

Study on Landscape Protection Strategy of Nanjing Tulou Settlement

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Abstract

Nanjing Tulou is a part of the world cultural heritage, is the precious wealth of the Chinese nation, is an important embodiment of Hakka culture, for a long time by the attention of all walks of life. With its unique settlement landscape environment, Nanjing Tulou attracts a large number of foreign tourists. While tourism development has brought considerable benefits to the Tulou cultural heritage villages, the rapid development of urbanization and a large number of "constructive" developments has caused varying degrees of damage to the Tulou buildings and the surrounding landscape environment, seriously threatening the sustainable development and protection of the Tulou cultural heritage. Therefore, this paper analyzes the landscape characteristics of the two settlements through the field investigation of Yunshuiliu Tulou scenic spot and Tianluokeng Tulou complex in Nanjing Tulou, as well as consulting relevant documents and materials, and then finds out the problems, in order to explore the protection strategy of the Tulou settlement landscape in Nanjing.

Keywords

Settlement landscape, Nanjing Tulou, Protection strate.

1. INTRODUCTION

Nanjing Tulou in Fujian Province is an important intangible cultural heritage of mankind, which is derived from the harmonious coexistence and development of human culture and natural ecology, and an important historical and traditional cultural relic of Hakka people living together. It is a residential settlement with traditional national culture and ecological spirit created by local villagers by adapting to, changing and living in harmony with the natural environment. It is of great historical significance in architectural design, aesthetics, landscape, culture, natural environment and other aspects. In 2008, Fujian Province's Tulou was included in the World Heritage List; In 2010, the people's Government of Fujian Province established the Yongding Tulou Scenic spot and the Nanjing Tulou Scenic Spot. In 2011, it was rated as a national 5A-level scenic spot, ushering in a new upsurge as a tourist attraction. In a certain sense, tourism has changed the way of production and life of the villagers, and made Nanjing Tulou Village achieve various benefits to different limits. However, it also causes the phenomenon of natural environment pollution and human settlement environment destruction, especially in the settlement landscape. The landscape layout of Tulou is influenced by the changes of natural environment and ecological environment and people's historical activities. The changes of villagers' traditional living mode and production activities as well as the development of cultural tourism have affected the overall landscape and ecological protection of the Tulou community to some extent, seriously changing the inherent landscape style of the traditional settlement and breaking the structure and overall layout of the traditional village. And seriously affected the preservation of the historical authenticity of the world cultural heritage of Tulou and its sustainable development. In-depth research on the natural landscape

ecology and environmental protection of the World cultural heritage villages such as Tulou will be conducive to comprehensively improving the natural landscape features of Fujian Tulou and effectively promoting the protection of World heritage and economic development.



Figure 1. Yunshuiyu Tu lou and Tianluokeng Tu lou

2. REVIEW OF DOMESTIC AND FOREIGN RESEARCH

2.1. Research status of cultural heritage landscape protection

Compared with the cultural heritage itself, the cultural heritage at the landscape scale often has an overall function and diversified utilization value because it contains more abundant elements and has specific and complex natural, economic and social structures. According to the Charter of Venice, "the concept of historical sites is not only a single architectural entity, but also involves the urban or rural environment containing evidence of specific social developments and significant historical events", which has stimulated more and more people's in-depth attention to the nature-historical type of cultural heritage. At the 16th session held in New York in 1992, the UNESCO World Heritage Committee for the first time put forward the definition of "cultural traditional spiritual natural landscape", that is, "nature is the common product of people's life and creation", and expresses its unique spiritual content, especially due to the common characteristics of human society, history, religion and culture. As well as the special natural landscape formed by the environmental impact and the surrounding natural conditions. The formation of artistic style heritage enables the dynamic relationship of goal-oriented and mutual influence between man and nature to be concretely expressed in intangible cultural heritage. Compared with the foreign society's emphasis on cultural heritage and cultural landscape, the progress of relevant theoretical research in China is relatively slow.

2.2. Research status of landscape environmental protection of Nanjing Tulou

As a treasure of rural dwellings, Nanjing Tulou has always attracted academic attention since it was listed in the World Cultural Heritage List. Mr. Huang Hanmin was engaged in the research of Fujian Province's Tulou cultural traditional residence in the early days, and introduced the Nanjing Tulou in southern Fujian for the first time in the article "The Traditional Cultural Characteristics and Local Features of Fujian's Civil Houses". In the literature materials about Chinese traditional villages such as Tulou, the early investigation mainly focused on the historical formation and development of Tulou, the space and structural characteristics of

individual buildings, and the art and folk custom of Tulou architecture, so little attention was paid to the material cultural landscape relics caused by the integration of Tulou architecture and the surrounding natural environment. In some Tulou protection planning documents, more emphasis was given on specific and feasible protection measures and countermeasures for the composite monomer, infrastructure and intangible cultural landscape of Tulou buildings, while there were few specific protection measures planning cases for the overall style layout of the Tulou community, the natural environment and various surrounding landscape elements. With the further expansion of China's cultural landscape heritage theory, in recent years, the theoretical circle has also noticed the significance of Tulou cultural protection, and has tried to study the cultural spirit connotation of the coexistence of man and nature embodied by Tulou from the aspects of architectural community landscape, heritage corridor, landscape planning and other aspects. Therefore, it can be found that at present, there are few researches on the landscape protection measures of Fujian Tulou community at home and abroad, and most of them focus on summarizing qualitative protective design schemes by means of current situation studies and cultural excavations

3. ANALYSIS OF THE PRESENT SITUATION OF THE TULO SETTLEMENT LANDSCAPE IN NANJING

3.1. Overview of Nanjing tulou settlement

Nanjing County is located in the middle and upper reaches of Jiulong River in the central and eastern part of Fujian Province. There are 62 km of named peaks and 72 small streams in the territory. Many small hills or inter mountain basins are formed in the low mountain belts here. The streams cut the mounds into deep valleys, which is interwoven with mountains and rivers, forming a beautiful and unique natural ecological landscape. As Nanjing is located in the South Asian tropical region, it has abundant sunshine and abundant rain, which is conducive to the development of tropical cash crops, so it is especially rich in rice, sugarcane, oil tea, bamboo and medicinal materials. At present, most of the Nanjing Tulou buildings are scattered in 9 villages in the upper section of Xixi River, Jiulong River, with a total of more than 1300 buildings. Among them, there are 236 round Tulou on the third floor and 496 square Tulou on the third floor, which is the most concentrated place and the largest scale of Tulou circle and square Tulou layout in Fujian, and also the most harmonious area between Tulou community and the surrounding landscape. There are Tianluokeng Earth building Group, Taxia Earth building Group, Shiqiao Earth building Group, Hekeng Earth building group and other characteristic earth building settlements, in addition to Huaiyuan Building, GUI building, Yuchang Building and other local ethnic characteristics of the earth building dwellings, in addition to Yunshuiyu scenic spot and Tianluokeng scenic spot two 5A tourist attractions. Different from the scattered Tulou buildings in other areas, which coexists with modern buildings, the Tulou buildings in Nanjing mostly appear in the form of communities, which has been developed by their ancestors and preserved as a whole by the ancient architecture and family living style of the Han Chinese villages from generation to generation by the construction technology and ancient living lifestyle.

3.2. Analysis of the overall landscape of Nanjing Tulou

Nanjing Tulou has a special spatial modeling art, and the overall layout of the village shows the overall pattern of the Tulou focusing on the residential village, as well as the extraordinary achievements in the harmony between human living environment and nature. In addition, there are some exquisite combinations of individual Tulou architectural groups and surrounding landscapes, the spatial emission of Tulou modeling, and the poetic images that combine with important aspects of people's production and living behaviors, traditional living customs and

other aspects. The existing Tulou buildings in Nanjing are highly concentrated in Shuyang Town, Mailing Township and Funtian Township, among which Shuyang Town has the largest total amount of existing Tulou buildings. At the same time, Shiqiao Earth buildings, Hekeng Earth buildings, Taxia Earth buildings and Tianluokeng earth buildings all belong to the jurisdiction of Shuyang Town, and are successively scattered on both sides of Hekeng River from north to south, and have the same geological, meteorological, hydrological characteristics and natural environment. By comparing the mountain terrain, building layout, surrounding environment and village development of other Tulou cities or settlements, we can find the landscape potential value of the earth buildings in Hekeng village. As Yunshuiyu ancient village scenic spot group was established in the earliest time, it has rich experience in protection and development, and after several rounds of scenic area rectification, the settlement conditions have also been greatly improved.

3.2.1 Yunshuiyao Town

Yunshuitao Town, also known as "Changjiao", has a history of more than 700 years. Earlier, some people called it "Zhang Jiao", indicating that it was once the place where the Zhang family lived together. Yunshuiballu Ancient Town is located in Mailing Township, Nanjing County, the terrain is high in the south and low in the north. Chuanchangxi River winds through the southeast. There is two peaks on each side, and in the middle are Bijia Mountain and Huback Mountain. Following the traditional Chinese feng shui theory, "Left green dragon", "right white tiger", "negative Yin holding Yang", "Tibetan wind gathering water" and other theories, the three natural villages of Pu Shan Village, Guanyang Village and Kanxia Village along both sides of the Chuanchang River, and the two green mountains backed by the south to the north is scattered in this valley basin. Therefore, as the planning site selection and construction criteria, the Tulou community of Yunshui Ballad will present the spatial layout characteristics of "dense north and south", "dense far stream" and "dense hills and plain". According to statistics, a total of 53 Tulou buildings have been preserved in Yunshuiballu so far, among which the most famous are the two world culture Tulou and GUI Lou and Huaiyuan Lou. They are located at the north and south ends of Yunshuiballu, and their main axes with gate columns as the core correspond to the east Bijia Hill, which means that future generations of people are coming out. Hegui Tower, known as "the first wonder in the world", is the largest of the square Tulou buildings in Fujian Province at present, with a total of 5 floors, 21.5 meters, and 28 rooms on each floor. Hegui Tower is an earthen building built in a swamp, with more than 100 cubic meters of piles as the ground. It has remained impenetrable for 200 years. But what is particularly strange is that there are two ancient Wells separated by about 18 meters from the inner courtyard of your building. One is as bright as a mirror and the water is sweet, while the other is more cloudy and inedible.

Huaiyuan Building is located in Kanxia Village, about one kilometer away from and your building, for the current preservation of a relatively complete double circular building, the door column is written on the "Huai by virtue of benevolence benevolence to repair Qi obey ancestral instructions, far and near mountains and water by virtue of Lingxiu Yu humanity", in order to instruct the descendants of Jian's benevolence to pass down the family, study and cultivate as, mind ambition. Its inner circle building in the building "Si is the room" is the unique Huaiyuan building, this four stand three halls of the five phoenix building, not only worship ancestors, elders to discuss the ancestral hall, but also the younger generation of the family to learn private school.

The traditional spiritual connotation of respecting teachers and ancestors, cultivating and inheriting the family, and worshipping literature and education have penetrated into the Tulou structure, family ancestral hall, mountain landform and other spatial environments, forming a close connection and complete and unified cultural landscape. The attraction of Yunshuiyu Ancient village lies not only in the surrounding Tulou community, but also in the old banyan

trees, ancient trestles, and poetic landscape layout that witnesses hundreds of years of history. Next to the ancient road, there is an ancient two-story brick and wood building with residences above and shops below. The wooden eaves between the two-story buildings protrude into the middle of the street, forming a corridor under the house to shelter from the rain and sunsets, thus forming a unique "arcade street" in southern Fujian. Thirteen old Banyan trees, which is hundreds of years old or even thousands of years old, stand beside the stream along the ancient post road. The trunk length is more than 30 meters, and the width of the bottom end of the tree is as wide as a dozen adults to hug. Under the shade of the century-old Banyan tree, you can look at the rolling green mountains, listen to the murmuring water, and the shophouses not far away are filled with visitors, making the ancient and modern interwoven, quiet and noisy coexistence. However, even in such a prosperous tourism development today, the people of Yunshuiyu ancient village still retain the ancient survival mode and labor customs. In the village, there are a large area of cultivated land, terraces, tea trees and other planting gardens, planted with rice, banana, passion fruit, seasonal vegetables, etc. These not only solve the main survival problems of the villagers in the ancient town, but also form a rich pastoral scenery and a good living atmosphere.



Figure 2. Front view and interior picture of Huaiyuan Building

3.2.2 Tianluokeng Earth Building Group

Tianluokeng Earth building Group, located in the lake bank of Bancun village, Shuyang Town, Nanjing County, on the hillside of 0:5, because of the landform like Tianluokeng, and surrounded by mountains, among which the low-lying place, because of the shape of the pit named Tianluokeng. Tianluokeng earthen house Group consists of three round towers (He Chang Tower, Zhenchang Tower and Ruiyun Tower) and one oval earthen tower (Wenchang Tower) surrounding the central square tower (Buyun Tower). Because the earthen tower is scattered and distributed along the surrounding platform, some scholars call it "the flying saucer falling from the sky", and because its settlement layout resembles the typical dish of one of the four outer dishes. It is named "four dishes and one soup". According to genealogy records, the Kaiji ancestor of Tianluokeng originated from Yongding. His father was named Huang Baisanlang, who raised his mother duck for a living. According to legend, the female ducks he raised would lay double yellow eggs every day, so that the first funds he collected could be used to build Tulou. The first Tulou in Tianluokeng was called Buyun Lou. It was built in the first year of Jiaqing in the Qing Dynasty. It was a three-story square building with 26 guest rooms on each floor and shared four staircases. The name Buyun means that future generations and grandchildren have been prosperous and promoted in their official career since then. Buyun Tower was still under

construction at that time, and the later people began to build the Hexang Tower, but because the foundation was destroyed by the White Army in 1930, the Hexang Tower was rebuilt in 1953 into a round tower, with three floors and 22 rooms per floor. In addition, there are two round towers, namely Zhenchang Tower (1903) and Ruiyun Tower (1936), which are still three floors, with 26 rooms each. Another oval-shaped Tulou in Tianluokeng, Wenchang Lou, was built in 1966. It is one of the later-built Tulou in China. Its name Wenchang not only means "prosperity of literature", but also relates to the folk deity "Wenchang Dijun". The unique settlement scenery of the earthen buildings in Tianluokeng was selected and arranged by local villagers in accordance with the traditional Chinese feng shui thought. After the ancient people chose the house foundation, the first step was to look at the mountain. In the Chinese feng shui thought, the mountain is the "dragon" and the mountain is the dragon vein. The ups and downs and winding dragons are regarded as the place where "wind and qi gather". Tianluo pit earth house group ancestors to lake Dongshan five point slope platform as a support, selected a high terrain and drought ventilation good place, and back to the hills by the mountain to build a Tulou, step cloud floor for the Chinese feng shui theory on the "tiger" position, and Chang floor for the "crab ground" position. And five Tulou are sitting north to south, that is, the formation of Chinese feng shui in the "negative Yin Yang", all the doors are facing the southwest direction or the distant mountain pass. The five Tulou buildings in Tianluokeng are constructed with the golden section ratio (2:3, 3:5, 5:8). According to the pattern of "Ming Hall and five rooms" in "Zhou Li Kao Gong Ji", Wenchang Lou, Chang Lou, Zhenchang Lou, Ruiyun Lou and Buyun Lou is successively relative to the "gold, wood, water, fire and earth". In "Zhou Yi". In order to meet the needs of human settlement at that time, the ancestors built the Tianluoceng Tulou Group according to the Chinese feng shui theory, looking at the wind direction, choosing the base site, hillside land and choosing the highland. Today, the Tianluokeng earthen building group has been regarded as an important landscape part of the national 5A-level tourist attraction "Nanjing Earthen Building" scenic spot, integrating earthen building, mountain, terrace and forest. As the water environment of Tianluoceng earth building group is very different from other earth building communities, there is no stream or natural pond through the village, the local villagers dig Wells in the inner court and outer space of the earth building, the water is clear and bright, some visitors throw coins into the well, in order to be safe and lucky. Tianluokeng earth building group is surrounded by mountains, and the terraces on the slopes are shaped like strips extending along the slopes. Farmers have planted food crops such as tea trees, passion fruit, rice, mustard greens, corn grains, and supplemented by plantain, bamboo, plum blossom, pine and cypress vegetation on the terraces, presenting different scenery with the changes of the four seasons. Looking up from the sightseeing platform on the southwest side, the whole village is built along the mountain. The buildings are scattered and uneven, and the elevation of the earthen buildings changes with the fluctuation of the mountain. Mr. Luo Zhiwen, a well-known architectural research expert and scholar, once wrote a poem praising the earth buildings in Tianluokeng, among which the "looking at the spirit of Budalla" is to describe this unique landscape of small mountain settlements, and the "Little Potala Palace" in Tianluokeng is said to come from this. After several rounds of scenic area rectification, the living environment has also been greatly improved. The road surface is laid with local stone, and the architectural landscape elements such as road sign guidance, fences and guardrail are all constructed with wooden building materials. The village is surrounded by green shade, lush, bamboo swaying. On the land around and in the middle of the Tulou, green plum, Chinese rose, red camellia, bougainvillea, osmanthus and other trees are planted, or some farmers plant small vegetable gardens. The interactive penetration of mountain land and Tulou folk houses, the settlement landscape and the main style of their own, constitutes the "mountain - village - field" settlement landscape layout in the soil building group of Tianluokeng.



Figure 3. Top view of Tianluokeng Viewing platform

3.3. Analysis of landscape elements of Nanjing Tower

3.3.1 Analysis of physical geographical environment and spatial location layout

The natural environment where different villages are located has different influences on the overall spatial layout and life rules of the village and on the reproduction and survival of the villagers, among which the influencing factors such as mountains, rivers, climate and land are particularly critical, and these factors are integrated to form the overall landscape pattern of traditional Chinese villages. The topography of Fujian Province is complex, mainly mountainous and hilly, with dense

river network but few and fast-flowing rivers. Valleys and basins are formed by the impact and interweaving of mountains and rivers, and are known as "eight mountains, one water and one field". Under such a geographical background, the settlement space of Nanjing Tulou is constructed according to the original natural view of the balance of "heaven, earth and man" in accordance with the Chinese feng shui thought, and the water on the mountain side, to achieve the spatial layout of wind and gas accumulation with "case mountain in front and Zu Mountain in back and the protection mountain in front and back" .



Figure 4. Layout of the settlement space "storing wind and gathering air"

Surrounded by green mountains, Guzhen Lou Settlement is covered with forests and cultivated land. Streams over 20 to 30 meters long pass through the middle of the settlement. Ancestors built Tulou buildings on the flat ground and slopes on both sides of the stream, forming a spatial layout with mountains surrounded by water and a seat full of air. But

Tianluokeng earthen house group is different, although the back of the highlands steep slope, surrounded by mountains, but because there is no stream and pond in the village, so the five earthen houses into a hug, and with the winding and undulation of the mountain, and formed a very typical mountain community. Tianluokeng earthen buildings were originally the residence of the Huang family, while the ancestors of the other three earthen buildings were all surnamed Zhang. Although the different group living modes and survival modes among the ethnic groups with surnames resulted in different village siting patterns, the construction of the earthen buildings all reflected the traditional Chinese feng shui concept and the architectural layout characteristics of family centrality. However, under the natural conditions of high mountains and low flat land in China, in order to meet the living needs of large clan families and maintain rich land resources, people built multi-storey earthen buildings along the slopes as far as possible according to the requirements of natural topography and actual urban construction needs, and used the flat and open open land as farmland, while developing part of the platform on the slopes into terraces. This can not only reduce the cost of using land on steep slopes, but also achieve the effect of avoiding flood disasters. Yunshuiju Ancient Town has a large area of cultivated land around, mainly scattered in the foothills and the middle of settlements, while Tianluokeng earth building group is closely connected with Tulou houses due to the large number of families, dense mountains and complex terrain, and the plain land is scarce, so it mainly cultivates terraced fields, presenting different field scenery and vegetation characteristics. In view of the complex natural geographical environment, the ancestors of Tulou cleverly took advantage of the natural mountain situation and adapted to local conditions, organically combined the Tulou community with the surrounding natural environment, forming a settlement landscape with the integration of mountains, water, fields and villages.

3.3.2 Analysis of historical and human landscape

The overall landscape style of Tulou settlement is composed of natural ecology and environmental protection, magnificent and unique traditional cultural architecture remains and ancient and heavy social history and human landscape. In particular, the family cultural cohesion passed down from generation to generation, the historical traditional culture of respecting teachers and ancestors, as well as the traditional festival social culture of Taoist thoughts and concepts, after hundreds of years of development and evolution, continue a large number of social historical and cultural symbols, passing on the traditional national culture of ancestors, ancestral temple beliefs, family survival mode, and clan social culture. On the other hand, plaques and couplets are the traditional national cultural architectural decoration art commonly used in Nanjing Tulou. Each Tulou has its building name and door plaque, which is used to distinguish it from concentrated residential families.



Figure 5. The plaque at the front door of Yu chang Building

The name of the building mostly means auspicious Changshun, in order to express the belief and requirements of the owner of the building, such as the "Buyun Building" and "Wenchang Building" of the Tianluokeng Earth building group, and the "He GUI Building" and "Huaiyuan Building" of the Yunshui ballad. Couplets are generally used for couplets on the gatehouse, and most of the names of the buildings are inlaid with characters, expressing the humanistic feelings of the owner of the earth house and the expectations of the descendants. In addition to the columns of the famous houses, the intangible cultural heritage villages of Tulou also have a special historical context and cultural landscape. Such as the ancient village of Yunshuiyu, the ancient pebble road with a total length of 10 kilometers and the ancient trees that have stood on the ancient road for more than 100 years, all describe and support the splendid years and development of Nanjing Tulou, forming a unique historical and cultural landscape among the intangible cultural heritage villages of Tulou.



Figure 6. Landscape of Yunshuiyu Ancient Town

3.3.3 Analysis of tu lou architectural features

There are differences in site selection pattern, construction form and spatial division, so the Tulou community in Nanjing also presents completely different spatial layout patterns, such as "four dishes and one soup" in the Tianluokeng earthen building group, dense houses along the stream and few far stream layout in the Yunshuiyu ancient village group. In addition, the construction types of each Tulou community are also different. The most common construction types are rectangle, ellipse and five-phoenix shape, etc. However, other types of Tulou, such as stilted buildings, cloth-skirt houses and double-ring houses, were also produced due to topography, river direction and clan culture. In addition, the ancestral hall structure of each Tulou community also has its own characteristics. The Nanjing Tulou not only reflects the traditional construction techniques and ecological wisdom of Hakka culture, but also the comprehensive reflection of clan civilization and local natural environment in spatial layout and architectural forms.



Figure 7. Tu ou with different shape3.3.4 Landscape environment status analysis

With the establishment of Nanjing Tulou tourist attraction, Yunshuiyu ancient village and Tianluokeng earth building group have been included in the category of scenic spots, and other earth building groups have begun to imitate this tourism development mode. Villagers use the ancient Tulou to introduce modern tap water, power supply, air conditioning and other equipment. They sell traditional Tulou characteristic snacks such as Golden Lotus, Red beauty, Pien Zi Huang, and love fruit, as well as wooden Tulou models and handicrafts on the first floor. Inns, teahouses and small restaurants are set up on the second floor and above. Taxia Village earth building group and Yunshuiyu ancient village, on the other hand, make use of the footpaths on both sides of the stream to set up shops. In particular, the "shop-style" old street of Yunshuiyu Ancient Village is more distinctive, integrated into the background of movies and TV dramas, and combines traditional post roads with modern retail shop streets, which can not only reflect the historical and cultural content of the ancient village, but also provide farmers with considerable business income. In recent years, in order to create the characteristics of rural tourism and further improve the facilities of scenic spots, the Nanjing People's Government has carried out the scenery rectification work of Tulou Village. Tianluokeng Earth building Group also set up wooden fences around the lawn, and launched scenic spot signs and warning signs, and planted camellia, osmanthus, iris and other plants around the few public open Spaces in the village to increase the interest of scenic spots and natural viewing. However, the landscape reconstruction of some villages not only failed to change the human settlement conditions and improve the landscape quality, but damaged the integrity and coordination of the landscape of Tulou village, damaged the overall landscape style of Tulou village, and was not conducive to the management and maintenance of the Tulou cultural heritage and the long-term development of the village.



Figure 8. Various forms of business in Tu lou villages

4. THERE ARE PROBLEMS IN LANDSCAPE PROTECTION OF NANJING TU LOU SETTLEMENT

4.1. The landscape protection mechanism of Nanjing Tulou settlement still needs to be improved

In recent years, the local government has introduced many protection measures and governance policies for Fujian Tulou, but most of them only emphasize the management, restoration and maintenance of traditional houses. For example, private restoration and construction are strictly prohibited within the scope of cultural relics protection, and special expenditures are set for restoration of Tulou construction and remediation of the surrounding environment. The interaction between Tulou construction and the surrounding natural environment in the long-term historical development has been neglected due to the disunity of management institutions, limited funds, and lack of certain protection design basis and standards. However, how to protect and develop the Tulou community in a scientific and reasonable way while fully protecting the surrounding natural environment, so as to achieve the harmonious co-prosperity of historical culture, natural environment and spiritual civilization has become an important issue that must be faced squarely in the development of Nanjing Tulou. Meanwhile, the landscape environmental protection system for the protection of Tulou and other historical and cultural villages also needs to be gradually improved.

4.2. The landscape ecological environment problem of Nanjing Tu lou settlement is prominent

The impact of Nanjing Tulou settlement on the landscape environment is mainly reflected in the living environment and the infrastructure of living space. Although the natural environment of the Tulou has always been in good condition, due to the development of tourism and the change of people's living habits in recent years, the natural environment of the settlement has also suffered some damage, including the environmental problems that need to be solved urgently, such as domestic garbage, wastewater quality and so on. Although domestic waste receiving stations have been set up within the village, quite a few farmers are still accustomed to burning their own waste or dumping it into the surrounding streams, which has caused damage to the air environment and drinking water environment in the settlement to a certain extent. In addition, there are many duck breeding sites distributed along the stream in Yunshuiyu Ancient Town, and animal feces and household garbage feed directly enter the stream, seriously reducing the quality of drinking water. Most of the public entertainment space in the settlement is in the open space in front of the courtyard building in the Tulou. The amount of entertainment space is small and the area is small, and there is no supporting leisure and amusement equipment. The lack of entertainment space causes the overall vitality of the settlement and the low efficiency of farmers' survival, and also indirectly causes the negative effect of the decline of the centripetal force of the village and the aggravation of the "hollowing out" phenomenon in the settlement.

5. LANDSCAPE PROTECTION STRATEGY OF NANJING TU LOU SETTLEMENT

5.1. Construct multiple protection mechanisms and improve the landscape protection system

To protect the landscape of Nanjing Tulou settlement, first of all, we need to have a solid institutional foundation, strengthen the coordination and cooperation between various government departments, and improve the system, so as to implement the protection work. Major urban departments such as housing management, environmental protection and fire protection should actively participate in the formulation of relevant protection regulations, link

up every step of protection and management work, and improve work efficiency. Secondly, more participants should be added to build a flexible and diversified protection platform. The historic building protection plan not only relies on the overall control of local government departments, but also needs the government to encourage the public to join the historic building heritage protection plan and do a good job in the architectural heritage survey.

5.2. Use modern technology to strengthen environmental monitoring and protection around tulou ancient buildings

The preservation of Tulou buildings is closely related to the surrounding environment. In the face of such surrounding environmental conditions, specific and feasible protection measures need to be formulated. Different Tulou ancient building groups have different degrees of environmental pollution problems. By launching the environmental monitoring plan, the government can monitor the Tulou ancient building groups and the surrounding environment in real time, so as to put forward feasible environmental improvement measures to promote environmental protection of the Tulou ancient building groups.

5.3. Pay attention to the overall protection of the settlement landscape style and ecological environment

When protecting the natural landscape and ecological environment of the Tulou community, it should be realized that the cultural value of the Tulou community is not only reflected in the single building, but also in the community landscape layout and building site selection layout in high harmony and unity with nature. Whether it is the mountain planning layout of "four dishes and one soup" in Tianluokeng earth building group, or the "Taiji Water Town" in Taxia Village earth building group, they all reflect the construction process of human beings continuously conforming to nature, conforming to the natural environment and organically combining with nature, and even the traditional Chinese feng shui ideal of "backing mountains and facing water, preserving wind and gathering air". It can be seen that the perfect natural landscape of the community is the common feature of the intangible cultural heritage and ecological environment protection of Nanjing Tulou Complex, and has become a world cultural landscape relic that is difficult to get in the Hakka earth complex in Fujian Province. Therefore, the landscape ecological protection measures for Nanjing Tulou and other cultural villages should first adhere to the principle of the integrity of natural environment landscape features, that is, in the process of preservation and development, the mountain form should not be damaged and the flow direction and water pattern should not be changed.

6. CONCLUSION

Although considerable attention has been paid to the preservation of the landscape of the earth building cluster in Nanjing, the long-term development of the community still must be paid more attention to. Therefore, for the future development research, management and maintenance of the Earth building culture village cluster, it is necessary to strengthen the relationship between government departments, scholars, architectural planners, farmers, tour guides and other stakeholders, with experts and scholars from government departments at all levels as the main body. And actively mobilize farmers and tour guides to join in. Government departments put forward funding guarantees and establish management and protection treaties, experts and scholars use their knowledge and skills to prepare and implement protection plans, villagers and visitors enhance awareness and restrict individual behavior, and different ethnic groups work together to create a more perfect Tulou ecological environment protection. The preservation of the natural ecological environment of the settlements is the inheritance of traditional civilization, and it is also of great value to cultural research and development, which needs to be passed down and developed from generation to generation.

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