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Local Knowledge Mapping and Multidimensional Value Assessment of Traditional Villages of ethnic areas in Northwestern Sichuan: A Case Study of Moluo Village

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Abstract: Currently, all human beings around the world are collectively facing the crisis of rural decline. The protection and development of traditional villages are of great value and significance for the inheritance and promotion of rural traditional culture. As a knowledge system rooted in a specific geographical, cultural and social environment, local knowledge is of great significance for maintaining and inheriting cultural heritage, promoting rural revitalization and achieving the construction of harmonious and beautiful villages. This article takes the Molo Village in the ethnic areas of northwestern Sichuan as the research object. Through on-site investigations and interviews, it analyzes the local characteristics of Molo Village, sorts out the local knowledge map of Molo Village, and conducts a multi-dimensional value evaluation. The aim is to improve the theoretical research system of local knowledge, enrich the research perspective of traditional villages, and provide some ideas for the survival and livelihood of traditional villages.

Keywords: Local Knowledge; Value Assessment; Traditional Villages; Moluo Village

1. Introduction

The crisis of rural decline has emerged as a global challenge faced by humanity and constitutes a crucial component of the global governance system. The protection and development of traditional villages are of significant value and importance for the inheritance and promotion of rural traditional culture. Currently, the protection of traditional villages in China has transitioned from preliminary surveys to the stage of scientific research. In recent years, driven by the vigorous implementation of strategies such as rural revitalization and the building of livable, workable, and harmonious countryside, some ethnic minority traditional villages have developed their tourism industries relying on their natural and cultural resources, thereby promoting rapid economic growth. Tourism has become the pillar industry of these villages. However, issues such as the loss of local distinctiveness and unsustainable development still exist in the tourism development of traditional villages.

The vernacular culture of traditional villages is characterized by unique ethnic customs and regional features. The local knowledge that embodies the production and living wisdom of local residents, serves as a crucial cultural resource and knowledge base for advancing the rural revitalization strategy. It is precisely that the excavation of local distinctiveness provides an effective approach to avoiding the "homogenization" in rural tourism development. Therefore, studying the protection and development of traditional villages from the perspective of local knowledge can effectively respect rural and traditional cultural values, preserve the rural fabric, and thereby resolve the survival and development issues of these villages. Building upon this, drawing on perspectives from sociology and tourism anthropology, this paper selects Moluo Village in Suopo Township, Danba County-one of the first batch of villages included in the National Traditional Village Directory in the ethnic areas of northwestern Sichuan-as a case study. This study explores the local knowledge of traditional villages, focusing on three main aspects: the construction of the local knowledge genealogy, multidimensional value assessment, and the protection and development of traditional villages. This article explores and resolves the survival and livelihood issues of traditional villages in this area, and attempts to put forward targeted strategies and countermeasures.

2. Current Research Status on Local Knowledge

In the 1960s, American cultural anthropologist

Geertz advocated for the importance of recognizing the differences in human cultural forms. He first proposed the concept of "local knowledge" and defined it as regional knowledge with cultural characteristics [1]. Subsequently, local knowledge began to be applied in anthropology for field investigations of indigenous populations. Since then, the concept has garnered significant attention. Scholars have extensively discussed its definition and explored theoretical elements relevant to their specific research subjects from various disciplinary and spatial perspectives.

Domestic academia tends to define local knowledge more from the perspective of knowledge systems. For instance, Wang Yonghua et al. argue that local knowledge is a knowledge system characterized by regional attributes or a value system of a subcultural group, formed within specific spatial boundaries under particular natural habitats, social backgrounds, and historical conditions [2]. Furthermore, scholars have conducted extensive research on local knowledge mapping, value assessment, sustainable development and conservation, as well as development and utilization. For example, Zhang Zhonghua et al. and Wang Xiaolei et al. investigated the local knowledge mapping of traditional village landscapes in Dangjia Village (Hancheng) and the Hetao Plain, respectively, constructing corresponding local knowledge genealogies for these traditional village landscapes [3,4]. Additionally, Wang Yonghua et al. conducted a value assessment of local knowledge in traditional village landscapes using Yuanjia Village as a case study, and proposed strategies for the conservation and enhancement of local knowledge [5].

Currently, local knowledge is widely applied across various fields, primarily including traditional village landscapes, tourism development in traditional villages, ethnic tourism, ecological conservation in ethnic areas, and the inheritance of ethnic culture. The depth, scope, and content of related research are constantly being expanded. In the field of traditional village landscapes, research on local knowledge mainly focuses on three aspects: Local experience and wisdom in the evolution of traditional village landscapes, which provides a strategic basis for the conservation and development of settlement landscapes (Ma Hang; Liu Peilin) [6,7]; Local characteristics and place identity in traditional village landscapes, which explores place identity and public participation in the creation of human settlement landscapes (Yang Liguo et al.; Qu Xiaoshuang et al.) [8,9]; The future of traditional village landscapes, which discusses how to preserve local distinctiveness in the protection and heritage design of traditional village landscapes under the impacts of globalization and urbanization (Yu Hui et al.) [10].

In the field of tourism development in traditional villages, scholars have widely recognized issues such as the loss of local distinctiveness and unsustainable development. They also acknowledge that excavating local distinctiveness is an effective approach to avoiding the "homogenization" of tourism development. Consequently, numerous empirical studies have been conducted on specific case sites, proposing tourism development strategies such as respecting the logic of local knowledge, promoting the commodification of local knowledge into tourism products, and ensuring its effective inheritance (Han Meng et al.) [11].

In the field of ethnic tourism, scholars primarily examine the cultural representation of tourism in ethnic areas and the interactive relationship between local knowledge and tourism from the perspective of local knowledge. It is widely recognized that local knowledge, serving as a local cultural symbol, acts as an attraction and driving force for sustainable tourism. It can facilitate the adaptation of minority cultures to new environments during tourism development, leading to better livelihoods and progress. Furthermore, it can attract the mainstream ethnic groups to re-evaluate minority cultures and promote ethnic identity (Li Yanqin et al.; Zhang Jin) [12,13]. Thus, practical research on local knowledge and ethnic tourism has increasingly attracted scholarly attention.

Regarding the protection of ethnic ecological environments through local knowledge, Liu Xiangjun et al. point out that the local knowledge in ethnic villages can effectively coordinate the conflicts between tourism development and environmental protection, achieving effective governance of the natural environment [14]. Furthermore, Yang Junchang et al. conducted in-depth research and found that "customary laws," "village regulations and civil agreements," and "folk beliefs and customs" within local knowledge serve as guarantees and support for ecological environment maintenance [15]. Scholars generally agree that, as a crystallization

of the collective wisdom of local ethnic groups, local knowledge can continuously construct and self-improve through practical application to adapt to ecological changes and balance the demands of survival and development, thereby playing an active role in regional environments.

In terms of the inheritance of ethnic culture, Jiang Pei pointed out that local knowledge has a relatively stable "substantive" tradition, which can enable the ethnic culture that gradually disappears over time to always maintain its internal rationality, and achieve adjustment and continuation on the basis of "form" changing but "quality" remaining unchanged [16].

In conclusion, the academic community in China generally recognizes the significance of local knowledge in the protection and tourism development of traditional villages. They unanimously emphasize its role in preserving cultural heritage, promoting local economic development, and enhancing the tourist experience. However, at the same time, scholars also point out that in the process of rapid modernization and globalization, the local knowledge of traditional villages is facing challenges and the urgency of protection. In the future, it is necessary to deepen the theoretical research of local knowledge, explore more effective mechanisms for its protection and inheritance, and innovate tourism development models to achieve the sustainable development of traditional villages. Furthermore, in the future, more focused discussions are needed on how to promote the comprehensive development of local society and economy through the rational utilization of local knowledge, while ensuring the integrity and sustainability of cultural heritage, and providing theoretical and practical support for achieving rural revitalization. Currently, there are relatively few studies that apply local knowledge to analyze the traditional villages of ethnic minorities in Southwest China, especially in the ethnic areas of northwestern Sichuan. Moreover, there are more studies on the protection and development of traditional villages from the perspective of rural revitalization, but relatively few from the perspective of local knowledge. Moreover, there are more studies on the protection and development of traditional villages from the perspective of rural revitalization, but relatively few from the perspective of local knowledge. Although the number has increased in recent years, the coverage is not wide, and the case points are mostly concentrated in the central and eastern regions. There are also relatively few studies on traditional villages in the southwestern region and even in the northwestern Sichuan.

3. Introduction to the Case Study

Moro Village is located in Suopu Township, Danba County, Sichuan Province, at 101.55°E and 30.51°N. It is 4 kilometers away from the county seat of Danba, with an altitude ranging from 1900 to 2300 meters. The average annual temperature is 13.6℃. It is a typical arid river valley area. Moro Village is surrounded by mountains on three sides. It is located west of the Dadu River. The terrain slopes from the northeast to the south and has a mountainous canyon landscape. The village covers an area of 20 hectares and is divided into 5 villagers' groups. It has nearly 200 households and a population of nearly 900. The majority of the residents are ethnic minorities, with a small number of Han people living together. The residents mainly engage in agriculture and are also exploring the development of tourism and other industries. Moluo Village has completely preserved the traditional customs and residential culture of ethnic minorities. In recent years, Moluo Village has become famous worldwide for its typical and unique stone-built village buildings and a large-scale, diverse, and centrally constructed defensive watchtowers. It was awarded the title of "Chinese Historical and Cultural Village" by the Ministry of Construction and the State Administration of Cultural Heritage in 2005. It was included in the first batch of traditional villages list in China in 2012. Subsequently, it was named one of the Second Batch of Chinese Ethnic Minority Characteristic Villages in 2017, and was selected as one of the Third Batch of "Most Beautiful Ancient Villages in Sichuan" in 2021. After thousands of years, the traditional style of Moluo Village remains intact and retains its distinctive features.

4. Construction of the Local Knowledge Map of Moluo Village

4.1 Data Sources and Research Methods

The main sources of the data in this study are: literature materials, the extraction of online travel diaries, chronicles of Danba County and tourism planning of Moluo Village, etc.; field research, interviews with local residents, surveys, and images captured by mobile phones and other

graphic materials; in addition, this study combines GIS, Gaode Map, etc. to obtain geographical information and extract geographical environment information where local knowledge is rooted.

This study defines local knowledge as the knowledge or knowledge system with regional characteristics that is generated and accumulated during people's production and living practices within a certain spatial range under specific natural environment and historical background. This article draws on the classification standard of knowledge proposed by British scholar Michael Polanyi [17], and, considering the dual nature of traditional villages as both material and non-material forms, classifies traditional village knowledge into two major categories: explicit local knowledge and tacit local knowledge. Among them, explicit local knowledge is rooted in the external manifestations of the village spatial system, such as residential buildings and village alleys; tacit local knowledge is hidden within the village spatial system, such as cuisine, music and dance, and handicrafts, which embody local social culture and local psychological patterns, and are the potential manifestations of local knowledge.

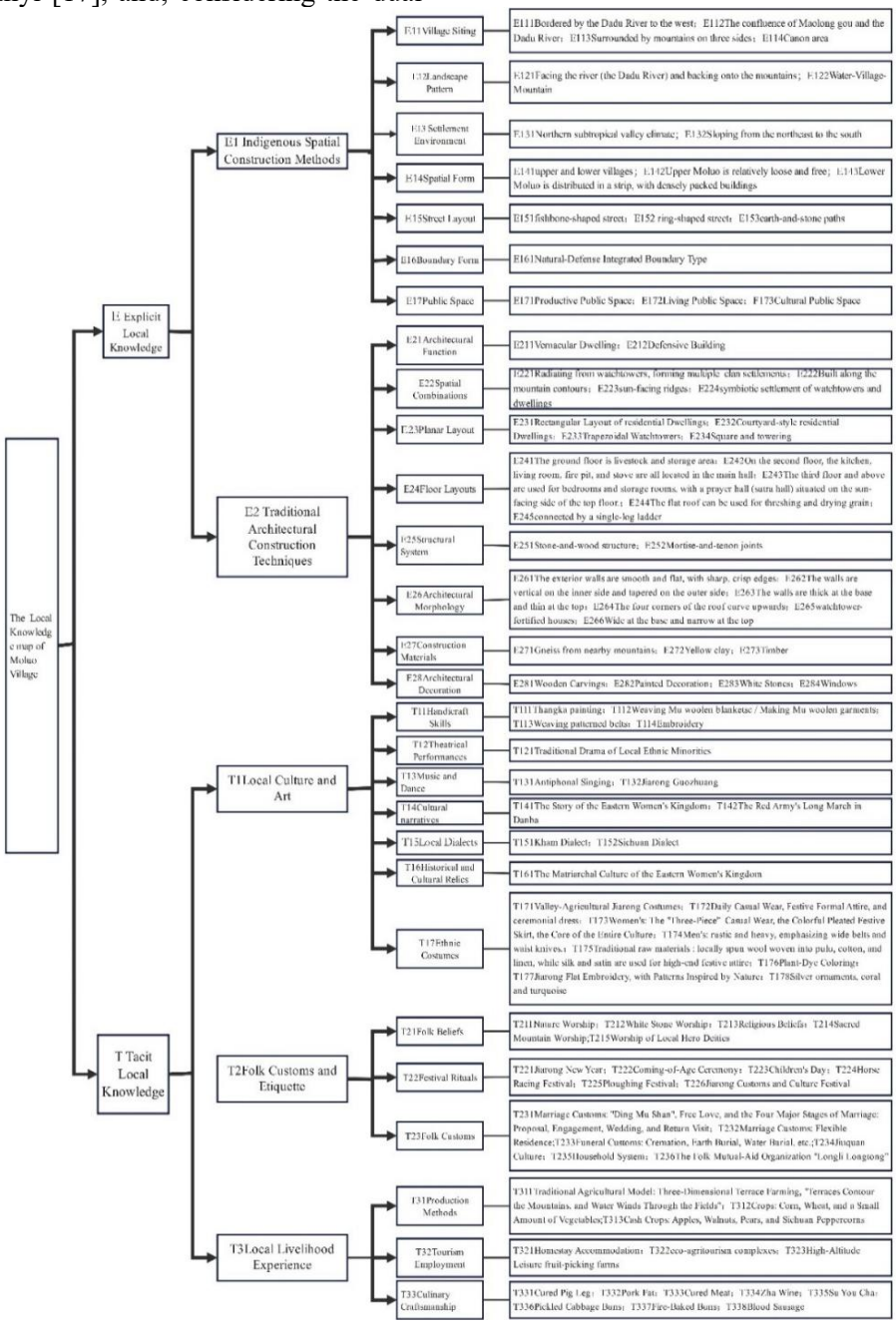


Figure 1. Local Knowledge Map of Moluo Village

4.2 Construction of the Local Knowledge Map for Moluo Village

In this study, when extracting the local knowledge of Moluo Village, the "DIKW hierarchy model" was combined. Based on the local knowledge classification system, through three basic steps - "target data collection - key information extraction - local knowledge integration", the local knowledge of Moluo Village was ultimately summarized and refined. Moreover, drawing on the construction method of the local knowledge map of traditional cave dwellings in Shanxi Province by Wang Yonghua et al. [18], with a focus on "semantic structuring", the core essence of the local knowledge of Moluo Village was extracted, the types were summarized, and the basic knowledge units were analyzed. The systematic local knowledge network was presented in the form of a mind map.

During the process of constructing the local knowledge map of Moluo Village, due to the large and complex amount of information, in order to achieve efficient storage, classification and retrieval, this study was guided by the theory of information encoding. Based on typological principles and existing coding rules [19], a coding format of "one uppercase letter followed by three Arabic numerals" was adopted. Local knowledge was classified and encoded across a four-tier hierarchical system comprising major categories, medium categories, subcategories, and sub-subcategories.

The major categories are denoted by the initial letters "E" and "T", representing explicit and tacit knowledge, respectively. The sequential codes for the medium, sub-, and sub-subcategories are represented by the numbers 1 through 9, following the "E/TXXX" format. Through this system, a genealogy of local knowledge for Moluo Village was constructed, consisting of 2 major categories, 5 medium categories, 28 subcategories, and 99 sub-subcategories, as illustrated in the figure 1.

4.3 Interpretation of the Characteristics of Local Knowledge in Moluo Village

4.3.1 Indigenous spatial construction: built against mountains and beside waters, adapted to local conditions, and embodying the harmony between humanity and nature

Indigenous spatial construction is reflected in the relationship between village establishment and the overall natural environment [20]. The indigenous spatial construction of Moluo Village embodies the local knowledge characteristics of "being built against mountains and beside waters, adapting to local conditions, and achieving harmony between humanity and nature," which is manifested in the following aspects:

The village is situated at the confluence of Maolong Gou and the Dadu River, surrounded by mountains on three sides and facing the Dadu River to the west, which is a typical example of the "built against mountains and beside waters" construction style. Located in a canyon area and influenced by the terrain and river flow, the village boundaries align with the contours of the mountains and the Dadu River. This site-adaptive approach fully embodies the traditional Chinese concept of "harmony between humanity and nature."

In terms of its landscape pattern, spatial form, and street layout, Moluo Village adapts to its local topography and coexists harmoniously with the surrounding environment. It features a "water-village-mountain" landscape pattern, two spatial forms (loose-and-free and ribbon-shaped), and two street layouts (fishbone-shaped and ring-shaped). Specifically, Upper Moluo is distributed in a relatively loose and free manner based on the natural terrain, whereas Lower Moluo is arranged in a dense, ribbon-shaped layout along the bank of the Dadu River. The fishbone-shaped street layout is formed when the external highway crosses the Dadu River in the northwest and enters Lower Moluo along the riverbank, connecting with the traditional earth-and-stone paths that link individual households within the village. The ring-shaped street layout mainly refers to the 4.1-kilometer village loop road, which starts at the parking lot at the village entrance and runs through the entire Moluo Village.

In terms of its boundary form, Moluo Village is built against the mountains and distributed along the river, with its boundaries formed by the combination of the mountainous terrain, the river environment, and artificial defensive boundaries.

In terms of public space, the village integrates with the natural environment externally, while internally fulfilling the consensus needs of residents in their production and daily life, thereby forming three types of public space: productive, living, and cultural. Specifically, productive public spaces are located in the fields, such as the Mani mounds built by stacking stones engraved with the six-syllable mantra; living

public spaces are found at the street corners within the village, such as on stone benches; and cultural public spaces are situated at the village entrance, including the temple, the white stupa, and the rural party-mass service center.

4.3.2 Traditional architectural construction techniques: sourcing materials locally, rustic and solid, and distinctive characteristics

Traditional architectural construction techniques are manifested in the design and fabrication processes of historical village buildings [20]. Historically known as "Boga Yi", Moluo Village is renowned for its watchtowers, which serve as the village's iconic symbol and are classified into two types: residential watchtowers and communal defense watchtowers. Furthermore, the residential architecture of Moluo Village follows the traditional ethnic minority style, employing watchtower construction techniques to build fortified dwellings.

Focusing on the watchtowers and residential buildings of Moluo Village, this study identifies that their construction techniques exhibit the local knowledge characteristics of " sourcing local materials, rustic and solid, and distinctive characteristics ", which are demonstrated in the following aspects.

In terms of architectural functions, there are currently six ancient watchtowers remaining in Moluo Village, including ruined ones less than two zhang (approx. 6 meters) in height. Among them, four are square watchtowers, one is a pentagonal watchtower, and one is an octagonal watchtower. Four of these watchtowers are located in the central part of Upper Moluo; most serve as ancillary structures to residential buildings. The remaining two square watchtowers are situated respectively at the upper edge of the village and south of the mountain stream in the eastern part of the village. The watchtower was not merely used for defense; it combined multiple functions such as residence, grain storage and observation.

In terms of spatial combination, the residential buildings of Moluo Village are built along the mountains. On the sun-facing ridges, they are distributed radially with watchtowers as the center, forming multiple family settlements. Moluo Village is a typical settlement where watchtowers and houses coexist. The residences are closely connected with the ancient watchtowers, and some of the ancient houses and watchtowers are interconnected.

In terms of planar layout, the traditional dwellings in Moluo Village have a rectangular floor plan. The facade is divided into upper and lower parts. The floor plans of the lower two to three floors are all rectangular, while the floor plans of the upper two floors are flexible and diverse. A group of residential buildings generally consist of the main building, the ancillary building, and the courtyard between them. The courtyard is enclosed by low stone walls, and the entrance of the courtyard faces south or is slightly to the east or west. The plan of the watchtower in Moluo Village is trapezoidal, with a wider base at the bottom and a narrower top, and it is square and tall.

In terms of floor layout and architectural structure, the traditional dwellings in Moluo Village are three to five-story stone-and-wood structures known as "diaofang". The floors are vertically logically distributed according to "animal-human-god", and the bottom floor is filled with livestock and agricultural tools and debris.The second floor has a kitchen and a living room. The fire pit and kitchen stove are all in the main house. The third floor and above are bedrooms and storage rooms, and the top floor, facing the sun, has a prayer hall. The roof is flat and can be used for threshing and drying grains. The watchtowers in Molo Village are mostly between 20 and 30 meters in height, with walls as thick as 1 meter. The ground floor usually has no Windows, leaving only narrow shooting holes. The middle floor has small Windows for ventilation and lighting. The top floor is equipped with a wide viewing platform, offering a panoramic view of the entire river valley. The floors of the residential buildings and watchtowers are connected by single-log ladders. This vertical layering design not only adapts to the mountainous climate but also reflects the balance between defense and life.

In terms of architectural morphology, the traditional residential buildings in Moluo Village have both the features of fortified houses and the shape of watchtowers. They were formerly known as " watchtower-fortified houses ". The stone-built exterior walls are smooth and flat, with sharp wall edges. The walls are straight inside and curved outside, with thick wall bases and thin wall tops. The four corners of the roofs are upturned. The interiors of the four-cornered and five-cornered watchtowers in Moluo Village are all square. The stone-built outer walls gradually taper inward from bottom to top, forming a trapezoidal shape. The bottom side is about 6 meters long, the wall thickness is 1.5 to 2

meters, and the top wall thickness is 0.6 to 0.8 meters. The highest height reaches 40 meters, and most are between 25 and 35 meters. The eight-cornered watchtower has a barrel-shaped interior, with the bottom wall thickness being over 2 meters, and there are 9 to 15 floors.

In terms of construction materials, local sources are used. Craftsmen select gneiss, yellow clay and timber from nearby mountains. The rubble is interlaced and laid, the clay is jointed, and the stones are interlocked in a staggered manner. The inner wall is smooth and the outer part is folded. Horizontal wooden beams are embedded in the interior of the wall, and the corners are joined with mortise and tenon joints to disperse seismic stress and ensure strong stability.

In terms of architectural decoration, the overall style presents a unique and distinctive style of local ethnic minority dwellings. The masonry texture of the stone wall itself is a simple structural decoration. In addition, the large area of the wall is painted white, and the edges around the window openings and at the corners of the wall are outlined in black or deep ochre red, creating a strong contrast. The walls are painted with patterns of the sun, moon, stars, Yongzhong (ten thousand characters), the eight auspicious signs or animal patterns, mainly flat paintings, with very few reliefs. Some residential walls are painted with horizontal or vertical stripes of white, brown, and black, which are traditional markers in the Molo village. Natural white stones are placed at the corners, window sills, and eaves. The murals of the ancient residences in Upper Moluo retain more original religious elements, while those in Lower Moluo, influenced by foreign cultures, feature more auspicious Buddhist patterns. Wooden doors and Windows are fine decorative carriers of dwellings in Moluo Village. The traditional heavy and low doors of the fortified dwellings are elevated above the ground and accessed via single-log ladders. The door frames and lintels feature shallow reliefs of scrolling vines and Baoxiang floral patterns, painted gold on a red background, with khata (ceremonial scarves) and white drapes often hung from the lintels. Windows are a focal point of decoration; they are wider on the inside and narrower on the outside, featuring wooden lattice grilles in diamond and key-fret geometric patterns. The wooden window eaves cantilever out from the wall, with murals painted underneath, and are paired with linen curtains to shield against the intense highland sunlight. The ends of corbels and rafters feature only simple paintings or shallow carvings, avoiding elaborate ornamentation.

The flat rammed-earth roofs serve as a spiritual space, bearing sacrificial decorations. A Weisang (incense burning) tower made of yellow clay or white stones is built at one corner of the roof as a daily household ritual component, bearing cultural imprints of the ancient Eastern Women's Kingdom's female worship culture. Wooden poles with five-colored prayer flags stand at the four corners of the roof and beside the Weisang tower. The parapets are topped with white stones, some of which are edged with red and white paint.

Interior decoration exhibits distinct hierarchical differences. The second-floor Guozhuang (hearth) room is the core space for family life, featuring highland wooden pillars on stone bases, with the pillar capitals painted gold on a red background. Wall cabinets and furniture are carved with auspicious scrolling vine motifs, and folk murals remain above the stove. The independent prayer hall on the fourth floor is the most highly decorated space in the house. Built with mortise-and-tenon timber framing, its walls and ceilings are painted with mandala and Buddha murals using mineral pigments. The hollowed-out, gold-painted Buddhist niches are furnished with ritual vessels, and the murals in some ancient prayer halls remain remarkably well-preserved after centuries. The single-log ladders connecting the floors are purely functional, with only minimal, simple carvings. Attached residential watchtowers primarily derive their aesthetic from their sharp stone-masonry edges; they feature very little large-scale mural painting, with only simple outlining around the watchtower doors and loopholes.

Overall, the residential decoration in Moluo Village does not aim for extravagant carving. Instead, it integrates multiple functions, including defense, practicality, blessings, and identity marking. In contemporary newly built houses, modern paints and glass materials are widely used. Traditional mineral paintings and woodcarving patterns have tended to become simplified, and some decorations exhibit characteristics of tourism-oriented renovation.

4.3.3 Indigenous cultural arts: pluralistic symbiosis, integration into daily life, and living inheritance

Indigenous cultural arts are reflected not only in the villagers' needs regarding life, aesthetics, and emotions, but also in the various decisions they make in their pursuit of progress [20]. The

indigenous cultural arts of Moluo Village possess the local knowledge characteristics of "pluralistic symbiosis, integration into daily life, and living inheritance", which are specifically manifested in the following aspects.

In terms of handicraft skills, the villagers of Moluo village utilize local materials, integrate local culture and local aesthetics, and create practical, beautiful and life-integrated handicraft categories, such as painting Thangka, weaving Mu woolen blankets and making Mu woolen garments, weaving patterned belts and embroidery, etc. All materials are sourced from local cow and wool, mineral pigments, plant dyes, and local natural alpine flowers, cloud patterns, water ripples and geometric loops and other embroidery patterns.

In terms of theatrical performances, music and dance, cultural narratives, local dialects and historical heritage, a feature of pluralistic symbiosis is presented. This includes local ethnic minority dramas performed in villages and counties during festivals, cultural festivals, and large-scale sacrificial activities; Young men and women gather at night to enjoy singing antiphonal songs, making friends through songs, expressing their feelings and communicating with each other. The Jiarong Guozhuang (locally known as "Zhuo"), dating back to the Sui and Tang Dynasties, belongs to the Suopo school. It integrates nature worship with religious culture, with the "Hare Guozhuang" (Akeriweng) as its iconic masterpiece—a participatory, circular song-and-dance for communal entertainment. Villagers use the local Kham dialect of the ethnic minority in their daily lives, interspersed with archaic vocabulary and expressions, while the vast majority can also communicate in the Sichuan dialect.

Located in the core area of the ancient Eastern Women's Kingdom of the Tang Dynasty, the village served as a defensive settlement on the periphery of the Queen's capital. It retains multiple matriarchal cultural relics of the Eastern Women's Kingdom, along with oral narratives about the Queen building watchtowers and guarding the river valley. Furthermore, the Zhenbu Ferry in Moluo Village is a significant "Red Site" of the Fourth Front Army of the Chinese Red Army's Long March in Danba. After the Fourth Front Army occupied Danba to establish a revolutionary base, the ancient watchtower complex of Moluo served as a forward alert outpost on the north bank. The tall watchtowers were used as lookout posts, while the residential dwellings served as temporary barracks. The villagers acted as guides,collected provisions,and rescued the wounded for the Red Army, supporting them. The stories of the Red Army were integrated into the oral tradition of the village, becoming a composite cultural resource of the village. Multiple cultures such as religious culture,ancient watchtower culture,the matriarchal culture of the Eastern Women's Kingdom,red culture, and foreign cultures coexist harmoniously in Moluo Village.

In terms of ethnic costumes, the clothing of Moluo Village belongs to the minority ethnic costumes of the Danba Suopo Area. It is a typical sample of the agricultural-style Jiarong clothing in the river valley. It retains the relics of the matriarchal culture of the Eastern Women's Kingdom. It is divided into daily casual wear, festive formal attire, and ceremonial dress for the girls' coming-of-age ceremony known as "Jisa." The color system is the same as the white, red, and black murals of local dwellings. It is made from local materials, such as self-woven linen, yak wool pulou (a traditional woolen fabric), silk satin, and otter fur. The pigments and embroidery dyes are taken from local minerals and plants. The patterns mainly include geometric patterns,scroll vines, wild flowers and mountain plants,and sun and moon symbols. It also takes into account the practicality of mountainous labor and the symbolic function of rituals.

The women's clothing is the most distinctive. Women's clothing is the most distinctive. For daily wear, it is a "three-piece" casual outfit (a headscarf Bare and two aprons on the front and back), which is the standard for women's daily wear and suitable for mountain labor. Festive formal attire includes a leather-lined long coat and a colorful pleated long skirt, along with Jiarong handcrafted embroidery, silver ornaments gau(amulet boxes),and coral and turquoise accessories. The iconic "dai jiao jiao" headdress for girls' coming-of-age ceremony inherits the ancient custom of Eastern Women's braids and is the most important ceremonial costume in the village.

The men's clothing style is simple and substantial, mainly featuring Chuba(traditional robes). Accessories include waist knives and gau. The decoration is minimalistic, emphasizing practicality. There is very little embroidery. Currently, most young people in Moluo Village wear modern casual clothes. The full traditional

set of formal attire is only worn during coming-of-age ceremonies, weddings, festivals, and cultural and tourism performances.

4.3.4 Folk customs and rituals: Polytheistic worship and the reinforcement of ethnic identity

Folk customs and rituals refer to the values that villagers have practiced over a long period of time [20]. The folk customs and rituals of Moluo Village possess the local knowledge characteristics of "polytheistic worship and reinforcement of ethnic identity", which are specifically manifested in the following aspects.

In terms of folk beliefs, Moluo village has polytheistic belief system, mainly including nature worship, white stone worship, sacred mountain worship, local heroic god worship and religious beliefs, etc. Specifically, the yellow, black, and white color bands encircling the outer edges of the top floors of residential buildings correspond to the colorful clouds in the sky, the sacred snow-capped mountains, and the vast earth, serving as a rustic expression of nature worship. The large-scale whitewashing of walls, along with white stones placed at the four corners of the roof, wall corners, window sills, and eaves, embody the white stone worship. The murals on residential walls featuring motifs such as the "Qiong bird", the "Yungdrung" symbol, the sun, moon, and stars, and the Eight Auspicious Symbols, as well as the Weisang (incense burning) towers and prayer flags on the roofs, serve as a silent expression of religious beliefs.

Villagers also worship sacred mountains, including Mount Muerduo, which is shared across the entire Jiarong region, and Mount Zebanong, which is exclusive to Suopo. Local hero worship is reflected in the Jiarong New Year (Dairu Festival), held on the 12th and 13th days of the 11th lunar month, to commemorate the Jiarong hero Amigeldong for his deeds of vanquishing demons and protecting the people.

Festival rituals and wedding/funeral customs are life-cycle ceremonies and community activities that run through a person's entire life. Centered around ancient watchtowers and Guozhuang (hearth) rooms, these events emphasize collective participation and reinforce ethnic identity. Among them, the most representative is "Jisa," a provincial-level intangible cultural heritage representing a girls' coming-of-age ceremony. Designed exclusively for young women, it confirms their adult status through the wearing of the iconic horn-shaped headdress, serving as a living carrier of ancient Eastern Women's Kingdom customs. A particularly distinctive feature of marriage customs is the ancient "Ding Mu Shan" practice. Today, it has become a bridge for young men and women to express affection, build friendships, and engage in free love, acting as a ferry for couples stepping into marriage.

The villagers of Moluo Village uphold the ethical concept that "the maternal uncle is more important than the father". As the protector of the nephews, the maternal uncle holds a prominent position in life etiquette, and the culture of maternal uncle authority (Jiuquan) is prominent. In Moluo Village, the household is regarded as the basic social unit rather than a mere blood-related family. Each household has an exclusive "house name", with the suffix "bo". The house name serves as a carrier of property, sacrificial rights, and social status, which can be passed down for several generations and is more important than a personal name. It differs from the patriarchal family system of the Han ethnicity. Furthermore, Moluo Village features a folk mutual-aid organization called "Longli Longtong," an internal labor mutual-aid community. During major events such as house construction, autumn harvests, weddings, and funerals, the entire village engages in mutual assistance through a labor-exchange model without monetary compensation. This mechanism sustains the operation of village society and is a vital component of Jiarong rural society. Practices such as the "Ding Mu Shan" custom, flexible residential marriage customs, the household system, and the maternal uncle authority culture in Moluo Village are all continuations and evolutions of the matriarchal culture of the ancient Eastern Women's Kingdom.

4.3.5 Local livelihood practices: Adapting to local conditions and market-driven development

The local livelihood practices of traditional villages refer to the ways in which villagers make a living [20]. The local livelihood practices in Moluo Village exhibit the local knowledge characteristics of "adapting to local conditions and market-driven development", which are specifically demonstrated in the following aspects.

In terms of production methods, Moluo Village is a traditional agricultural community that makes full use of the surrounding topography. Terraced fields are built along contour lines from the river valley up to the mid-mountain slopes, forming a unique and stunning three-dimensional agricultural landscape characterized by "trraces

contour the mountains, and water winds through the fields." The main crops are corn and wheat, supplemented by a small amount of vegetables. Cash crops include apples, walnuts, pears, and Sichuan peppercorns. Meanwhile, driven by the rapid development of the tourism industry in Danba County in recent years, Moluo Village has attracted a large number of tourists drawn by its unique cultural landscape. Driven by the need to adapt to market demands, the livelihoods of some villagers have transformed: some operate homestays, some build and manage eco-agritourism complexes, and others run high-altitude leisure fruit-picking farms.

In terms of culinary craftsmanship, the local ethnic minority diet belongs to the mid-mountain agricultural food culture of the Dadu River Valley. Representative delicacies mainly include cured pig leg, pork fat, cured meat, Za wine (a traditional fermented grain wine drunk through a straw), Su You Cha, pickled cabbage buns, fire-baked buns, and blood sausages.

5. Evaluation of the Value of Local Knowledge in Moluo Village

Currently, the inheritance system for China's excellent traditional culture is continuously being refined. Concurrently, the cultural tourism industry is gradually transitioning from traditional sightseeing to deep cultural experiences. As a result, tourism consumption increasingly favors authentic, localized, and immersive rural cultural experience scenarios. Against this backdrop, this study conducts a multidimensional value evaluation of the local knowledge in Moluo Village across five dimensions: ecological value, cultural heritage value, social value, economic value, and educational value.

5.1 Ecological Value: A Typical Practical Paradigm of Harmonious Human-Nature Coexistence in Mountain-Valley Landscapes

Moluo Village is situated in the unique geomorphological environment of the Dadu River Canyon. It follows the traditional construction philosophy of "nestling against mountains and waters, adapting to local conditions, and achieving unity between heaven and humanity." The overall layout conforms to the terrain of the mountains and the river system, forming a hierarchical landscape spatial structure of "water - village - mountain". The boundaries of the village, the patterns of the streets and alleys, and the functional layouts all respect the natural topography and landforms, minimizing the disturbance to the mountain ecosystem caused by human intervention. The local traditional stone-and-wood structures are sourced locally and have strong adaptability, which can effectively cope with the mountain climate and geological environment. The vertical layout mode and low-carbon circular construction method of the buildings carry profound traditional ecological wisdom. These practices can provide local reference for the protective renewal of traditional villages and low-intervention habitat construction in the alpine canyon regions of western Sichuan, aligning closely with the development orientation of ecological civilization construction and the inheritance of traditional ecological culture in the new era.

5.2 Cultural Heritage Value: A Living Cultural Carrier of Multi-Source Cultural Layering, Enriching the Cultural Resource Repository of the Chinese Nation Community

The cultural system of Moluo Village integrates multiple cultural cores, including architectural culture, the matriarchal legacy of the ancient Eastern Women's Kingdom, multi-religious syncretic culture, and the Red Long March culture. The settlement pattern of ancient watchtowers coexisting with residential dwellings, the provincial-level intangible cultural heritage girls' coming-of-age ceremony, the "Ding Mu Shan" customs, Jiarong Guozhuang dance, and traditional handicrafts together constitute a comprehensive and living regional cultural genealogy. Compared with static cultural relics, the local knowledge of Moluo Village is rooted in the villagers' daily production, life, and festival rituals, possessing strong authenticity and vitality. It clearly presents the historical trajectory of exchanges, interactions, and integration among ethnic groups in ethnic areas over a long period, serving as a high-quality rural cultural carrier for forging a strong sense of community for the Chinese nation.

5.3 Social Governance Value: A Crucial Link for Maintaining Village Community Order and Consolidating Ethnic Cultural Identity

The household system, maternal uncle authority (Jiuquan) culture, and the "Longli Longtong" folk mutual-aid system, which have been accumulated and formed in Moluo Village, have constructed an endogenous operating mechanism adapted to

the mountainous rural society. This mechanism effectively maintains neighborhood mutual-aid relationships and community stability. Traditional folk practices, such as sacred mountain worship, white stone beliefs, folk festivals, and collective Guozhuang dancing, have shaped shared values and a sense of cultural belonging among the villagers, continuously strengthening regional ethnic cohesion. These indigenous rural institutions and cultural norms can effectively supplement the modern rural grassroots governance system, reduce the costs of governing rural public affairs, and provide localized support for the construction of rural spiritual civilization and the modernization of grassroots governance in ethnic areas.

5.4 Economic Revitalization Value: Precisely Adapting to the Transformation and Upgrading of the Cultural Tourism Industry and Consumption Iteration Trends, with Significant Potential for Industrial Empowerment

Currently, mass tourism consumption has moved beyond the single model of landscape sightseeing, shifting towards differentiated, immersive, and connotative cultural experience consumption. The scarce ancient watchtower settlements, pure Jiarong folk customs system, distinctive mountainous agricultural production patterns, red cultural resources and ethnic culinary culture in Moluo Village have formed a core competitive advantage that distinguishes it from other similar villages in western Sichuan. These elements can support the development of various tourism and cultural industries such as architectural study tours, folk customs experiences, agricultural leisure, and red education.

Meanwhile, the revitalization and utilization of local knowledge are driving villagers to transition from traditional agricultural livelihoods to new business formats such as homestay hospitality, cultural tourism operations, and rural cultural and creative industries. This transition has broadened channels for increasing income locally, injecting endogenous momentum into rural industrial revitalization.

5.5 Rural Education Value: Field Study and Educational Resources Integrating Comprehensiveness and Practicality

The contents encompassed by Moluo Village—including the wisdom of mountain settlement construction, ethnic folk culture, red historical memories, and mountainous agricultural technologies—span multiple disciplines such as ecology, architecture, history, folklore, and ideological and political education. These resources can be used to build immersive rural practical education classrooms, helping to cultivate adolescents' rural cognition and enhance their traditional cultural literacy. Meanwhile, the normalized inheritance of local knowledge can continuously strengthen the cultural confidence of the village's youth and alleviate the problem of intergenerational discontinuity in rural culture, aligning closely with the current educational development trends of popularizing study tours and utilizing rural culture for educational purposes.

6. Conclusions and Discussion

6.1 Conclusions

Set against the backdrop of the practical dilemmas currently facing the protection and development of traditional villages in the ethnic areas of northwestern Sichuan, this study utilizes the theory of local knowledge and takes Moluo Village in Suopo Township, Danba County, as a case study. It establishes a clear identification and extraction pathway for the local knowledge of traditional villages, categorized into explicit and implicit local knowledge. By employing knowledge graph technology and information coding techniques from computer science, a visualized local knowledge graph was constructed. Furthermore, a multidimensional value evaluation of this local knowledge was conducted from the perspectives of inheriting and developing excellent traditional culture and promoting the cultural tourism industry. Main conclusions are as follows:

(1) The local knowledge genealogy of Moluo Village consists of 2 major categories, 5 types, 28 subcategories, and 99 sub-subcategories. This map can serve as an important information resource for the protection and inheritance of traditional villages in Moluo Village and the Garurong region, providing crucial theoretical support for reconstructing the historical memory of the village, strengthening residents' sense of local belonging, and formulating protection and development strategies.

(2) Overall, the local knowledge system of Moluo Village exhibits multi-dimensional and differentiated characteristics. Indigenous spatial construction methods are characterized by

nestling against mountains and waters, adapting to local conditions, and achieving unity between heaven and humanity. Traditional architectural construction techniques are marked by the use of locally sourced materials, a rustic and profound aesthetic, and distinctive features. Local cultural arts are characterized by pluralistic coexistence, integration into daily life, and living inheritance. Ethnic customs and rituals feature polytheistic worship and the reinforcement of ethnic identity. Local livelihood practices are defined by adapting to local conditions and being market-driven.

(3) In general, the local knowledge of Moluo Village possesses five-dimensional value encompassing ecological, cultural heritage, social, economic, and educational aspects. It is a composite indigenous knowledge system that integrates ecological wisdom, living cultural heritage, rural social rules, cultural tourism resources, and rural educational materials. These multiple values are mutually nested and inseparable.

6.2 Discussion

The global crisis of rural decline poses severe challenges and new imperatives to the protection of traditional villages. Based on this, it is of great practical significance and urgency to discuss the local characteristics and local exploration of traditional villages. From the perspective of local knowledge, this study attempts to clarify relevant concepts and connotations, construct a targeted local knowledge graph for traditional villages, and provide an important basis for the protection and development of traditional villages in the ethnic areas of northwestern Sichuan, using Moluo Village as a case study.

Given the large number of traditional villages listed in the directory in the ethnic areas of northwestern Sichuan, which are distributed across settlements of various ethnic minority branches, there are abundant case samples and diverse research environments. In the future, comparative analyses of different types of traditional ethnic minority villages should be further strengthened to better guide local cultural practices in these regions. This study has only provided a holistic understanding of the local knowledge characteristics of traditional villages using Moluo Village as an example and conducted a qualitative assessment of their multidimensional values, laying the foundation for subsequent in-depth research. In the future, the causes and generation mechanisms of these characteristics can be further explored, and a systematic value assessment can be conducted using quantitative methods. At the same time, the graph constructed in this study also has certain individuality and typicality. Further extensive exploration is needed to build a more complete and comprehensive local knowledge graph database. The origin, development trajectory and evolution process of local knowledge can also be explored from the temporal dimension, further enhancing the richness of the graph.

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