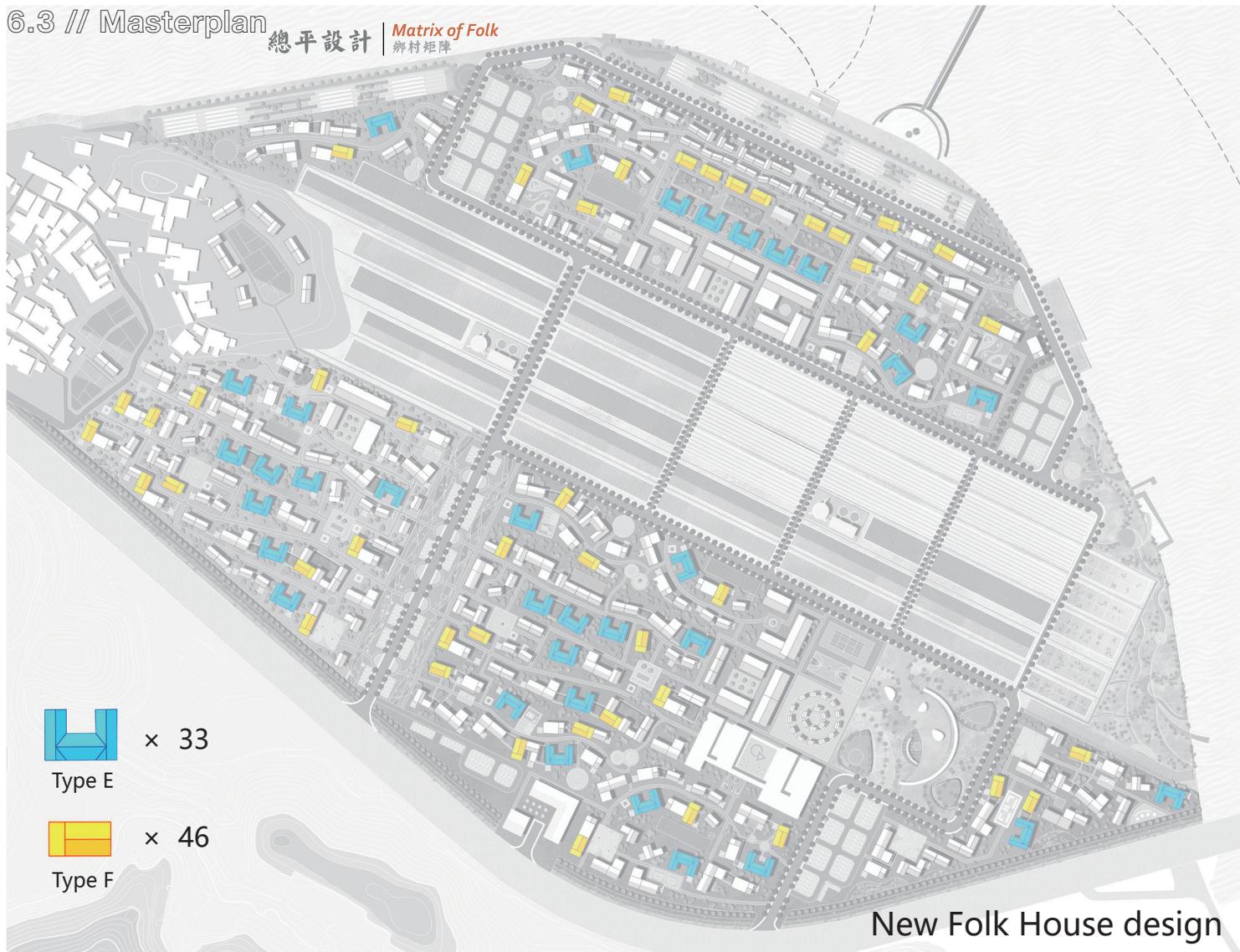


4 people living together

1.Increase the window area, get better ventilation and daylighting  
2.Raise the roof and add glass. Get better daylight  
3.Remove part of the wall to obtain balcony and outdoor space

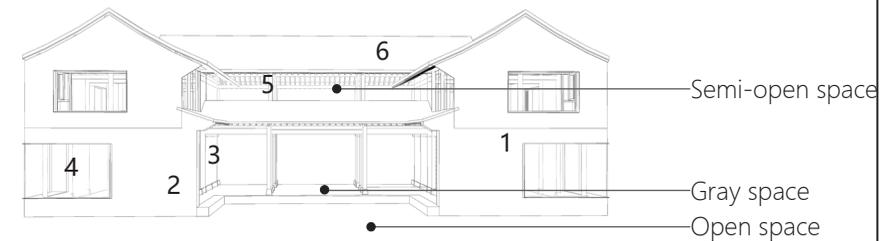
6.3 // Masterplan

總平設計 | Matrix of Folk  
鄉村矩陣



New Folk House design

Type E



Total area:418 m<sup>2</sup>  
Open space area:38 m<sup>2</sup>  
Semi-open space area:57 m<sup>2</sup>



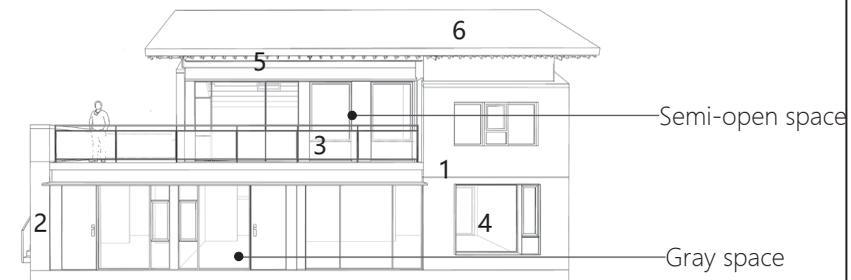
1.Rammed earth  
2.Stone  
3.wood  
4.Plexiglass  
5.Lightweight steel  
6.Tiles



8 people living together

- 1.Open the ground floor space completely
- 2.Increase the window area, get better ventilation and daylighting

Type F



Total area:240 m<sup>2</sup>  
Semi-open space area:28 m<sup>2</sup>



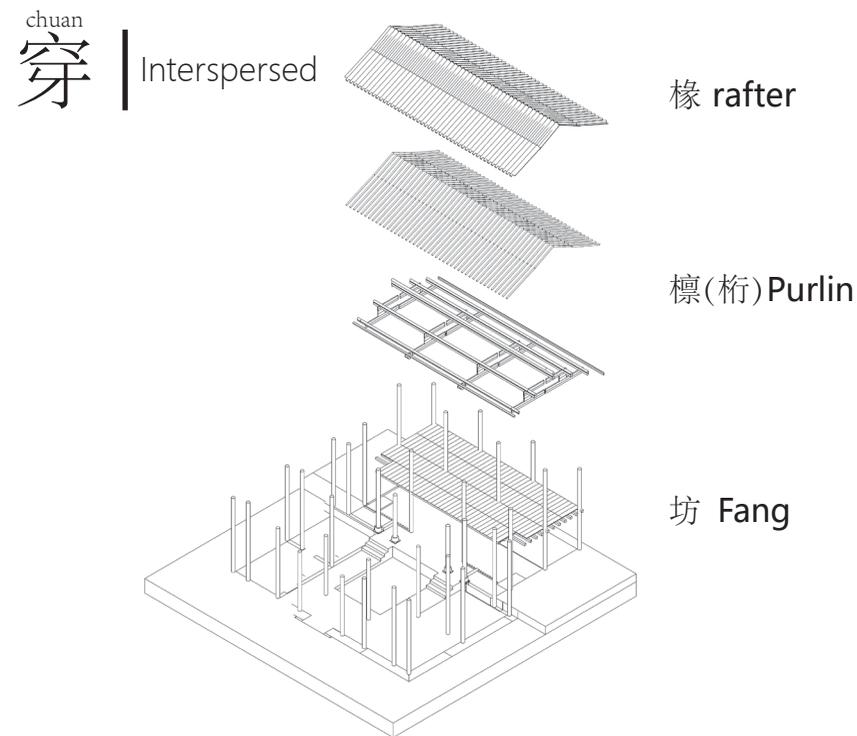
1.Rammed earth  
2.Stone  
3.wood  
4.Plexiglass  
5.Lightweight steel  
6.Tiles



6 people living together

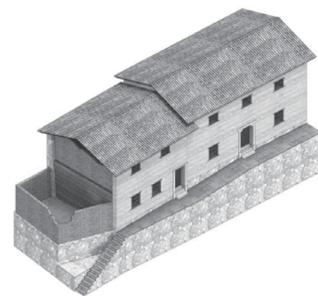
- 1.Increase the window area, get better ventilation and daylighting
- 2.The original building and part of the roof were demolished to obtain outdoor space.

**Structural optimization design**  
Traditional wooden structure

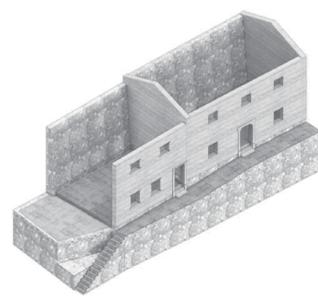


The structure of the residential buildings is mostly a bucket-type wooden frame, and the purlins are directly supported by columns, and the roof structure is thinner than that of the northern residential buildings.

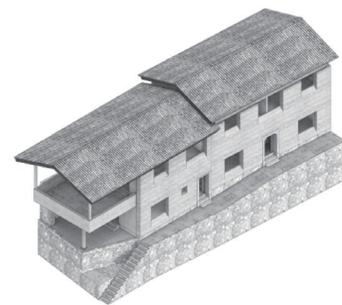
New lightweight steel frame



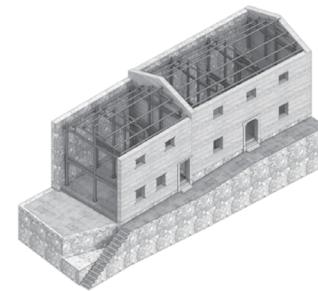
**Step 1**  
The dwellings are typical mountain dwellings in southern Zhejiang, surrounded by rammed earth on three sides, one side is close to the rubble retaining wall, and the internal roof truss is a traditional wooden structure.



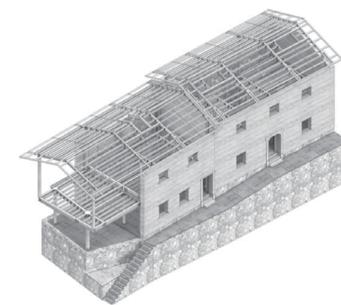
**Step 2**  
The rammed earth walls of the residential buildings are relatively well preserved, and the design keeps them as a whole



**Step 3**  
Protect traditional settlements



**Step 4**  
The wooden roof truss inside the building has been in disrepair for a long time, and it is removed

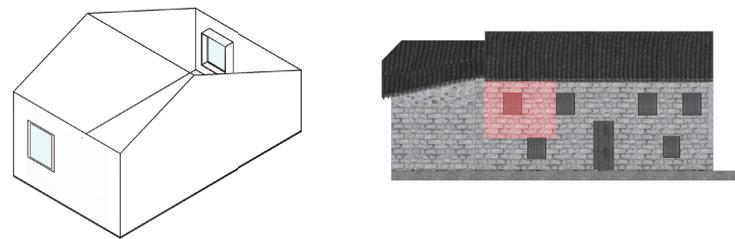


**Step 5**  
A new type of light steel structure is implanted, and the new structure is separated from the retained rammed earth wall to prevent the earth wall from bearing the load of the new building.

Picture from "Asuka Collection" hotel

Improvement of the interior environment

Original building

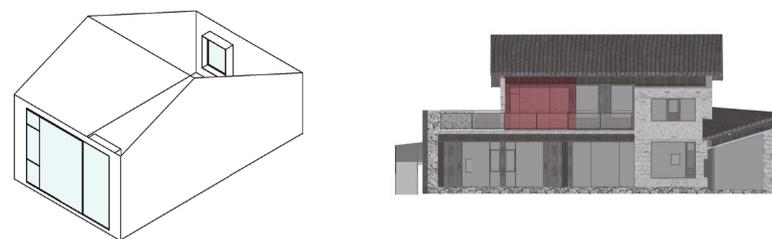


ventilation

	$q_{v-ref}$ [m³/h]	$q_v$ [m³/h]	$F_{top}$ [-]	$h_{top}$ [-]			$q_{v-ref}$ [m³/h]	$q_{v-cool}$ [m³/h]
january	35.023237	0.04647	0.5	12			40.5	
february	22.732579	5.46516	0.5	12			40.5	
march	21.008761	2.01752	0.5	12			40.5	
april	43.109743	86.21949	0.5	12			40.5	
may	47.274423	94.54885	0.5	12			40.5	71.2
june	55.485115	10.9702	0.5	12			40.5	67.1
july	21.00928	2.01856	0.5	12			40.5	71.9
august	22.121643	4.24329	0.5	12			40.5	59.9
september	20.98137	1.96274	0.5	12			40.5	65.1
october	12.422583	4.84517	0.5	12			40.5	
november	35.486112	0.97222	0.5	12			40.5	
december	35.221606	0.44321	0.5	12			40.5	

Poor ventilation, most of values are lower than the reference value

new house

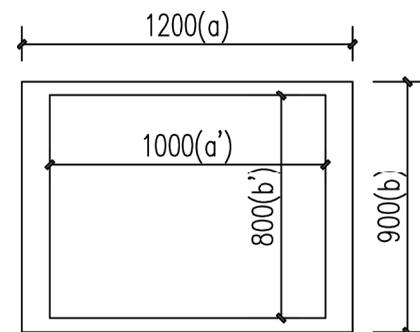


ventilation

	$q_{v-ref}$ [m³/h]	$q_v$ [m³/h]	$F_{top}$ [-]	$h_{top}$ [-]			$q_{v-TAQ}$ [m³/h]	$q_{v-cool}$ [m³/h]
january	106.34783	212.6957	0.5	12			40.5	
february	72.664776	145.3296	0.5	12			40.5	
march	65.201215	130.4024	0.5	12			40.5	
april	122.84758	245.6952	0.5	12			40.5	
may	138.73659	277.4732	0.5	12			40.5	135.4
june	160.7464	321.4928	0.5	12			40.5	127.5
july	65.351876	130.7038	0.5	12			40.5	138.4
august	69.831959	139.6639	0.5	12			40.5	115.6
september	69.362516	138.725	0.5	12			40.5	123.1
october	39.154875	78.30975	0.5	12			40.5	
november	105.06959	210.1392	0.5	12			40.5	
december	106.71872	213.4374	0.5	12			40.5	

Ventilation status improves both in winter and summer

insulation



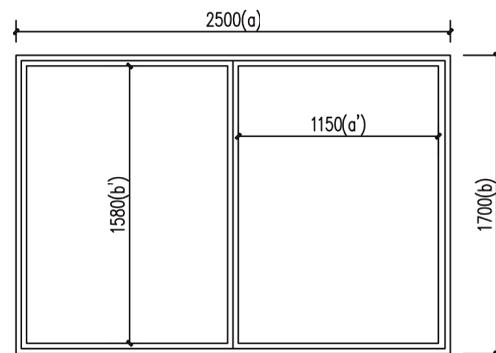
**SIZE**  
 $a$  [m]=1.2  $b$ [m]=0.9  
 $a'$  [m]=1.0  $b'$ [m]=0.8

**MATERIAL**  
 $U_f$  W/(m²·K)=2.20  
 $U_g$  W/(m²·K)=0.89  
 $\psi_g$  W/(m²·K)=0.06

**Result**  
 $U_w=1.43$ W/m²K >  
 $1.4$ W/m²K(Reference value)

Poor room insulation

insulation



**SIZE**  
 $a$  [m]=2.0  $b$ [m]=1.5  
 $a'$  [m]=1.3  $b'$ [m]=0.85

**MATERIAL**  
 PVC-hollow profiles  
 two hollow chambers  
 $U_f$  W/(m²·K)=2.20  
 $U_g$  W/(m²·K)=0.89  
 $\psi_g$  W/(m²·K)=0.06

**Result**  
 $U_w=1.19$ W/m²K ≤  
 $1.4$ W/m²K(Reference value)

The insulation of the room has been improved

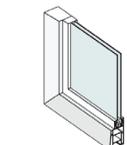
Material



wall(Rubble)



Railing and floor (Bamboo)



Glass (Hollow double glazing)

The exterior wall uses the local rubble veneer, which reduces transportation and material costs.

Bamboo comes from Songyang County, a subsidiary of Lishui City. Bamboo is strong and easy to obtain. It is a renewable material.

The hollow double-layer glass has a higher DF value, which can better heat insulation and prevent rapid changes in indoor temperature.

### The new birth of history

The traditional building façade in this community has been inherited, retaining the original format, but has been modified to meet the needs of modern villagers. The originally cramped space has become bright and spacious, and the living space industry has become bigger.



### New landscape by the Ou River

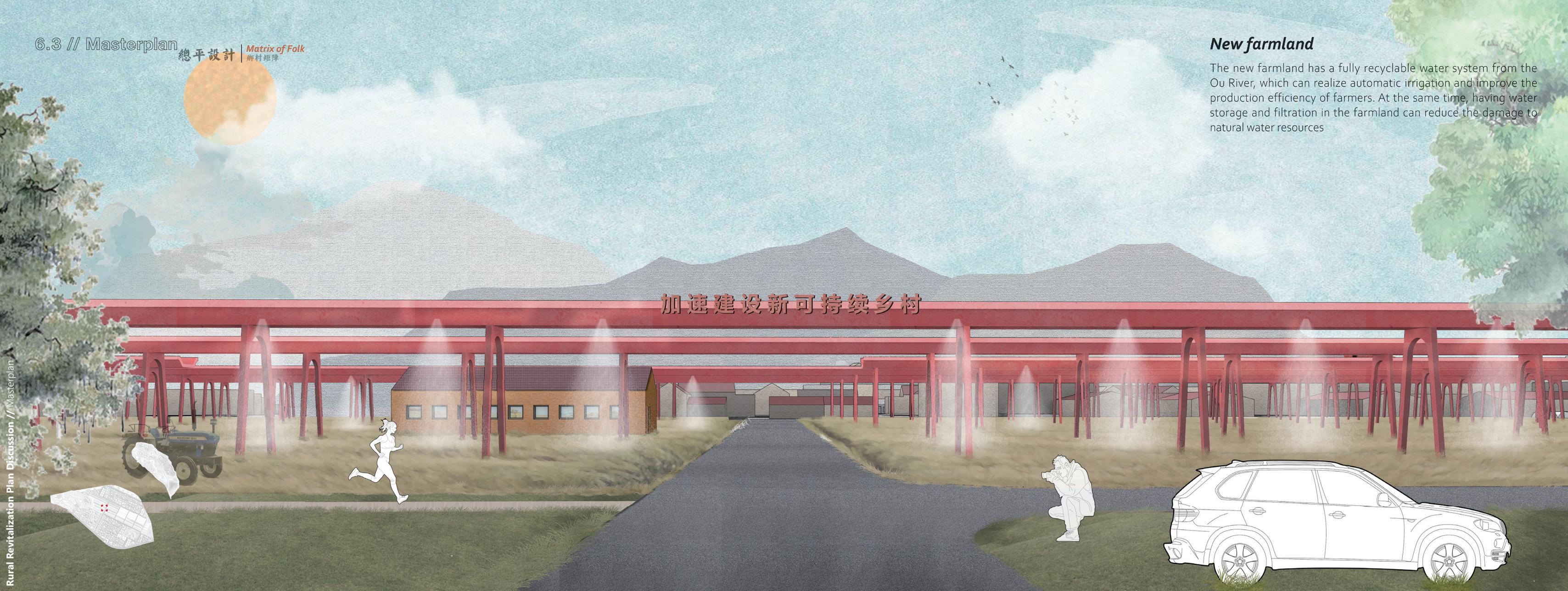
The original river is surrounded by accumulated sand and tons of garbage. Now this site is transformed into a sponge park. It has landscape value and can also serve as a barrier during the annual rain season to reduce the economic impact of flooding on the village.



### New farmland

The new farmland has a fully recyclable water system from the Ou River, which can realize automatic irrigation and improve the production efficiency of farmers. At the same time, having water storage and filtration in the farmland can reduce the damage to natural water resources

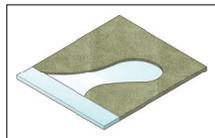
加速建设新可持续乡村



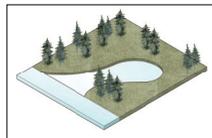
## 6.3 // Masterplan 總平設計

### 2 Island of Art 藝術之島

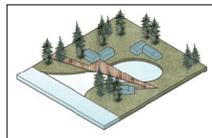
#### The Practice of Sato Caspianism



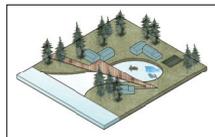
Excavation of artificial water system



Planting trees



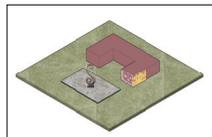
Building houses and plank roads



Farming and fishing



Web advertisement



Art function implantation

In Japan, the result of Satoyama Doctrine was the birth of the Echigo Wisdom Land Art Festival, and what we want to do on the island is similar to it. We first need to introduce the Ou River water into the island and turn the entire island into a wetland. Build houses on the island and plow the fields for fishing. When the island's ecology is perfected, it will be marketed on the Internet, and then artistic functions will be added.

#### Types and marketing of artistic activities

##### Art activities



art exhibition



art exhibition



art auction



art derivatives store

##### Marketing



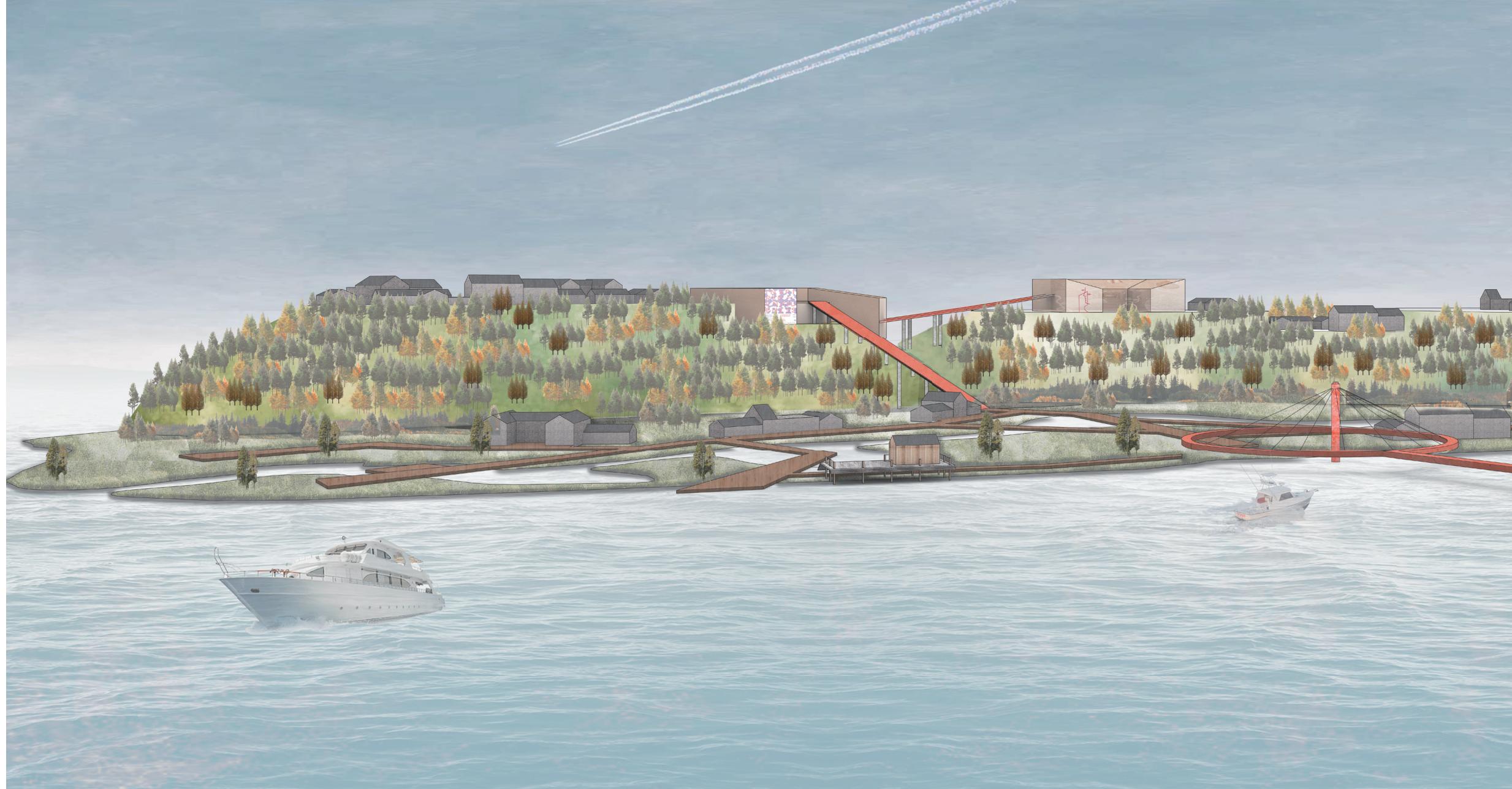
web marketing



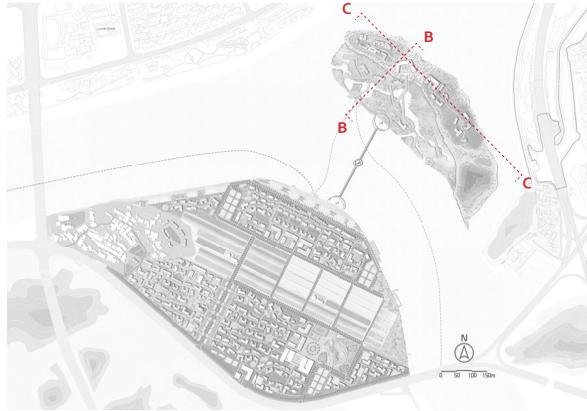
art studio



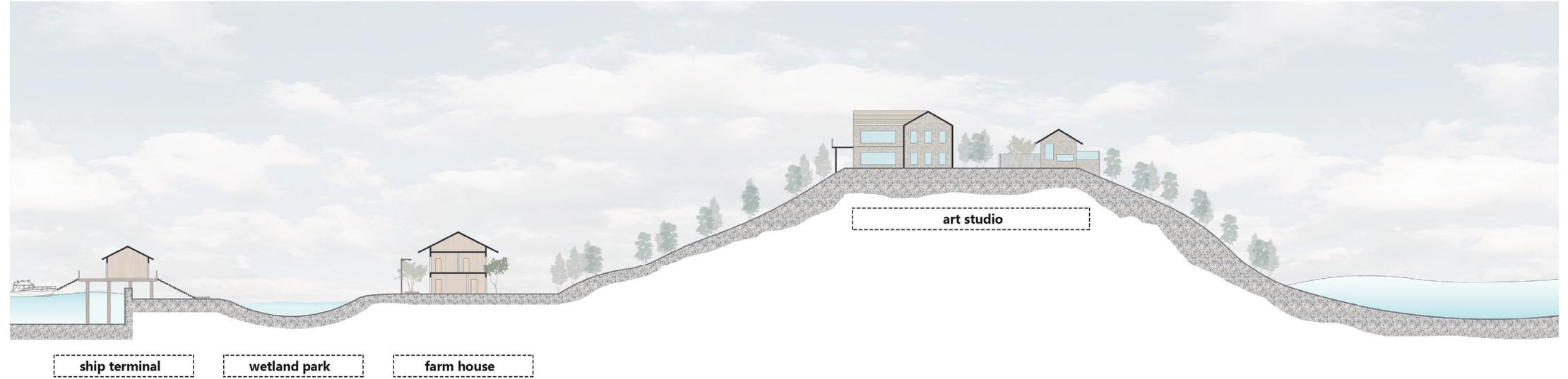
celebrity interaction



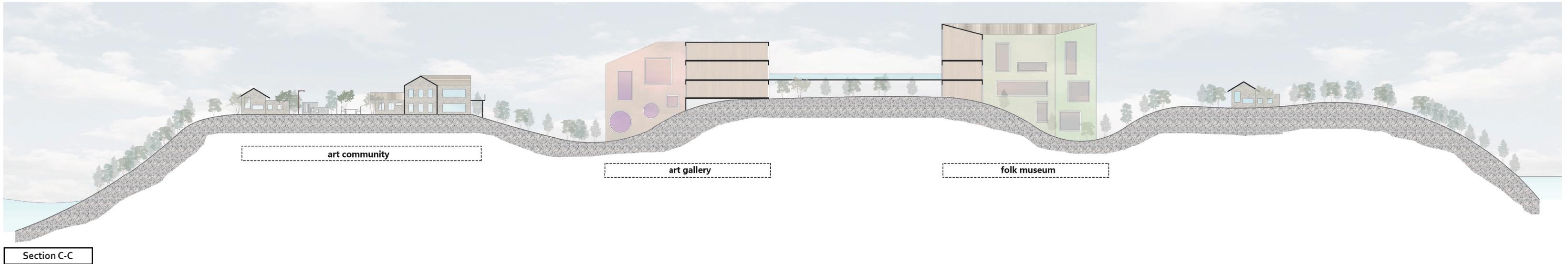
6.3 // Masterplan 總平設計 | *Island of Art* 藝術之島



Section B-B



ship terminal    wetland park    farm house    art studio



Section C-C



### Wetlands

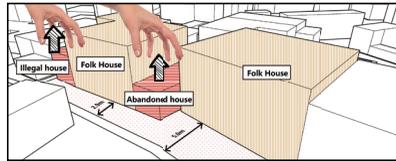
The wetland has strong self-healing ability and pleasant scenery. At the foot of the mountain on the island.



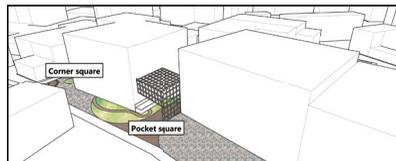
## 6.3 // Masterplan 總平設計

### 3 Renew the old village 舊村煥新

#### Public space insertion



**Narrow space**  
Because of the lack of planning and autonomous construction by villagers in the early days, the space in the village caused the lack of traffic space and public space. We decided to demolish those illegal and abandoned buildings and use them as public spaces.

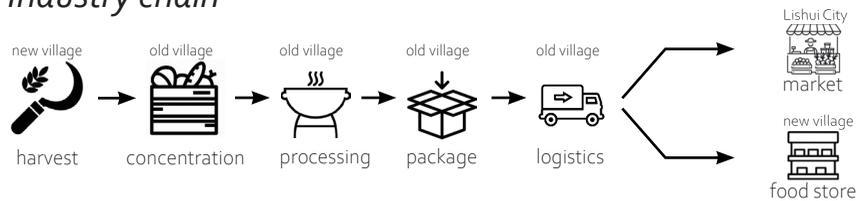


**Open up new space**  
After the abandoned and illegal buildings are demolished, the original space can be transformed into a corner square and a pocket square, where the villagers can communicate and relax.

#### Mutual assistance in old and new villages



#### Industry chain



## 6.3 // Masterplan 總平設計

### — *Matrix of Folk*

This is a new design method that modularizes community functions and can be easily applied to new future villages. The residential module has larger living space and public space. At the same time, people's livelihood functions will be more readily available, and a more sustainable strategy in the rural module will make the water cycle of farmland more efficient.

### — *Island of Art*

After implementing the subject of Lishan Lihai, young people in Lishui need a place of art. The combination of natural landscape and art will increase the priority of the island as a whole.

### — *Renew the old village*

The old village space is cramped and lacks people's breathing space. We decided to open up the space and help the new and old villages function mutually. The processing and production of agricultural products will be realized in the old villages, which can enhance the economic vitality of the old villages.





## 0.Abstract

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2. Li Kaisheng "Think village spatial method of premodernity" Time+ Architecture (2020/2):126
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