Study on Conservation strategy of Historical and Cultural Towns and Villages in Southeast Hubei Based on Ecological View

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Abstract. Historical and Cultural Towns and Villages are important parts of Chinese cultural heritage. At present, the research and ecological concept and characteristics of regional Historical and Cultural Towns and Villages is still shallow. This article takes Historical and Cultural Towns and Villages in Southeast Hubei as an example, discusses the location and layout of Historical and Cultural Towns and Villages as well as the ecological characteristics of traditional residential building layout, architectural skills and architectural decoration. Finally, conservation strategies based on ecological concept are analyzed.

1. Introduction

In Chinese traditional culture, the concept and design of vernacular settlement and traditional architecture are located in the remote villages and towns, which is perceived via the state of fusion with the natural environment, and become one of the main characteristics of regional culture. A large number of local cultural heritages are declining, and the ecological view of vernacular settlement is also declining.

The conservation system of Historical and Cultural Towns and Villages in China is formally established in 2003. The Ministry of Housing and Construction and the State Administration of Cultural Relics announced six batches of 528 Historical and Cultural Towns and Villages by Dec 31, 2020. The number of National Historical and Cultural Towns and Villages in Hubei Province is 28, eight of which are located in Southeast Hubei, accounting for 28.6% of the total number of Hubei Province. In addition, there are 16 Provincial Historical and Cultural Towns and Villages, nine of which are located in Southeast Hubei. The number of Provincial and National Historical and Cultural Towns and Villages in Southeast Hubei accounts for 38.64% of the total number of villages in Hubei Province, which is one of the regional representatives of Hubei Historical and Cultural Heritage.

Most of the studies on Historical and Cultural Towns and Villages in Southeast Hubei are based on the traditional Architecture and Urban Planning, including types of traditional dwellings (Li Xiaofeng, Tan Gangyi 2009)[1], construction techniques (Jiang Lan, Li Xiaofeng 2005) [2], layout structure of residential buildings (Li Xiaofeng, Zhou Le 2019) [3] and spatial morphology of Historical and Cultural Towns and Villages (Li Baihao, Yi Bo et al. 2005) [4, 5], (Liu Wei et al. 2008, 2009) [6-8]. However, the field of systematic research and conservation strategy of Historical and Cultural Towns and Villages
in Southeast Hubei via ecological view is still a blank. On the basis of previous studies, this article discusses the location and layout of Historical and Cultural Towns and Villages in Southeast Hubei, as well as the ecological characteristics of layout of traditional residential buildings, architectural techniques and architectural decoration. Finally, conservation strategies based on ecological view is also analyzed.

2. Natural and Cultural Background of Southeast Hubei

2.1. Natural Characteristics of Southeast Hubei
The Southeast Hubei is adjacent to Anhui province in the east, Jiangxi province in the southwest, Hunan province in the south, and the Dabie Mountains in the north. Mufu Mountains in the south run through Hunan, Hubei and Jiangxi provinces, hills and mountains in the hinterland are gentle. According to the geographical division, the Southeast Hubei is north from the extension of Tongbai Mountain, the south reaches the east of Panlong city in Huangpi, the current administrative partition includes Huangshi, Ezhou, Xianning, south of Huanggang and Wuhan. The region of Southeast Hubei is rich in river system and vegetation, the mountains are connected with farmland and vernacular settlements. The area has a climate with four clearly distinct seasons, which is belong to the typical hot summer and cold winter climate, the weather is damp and rainy throughout the year.

2.2. Cultural Characteristics of Southeast Hubei
As early as the Neolithic Age, there are traces of human activities in Southeast Hubei. Because of the developed river system, gentle hills and mountains in the region, it is easy to establish contact with the outside world since ancient times, and became a place of multi-cultural blending. With several times of population migration, the ethnic structure is constantly changing, which is stable until the early years of the Qing Dynasty. The most profound impact on the Historical and Cultural Towns and Villages in Southeast Hubei is the immigration movement of "Jiangxi filling Huguang, Huguang filling Sichuan" in history. According to textual research, the immigration from other provinces to Hubei begins in the Tang Dynasty and lasts until the end of the late Qing Dynasty. In the late Qing Dynasty, Jiangxi migrants account for 77% of the total immigrant population in Southeast Hubei [9].

The ethics of Chinese traditional culture includes the relationship between man and society as well as the relationship between man and nature. In the relationship between man and society, the idea of "Ritual" system in ancient China is one of the core ideas of traditional culture, which holds that there is a strict hierarchical relationship among people. The immigration culture makes the settlement pattern form into clan as a unit in the Southeast Hubei, namely the settlement space pattern of one clan, one village, one surname, which has a profound influence on the internal structure of the villages in the Southeast Hubei.

Under the influence of natural environment and regional culture, the Historical and Cultural Towns and Villages in Southeast Hubei are mainly distributed in Xianning City, Yangxin City and Daye City (Table 1).

3. Ecological characteristics of Historical and Cultural Towns and Villages in Southeast Hubei

3.1. Ecological concept of site selection and layout of village and town

3.1.1. Ecological concept of site selection of village and town
The location of Historical and Cultural Towns and Villages in the Southeast Hubei is affected by many factors, especially the geographical environment. The region is dotted with hills, mountains and lakes, which has the natural advantage of being between mountains and rivers. The beautiful environment of natural mountains and rivers is integrated into the village and town, which is one of the main concepts of ancient people to settle down. Because there are better beach valley and hilly areas in Southeast Hubei, the location of village and towns is mainly in low mountains, valleys, gentle slope areas or along rivers.
There are two main mountain ranges in Southeast Hubei, namely the Dabie Mountain Range in the north and the Mufu Mountain Range in the south. The Historical and Cultural Towns and Villages distribute along the low mountain and gentle slope areas, including Huitouling Village, Baoshi Village, Liujiaqiao Village, Yanglouldong Village, Jianjiatang Village, Shangfeng Village (figure 1) and Yuling Village.

Table 1. List of Historical and Cultural Towns and Villages in Southeast Hubei

| Historic and Cultural Towns in China (Southeast Hubei) | Batch | Historical and Cultural Towns and Villages in Hubei Province (Southeast Hubei) | Batch |
|-------------------------------------------------------|-------|--------------------------------------------------------------------------------|-------|
| Tingsiqiao Town, Xianning City, Hubei Province       | 2     | Xingguo Town, Yangxin County, Huangshi City                                   | 2     |
| Longgang Town, Yangxin County, Hubei Province         | 2     | Jinniu Town, Daye City, Huangshi City                                         | 1     |

| Historic and Cultural Villages                        | Batch | Historical and Cultural Villages in Southeast Hubei                          | Batch |
|-------------------------------------------------------|-------|--------------------------------------------------------------------------------|-------|
| Yanglou Dong Village, Zhao Lijiqiao Town, Chibi City, Hubei Province | 5     | Yutu Village Fu Tu Town, Yangxin County, Huangshi City                        | 1     |
| Shangfeng Village, Jinhu Street, Daye City, Hubei Province | 7     | Huitou Ling Village, Bai Ni Town, Chongyang County, Xianning City             | 1     |
| Xia Rong Village, Pai Town, Yangxin County, Hubei Province | 7     | Shimen Village, Nanlinqiao Town, Tongshan County, Xianning City              | 1     |
| Ke Daxing Village, Dajiu Town, Daye City, Hubei Province | 7     | Jiangyuan Village, Henggang Town, Tongshan County, Xianning City             | 1     |
| Jinzhai Village, Dawangzhen, Yangxin County, Hubei Province | 7     | Yezhuqiao Village, Xindian Town, Chibi Town, Xianning City                   | 1     |
| Baoshi Village Chuangwang Town, Tongshan County, Hubei Province | 7     | Liujiaqiao Village, Guihua Town, Xianan District, Xianxi City                 | 1     |

Because of the developed river system, another part of Historical and Cultural Towns and Villages in Southeast Hubei are mostly located on the riverbank, such as the estuary, ferry and fluvial alluvial area. Abundant water resources and land have become the basis for the formation and stable development of farming culture. In addition, due to the convenience of water transport, historical towns and villages with economic functions have been formed at important water transport nodes. Longgang Town (figure 1), Tingsiqiao Town, Baoshi Village, Kanjiatang Village and Yanglouldong Village are all typical representatives.

Most of the Historical and Cultural Towns and Villages in Southeast Hubei are immigrant village and town, few of them have the function of military defense, which mainly focuses on agricultural production. The size of arable land, soil fertility has a profound impact on the size of the village, the natural resources of village and town, especially water, mountains, forests, land, which are the basis of people's survival.

Figure 1 Shangfeng Village (Photo source: Ru Chen)

3.1.2 Fengshui view on the layout of village and town
Influenced by the Fengshui view of "Formalism" in Jiangxi Province, residents choose a good place for flourishing family through the observation of the natural environment, which is combined with the methods of looking for dragons, inspecting sand and watching water (figure 2A). "dragon" refers to
mountains (namely zushan), "sand" refers to the hills near zushan, and "water" refers to the form and trend of rivers. Landscape environment in Southeast Hubei has an extremely important impact on the location of villages, most of the Historical and Cultural Towns and Villages are back to mountains and facing water, or surrounded by mountains and water, or headed on mountains and surrounded by water. In addition, these towns and villages also choose good lairs of "Fengshui" with shady and sunny. The internal space organization of the village is also built according to the trend of mountains and rivers, and the buildings and landscapes all reflect the influence of Fengshui on them.

![Scheme of Fengshui](image1)

**Figure 2** A. Scheme of Fengshui. B. Current situation of Shangfeng Village. (Photo source: Ru Chen)

Shangfeng Village is built in the valley (figure 2B). The main roads of the village are built along the contour line, so as not to occupy the arable land in front of the village. The whole village faces southwest, the buildings are located in the northeast direction, while the farmland is located in southwest with a relative flat terrain. Overlooking Shangfeng Village, it likes an entrenched Wolong. Traditional residence likes a dragon head, Longjiao Mountain behind the village is the dragon tail, and two ancient wells are the dragon eyes [1]. Baoshi Village is built upon the natural mountains and rivers, which is a place with auspicious Fengshui. Traditional residences are built on the highlands on both sides [1]. Due to the influence of the terrain variation, the courtyard building will rise layer by layer according to the change of the terrain, which is neatly combined with the architectural function.

The development of most village and town has always followed the Fengshui concept of its initial construction, which make its form relatively stable for a long period. Fengshui concept has become the main factor on the spatial shape of village and town.

3.1.3. Natural view of the layout of street and alley in village and town
The street and alley of Historical and Cultural Towns and Villages in Southeast Hubei are generally organized according to the topographic features, so as to cope with the muggy, humid and rainy climate, and meet the living needs of residents such as ventilation, heat dissipation, shading, water intake and drainage.

The layout of street and lane is mostly narrow lanes and high walls, which is conducive to mutual shading between buildings. In addition, the sun can not directly shine into the lanes, the lanes are in the shadow of buildings with a relative low temperature, thus forming a more comfortable outdoor space. Even in summer, residents can come out appropriately. Corbel-step in the courtyard house is higher, which is convenient to shelter from the sun in addition to the role of fire prevention. The width-height ratio of Miaochang Street in Yangloudong (figure 3A) and Longgang Street in Longgang Town (figure 3B) is less than 1 [4, 5]. The eaves of buildings on both sides of street and alley extend relatively further, which make the streets appear comfortable and quiet. Because most of the houses are organized
according to the terrain and wind direction, the trend of the main street and lane in many village and town is quite agree with dominant wind direction in summer, street and lane become important ventilation corridors. Furthermore, ventilation corridors together with narrow lane and high wall, outdoor space with shade ventilation is formed. In addition, the architectures are adjacent to each other to form a building complex, in which roads are connected to each courtyard and thereby integrating into a whole. This kind of compact combination of buildings, street and alley can shield each other to reduce the exposure of direct sunlight, and improve shading effect.

Figure 3 A. Miaochang Street in Yangloudong; Longgang Old Street in Longgang Town.

In terms of water intake and drainage, the layout of street and lane is also important. Village is usually located near river or pond to meet the requirement of residential water demand and irrigation of farmland. In addition, residents also construct open drains and pipe drains due to the elevation difference of the laneway. The water is then led into the village interior and finally gathers in the surrounding river and lake (figure 4), which is also to meet the function of drainage and flood discharge. The artificial water system can also play a role in regulating the microclimate.

Figure 4 Fengshui pond in Shangfeng Village (Photo source: Ru Chen)

3.2. The ecological concept of the construction of traditional dwellings in Southeast Hubei

3.2.1. Climate-adapted architectural spatial layout
Affected by climatic factors, stilt style architecture is the main architectural form in the early stage in Southeast Hubei. Later, under the influence of many cultural invasions such as immigration in history, stilt style architecture is gradually replaced by courtyard architecture. Influenced by Huizhou culture, Jiangxi immigrant culture, and form a basic layout unit of three rooms in a row [1], and then expand to five rooms in a row, three bright and five dark rooms, as well as building with courtyard, namely ‘Si shui gui tang’.

Dwellings with courtyard is one of the most commonly used types in Southeast Hubei, which is symmetrical in the central axis and deep in the layout, with a main hall surrounded by two compartments (figure 5A). In order to resist the long hot and humid period in summer, building with courtyard is used
as the main passageway for indoor ventilation, heat dissipation, tide dissipation and lighting. The external walls of traditional houses are generally tall without windows. A narrow courtyard is set between hall and gate, the space between courtyard and rooms is also completely open and form natural ventilation system between courtyard and corridor. The courtyard can regulate the indoor airflow, the enclosed courtyard space limits the horizontal movement of airflow, and the stratification effect in the courtyard will appear vertical gradient, which makes the indoor temperature gradually increase from top to bottom in winter and decrease from top to bottom in summer [10]. Another special building component of traditional dwellings in Southeast Hubei named Tiandou (figure 5B and 5C), which is covering the roof above the courtyard, has the function of resisting direct sunlight in summer, rain and snow in winter. After covering with transparent tiles, the courtyard has the function of lighting and ventilation.

Figure 5 A. Courtyard of Peng Dehuai’s former residence in Longgang Town. B and C. Tiandou and its schematic diagram. (Photo source: Dwellings of Dongting& Poyang Lakes)

In addition to the courtyard, the house is mainly built with brick and tile or brick and wood, which possesses thin wall, high wall base, south-facing window and big slope of roof. These structure characteristics can solve hot, rainy and strong solar radiation in summer. In order to solve the problems of heat dissipation and moisture-proof, some dwellings have copper plate-shaped holes on the courtyard wall close to the ground, which are also specially designed for the indoor elevated wooden floor without ventilation, so that the moisture seeped from the foundation will not be deposited under the wooden floor [2]. The sunlight and wind arrive at the indoor through courtyard, and form draught which is the most effective dry method in the indoor.

3.2.2 Regional Architectural material and technique

The traditional dwellings in the Southeast Hubei are all made of local building materials, such as soil, brick, stone and wood, and the structures are post and lintel construction, through-jointed frame, insert beam or mixed type (figure 6). Combined with raw soil to form rammed earth wall, part of the wall fired brick wall, stone used in the building platform foundation. At the Baoshi Village, roads, roadways and building foundations are mostly paved with local cobblestone, since there are a large number of cobblestones in the village. In addition, the use of inserted beam or mixed wood structure can reduce the amount of wood and ensuring more stable structure. Combining the construction technology and local materials can reduce the cost of construction, as well as protect the environment.
3.2.3. Architectural decoration with rich implication

In Chinese traditional culture, the philosophical view of "Harmony between Man and Nature" is emphasized, which emphasizes the harmonious coexistence of man and environment. The architectural sculpture decoration, pattern decoration and colour decoration reflect the harmonious coexistence of man and nature, and the beautiful vision of harmony between man and nature.

Traditional dwellings in Southeast Hubei are mainly decorated in beam, column, bracket, wall, window, door, grille, threshold, column foundation and other part of the building. Architectural carving mainly includes stone carving, brick carving and wood carving. Stone carving is mainly located in the base of the building, such as column, column foundation, threshold and drum stones, which is mostly carved as geometric pattern and plant branch and leaf; Wood carving is mostly used in door and window, grille, bracket, wooden beam and interior decoration, which is carved as character, landscape, flower and bird; Brick carving is mostly on eave, roof and gable, which is carved as cloud design pattern, flower and opera character. In addition to geometric pattern, architectural pattern is mostly decorated with plant, flower, animal, fish and insect. Plant flower and plant are mainly pine, bamboo, plum, which are used in column foundation, door and window or indoor decorative painting.

Most of the traditional dwellings in Southeast Hubei are brick wall without plastering. The colour is elegant and simple. The interior of the dwellings is mostly natural, with black, white and grey as the main tones, and some of them are painted. Influenced by the traditional Chinese doctrine of the mean, simplicity and elegance are the common aesthetic pursuit of residents, and the architectural colour mainly expresses the experience of watching the world quietly, and also shows the local residents' yearning for a peaceful life. Traditional dwellings are also integrated into the surrounding landscape, which is quiet, beautiful, harmonious and unified as a whole.

4. Conservation Strategies of Historical and Cultural Towns and Villages in Southeast Hubei Based on Ecological View

At present, the main difficulties in the conservation of Historical and Cultural Towns and Villages in Southeast Hubei include: 1) The new construction of modern dwellings without historical context has seriously damaged the overall style of Historical and Cultural Towns and Villages. 2) The economic and human resources needed for the conservation of Historical and Cultural Towns and Villages are extremely scarce. Because the economic level is generally low, most villages and towns still rely on natural resources of agricultural production. Meanwhile, a large number of people go out to work, which make the village in the unprecedented danger of hollowing out. 3) Conservation consciousness is weak for the government and residents. Some National Historical and Cultural Towns and Villages have not yet formulated conservation plan or conservation plan is incomplete. There are still many problems, such as insufficient formulation and guidance of conservation policy, inadequate conservation implementation. Residents only pay attention to the immediate short-term interests, but lack of the understanding of the ecological characteristics, scarcity and value of historical and cultural heritage.
In view of the above problems, integrating the traditional ecological concept into the whole process of "Policy-System-Power-Consciousness" of Historical and Cultural Towns and Villages will further enhance the conservation of Historical and Cultural Towns and Villages in Southeast Hubei.

4.1. The regional ecological characteristics should be included in the evaluation system of Historical and Cultural Towns and Villages, and strengthened the guidance of ecological overall evaluation.

The current "Chinese historical and cultural towns (villages) evaluation index system" has a quantitative index system for the natural environment, historical streets, historical rivers, cultural relics and historical buildings of village and town, but it can not comprehensively evaluate the ecological characteristics of Historical and Cultural Towns and Villages. The natural and human environment of each Historical and Cultural Towns and Villages has its own characteristics, we can not use the same standard to score and judge. How to carry out a holistic, comprehensive and regional evaluation to achieve the overall conservation effect remains to be further studied.

4.2. Formulate an ecological integrity plan for the “conservation of Historical and Cultural Towns and Villages”.

We should strengthen the compilation of Historical and Cultural Towns and Villages in Southeast Hubei, supervise the villages and towns that have not yet compiled the conservation plan of Historical and Cultural Towns and Villages, order them to compile the "conservation plan of Historical and Cultural Towns and Villages", and speed up the implementation of conservation plan Preparation of conservation plan should base on the "evaluation index" and pay more attention to the overall conservation of ecology of village and town. Current core protected areas and construction control zones can not include the ecological relationship between the material environment and the natural environment of villages and towns.

4.3. Consideration of the ecological potential of economic development and economic structural transformation

At present, the conservation of Historical and Cultural Towns and Villages in Southeast Hubei mainly depends on the support of the state and local governments to carry out the renovation of historical buildings and environmental renovation. Most of the conservation of villages and towns are still in the stage of passive conservation methods. In order to establish a sustainable conservation system of Historical and Cultural Towns and Villages, the problem of low economic structure should be solved. Afterward, combined with the characteristics of ecological and human resources of Historical and Cultural Towns and Villages, the research on industrial strategy should be accelerated, and establish a virtuous circle system of multi-dimensional promotion of ecological good, heritage conservation and industrial development.

4.4. Establish an active public participation mechanism and improve citizens' awareness of ecological conservation.

In the current public participation mechanism, residents are not involved in the whole process of project initiation and research, conservation plan, project implementation and feedback, but only listen to one or two as bystanders. However, the routine focus of heritage conservation, such as how to maintain and improve the historical buildings via traditional ecological concepts, and improve the quality of living environment, should meet the requirements of the cultural relic conservation and administration department. Therefore, residents can identify which of these historical architectures can be changed, how to select architectural components to conform to local traditional reference patterns, how to choose architectural color so as to realize the harmony and unity of environment, how to protect and renovate the outdoor environment. Therefore, residents can participate directly in the whole process of conservation, so as to continuously improve their willingness and awareness of conservation. Spontaneous consciousness of residents' ecological conservation is one of the important reasons for the sustainable development of historical and cultural conservation. Therefore, establishing a sound public
participation mechanism, and combining the "bottom-up" conservation will with the "top-down" policy and management is an effective way to establish the independent conservation of Historical and Cultural Towns and Villages.

5. Conclusion
This article systematically assesses the ecological characteristics of Historical and Cultural Towns and Villages in Southeast Hubei. The results show that regional ecological view is the core of vernacular settlement construction and heritage conservation. The construction of Historical and Cultural Towns and Villages in Southeast Hubei is under the guidance of Chinese traditional ecological view, including utilizing the concept of Fengshui for the location and layout of village, building layout adapting to climate via ethics, building construction via regional materials and techniques, as well as utilizing the concept of "Harmony between Man and Nature" for architectural decoration. This achievement makes up the blank of vernacular settlement heritage in Hubei based on ecological view. Meanwhile, after analyzing the dilemma of conservation in Historical and Cultural Towns and Villages, the research emphases of whole conservation of ecological view, including the introduction of evaluation index of regional ecological characteristics into the evaluation system of Historical and Cultural Towns and Villages in China, delimiting the scope of ecological protection in the conversation plan, introduction of ecological impact assessment in the process of economic development, and guiding the ecological protection of residents in daily protection and repair. These strategies will also provide a research example for the conversation of vernacular settlement in the construction of ecological civilization in the Territorial Spatial Planning.

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