

Enlightenment on the Spatial Characteristics, Interior Layout and Design of the Traditional Dwellings in the Dai Villages in Xishuangbanna*

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Abstract—The Dai culture has a long history. The bamboo building is the original form of the Dai stilt style architecture. It has the original shape, simple structure and convenient construction. Conducting on-the-spot investigations on the Xishuangbanna Dai villages, exploring the remains of the traditional residences of the Yi villages, the types of buildings, the regional characteristics and the problems of the Yi people's residences, the authors briefly introduce the geographical environment and settlement space of the Yi villages, and focus on the spatial features and interior layout of traditional residences of the Dai villages. The results show that the Dai people's dwellings not only contain the material requirements of the Dai people's survival, life, production and aesthetics, but also the spiritual factors, beliefs, contexts and psychology formed by the national culture. Researchers need to analyze the regional characteristics, spatial characteristics and indoor layout of the Dai people's residences in an all-round way, and combine the pace of the times, develop and innovate, and explore the traditional residential design strategies and methods combining nationality and time.

Keywords—architectural design; traditional residential; spatial characteristics; indoor layout; Dai village; Xishuangbanna

I. INTRODUCTION

Folk dwellings are places where ordinary people live. Traditional dwellings are the living fossils of human civilization. They bring together the wisdom and intelligence of human beings living in harmony with nature. The settlement space and cultural connotation formed by traditional dwellings are the main means and important ways for different ethnic groups to express their respective cultures. Traditional dwellings combine the living reality, history and culture, religious beliefs, customs, lifestyles and production methods of the nation, and finally form the unique residential architecture art of each ethnic group.

The southwestern region of Yunnan is the most densely populated ethnic minority in Yunnan Province, with the Dai

nationality being the most regional and representative. The Dai people living in Xishuangbanna are a nation rich in national culture and profound in meaning. They have a long history and profound cultural heritage, and the preservation of the residences of the Dai people is relatively intact. It is the best testimony of historical memory and cultural remains of the carrier of national architectural culture. However, in the wave of modernization and urbanization, the unique ethnic customs of the past are gradually disappearing. How to apply the characteristic and humanized design concepts of the traditional residences of the Dai villages to the design of today's Dai people's residences has important design implications on village residential protection, regeneration design, and sustainable development.

II. THE GEOGRAPHICAL ENVIRONMENT AND BUILDING TYPES OF THE DAI VILLAGES IN XISHUANGBANNA

The different climatic conditions such as temperature, humidity, sunlight and rain in the natural environment often determine the colorful architectural features and architectural forms of traditional dwellings in the area. The geographical environment is the natural factor for the formation, continuation and development of regional culture. At the same time, the climatic conditions determine the natural characteristics of rivers, hydrology, soil, forests and vegetation in the natural environment, which affect the lifestyle and production methods of the local people. This constitutes a regional cultural difference between different regions and ethnic groups, and plays a decisive role in the formation and development of settlements, villages and even cities. Xishuangbanna is located in the south of Yunnan. It belongs to the tropical and subtropical monsoon climate. It is humid and hot all year round, with high temperature and rich rain, along with abundant precipitation. It is located on the Tropic of Cancer, bordering Myanmar and Laos. The terrain is high in the north and low in the south. The mountains stretch continuously, the rivers flow across the river, and the Lijiang River runs through the whole territory. Under the influence of this special climatic condition and geographical environment, the Dai people's ancestors made full use of the rich natural materials such as wood and bamboo to create a stilt style architecture with unique characteristics of the Dai

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— the bamboo building, which has been praised by the world as a wonderful work in the art of residential architecture.

Through the examination of historical documents and field investigations in Xishuangbanna, the Dai people's residence (the bamboo building) has a history of more than 1,400 years. According to the climatic conditions, geographical environment, topography and other factors of the Xishuangbanna Dai villages, the Dai people have a unified semantic feature. Especially the stilt style architecture is better adapted to the hilly terrain of the Dai villages, the flooding of the rainy season, the hot and humid climate and Influencing factors such as perishable mosquitoes. It has become a product of high integration and mutual penetration of regional culture and Dai people's dwellings.

Traditional dwellings of different nationalities will highlight their respective regional characteristics. Different geographical types will produce a variety of architectural types. The traditional residential dwellings are mainly related to climatic conditions and geographical environment. Their interaction creates the regional cultural characteristics of traditional dwellings. The Dai people's residence is a concentrated expression of the regional culture in the natural environment, the human environment, the social environment, and religious beliefs. From the perspective of typology research, the Dai people's dwellings are mainly stilt style architecture. Their distinctive architectural style and spatial characteristics contain rich Dai culture, which fully reflects the natural environment, social form, economic status and family structure of the Dai people. It reflects the wisdom and creativity of the Dai people.

III. ANALYSIS ON THE SPATIAL CHARACTERISTICS OF TRADITIONAL DWELLINGS IN DAI VILLAGES IN XISHUANGBANNA

A. *The Settlement Space Form of the Dai Village in Xishuangbanna*

The Xishuangbanna Dai villages have a rich heritage, a superior geographical environment, a complete overall structure, profound cultural heritage and rich architectural features. The religious beliefs, living habits and hobbies of the Dai people are often reflected in the materials, structure, crafts, decoration, etc. of the Dai people's residences, as well as space division and functional use. The spatial morphological feature is an important part of interpreting the architectural characteristics and ontological connotation of the Dai people's dwellings. It directly or indirectly expresses the material and spiritual needs of the Dai people in the language of spatial structure. It must be combined with the position and space view of the Dai people. The scientific, inevitability, rationality and uniqueness of this way can only find the correct way to protect, inherit and develop the residence of the Dai people.

The location and orientation of the Dai people's residences are closely related to the unique position of the Dai people. In the Dai villages, the east, south, west, and

north that people usually refer to are not the direction of the Earth's magnetic field in geography. Since most rivers in Xishuangbanna flow down from the mountains, the mountains are high in the north and low in the south. From north to south, the north-south orientation of the Dai people is naturally formed. However, it should be noted that the direction of the tributaries of Xishuangbanna is very different. For the Dai people in different regions, the north-south orientation they refer to may be completely different, thus forming a regional difference in the orientation of the Dai people's residential buildings. Therefore, the north-south orientation of the Dai nationality is determined according to the upstream or downstream of the local river. The upstream is north, and the upstream village is called "Northern Village" or "Shangzhai"; the downstream is south, and the downstream village is called "Southern Village" or "Xiazhai".

Space is a square style in the minds of the Dai people. According to the four directions of east, south, west and north, the spatial form of the Dai people's residences is divided into eight orientations. Each orientation corresponds to an animal, and the orientation of various animals has a specific symbolic meaning. They are closely related to the architectural geomancy, historical culture and religious beliefs of the Dai people. In the settlement of the Dai villages, according to the architectural space concept of the Dai people, each orientation of the east, south, west and north represents lucky and unlucky respectively. The forest is to the south, the water is to the west, the land is to the north, and the people's residence is to the east. Therefore, the East is the most important direction of the Dai people. It is the place where the sun rises, symbolizing life and good fortune. The West is the direction of the sunset, symbolizing death and bad luck. The North and the South represent the past and present, the upper and lower levels, and of course the north-south direction also symbolizes prosperity and wealth. In short, in the Dai villages, people have generally established this unique belief in space. They always believe that the northeast direction is the most auspicious direction, symbolizing the progress and beauty of life, while the southwest direction symbolizes death and unluckiness.

B. *The Architectural Space Structure of the Dai Villages in Xishuangbanna*

The ancestors of the Dai nationality have lived in the hilly areas of the valley since ancient times. They like to live by the water. The floods in the rainy season are frequent, and there is often water on the ground, which affects people's daily life. In order to meet the needs of life and production labor to the greatest extent, the Dai people's residence is a two-story housing form. In the space, the space is bounded by the floor, and the living room is set on the floor, and the upper space is set by the beam and pillar, so that the limited space is fully utilized. The ground floor is overhead, supported by wooden columns, the tall wooden pillars are bare, and there are no obstructions in the surrounding space. Warehouses can be built for storage, or used for stacking firewood, storing agricultural tools, and raising livestock. The stilt style structure of the overhead layer can effectively

ventilate and dissipate heat in Xishuangbanna's hot and humid climate, and also prevent the invasion of toxic plants and the infestation of injurious insects.

The upper residences of the Dai people live in the upper floors. The upper and lower floors are connected by stairs, along the ladder, and directly to the front porch of the second floor. The second floor is mainly a living space, surrounded by bamboo braids and has a cloister on three sides. It is mainly composed of front porch, terrace, hall, bedroom and other spaces. There are heavy roofs on the front porch, no walls on three sides, ventilation, heat dissipation, sunshade and rain protection, and can bring out the beautiful and chic of the main body of the building, and enrich the virtual and real level of the Dai people's dwellings. Seats can also be placed on the side of the front porch to meet people's rest, stacking debris and storing food. Connected to the front porch is a large drying platform that forms a completely open space, which is an extension of the indoor space to the outdoor space, with or without a low bar. There is a sand tank water tank on the drying platform for storing water. The main functions are washing and showering, drying clothes, planting flowers and plants and stopping to watch the scenery. The hall is an important place for living and hospitality, and the hall and the bedroom are side by side as a large room. The bedroom does not allow outsiders to enter or snop. It is the most intimate space area of the Dai people.

IV. THE CHARACTERISTICS OF THE INTERIOR LAYOUT OF THE TRADITIONAL HOUSES IN THE DAI VILLAGES IN XISHUANGBANNA

Like other residential buildings, the development of Dai people's dwellings is also affected by the natural environment, the human environment and the social environment. Through on-the-spot investigation and literature review, and using the method of architectural typology to simplify it, the influencing factors and objective laws of the traditional dwellings of the Dai villages are analyzed from multiple perspectives. It can be seen that whether it is the Dai Bamboo Building or the Dai Wooden Building, or the brick or tile house or the courtyard house, although there are some differences in the appearance of the Dai people's residences in various regions, they are rooted in the deep history of the Dai people's history, culture, ideas, religion and faith and customs. There is essentially some of the same "space prototypes" of the Dai. This "space prototype" has basically continued in the development of the Dai people's residences, and on this basis, it has been protected, passed down and developed.

In accordance with the actual living needs, the Dai people, on the basis of satisfying the material living conditions of today, use the "space prototype" of the Dai to renovate and activate the traditional dwellings, increase the corresponding functional uses, and form flexible and diverse spatial forms and layout changes. Although social development has progressed, foreign cultures have had an impact, and family members have changed, resulting in diversified architectural forms. The shape of the building has changed, but the "space prototype" of the Dai people's residence still leaves its hidden historical imprint. It can be

seen that this "space prototype" of the Dai is a binary space system composed of parallel relationships between the front gallery space and the main house that make up the functional use of the house and the bedroom, etc.

The stilt style architecture of the Dai people is the most suitable house for the Dai people to live in. The building is light and ethereal and greatly beautiful. The entire house consists mainly of walls, roofs, slabs, stairs, halls and bedrooms. The wall decoration and roof decoration are very elaborately carved and chiseled. Most of the patterns are dragons, fish, elephants, peacocks, tigers, flowers, grass and squares, with strong Dai culture. In particular, the unique spatial structure characteristics and rigorous indoor layout techniques have become the crystallization of the wisdom of the Dai people in the long-term production and labor, and they also contain profound national cultural connotations.

From the perspective of the layout, the Dai people's residences have reasonable functions. With clear division, the inside space and outside space are combined. The light and all-transparent structure and the low-density layout make the room transparent, commodious, decent, concise and flexible. The indoor function area is divided into a hall and a bedroom. They are rectangular passages separated by bamboo poles or wooden boards. The hall has the meaning of public space and is an open or dynamic space in the room. The bedroom is a relatively closed private or static space. There are no windows in the bedroom walls. Only the gaps of bamboo rafts or wooden boards are transparent. There are door openings in the partition formed by bamboo rafts or wooden boards, so that people can travel between the two space regions to meet people's living needs.

From the perspective of the traffic flow in the Dai folk house, it is simple, clear and flexible. From the stairs to the second floor space, people can enter the hall and then enter the bedroom. This layout allows the two-story space to form a cross-flowing traffic streamline. First, it passes through the front porch. The front porch is a transitional space or open space. It connects the living room and the outdoor, and is connected to the drying platform. Then the front porch enters the indoor hall, and the door opening on the wall connects the hall and the bedroom.

The Dai people's houses are built according to the north-south direction. The space inside is facing north, and the space outside is facing south. This distinction between inside and outside has a series of corresponding relations. In the Dai villages, the difference in family status makes people's understanding, demand and utilization of space different in different positions, especially the distinction between men and women, young and old. The order of living in the bedroom is strictly regulated and rigorous. In the custom of the Dai people, the inner the room is located, the more important the status of the person is, which means they have more obligations and rights to the family. Therefore, the layout of the bedroom bed position has formed the rules of three generations arranged in order of old and young. In fact, the order of life is from birth to death. In a certain sense, the bedroom is created as a ceremonial place. In general, the

innermost position is the bedroom of the old man, followed by the parents, and the outermost is the minor child.

In the layout of the bedroom bed, the Dai people follow an important "location principle", that is, people must sleep in the direction of the vertical ridge. In the Dai religious beliefs and customs, the Dai people think that head heading north is a dangerous posture. If the head is heading north, when the person's body is in the direction of the vertical house beam, the person will be attacked by the soul called Pim. Therefore, according to the orientation of people sleeping, other arrangements of the indoor space should follow certain rules, and only the head to sleep east can bring good luck. Most of the Dai family put the bedroom to the east, which also provides a lot of free space for the arrangement of the mattress.

V. CONCLUSION

Architecture is the carrier of culture. The stilt style architecture of the Dai nationality is a beautiful landscape in traditional dwellings. The cultural implication contained in it is a valuable asset of Chinese minority culture. Xishuangbanna is a relatively rich area of Dai people's residential buildings. The architectural type, regional characteristics and spatial characteristics of the Dai people's residences are developed along with the Dai people's ancestors in this land in adapting to nature and changing nature. The functions and forms of the Chinese Dai people's residences are constantly improving and developing.

The architecture of the Dai people's dwellings is rigorous and solid, the building space is wide and bright, and the architectural conception is imaginary. It is harmonious with the landscape of the Dai villages, showing natural and simple aesthetic features. Its high-open and transparent building constitutes a simple and natural space. The rigorous interior layout of the characteristics and order is a full expression of the architectural art of the Dai people. In addition, from the perspective of the building facade, the biggest characteristic of the Dai people's dwellings is that they are large, simple, flat, simple and straightforward. There are not too many overlapping twists and turns, misplaced, high and low staggered forms, and the roofs of the Dai people's dwellings are high and steep. The long beam high column and the open mountain roof are both beautiful and practical, which makes the indoor space more open on the façade, and is more convenient for ventilation inside and outside and up and down. It is hoped that this study will provide references for further suggesting effective traditional village residential protection and regeneration design measures, paths, strategies and methods.

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