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**A Case Study on the Adaptive
Renewal of the Public Space in
Historical and Cultural Towns
from the Perspective of Rural
Revitalization**

Take Fenghuang Ancient Town in Zhashui
County as an example

SCUOLA DI ARCHITETTURA URBANISTICA

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The research was started on the basis of the Sino
Italian cooperation workshop guided by professor
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deepening of the professor's studio course.

A Case Study on the Adaptive Renewal of the Public Space in Historical and Cultural Towns from the Perspective of Rural Revitalization

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Abstract:

This research focuses on the problems of "adaptability" and "adaptive renewal" in the development of Chinese villages and towns. Through the analysis of the origin, evolution and status quo of the Fenghuang ancient town, the author explores the spatial transformation of the public space of the ancient town in terms of the potential adaptability of environment, culture, and value. The research was started on the basis of the workshop guided by professor Laura Anna Pezzetti between Politecnico di Milano & Xi'an University of Architecture and Technology and completed under the deepening of the professor's studio course. At the same time, thanks to the support of China's current rural revitalization and development strategy, the author creatively discovered the compatibility between the existing buildings of the town and traditional industries, so the original tourism-led industrial form of the ancient town was extended to the cultural industry and agricultural products in the design. In this project, the

adaptive transformation of old and new buildings has enabled the ancient town to achieve sustainable development.

Key Words: Fenghuang ancient town; Adaptive renewal; Public space; Rural revitalization

INDEX

1. Relevant Research on the Adaptive Regeneration of public space	- 4 -
1.1 Definition of related concepts.....	- 4 -
1.2 Several aspects of Adaptive Regeneration	- 8 -
1.3 Significance of Adaptive Regeneration	- 11 -
2. Analysis of Historical Space in Fenghuang Ancient Town	- 15 -
2.1 Basic introduction to Fenghuang Ancient Town.....	- 15 -
2.2 Characteristics of historical space in the town.....	- 21 -
2.3 Problems of space in the town	- 36 -
3. Urban Strategy of Public Space in Fenghuang Ancient Town	- 39 -
3.1 Overall Strategy	- 39 -
3.2 Step 1 Planning ancient street tour route nodes.....	- 41 -
3.3 Step2 Establishing Yingpan Mountain slow travel system	- 43 -
3.4 Step3 Developing shechuan River industrial experience belt	- 45 -
4. Architectural Strategy of Public Space in Fenghuang Ancient Town	- 48 -
4.1 Background and Analysis of the site	- 48 -
4.2 Overall Strategy of the project.....	- 69 -
4.3 Architectural Strategy of the project.....	- 76 -
4.4 Reorganize the Order.....	- 77 -
4.5 Regenerating the Public space.....	- 82 -
4.6 Updating the gap space surrounding the interface.....	- 84 -
4.7 Energy Design of the site.....	- 85 -
5. Bibliography	- 89 -

1. Relevant Research on the Adaptive Regeneration of public space

1.1 Definition of related concepts

1.1.1 Rural revitalization

The revival of the Chinese countryside began with the founding of the People's Republic of China. The Chinese countryside that the Communist Party of China took over is actually a countryside in a state of "collapse and turmoil." Entering the new era, with the acceleration of China's urbanization process, many traditional villages and towns have gradually declined, the rural population has lost a lot, the phenomenon of "hollow villages and towns" has emerged one after another, and the original villages and streets have disappeared, resulting in the extinction of many regional cultures.

On October 18, 2017, in the report of the 19th National Congress of the Communist Party of China, President Xi Jinping officially proposed the strategy of rural revitalization for the first time, strengthening the reshaping of rural material space and the inheritance of social and cultural culture, and pointed out that "the prosperity of the rural industry is the foundation for solving all the problems in the village ", that is, industrial prosperity is the key to realizing rural revitalization.

1.1.2 Historical and cultural towns

When the State Council of China announced the second batch of national historical and cultural cities in 1986, it was proposed that small towns and villages should be protected at the same time, and then China began to protect ancient towns. In 2002, the "Cultural Relics Protection Law" first clarified the concept of "historical and cultural villages", that is, "towns and villages that are particularly rich in cultural relics and have significant historical value or revolutionary memorial significance."

In 2003, the Ministry of Construction and the State Administration of Cultural Heritage put forward the concept of "historical and cultural towns and villages" for the first time in the notice on the announcement of Chinese historical and cultural towns (villages) (the first batch).

In 2008, the "Regulations on the Protection of Famous Historical and Cultural Cities, Towns, and Villages" promulgated by the State Council stipulated four conditions for the certification of historical and cultural cities, towns and villages:

- 1) Preservation of cultural relics is particularly rich;
- 2) Historical buildings are concentrated in one piece;
- 3) Retention The traditional structure and historical features;
- 4) Important events have occurred in history, or have had an

important impact on the development of the region, or can reflect the architectural, cultural and ethnic characteristics of the region.

1.1.3 Public space of town

Public space, as its name implies, is an urban space for public use, which seems to be a consensus among people. At first, public space was used as a specific term in the fields of sociology and political philosophy. Its earliest appearance in the field of urban subjects was an article "The social function of open space" published by Lewis Mumford in the "Landscape" magazine in 1960, and Jane Jacobs' "Life and Death in Big Cities in the United States" published in 1961.

The public space referred to in this article mainly includes two levels: one refers to the public place where people in the ancient town can freely enter and exit and exchange ideas of various kinds. For example, people can gather freely in the temples, stage, ancestral halls, markets, riversides, threshing yards and even water wells in rural Chinese villages to exchange their feelings and spread all kinds of news. The second refers to the places where some institutionalized organizations and activities generally exist in ancient towns. For example, the place where organized activities such as party building activities, cultural activities, election activities, and ceremonial events occurred in the ancient town.

1.1.4 Adaptive Regeneration

The first concept of adaptability is an ability of the organism itself, or a kind of natural evolutionary force; the second concept is the developmental power of social culture, which is a manifestation of the inherent characteristics of things and social needs. In summary, adaptability was first born in the field of biological research, which refers to the adaptation of organisms to the environment, and then gradually applied to the field of urban planning.

"Renewal", as the name implies, is reborn by changing and replacing. Professor Wu Liangyong believes that "update" mainly includes the following three aspects:

- 1) Reconstruction or redevelopment, which refers to the relatively complete removal of certain aspects of the existing environment in order to open up space and add new content to improve the quality of the environment;
- 2) Rehabilitation, which refers to the reasonable adjustment and utilization of the existing environment, generally refers to partial adjustments or minor changes;
- 3) Conservation, which refers to the protection and maintenance of the existing structure and form, and generally no changes are allowed.

Adaptive regeneration is mainly a way to protect historical buildings. At present, in the field of urban planning, adaptive regeneration research includes, on the one hand, the adaptability of the built city to the natural environment, ecological environment, and social environment; On the other hand, it also includes adaptive urban design, that is, in the process of urban design, through the design artificially control and integrate urban lifestyles and place categories, and coordinate the social and economic forms and symbiotic relationships of the city, so as to make the city more suitable for humans.

Regarding the regeneration of the public space in the ancient town studied in this article, the adaptivity focuses more on the innovative transformation of the old space. The spirit of the place is preserved and the continuity of the ancient town's context is maintained through man-made adaptive strategies,. On this basis, the functions are appropriately updated to meet the needs of development.

1.2 Several aspects of Adaptive Regeneration

The adaptive regeneration of historical and cultural towns should be based on their own regional characteristics, take sustainable development as the core goal, establish a virtuous circle of adaptive relationship between industry and space, meet the dynamic needs of

villagers' production and life, urban residents' leisure tourism and other subjects and objects, and transform the contradictory relationship between traditional ancient towns and new styles into a mutually supportive relationship. Therefore, in the process of adaptive regeneration of ancient towns, it generally includes the following aspects of adaptive composition.

1.2.1 Ecological Adaptability

The ecological characteristics of historical and cultural towns are mainly reflected in the farmland landscape, landscape and architectural environment. Therefore, there are three aspects of its ecological adaptability in the process of regeneration:

- 1) Protecting farmland landscape boundary and reducing environmental pollution;
- 2) To protect the landscape relationship of the ancient town, prevent soil erosion and maintain the ecosystem;
- 3) In the process of building construction, we should give more play to the regional traditional construction wisdom, use local materials, and use low-cost, passive technology for low-carbon construction.

1.2.2 Economic Adaptability

The economy and industry of historical and cultural towns are closely related, and their industrial system is generally divided into three types:

the first industry (Agriculture), the second industry (handicraft), and the third industry (Tourism). Therefore, the general means of its economic adaptability is to strengthen the linkage of the first, second and third industries, extend the industrial chain, introduce diversified industrial forms such as leisure agriculture, handicraft experience and cultural tourism, strengthen urban-rural exchanges, build regional brands, deepen the industrial chain and enhance industrial value. In addition, the streets and alleys of ancient towns are the core of tourism, and the surrounding areas are the service support. The renewal of economic adaptability requires the mutual support of the two areas, while controlling the degree of commercialization and maintaining the authenticity of life, so as to obtain the sustainable development of tourism.

1.2.3 Mechanism Adaptability

As a special cultural carrier, the main body of historical and cultural towns is villagers. Therefore, in the process of renewal, it is necessary to adapt to the original governance system of the ancient town and balance the fairness and justice of the cooperation mechanism between the villagers and the government, the villagers and the capital, and the villagers themselves. In the villagers' self-governing organizations, the government should give equal voice and protects

the interests of the villagers; When negotiating with capital, villagers could talk with them in the form of cooperatives, village committees and other organizations to guard against and avoid the negative phenomenon of gentrification that capital may bring; In the meanwhile Industrial development should take into account the fairness within the villagers.

1.2.4 Cultural Adaptability

The culture of historical and cultural towns is the core value of the inheritance of the social significance of ancient towns, covering the material traditional style, non-material customs and activities as well as the daily life of villagers. We should emphasize the cultural adaptability in the renewal, that is, we should recognize and protect the traditional style of streets and alleys from the architectural style and materials, the proportion and scale of streets and alleys, and the overall texture and pattern; To record and inherit the traditional customs and celebrations, strengthen the villagers' sense of cultural identity and belonging; When upgrading the existing facilities, we **should continue the daily communication activities in the village.**

1.3 Significance of Adaptive Regeneration

Famous historical and cultural towns include many scattered cultural relics and historical buildings. To protect the ancient town is to protect

its traditional pattern and features, and to inherit and carry forward the excellent local historical and cultural traditions. It is of great significance to carry out the protection of historical and cultural towns.

1.3.1 Strengthen regional identity

Like other heritages, historical and cultural towns are the witness of Chinese traditional culture, religious art, historical events and social activities. At present, there are many characteristic ancient towns in China. However, due to the inadequate protection, the historical features of some ancient towns have disappeared, and some of them are too patterned, which leads to the phenomenon of thousands of similar towns. Organic protection of the material and intangible cultural resources of famous towns is conducive to the in-depth excavation, protection and utilization of historical heritage and culture, refining the unique value characteristics and rich cultural connotation of famous towns, strengthening the regional characteristics of differentiated ancient towns, and maintaining inheritance and play in the planning and construction.

1.3.2 Maximize the utilization of cultural resources

The essence of protecting historical and cultural towns is to protect the cultural resources in them. According to statistics, the total number of historical and cultural cities, protected areas and cultural relics

protection units that have been clearly protected in China is less than 100000, and the number and scope of protected buildings are far less than those in some countries with small area, short history and small population. For example, England has a land area of 130000 square kilometers, which is only 1 / 73 of China's, but England has 500000 registered buildings and more than 8000 protected areas. Therefore, the development of adaptive renewal of famous towns will be conducive to the protection of Chinese historical and cultural heritage in a wider range.

1.3.3 Weakening the contradiction between urban and rural evolution

Urbanization in China not only affects the development and evolution of cities, but also obvious to the villages of ancient towns. The contradiction between backward rural life and urban development has always been the focus of the protection of ancient towns. Traditional settlements, because of their integrity and unique architectural and settlement style, are easy to attract the attention of academia, government departments and capital. Therefore, tourism development is carried out to form these higher tertiary industries. In contrast, the development of vulnerable industries such as agriculture dominated by indigenous people is slow, which is limited by the

existing space and economic strength, and the contradiction between them is increasing. The adaptive renewal and protection of ancient towns can seek balance in the contradiction by means of intervention, so that the ancient town can develop sustainably.

2. Analysis of Historical Space in Fenghuang Ancient Town

2.1 Basic introduction to Fenghuang Ancient Town

2.1.1 Location

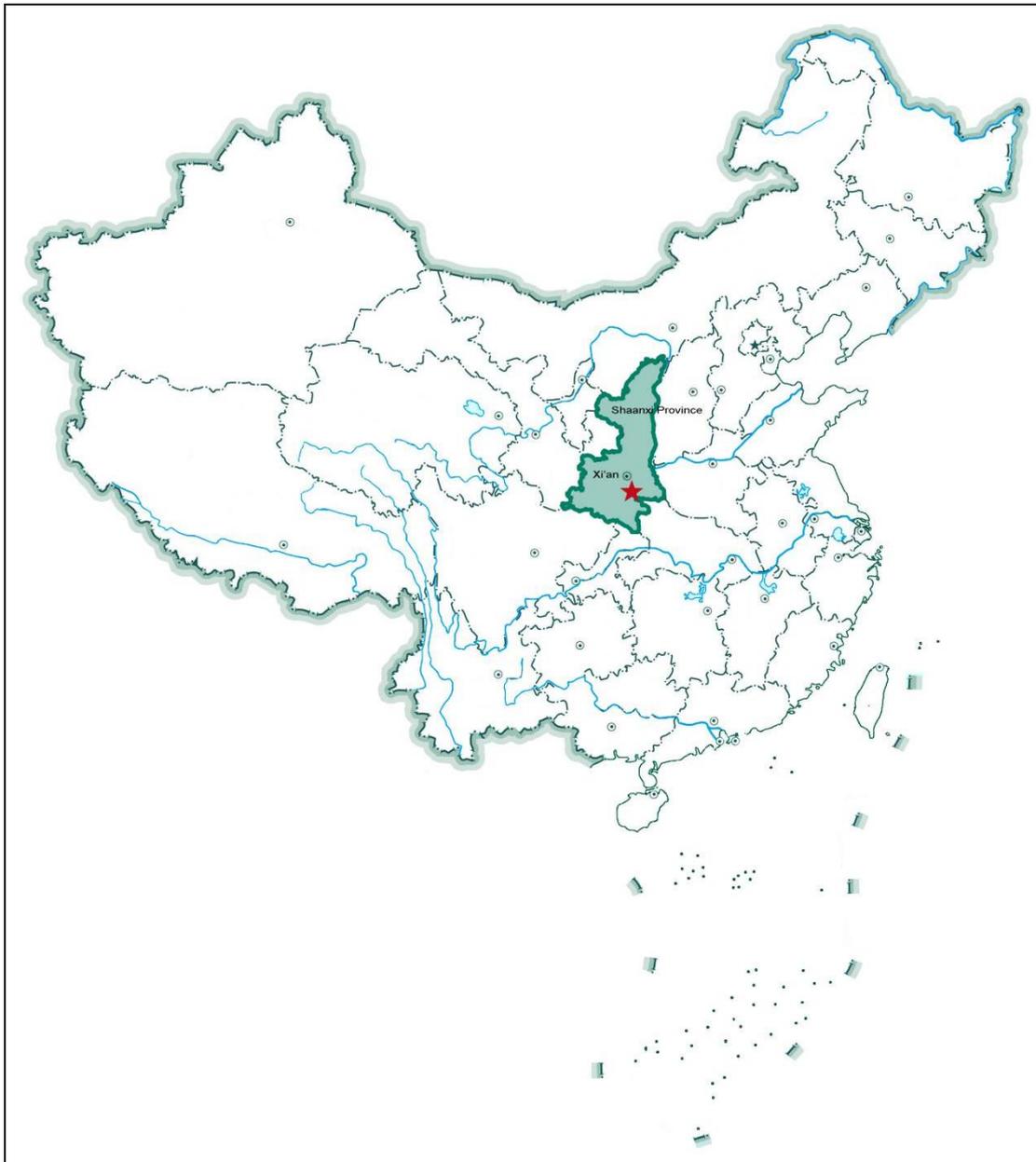


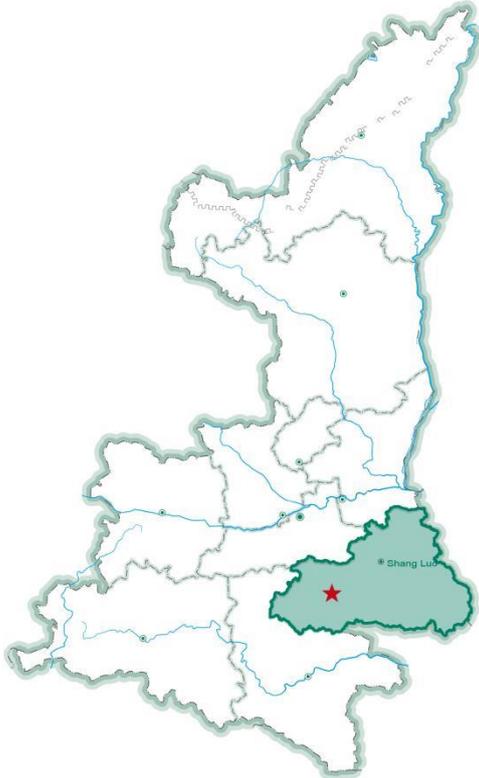
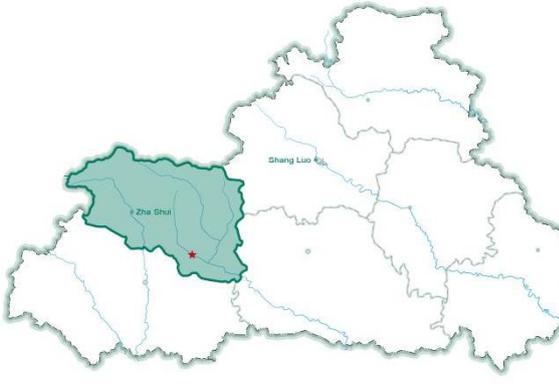
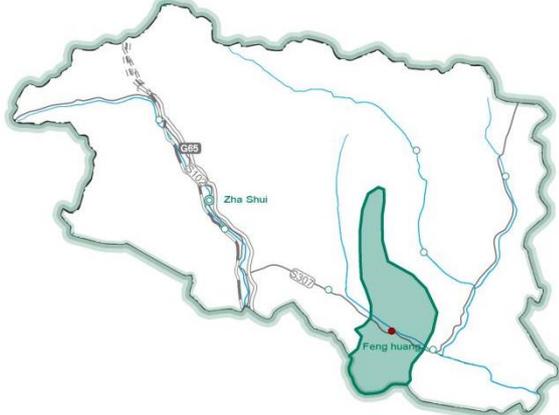
Fig.2. 1 Shaanxi Province in China

(Source: Redrawn from government documents)

Fenghuang ancient town is located in the southeast of Zhashui County, Shangluo City in Shaanxi Province. And the town is located at the

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south foot of Qinling Mountain, the North-South dividing line of China.

	
<p>Fig.2. 3 Shangluo City in Shaanxi Province</p>	<p>Fig.2. 2 Zhashui County in Shangluo City (Source: Redrawn from government documents)</p>
<p>(Source: Redrawn from government documents)</p>	
<p>Fig.2. 3 Shangluo City in Shaanxi Province</p>	<p>Fig.2. 4 Fenghuang Town in Zhashui County</p>
<p>(Source: Redrawn from government documents)</p>	<p>(Source: Redrawn from government documents)</p>

The ancient town is 45 km away from Zhashui County and 107 km away from Xi'an, the capital of Shaanxi Province. And its area is about 5km². Along 307 provincial road, the whole town presents a long and narrow strip development, with convenient transportation in the town.

Also it is a famous ancient commercial town in the history.

2.1.2 History of the town



Fig.2. 5 Aerial photos of Fenghuang ancient town

(Source: Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Fenghuang ancient town was first built in the Tang Dynasty and flourished in the Ming and Qing Dynasties. Since the Tang Dynasty, it has gone through ten dynasties including five dynasties, Song Dynasty, Liao Dynasty, Jin Dynasty, Yuan Dynasty, Ming Dynasty, Qing Dynasty and the Republic of China, and has a history of more than 1400 years. The ancient town was formed in the eighth year of Wude of Tang Dynasty (625 AD). During the Ming and Qing Dynasties, mule horse post road and waterway shipping were opened, and Commerce began to prosper. Until the period of the Republic of China, Fenghuang town was an important trade market town. Later, with the

decline of water transportation and the improvement of road traffic, the ancient town lost its status and role in the past, but its style and features, street space texture, a large number of ancient shops and ancient residential buildings have been completely preserved to today.

2.1.3 Protection status of the town

Fenghuang Ancient Town was selected as the fourth batch of cultural relics protection units of "Ancient Buildings and Residential Buildings" in Shaanxi in 2002. In 2010, it was selected as the fifth batch of national "historical and cultural towns". The ancient towns with many titles have accelerated the pace of development. In the core area of the ancient town, the complete market form formed during the Ming and Qing dynasties is preserved, including more



Fig.2.6 Fenghuang Folk House Cultural Relics
Protection Certification Stone Tablet

(Reference: <http://www.baidu.com>)

than 100 traditional houses, including more than 60 houses built in the Ming and Qing dynasties.

In 2013, the

People's

Government of

Zhashui County, in accordance with the requirements for the construction of famous historical and cultural towns and ancient cultural tourism towns in China, hired a professional planning agency to compile the "Master Plan for Tourism Development of Phoenix Ancient Town in Zhashui County", "Cultural Tourism Construction Plan of Phoenix Ancient Town in Zhashui County", The "Fenghuang Street Residential Cultural Relics Protection Plan in Zhashui County" provides a strong planning guarantee for the protection and development of Fenghuang Ancient Town.

First of all, the government limited the overall planning protection scope of Fenghuang Ancient Town, established a core protection area and a building control area, and carried out multi-directional protection of the streets and lanes in the core protection area, and coordinated control of the surrounding environment to achieve the overall purpose of protection.

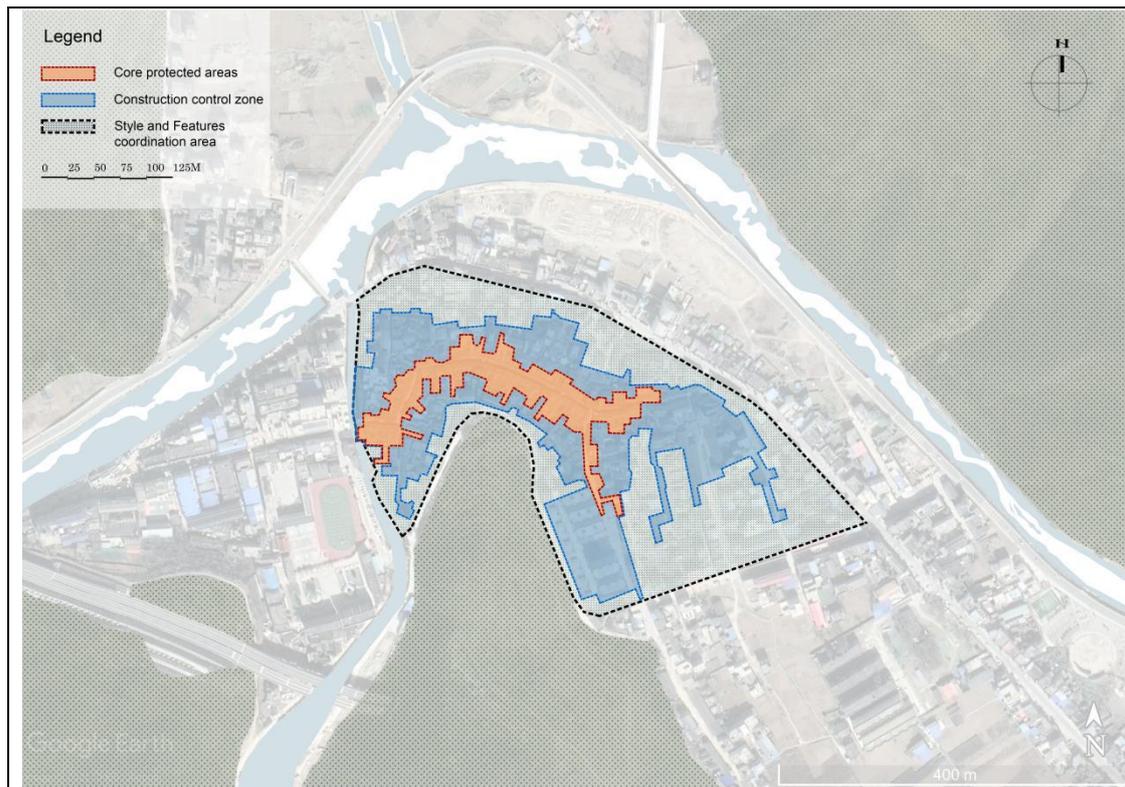
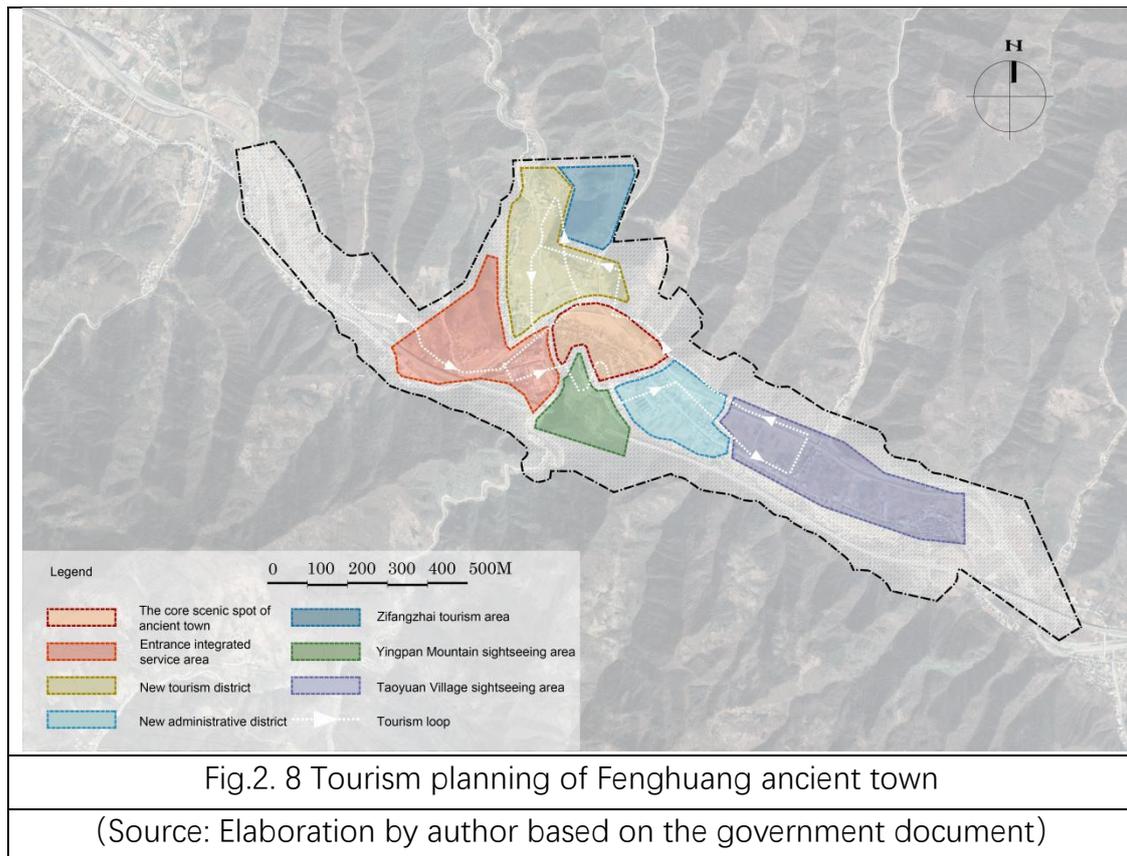


Fig.2. 7 Protection plan of Fenghuang ancient town

(Source: Elaboration by author based on government document)

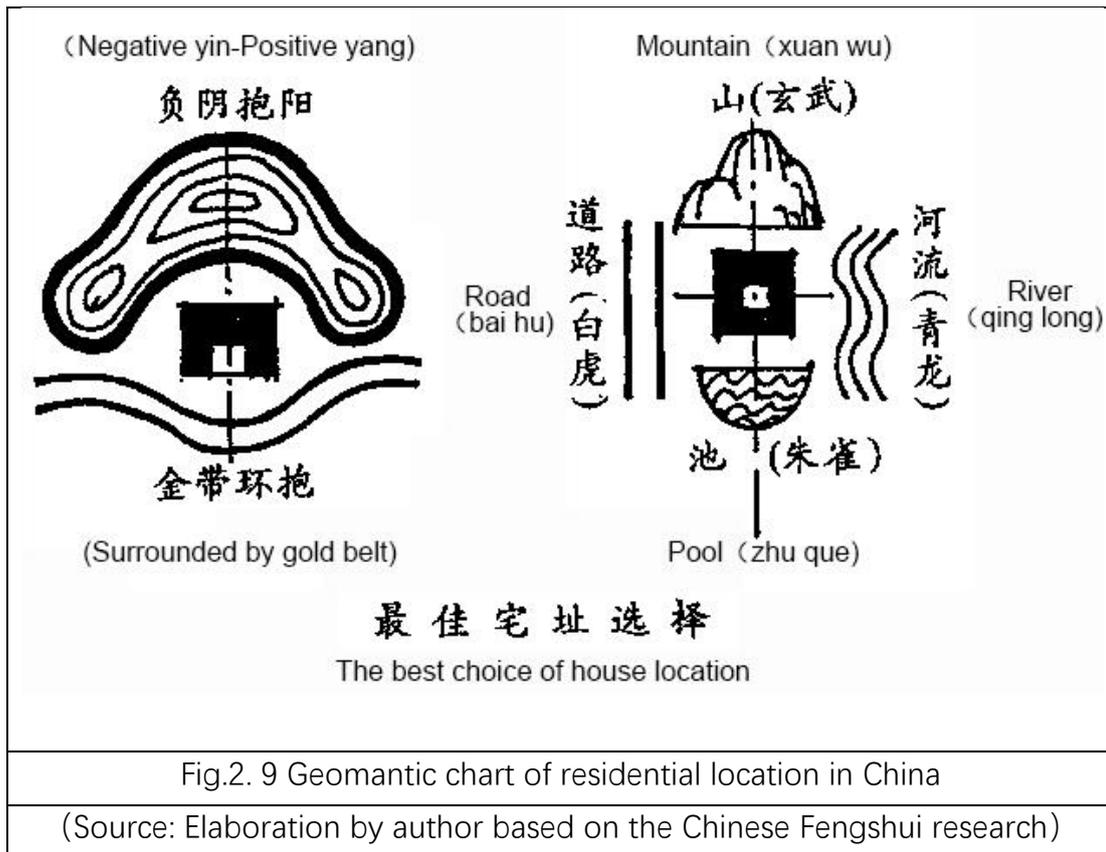
Secondly, in terms of structural layout, the overall planning structure is one center, two axes, three circles, and six areas: the core area, which protects the ancient dwellings of the Ming and Qing Dynasties; the two axes of water and land are used to guide the iconic scenic spots that reflect the theme. The surrounding area is divided into core circle, transition circle, radiation circle and entrance comprehensive service area, new tourism area, administrative function area, Yingpanshan sightseeing area, Taoyuan village pastoral recreation area, and Zifangzhai red tourist area. The ancient southern town in the northernmost part of China will be built.



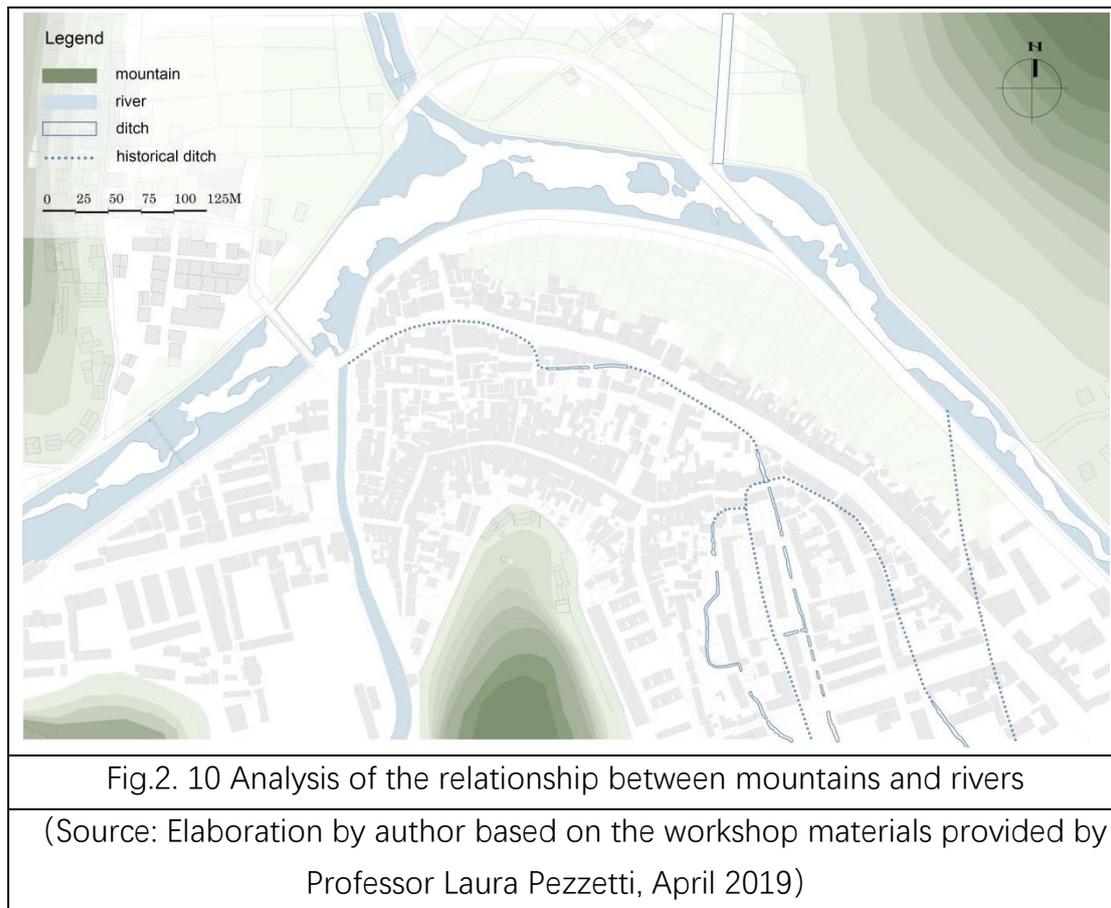
2.2 Characteristics of historical space in the town

2.2.1 Settlement formation

Fenghuang ancient town is adjacent to the middle reaches of shechuan River in the north and Fenghuang Mountain in the south, which is a "mountain by river" site selection mode, in line with the principle of "negative Yin embracing Yang" in ancient house site selection.



Secondly, the ancient town is located in the delta plain formed by the intersection of shechuan River, Tianhe canal and shuidui River, that is, on the convex bank of the river. This is the place where mountains and rivers gather in Fengshui, where wind and water are stored. In addition, there are also physical reasons: convex bank is the inner ring area of the river bend. When the river flows and turns, due to the physical inertia and centripetal force of the water flow, the flow speed of the river will slow down and the water level will drop on the convex bank of the river bend. The sediment brought by the river is easy to accumulate here, so that the convex bank area will continue to increase and more and more land can be used.



2.2.2 Greenery system

Fenghuang ancient town is surrounded by mountains on three sides with rich landscape resources.

First of all, through the investigation, we can see that there are ancient town cemeteries on Yingpan mountain, which is closely related to the location of ancient Chinese cemeteries. In geomantic omen, the location of the cemetery emphasizes " Mountain master Ding, water master wealth", which means that the choice of the mountain implies the prosperity of the people of later generations; The choice of water means wealth. At the same time, the location of the cemetery requires

a broad vision, which means that the future of the family is broad.



Fig.2. 11 Aerial photos of Fenghuang ancient town

(Source: Taken by groups of Polimi-XAUAT Workshop guided by Professor
Laura Pezzetti, April 2019)

Secondly, It can be seen from the figure that the biggest transverse feature of the farmland in the north of the ancient town is the zonal distribution along the river. This is because the distribution of water is the key factor restricting the distribution of local production and residents. Most of people's production and life are close to water and live by water, especially the irrigation of farmland needs water; On the other hand, the farmland presents the vertical distribution characteristics of rattan leaf outward divergence, which is due to the close relationship between farmland and residential buildings in the early days. Under the influence of "equal farmland system", the division of farmland follows the division of residential buildings, so it

mainly continues the horse head wall texture of the old streets.

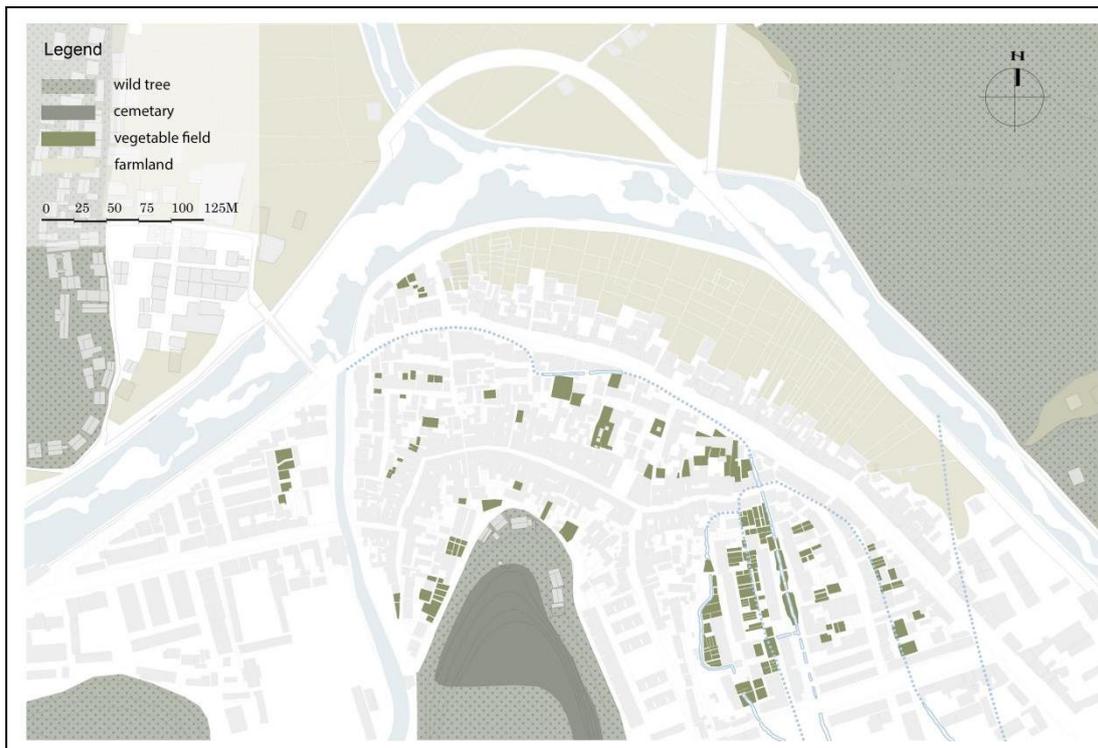


Fig.2. 12 Greenery Analysis of Fenghuang Ancient Town

(Source: Elaboration by author based on the workshop materials provided by Professor Laura Pezzetti, April 2019)

Finally, the distribution of vegetable fields in the streets and alleys of the ancient town is analyzed. The first feature is that the vegetable fields are mainly concentrated near the canal, that is, the southeast direction of the ancient town, which is also the result of water source; Other vegetable fields are scattered in the backyard of residential buildings.

2.2.3 Network system

First of all, the road network structure of Fenghuang ancient town is composed of new roads and old road system. Provincial highway S307

mainly connects the inside and outside of the ancient town, with modern commerce and new antique residential buildings distributed on both sides. The old road is mainly connected with the core of the ancient town, mainly the tourist trail.



Fig.2. 13 Network Analysis of Fenghuang Ancient Town

(Source: Elaboration by author based on the workshop materials provided by Professor Laura Pezzetti, April 2019)

The whole street of the ancient town is S-shaped, with a total length of about 1200m and an average width of 5-7m. Among them, the street with concentrated ancient buildings in Ming and Qing Dynasties is about 360m long, and the pavement material is mainly bluestone slab. The width of each street is different, which retains the original scale.

The internal road network structure of the ancient town presents a vine leaf-like street and lane pattern as a whole. The main part is the "S"-shaped main street under the vines, and the second level is the laneway under the branches. People enter the main street from these laneways perpendicular to the old street. In residential areas, the width of the roadway is generally 1-1.5 meters, and the ground material is mainly slate and small stones.

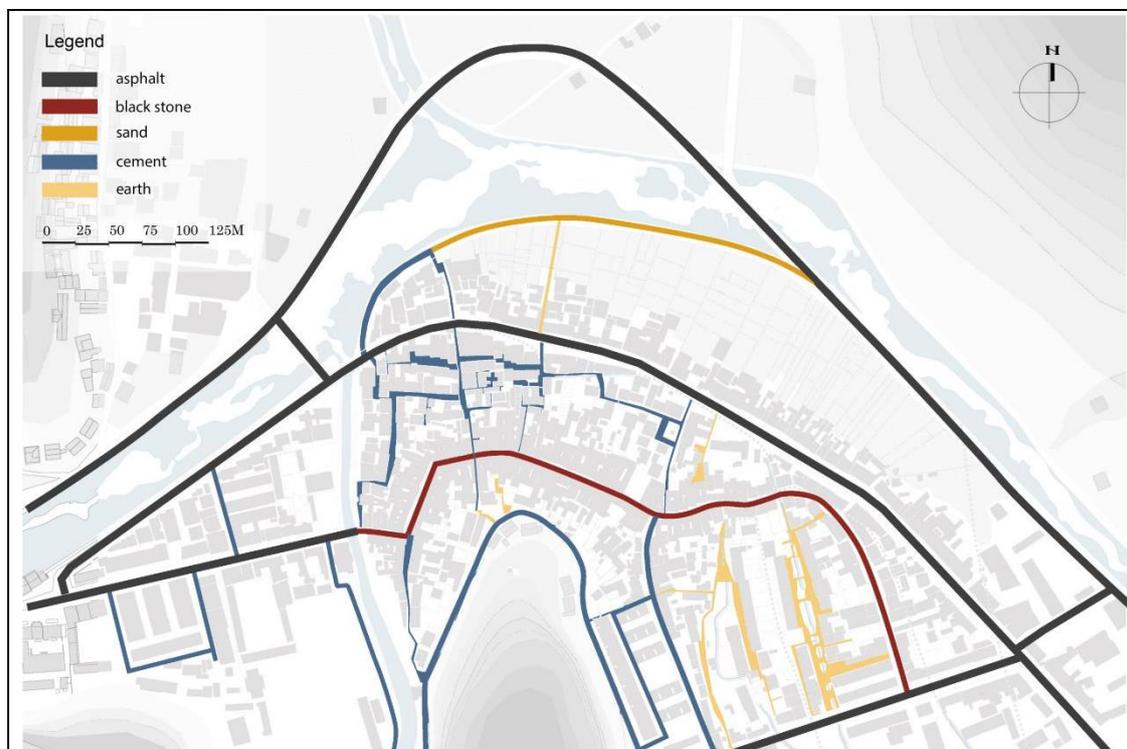


Fig.2. 14 Pavement Analysis of Fenghuang Town

(Source: Elaboration by author based on the workshop materials provided by Professor Laura Pezzetti, April 2019)

2.2.4 Construction system

After field research on the architectural space of the ancient town of Phoenix, the architectural space of the ancient town can be divided

into four categories based on the construction time, materials used, and spatial characteristics of the building, namely: courtyard buildings, other traditional buildings, brick-concrete buildings and temporary structure buildings.

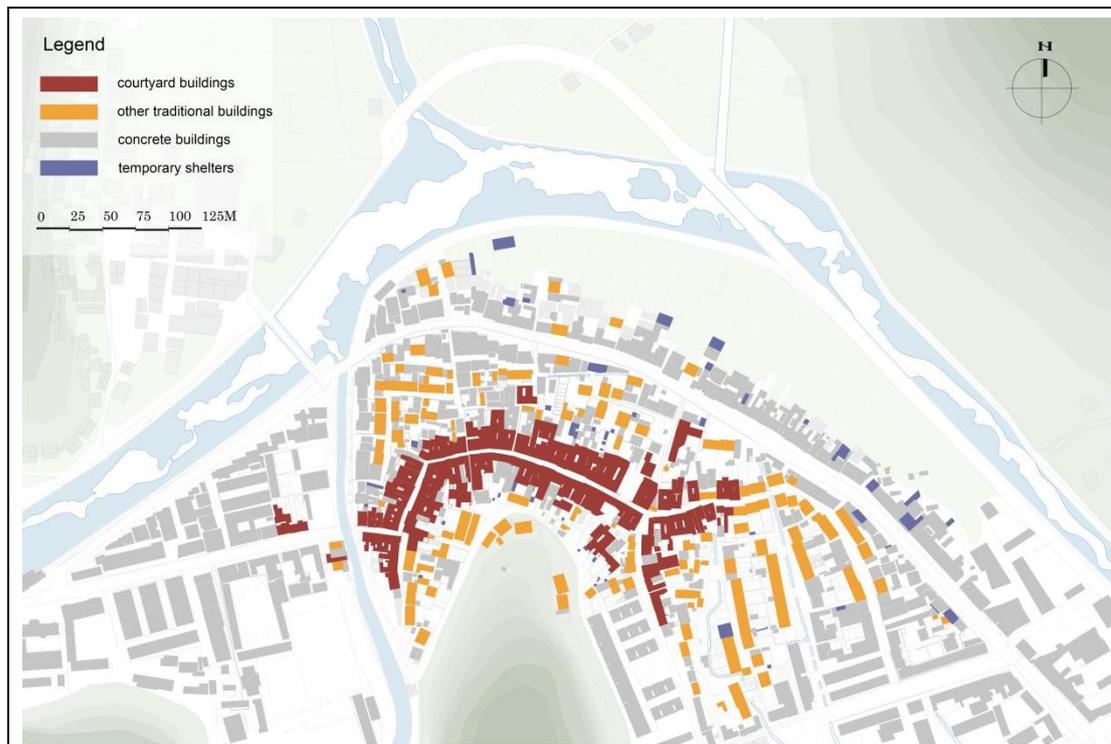


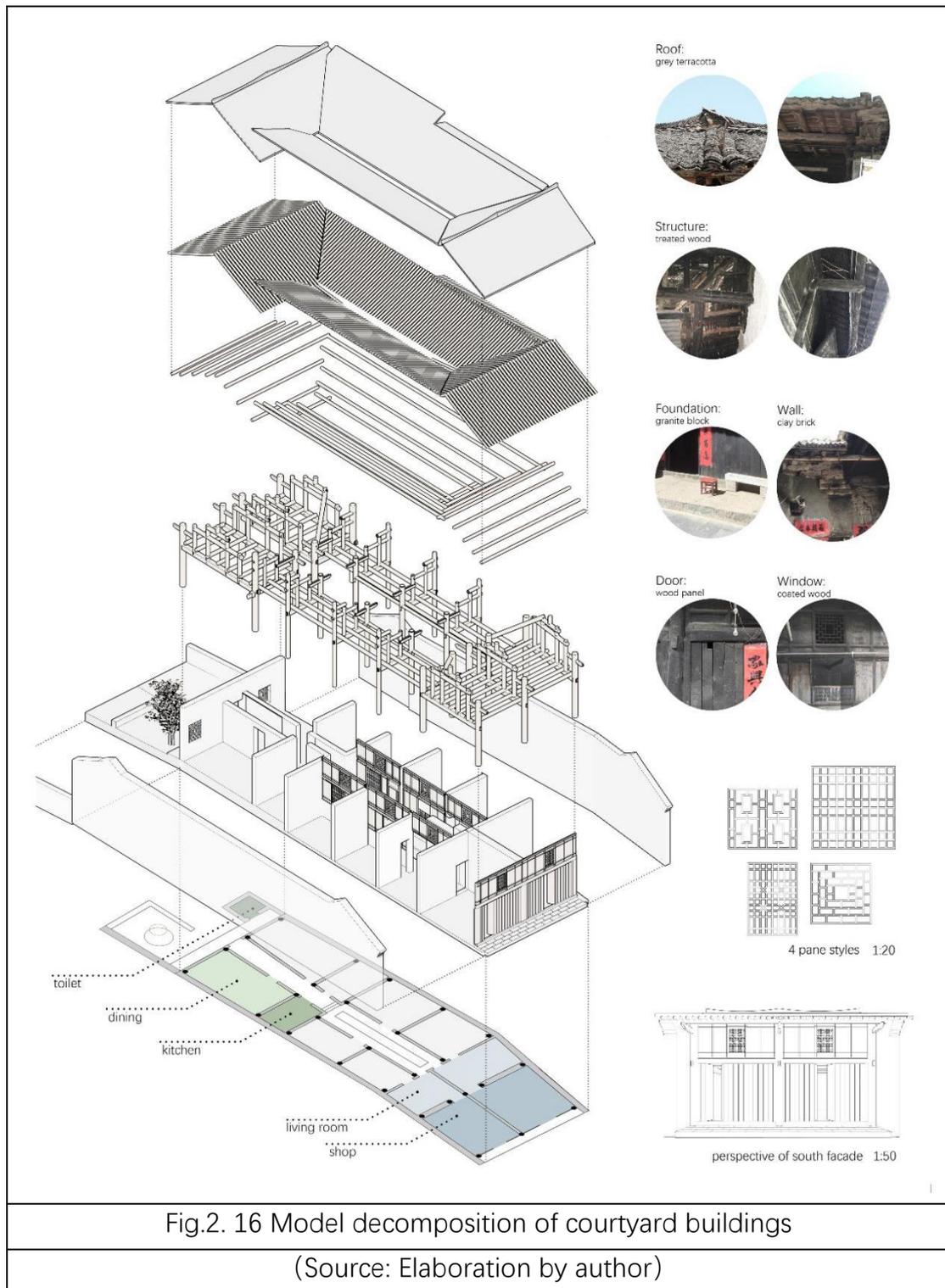
Fig.2. 15 Typology Analysis og Fenghuang Town

(Source: Elaboration by author based on the workshop materials provided by Professor Laura Pezzetti, April 2019)

1) Courtyard buildings

The first type of courtyard buildings mainly refers to the courtyard buildings built in the Ming and Qing dynasties, distributed on both sides of the old street, and basically evolved from the single courtyard style named “Sihe yuan”. The width of “Sihe yuan” is generally about 10 meters in three bays, and the depth of quadrangle courtyards is

usually about 20 meters. Other types of courtyards such as vertical multi-entry courtyards can reach depths of more than 30 meters. The middle courtyard is called a patio courtyard because of its narrow and long shape. Also it does not have the function of an activity place, but only serves as a lighting, ventilation and transportation function. Basic structure of this type is shown in the figure:



2) Other traditional buildings

The second category is the raw earth buildings in ancient towns. Most of them were built in the 1960s and 1980s. Their layout is basically a

regular rectangle. The most common one is a three-bay room with a length-to-width ratio of about 5:3.

It is worth noting that the building adopts raw soil as the material, and the heavy bearing wall is built by manual compaction. In order to achieve the purpose of strong and stable, the thickness of the wall has reached 400mm, so it has good heat insulation effect, and the interior of the house is warm in winter and cool in summer. At the same time, most of the earth buildings in the ancient town use wooden roof truss, which is supported on the load-bearing wall to form a sloping roof and covered with green tiles. The basic structure is shown in the figure:

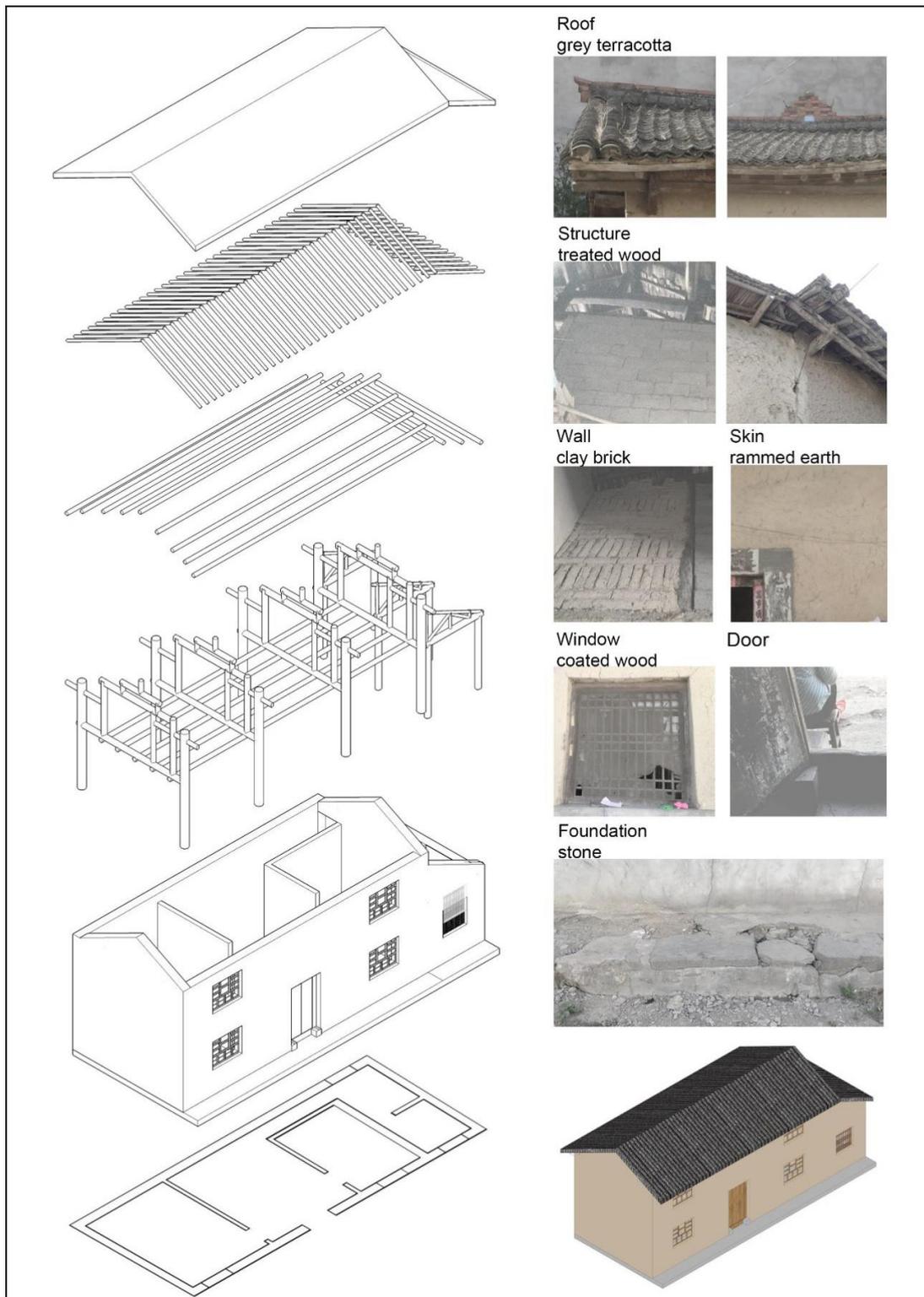
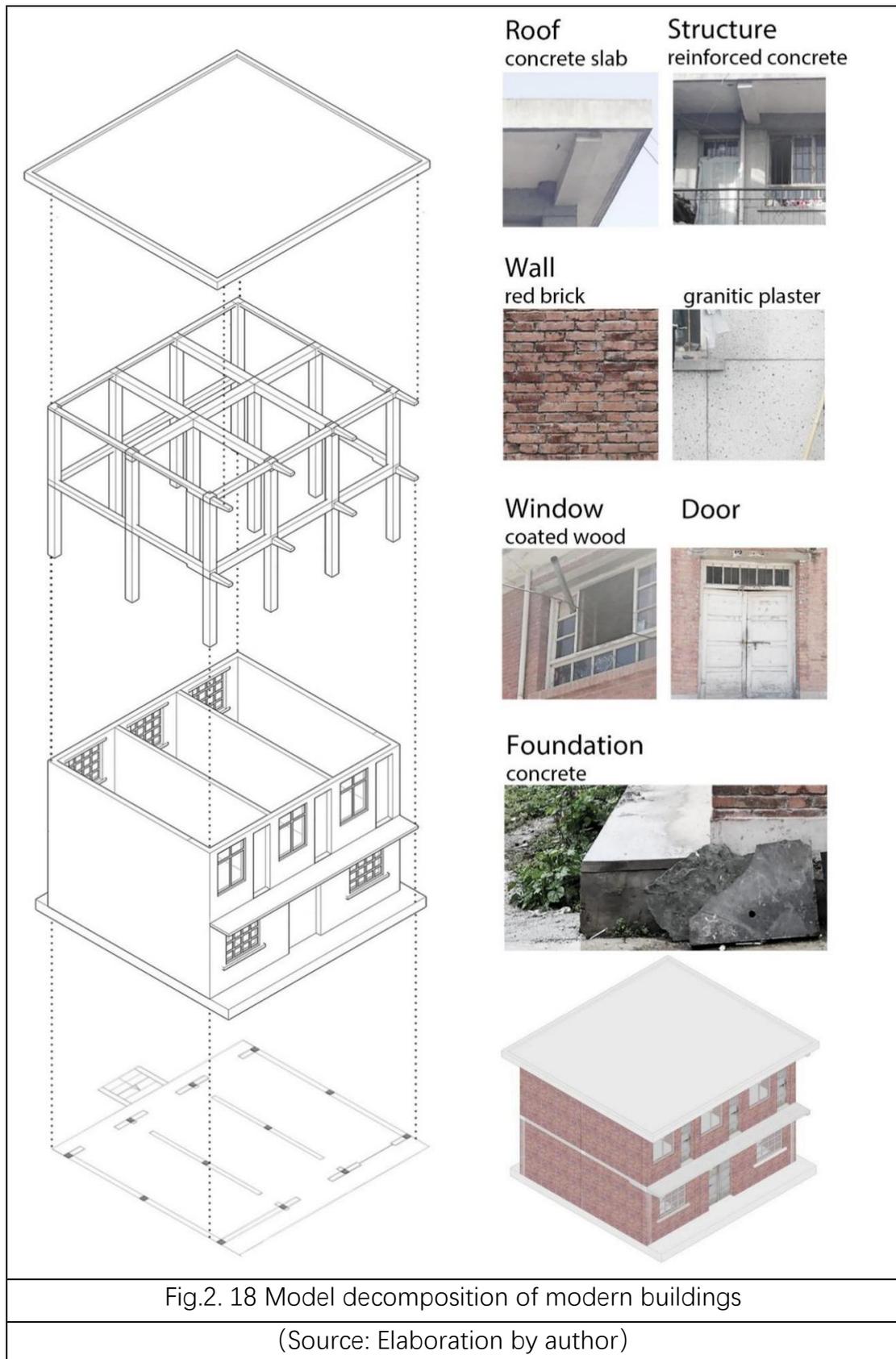


Fig.2. 17 Model decomposition of other traditional buildings

(Source: Elaboration by author)

3) Brick-concrete buildings

A large number of brick and concrete buildings are also distributed in the ancient town. As the name suggests, the buildings built with modern materials such as brick, cement and concrete generally adopt frame structure, which is more flexible than traditional courtyard and raw soil buildings. Due to the underdeveloped transportation in the Qinling Mountains deep in Fenghuang ancient town, these buildings began to appear in the early 1990s, and can be built to two or even three floors. The residents also implant the traffic space into the buildings, and the land use efficiency can be improved. But it also brings some negative effects to the ancient town, such as the red brick facade and tile facade outside the brick concrete building are not in harmony with the original traditional style, and the high height affects the skyline of the ancient town.



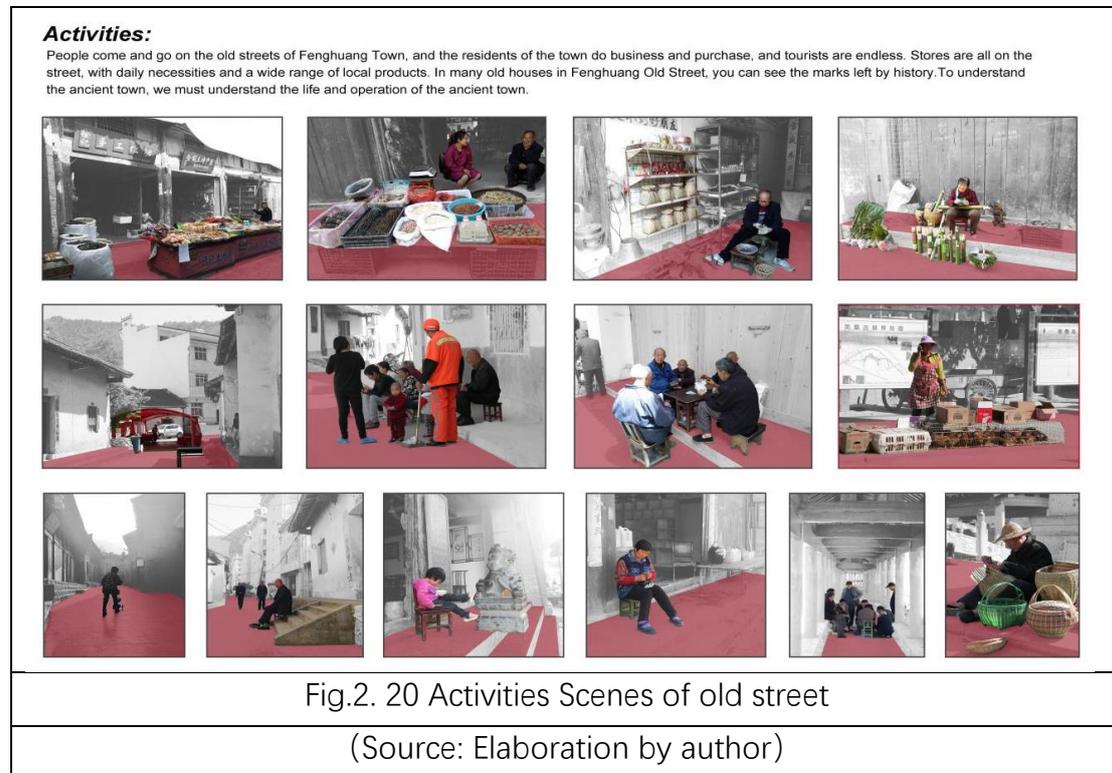
2.2.5 Attractions and Activities

Fenghuang ancient town has a long history of traditional industries, such as silk weaving, paper making, manual processing of iron and silver metal utensils, and traditional flavor food processing, such as bacon, Ciba, dried tofu, etc.



The activities in Fenghuang ancient town are mainly divided into two categories. The first category is for tourists, such as buying local products, visiting, taking pictures, commemorating, performing operas, etc. the second category is mainly for local residents. The ancient street is full of residents playing chess, talking, children sitting

at the door eating, doing homework and so on. The activities of these two groups of people make the ancient streets very lively.



2.3 Problems of space in the town

2.3.1 Loss of traditional dwellings and activities

Ancient Chinese buildings mostly use wooden frames. Compared with Western buildings based on stone, they are more susceptible to the natural environment such as climate. As time goes by and the environment changes, immovable building cultural relics will inevitably be weathered and corroded and gradually damaged. Especially in the state of disrepair for a long time, collapses and overturns occur from time to time. The buildings in Fenghuang Ancient Town are also inevitable. Many famous shops, temples, important residential

buildings and other cultural attractions have disappeared.

At the same time, the construction of streets and lanes is a necessary material carrier for the folk culture of the ancient town, and the development of folk culture requires space for display and performance. For example, the famous second harmony of Han-Huang opera and fish drums opera in Fenghuang Ancient Town mostly occur in courtyards of "Sihe Yuan". People sit and watch. Now that the courtyards are closed and even turned into indoor spaces, this kind of traditional activities has naturally gradually decreased.

2.3.2 Destruction of modern buildings to the overall order of the town

The buildings in Fenghuang Ancient Town have a unique style of Ming and Qing Dynasties and a unique blend of north and south. However, in the long-term non-scientific development process, many features have been artificially destroyed. The disadvantages of the ancient brick-wood structure have gradually emerged, and the living facilities lack preparation. Many equipments such as lighting, ventilation and sanitation cannot meet the needs of modern life, and their living performance is poor, and they are slowly out of touch with modern life.

On the one hand, the problem that followed was that the old house

was renovated or even demolished at will. On the other hand, a large number of new towns have been built around the ancient town. Residents are pursuing larger areas and more floors for practical purposes. As a result, the ancient houses and shops preserved in the ancient town are gradually being submerged. The dual characteristics of nature and nature are both severely damaged.

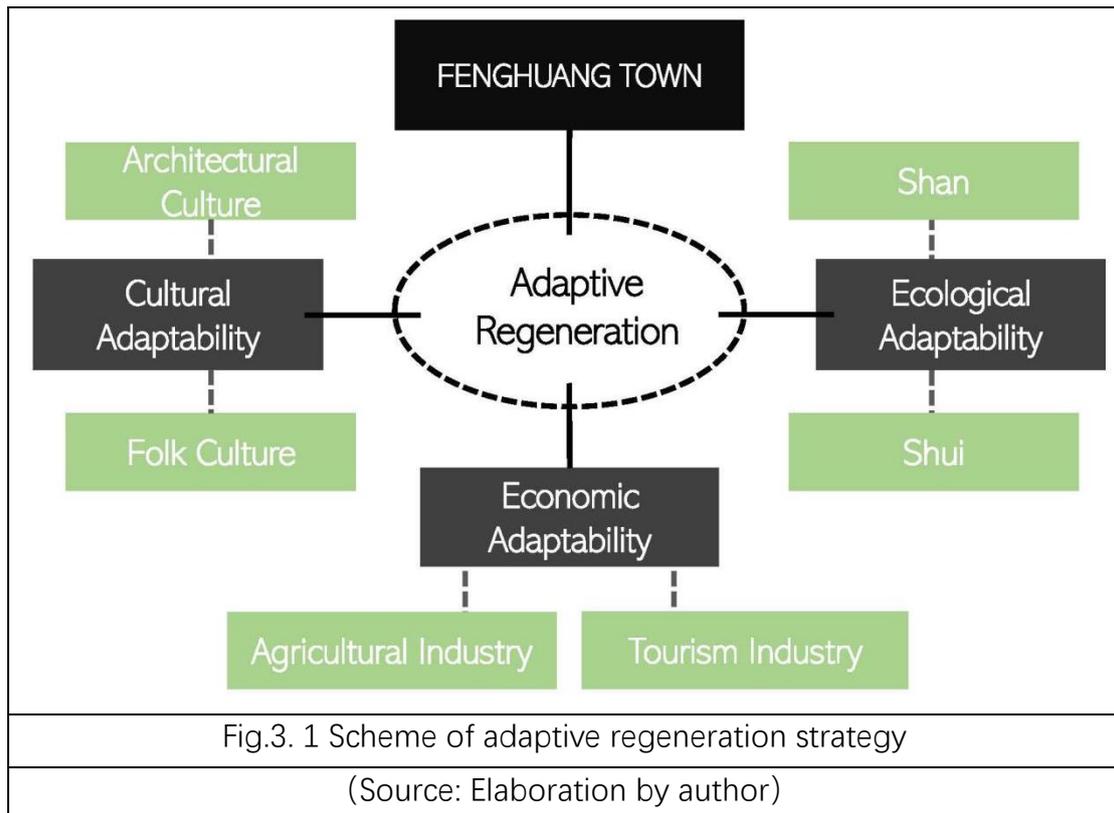
2.3.3 Low resource utilization in the town

Famous historical and cultural towns are rich in resources. Due to the lack of protection strategy research, the lack of protection funds and the urgent need to improve protection awareness, the utilization rate of various resources in the ancient town is very low. The first is the low utilization rate of cultural resources, which is mainly reflected in the decline of intangible cultural heritage, and the second is the lack of utilization of ecological resources, which is mainly reflected in the decline of mountains and water in the ancient town. The low utilization rate of these resources has directly led to the economic depression of the ancient town and the disappearance of famous cultural towns.

3. Urban Strategy of Public Space in Fenghuang Ancient Town

3.1 Overall Strategy

In view of the existing problems and the original planning intention of Fenghuang ancient town, the author puts forward the adaptive regeneration strategy from three levels.



First of all, the first step of renewal strategy is the adaptive renewal of culture. On the one hand, it is to strengthen the protection of old dwellings and improve the quality and utilization efficiency of space in the town. On the other hand, it is to protect the traditional folk culture, such as opera and bamboo weaving, so as to continue the cultural core of the ancient town.

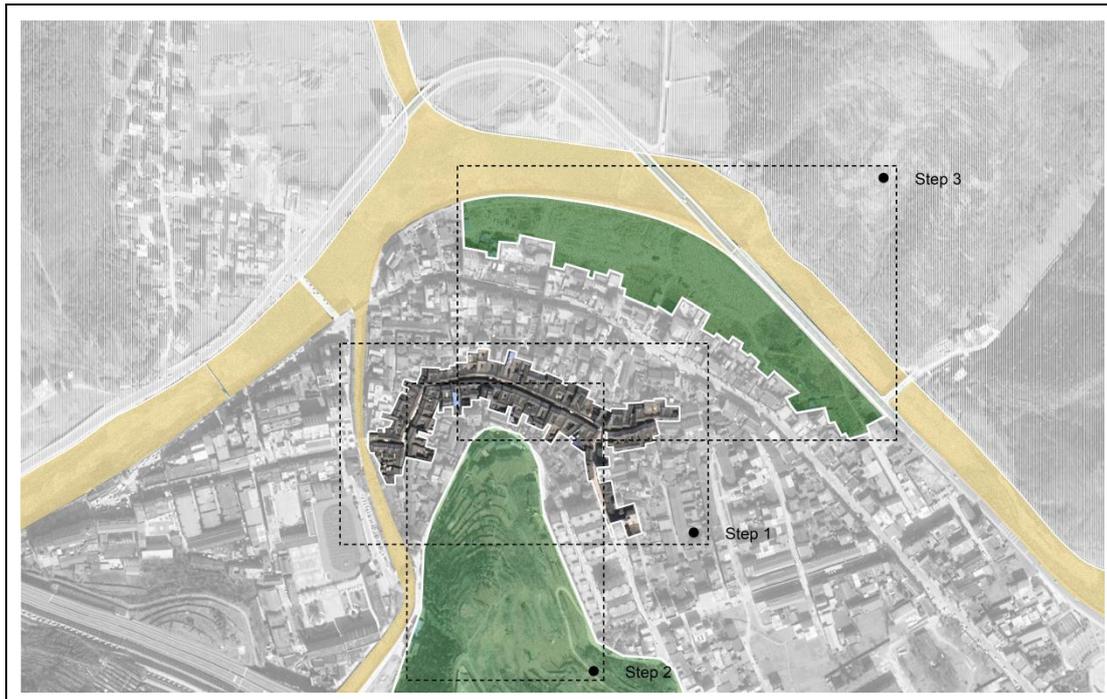


Fig.3. 2 Overall Urban Strategy of Ancient Town

(Source: Elaboration by author)

The second step is the adaptive renewal of ecology. Fenghuang ancient town is close to mountains and rivers. On the one hand, it brings the mountain river landscape into the tourism planning route, creates the natural oxygen bar based on the natural advantages of the ancient town, and improves the interest of the ancient town's sightseeing and life. On the other hand, it plans and uses the vacant farmland along the shechuan River, and develops the planting education, camping experience and other industries.

The third step is the adaptive renewal of economy. The biggest problem in the ancient town is the contradiction between the supply and demand of Aborigines and tourists. Therefore, the focus of

renewal is to promote the crops and agricultural products to better adapt to the development of modern society and make the villagers rich, on the other hand, to promote the tourism industry to drive the economy of Fenghuang ancient town more efficiently and finally make the ancient town achieve sustainable development.

3.2 Step 1 Planning ancient street tour route nodes

The reason why Fenghuang ancient town has a certain influence is because of its ancient streets and dwellings in Ming and Qing Dynasties. Therefore, the first step of the planning level is to strengthen the path experience of the fishbone style old street around the core of cultural adaptability, and connect the tourist tour path of the ancient street.

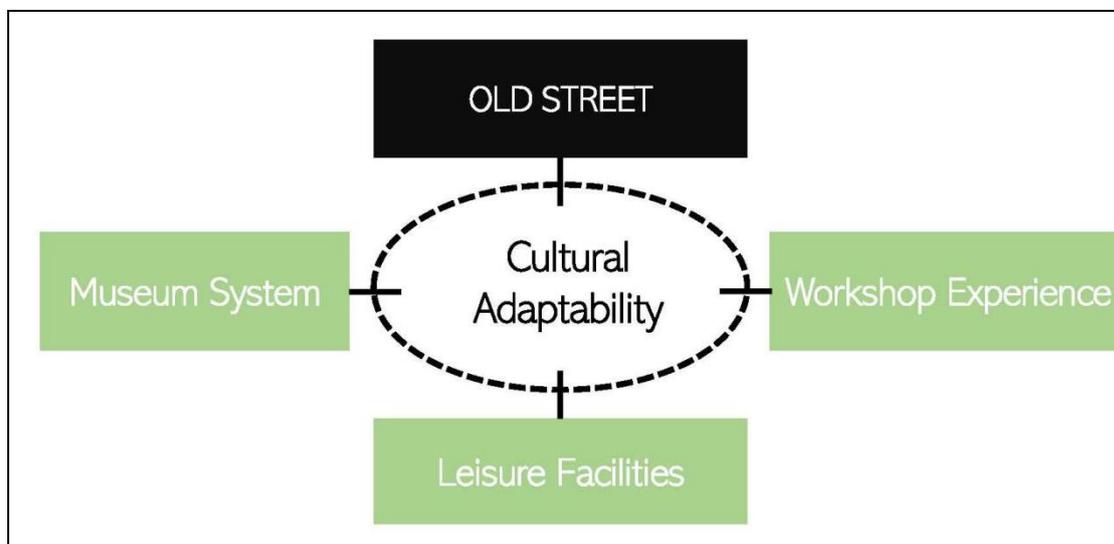


Fig.3. 3 Scheme of cultural adaptability strategy

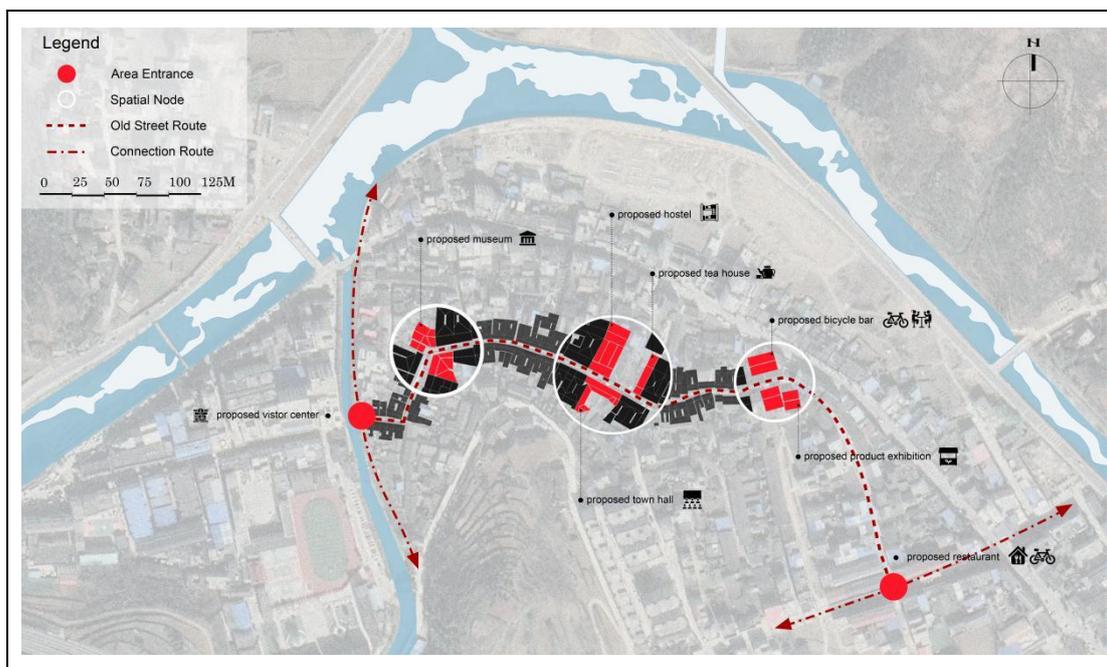
(Source: Elaboration by author)

First of all, the author emphasizes the establishment of the museum

system of Fenghuang ancient town, whose theme mainly covers the history of the town and characteristic industries, so as to increase the attraction of the street;

In addition, in order to develop the sustainable economy of the ancient town, it is necessary to start with the traditional industries of the ancient town and implant a certain number of experiential manual workshops, so as to prolong the stay time of tourists and enrich the sightseeing experience.

Finally, the most important point is the renewal of the public space of the street, which is the supplement to the leisure facilities. The adaptive renewal of these important node spaces not only creates a good rest experience for tourists, but also provides daily gathering space for the residents of the ancient town.



ARCHITECTURE AND URBAN DESIGN

Fig.3. 4 STEP 1 of the urban project

(Source: Elaboration by author)

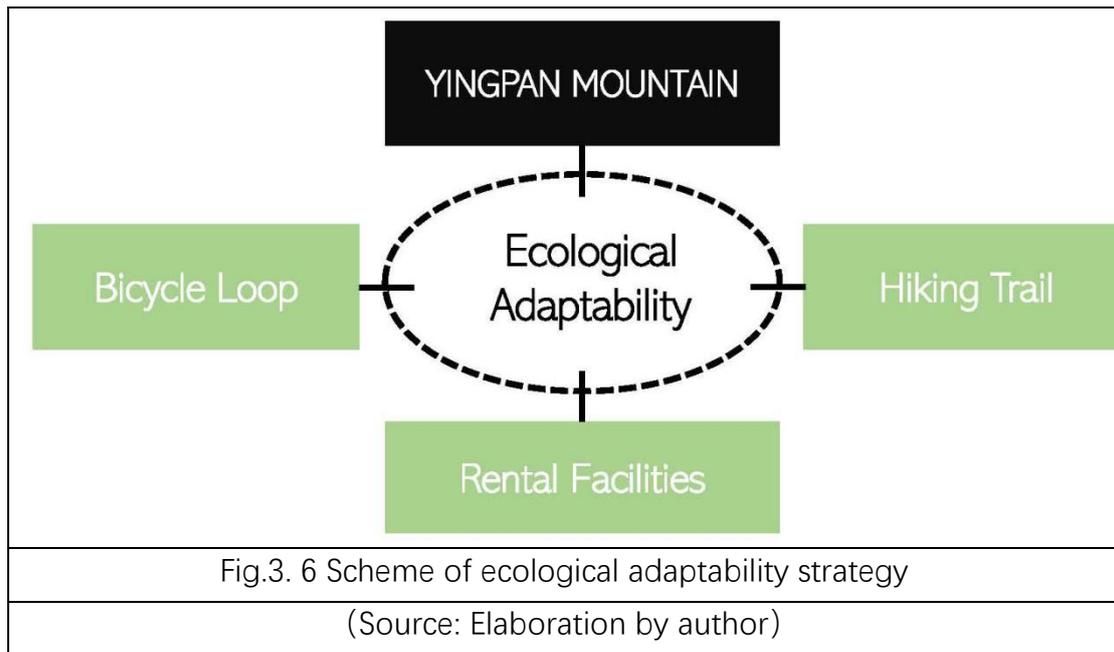


Fig.3. 5 Axonometric drawing of the old street

(Source: Elaboration by author based on the workshop materials provided by Professor Laura Pezzetti, April 2019)

3.3 Step2 Establishing Yingpan Mountain slow travel system

The natural environment of Fenghuang ancient town is a rare ecological advantage. However, in the current development of the ancient town, the use of mountains and water is obviously insufficient. Therefore, the second step of the planning level is to update around the focus of ecological adaptability.



First of all, the Yingpan mountain trail is created to enable tourists and residents to climb the mountain; In addition, the establishment of bicycle lane system and self-service rental system, so that people have more ways to visit. In order to make Yingpan mountain become the natural oxygen bar of Fenghuang ancient town, and form a supplement to its tourism development.

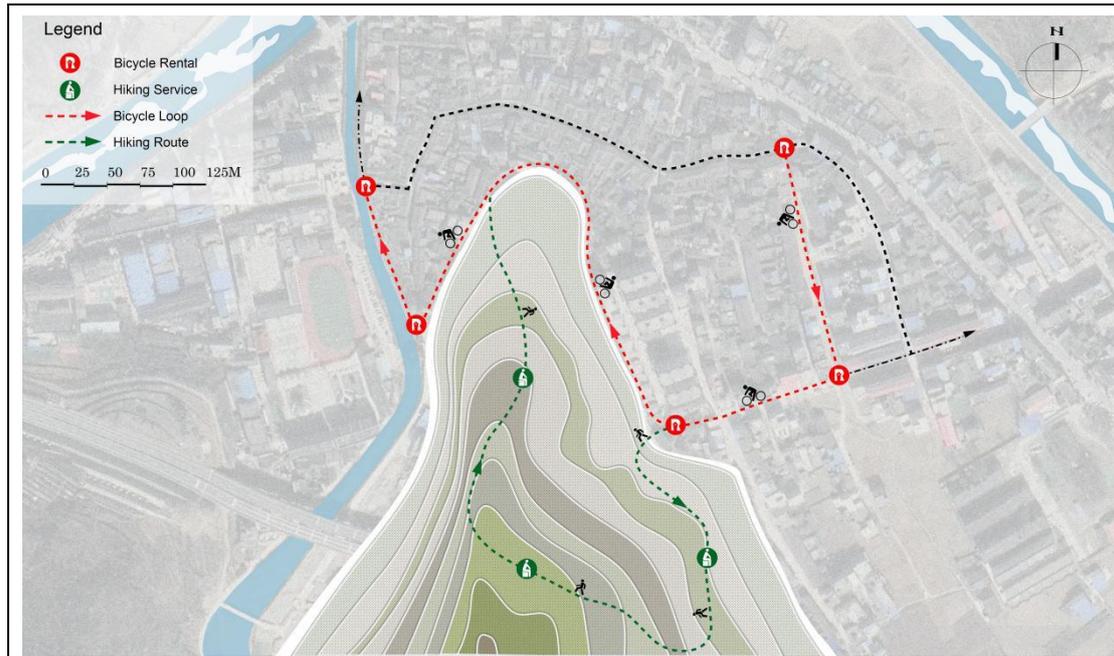
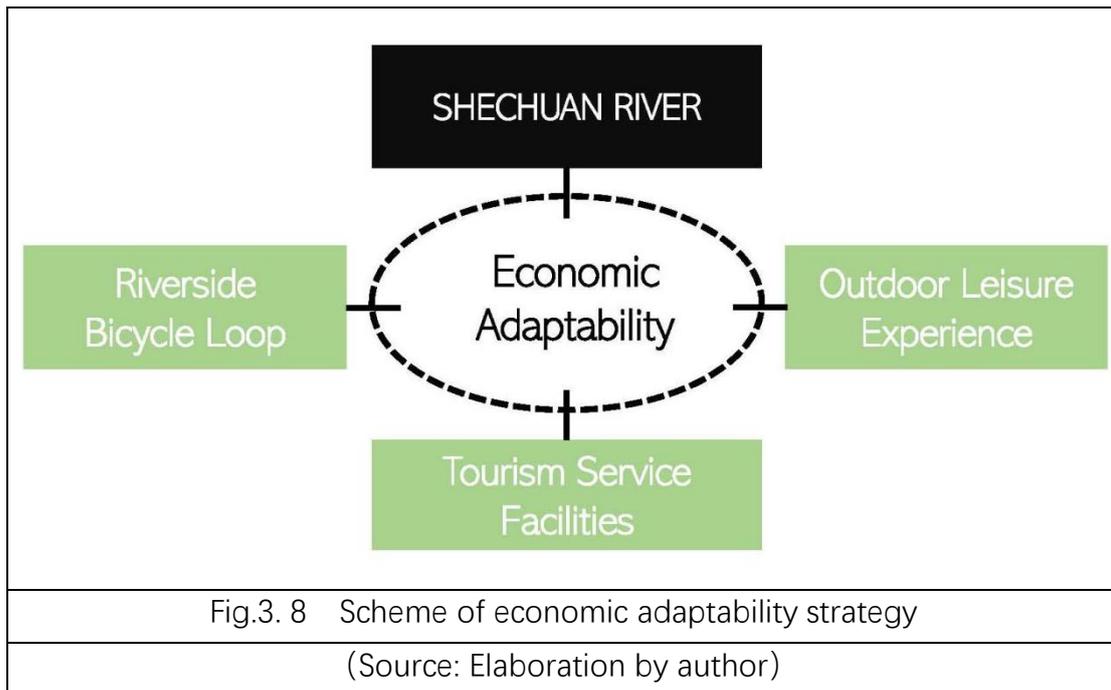


Fig.3. 7 STEP 2 of the urban project

(Source: Elaboration by author)

3.4 Step3 Developing shechuan River industrial experience belt

The economic foundation determines the superstructure, and there is no exception in the transformation of historical and cultural towns. Economic adaptability is the premise of sustainable development, and the industries in famous towns must be the main force to drive the economy.



Therefore, in the third step, the author takes the abandoned green space and open space along the shechuan River as the main renewal area. Firstly, the bicycle system along the river should be established. Secondly, various experience activities such as planting education, outdoor camping and fishing should be included to make it an industrial belt along the river; Finally, the built-up facilities of New Street are used to supplement the industrial belt along the river.

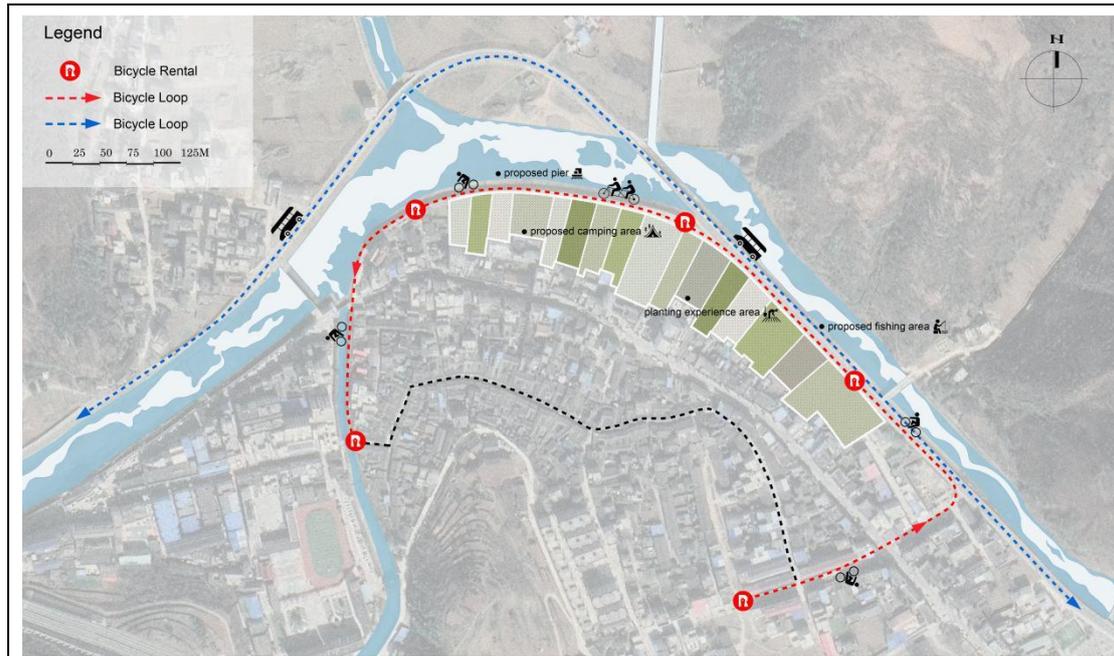


Fig.3. 9 STEP 3 of the urban project

(Source: Elaboration by author)

4. Architectural Strategy of Public Space in Fenghuang Ancient Town

4.1 Background and Analysis of the site

4.1.1 Situation of the site

According to the urban scale strategies and projects in the previous chapter, the author chooses the plot at the core of the ancient street as the adaptive transformation pilot at the architectural level.

According to the urban scale strategies and projects in the previous chapter, the author chooses the plot at the core of the ancient street as the adaptive transformation pilot at the architectural level. The current situation of the plot is complex, including the intact residential buildings, damaged residential buildings, the open space after the collapse of residential buildings and new concrete buildings. It is worth noting that on the opposite side of the intervention plot is Erlang temple in Fenghuang ancient town, which is an important historical relic remains of Ming Dynasty.



Fig.4. 1 Drone Photo of the site

(Source: Quoted by the book 'Layered Morphologies and Latent Structure'
wrote by Professor Laura Pezzetti, April 2019)

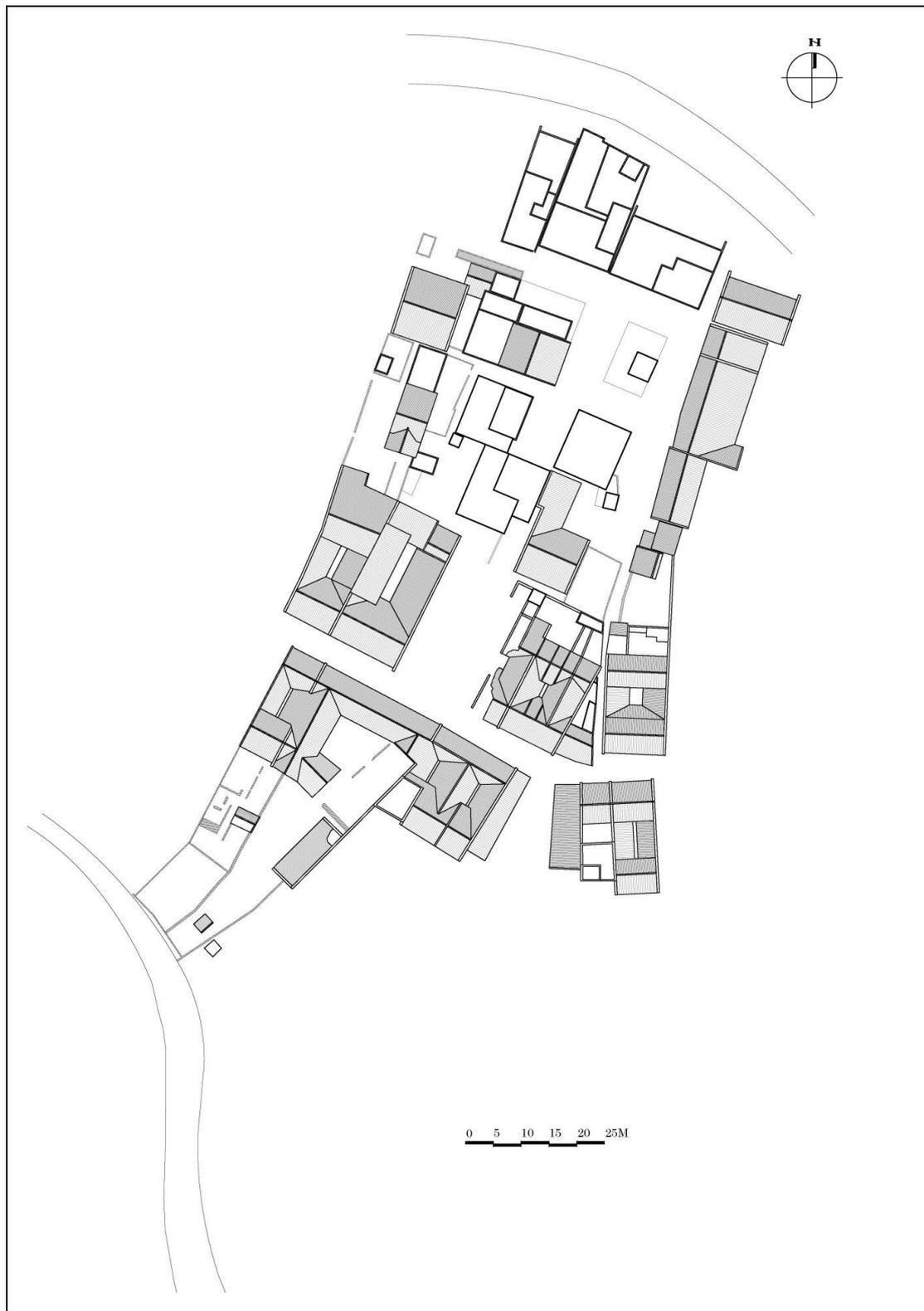


Fig.4. 2 Roof plan of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-
XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Based on the field survey, the author drew the following mappings to show the exact situation of the site:



Fig.4. 3 State of Art of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

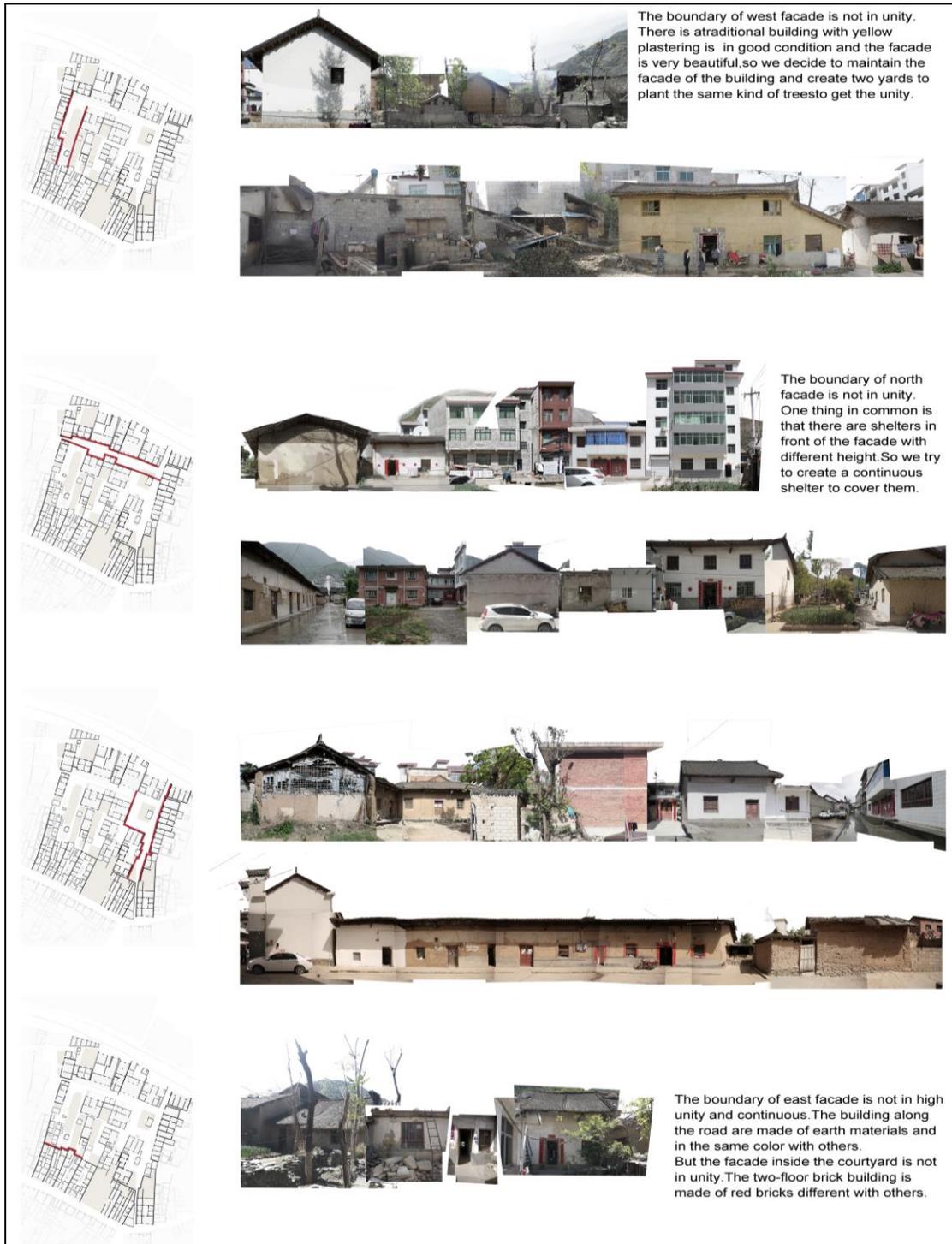


Fig.4. 4 Relevant Facade of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

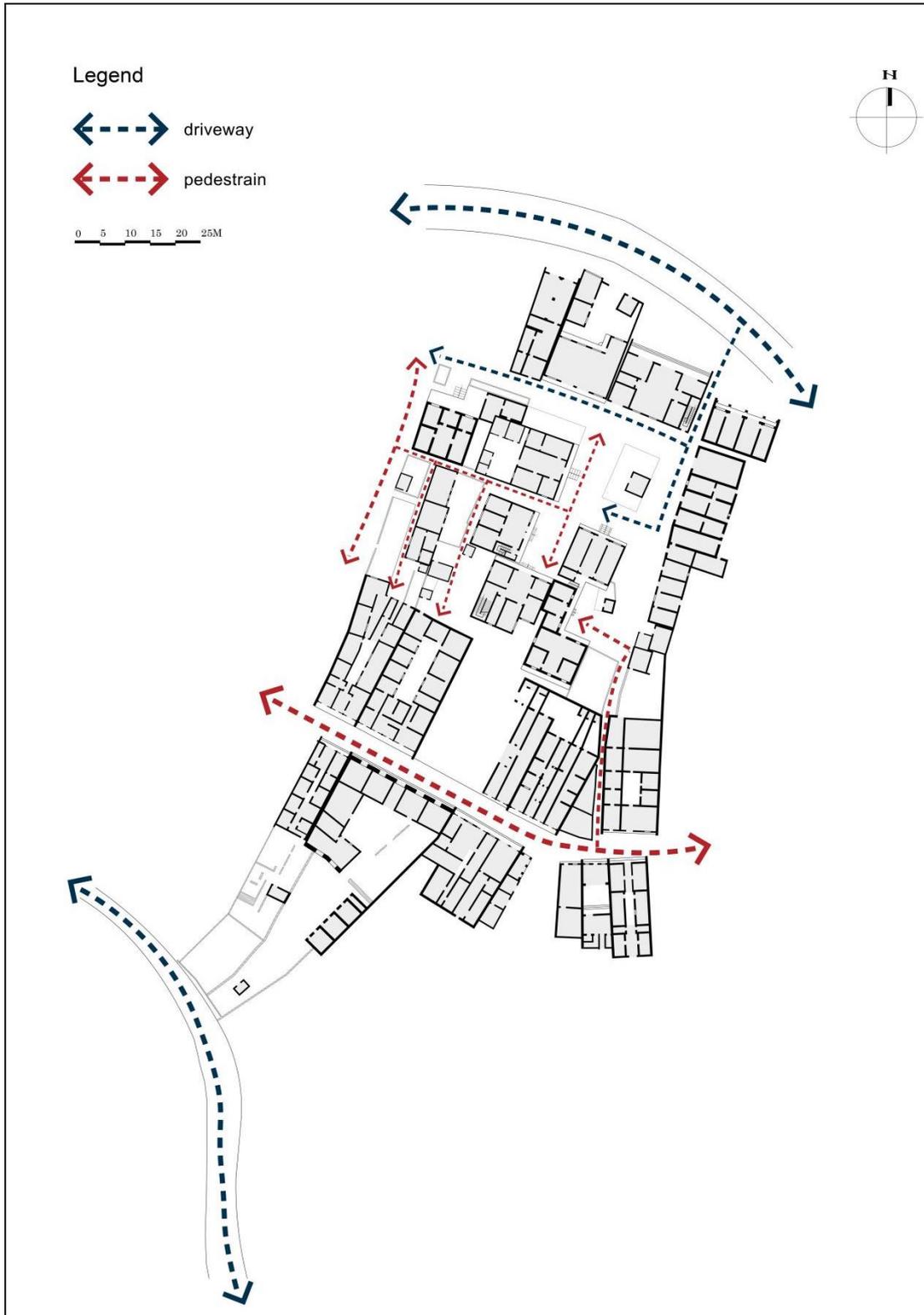


Fig.4. 5 Network Mapping of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 6 Floors Mapping of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 7 Functions Mapping of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 8 Strcuture Mapping of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 9 Material Mapping of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

4.1.2 Analysis of the site

According to the data collection and field visit, the center of the base was an important threshing field in Fenghuang ancient town. The current interface shows the boundary of the past threshing field.

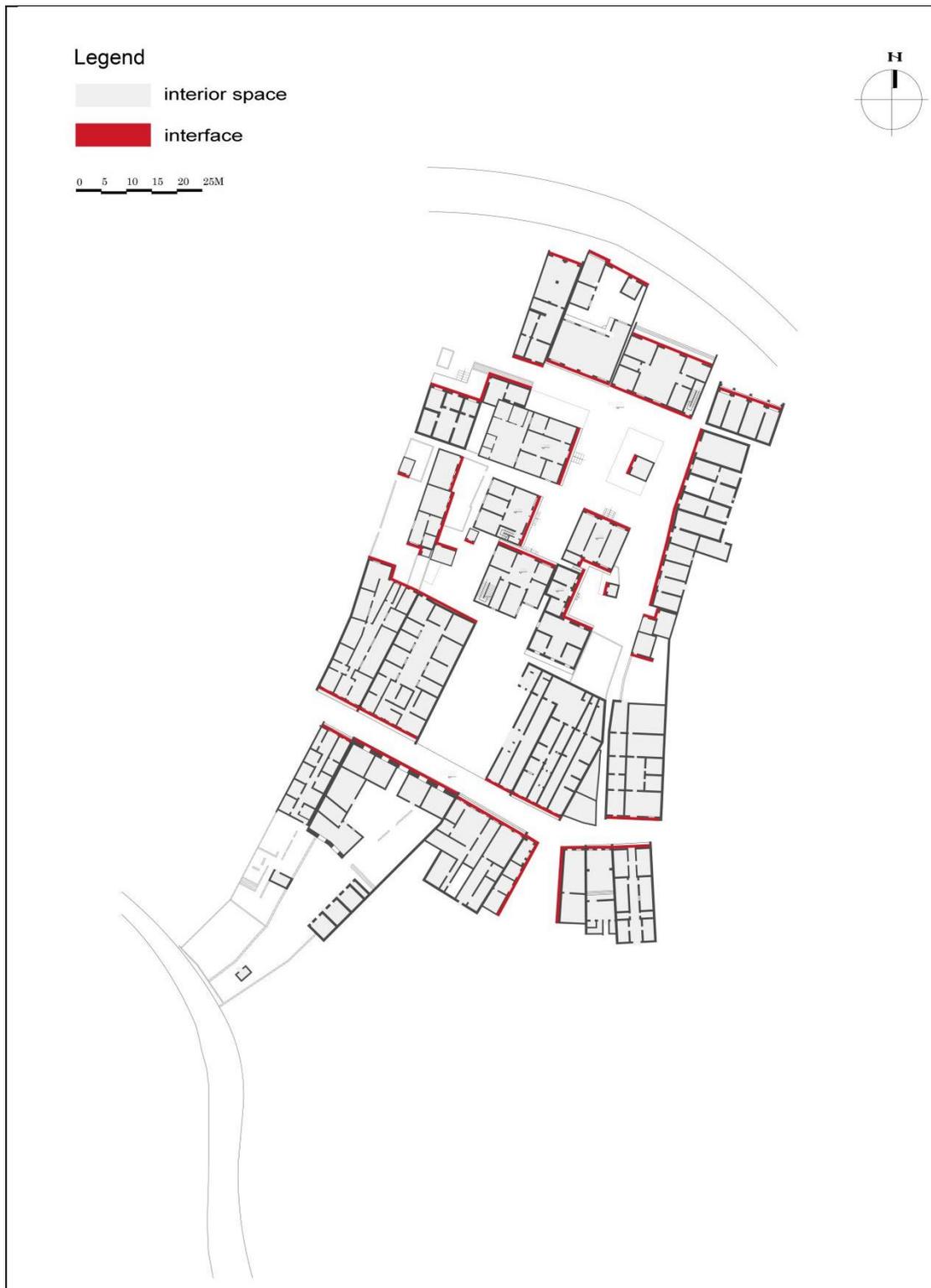


Fig.4. 10 Interface Analysis of the site

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

The threshing ground is an important public space in rural China,

ARCHITECTURE AND URBAN DESIGN

where people grind grain in the harvest season. What's more, the threshing ground also serves as a meeting space. People enjoy cool in summer, ski in winter, bask in the sun during the day and watch movies at night. Different groups of people are carrying out diversified activities here. However, with the destruction of old buildings and the invasion of new buildings, the original space texture has been destroyed, and even the public space has become a private vegetable or wild land, so the utilization rate of space is very low.



Fig.4. 11 Scene photos of threshing farms in rural China

Reference: <https://www.baidu.com>

What's more, the development of the sites follow the vertical structure of the town. So the trace of the site is closely related to the distribution of the Matou Wall of the old street.



Fig.4. 12 Trace Analysis of the site

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

4.1.3 Development Analysis of the site

The research base of this paper is located in the core of Fenghuang

ancient town, in the center of the town, and in the area where the temple is located. The buildings in this area cover three functional elements: folk houses, temples and threshing fields. It is an important cultural core area of ancient villages and, to a certain extent, the cultural center of ancient towns. Its significance of renewal and transformation is more effective than that of other sections, so it is worth studying and exploring.

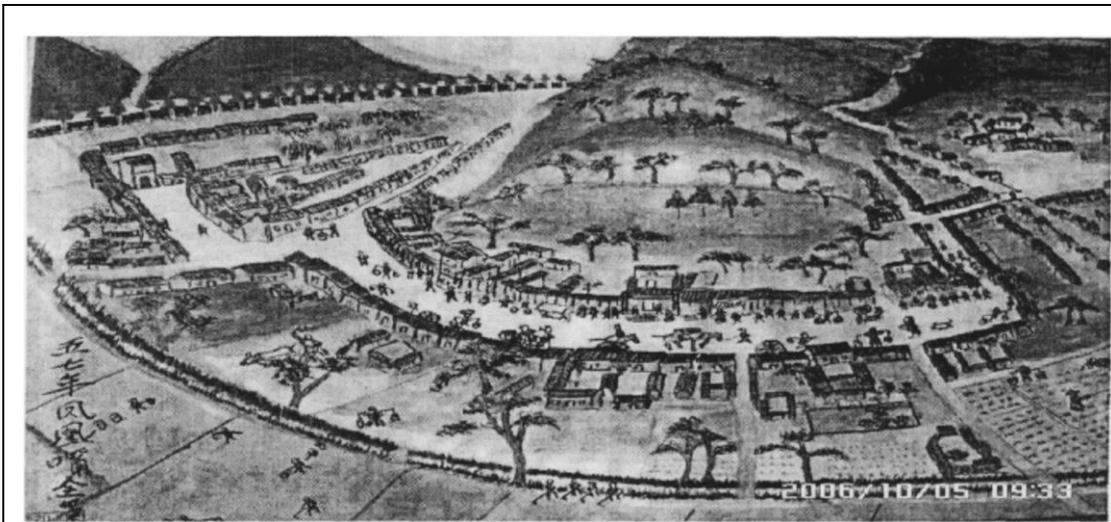


Fig.4. 13 Old drawings in 1957

(Source: Quoted by the book "Layered Morphologies and Latent Structure"
wrote by Professor Laura Pezzetti, April 2019)



Fig.4. 14 Satellite Map in 1980

(Source: Quoted by the book "Layered Morphologies and Latent Structure"
wrote by Professor Laura Pezzetti, April 2019)



Fig.4. 15 Satellite Map in 2013

(Source: Google Maps <https://maps.google.com>)



ARCHITECTURE AND URBAN DESIGN

Fig.4. 16 Satellite Map in 2021

(Source: Google Maps <https://maps.google.com>)



Fig.4. 17 First floor plan in 1957

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Fig.4. 18 Roof Plan in 1957

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 19 First floor plan in 1969

Fig.4. 20 Roof Plan in 1969

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 21 First floor plan in 1980

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Fig.4. 22 Roof Plan in 1980

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 23 First floor plan in 2013

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Fig.4. 24 Roof Plan in 2013

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 25 First floor plan in 2021

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Fig.4. 26 Roof Plan in 2021

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

4.2 Overall Strategy of the project



Fig.4. 27 Axonometric drawing of the nodes

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

Based on this, focusing on the theme of adaptive regeneration, the author arranges the intervention strategy at the architectural level into three steps:

4.2.1 Strengthen the inner courtyard axis

In the first step, the author mainly analyzes the interface of the research plot, and finds that the interface around the original threshing field is still continuous and forms a enclosed form, but the interface of the concrete building built inside is chaotic, so in the process of transformation, the designer focuses on the regeneration of the north interface of the open space; At the same time, in the transformation, the architectural form of ancient street quadrangle is continued, so that the interfaces of several new buildings are inward to form courtyards, and the axis relationship of the center is strengthened.



Fig.4. 28 STEP 1 of the architectural strategy

(Source: Redrawn based on the typological research performed by Professor
Laura Pezzetti, April 2019)

4.2.2 Darn the texture along the axis

Secondly, from the large-scale strategy of the previous chapter, we can see that the base is in a very central position. The texture of this area has a certain order to explore.



Fig.4. 29 STEP 2 of the architectural strategy

(Source: Redrawn based on the typological research performed by Professor
Laura Pezzetti, April 2019)

ARCHITECTURE AND URBAN DESIGN

After the axis passes through Erlang temple and old street, many buildings form a group after the continuation of history and are scattered in the open space. A rich architectural sequence is formed as a whole, which provides ideas and conditions for the renewal strategy of this study.

Therefore, in its functional layout, the design pays more attention to the regeneration and renewal of industrial culture, including the representative workshops of Fenghuang ancient town, and retaining the original residents, forming the architectural mode of “up-residence & down-workshop”. There are four main elements picked in the workshop design: opera performance, bamboo weaving experience, tofu making experience and wine making experience.



Fig.4. 30: Opera performance
(Source: <https://www.baidu.com>)



Fig.4. 31: Bamboo products weaving
(Source: Team shooting)



Fig.4. 32: Tofu making

(Source: <https://www.baidu.com>)



Fig.4. 33: Winemaking competition

(Source: Team shooting)

4.2.3 Collage the open space around the axis

At the same time, this area forms a very clear central axis, which runs through temples, old streets and public spaces, and echoes the mountains at both ends of the axis. Third, as the core public node of the ancient town, the collapsed residential buildings and open space are the important renewal scope. In the scheme, the author restores the combination form of quadrangle, and integrates the fishing drum performance and opera performance of Fenghuang ancient town into the design, forming a surrounded stage, responding to the local traditional performance place and behavior. And in the core of the renovation, the building roof adopts the ladder shape, on the one hand, it forms a landmark of the ancient town, on the other hand, it also makes the building dialogue with the performance stage and the landscape around the ancient town.

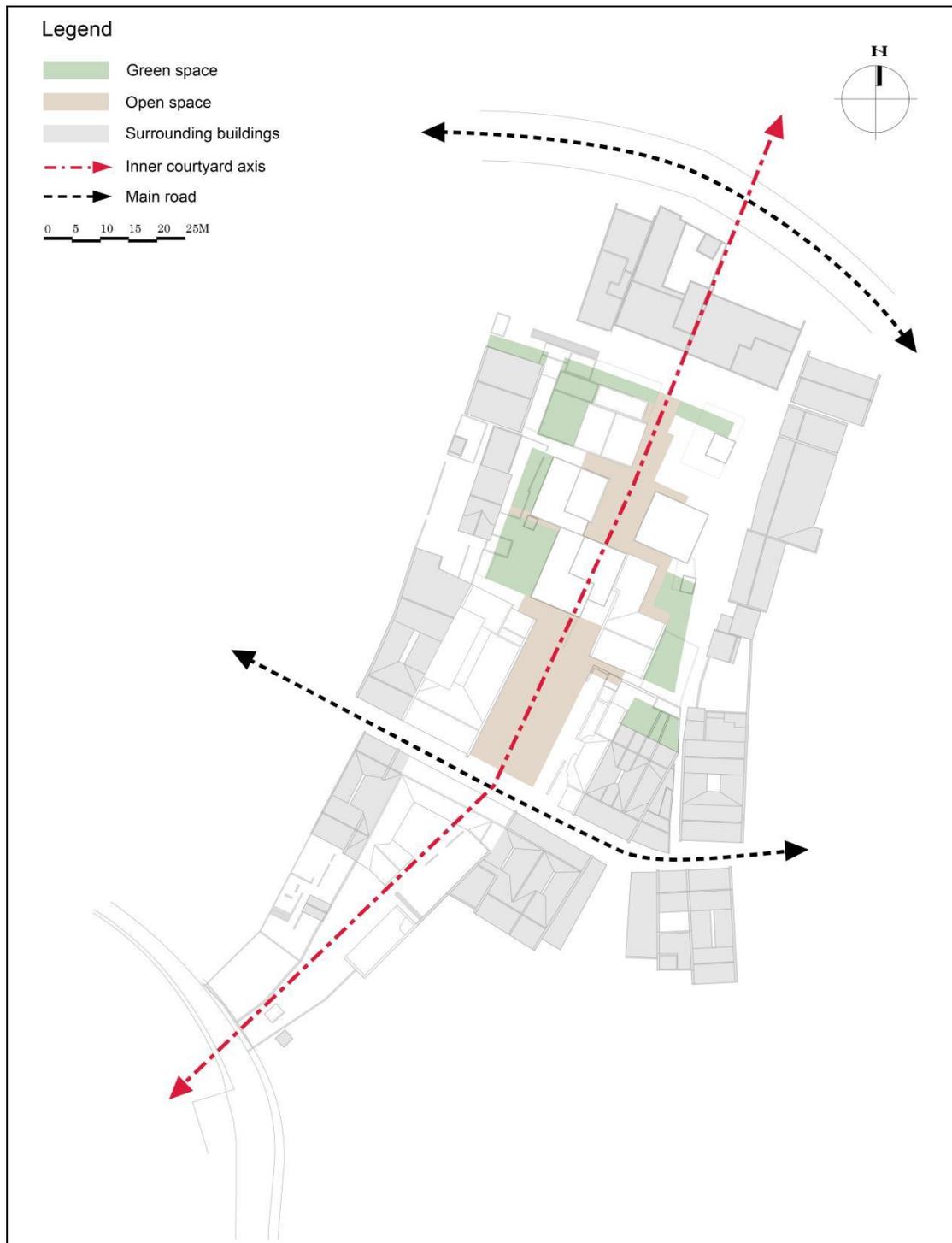


Fig.4. 34 STEP 3 of the architectural strategy

(Source: Redrawn based on the typological research performed by Professor
Laura Pezzetti, April 2019)

4.3 Architectural Strategy of the project

In terms of architectural strategy design, the author focuses on the continuity of architectural space sequence, takes the main axis as the leading, continues the context of this space sequence, and connects different types, different degrees of vitality and different degrees of openness, so as to make people feel richer in this space experience.

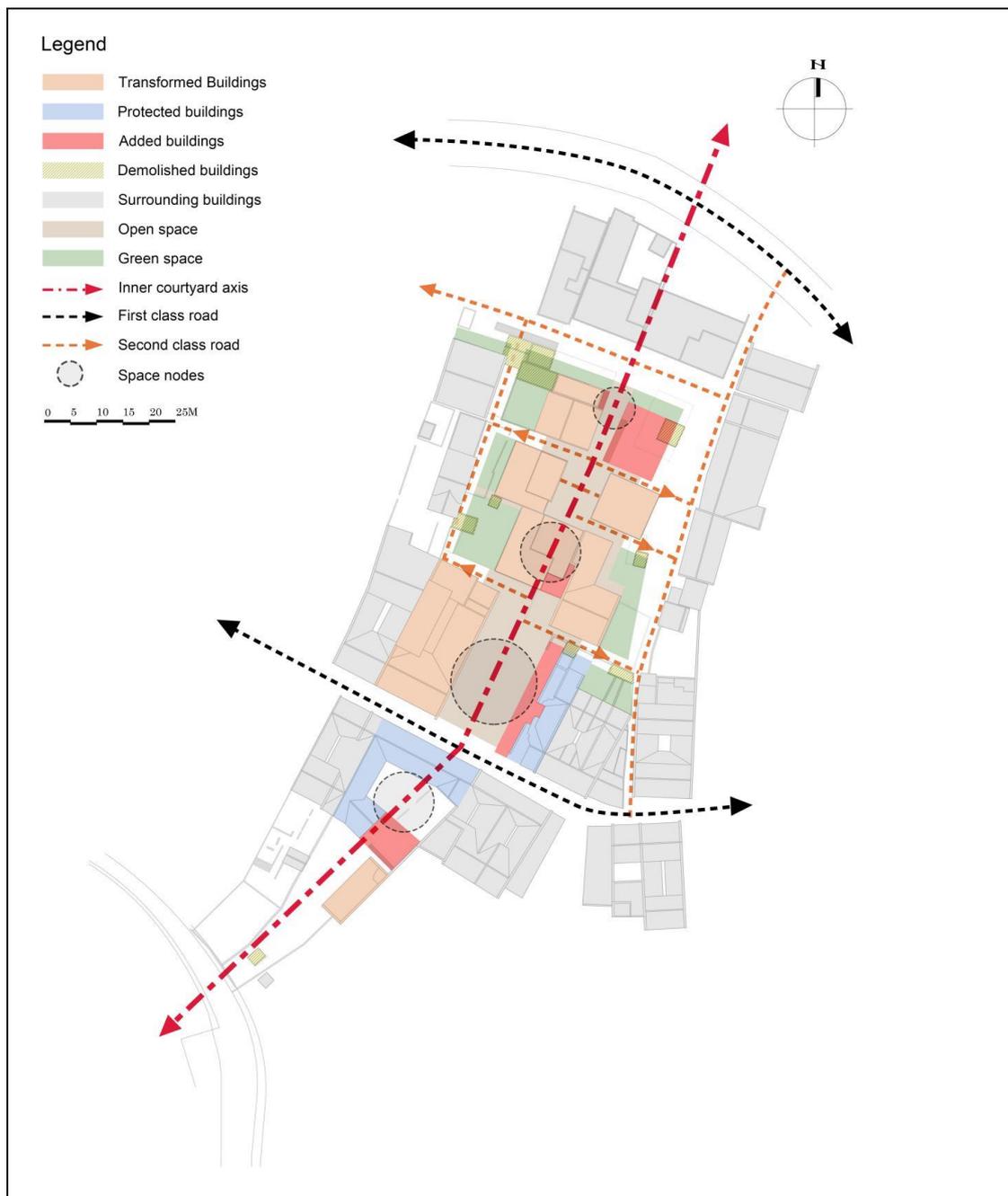


Fig.4. 35 Overall architectural strategy

(Source: Redrawn based on the typological research performed by Professor
Laura Pezzetti, April 2019)

4.4 Reorganize the Order

4.4.1 Strengthen the Inner courtyard axis

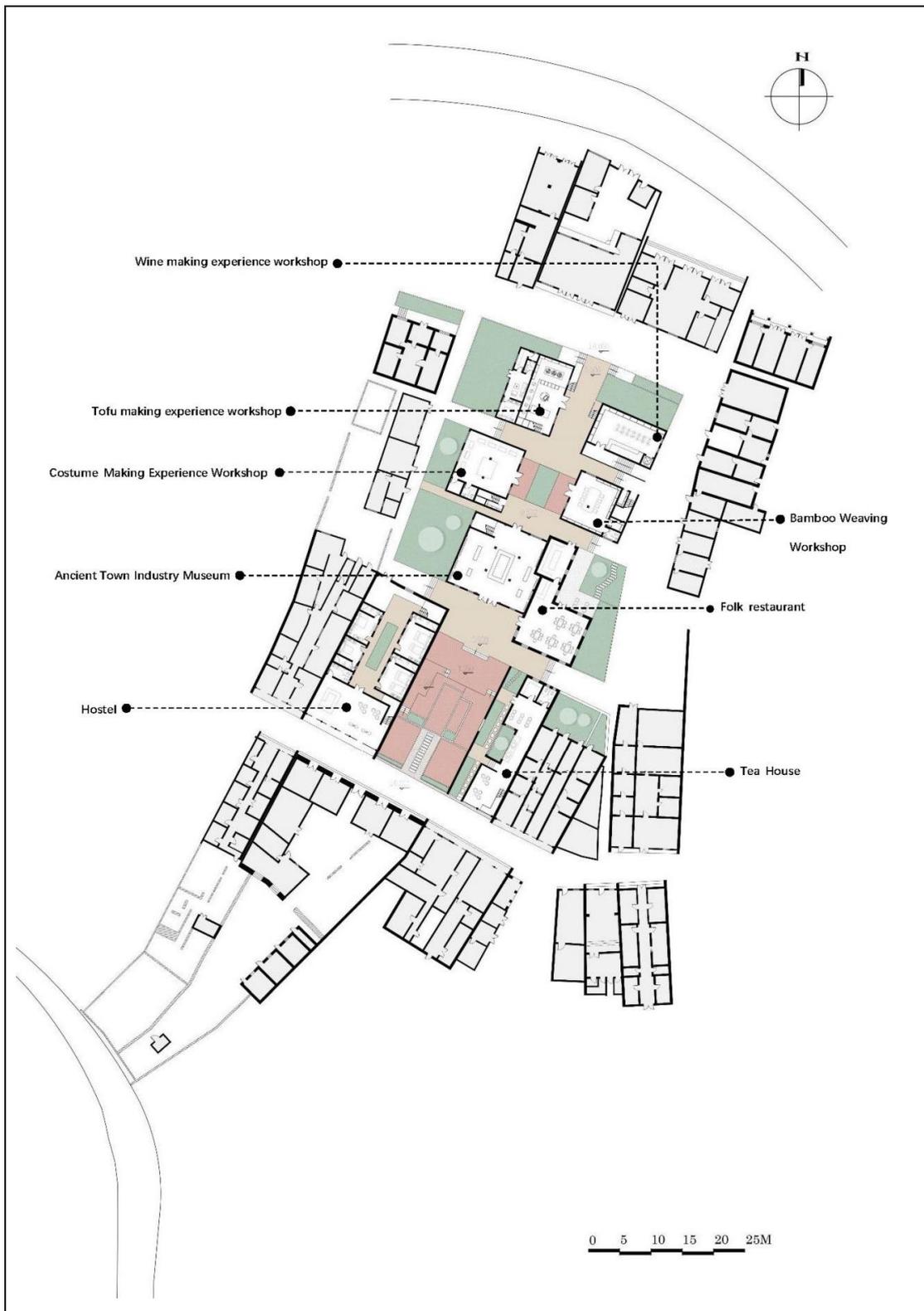


Fig.4. 36 First Plan of the project

(Source: Redrawn based on the typological survey Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)

4.4.2 Implant traditional workshop space sequence



Fig.4. 37 Axonometric drawings of the project

(Source: Elaboration by author based on the Studio work guided by Professor Laura Pezzetti, April 2019)



Fig.4. 38 Render of the Wine Workshop

(Source: Elaboration by author based on the Studio work guided by Professor Laura Pezzetti, April 2019))

4.4.3 Form the “up-residence & down-workshop” mode

There are two groups in the ancient town, one is tourists, the other is residents. So it is necessary to deal with the problems of space distribution and benefit distribution. In this scheme, the designer consider the needs of the indigenous people, and arrange the workshop space on the first floor and the living space on the other floors. The workshop on the first floor is operated by a relatively professional operating company and managed by local traditional craftsmen, while the space on the second floor is for indigenous people to live in. In this process, the operator, the manager and the indigenous people adopt the profit ratio of 4:4:2 to ensure the reasonable operation of the workshop.



Fig.4. 39 Second Floor plan of the project

(Source: Redrawn based on the survey materials Taken by groups of Polimi-XAUAT Workshop guided by Professor Laura Pezzetti, April 2019)



Fig.4. 40 Transformation of the tea house

(Source: Elaboration by author)

4.5 Regenerating the Public space

4.5.1 Reappear the courtyard performance stage

Zhashui Yugu and Hanhuang Er Diao are the representative operas of Fenghuang ancient town, and are listed in the intangible cultural heritage list of Shaanxi Province. Local performances include monkey opera, shadow play, Bangzi and other operas from other places in Henan Province, which are very diverse. In the design, the designer responds to the courtyard layout of the original residential buildings with the way of landscape design. At the same time, because the opera performance in history was carried out in the courtyard, the design restored the scene of sitting around the courtyard under the tree to listen to the opera.



Fig.4. 41 Render of the performance stage in the lacuna

(Source: Elaboration by author)

4.5.2 Shape the public space node of ancient street

The residential buildings adjacent to the open space are seriously damaged, but the indoor and outdoor space and narrow courtyard can be distinguished. This part is directly connected with the ancient street and is an important spatial node. At the same time, the author learned that Fenghuang ancient town has the habit of drinking tea after work. Generally, they put the tea into the teapot or tea arms, pour boiling water, and drink immediately. Therefore, in the design, the damaged building is transformed into a tea house, which not only serves the tourists, but also creates leisure space for the residents of the ancient town.



Fig.4. 42 render of the chatting scene along the Axis

(Source: Elaboration by author)

4.6 Updating the gap space surrounding the interface

4.6.1 Optimize of the surrounding pavement

The interior of the plot is relatively flat, but the materials are relatively diverse, including cement, soil, stones, etc. People's path experience into the site is not continuous enough. In the design, several workshops with their own characteristics have become a continuous space. Therefore, in the design, the designer would unify the internal pavement, raise the foundation appropriately, and enhance the continuity of the interface in the renewal area.

4.6.2 Embedded into the urban strategy project

The renewal of architectural level emphasizes space and function. To radiate to a larger scope, it should be included in the planning level system, and make good use of the surrounding tourism resources.

Therefore, in the follow-up design, it is necessary to break through the barrier between the design plot and the new street, create the connection with Erlang temple and Yingpan Mountain slow travel system, so that people can enter the Yingpan Mountain natural oxygen bar for slow travel in the South after the hand-made experience, and ride to the Bank of shechuan river for planting experience in the north.



Fig.4. 43 Garden behind the Erlang Temple

(Source: Elaboration by author)

4.7 Energy Design of the site

4.7.1 Analysis

Qinling mountain is an east-west mountain range in the middle of China, which is similar to a "barrier", blocking the cold air going south in winter and the northward movement of southeast monsoon in summer. It is not only the natural geographical boundary between the

South and the north of China, but also the boundary between the subtropical zone and the warm temperate zone.

Fenghuang ancient town is located close to the southern foot of Qinling Mountain, and has the characteristics of North-South climate zone, so the climate drop of the whole area is obvious, and the vertical distribution of vegetation is also obvious. The sunshine in the town is 1860.2 hours in one year, and the average coldest air temperature is 0.2 °C, the average hottest air temperature is 23.6 °C. In the meanwhile, its highest temperature is 37.1 °C and the lowest is - 13.9 °C. The frost free period is 209 days and the annual precipitation is 742mm. To sum up, the ancient town has distinct seasons, warm and humid, no intense heat in summer and no severe cold in winter, which is a more livable climate.

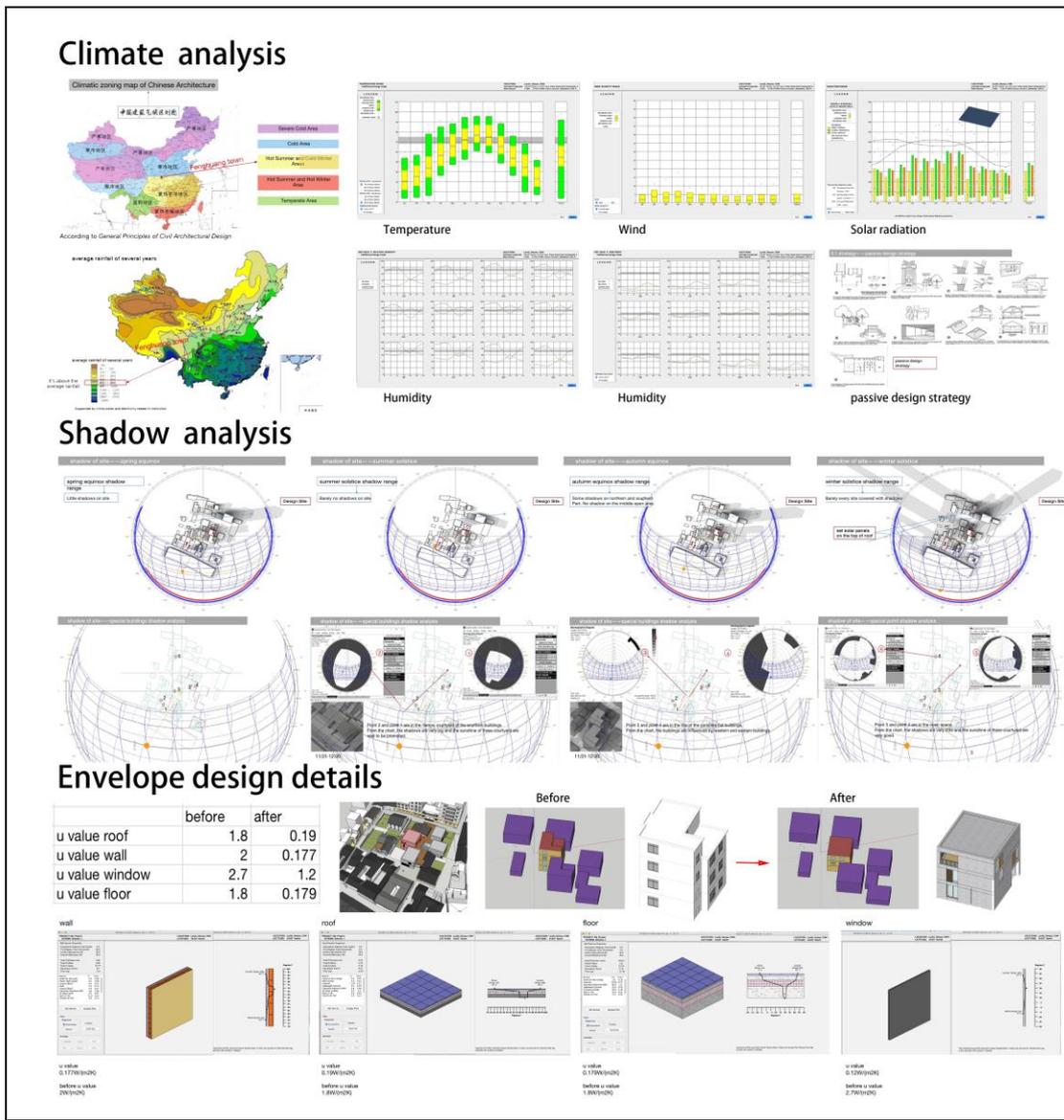


Fig.4. 44 Energy Analysis of the site

(Source: Studio group work guided by Professor Laura Pezzetti, April 2019)

4.7.2 Design

5. Bibliography

The urban hypothesis and design site definition in the research was defined by professor L.A. Pezzetti Design Studio and was published in the book 'Layered Morphologies and Latent Structure'. Also the figures mainly in the Chapter 4 are referenced to this book and some thesis materials provided in the studio course, the author has listed in the bibliography.

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