Spatial Characteristics of Miao Settlements in Changning, Yunnan Province, China

Ai Lijuan[1]

Pipu Boosabok[2]

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Abstract

This article takes the Miao settlements of Changning in South China as the object of study. Through a combination of fieldwork, field mapping, and graphic language, spatial analysis of the settlements is carried out using ArcMap to objectively and scientifically analyze the spatial characteristics of the settlements. The objective is to seek the existence of an inherent logical relationship between the spatial characteristics, the Miao ethnic group, and the cultural contents of the settlements and to provide a basis for the conservation and sustainable development of traditional Miao settlements. The study concluded that the Changning Miao ethnic group mostly live in high-altitude mountainous areas with slopes of 10°–30° at altitudes of 2,000–2,300 meters. The settlements are mainly composed of mountains, roads, fields, and buildings. The spatial grouping of the settlement buildings is based on the family unit, each occupying fields, buildings, and internal roads, and shows a relatively evenly scattered distribution. The core factor influencing the spatial characteristics of the Changning Miao settlements is the cultural identity of the ethnic group.

Keywords: Miao ethnic group, Settlements, Site selection, Spatial characteristics, Camping wisdom

[1] Affiliation: Faculty of Decorative Arts, Silpakorn University
Email: emilyai0081@gmail.com

[2] Affiliation: Faculty of Arts, Silpakorn University
Email: boosabok_p@su.ac.th

1. Introduction

Miao ancestors have migrated five times (Shi, 1995), forming a pattern now concentrated in southeastern Guizhou and dispersed in Hunan, Hubei, Sichuan, Yunnan, Guangxi, Guangdong, Shaanxi, Beijing, and Southeast Asia. As a result of the dispersed situation formed by long migrations, the geographical and social environment in which the ethnic Miao live varies from place to place. They have interacted with other ethnic groups in the areas where they have lived, resulting in increasing cultural diversification, which eventually led to the phenomenon of many Miao branches, significant differences in dialects, and diverse types of costumes (Writing Group of a Brief History of the Miao, 1985, p. 14).

The Miao ethnic group is mainly located in the higher mountainous regions of Yunnan Province in China. Western Yunnan is part of the fold zone of the Hengduan Mountains. The considerable altitude difference and mountainous and alpine terrain caused inaccessibility in ancient Yunnan, making it more difficult for the various ethnic groups living here to communicate. This geographical isolation gave rise to the diversity of Yunnan's ethnic cultures. In adapting to Yunnan's local environment and climate, the traditional social culture of the Miao ethnic group has developed spatial characteristics of settlements that are distinctly different from those of the Miao in other areas and other ethnic groups in the same region. The Changning Miao ethnic group is a group of Miao minorities living in Daping and Tupitai in Goujie Township, Changning County, Baoshan City, Yunnan Province, China. After they migrated to Changning County, their exchanges with other Miao ethnic groups decreased. Influenced by the local social and natural environment, they gradually developed a costume cultural system with independent and spatially distinctive characteristics. This study takes the 10 Miao settlements they inhabit as typical case studies for three reasons. Firstly, the complex mountainous environment in the area has created natural geographical isolation, as Changning's Goujie Township is located in the Himalayan Transverse Range on the east side of the Lancang River. Before the founding of the People's Republic of China in 1949, the Changning Miao group rarely interacted with the local Han and Yi groups due to poor transportation and linguistic and cultural differences (Compilation Committee of Changning County, Yunnan Province, 1990, p. 642), which enabled the Miao settlements to maintain a relatively independent development process after they migrated to this area. Secondly, the Miao costumes of Changning were selected for China's intangible cultural heritage in 2006, and the Miao settlement of Dashuitang in the region was selected for the second batch of traditional Chinese villages in 2013. Since this period, local officials and civil organizations have engaged in long-term and effective cultural conservation work, enabling this region to better preserve the traditional Miao landscape in terms of architecture, public places, and cultural practices. Thirdly, compared to the Miao

settlements in Wenshan City, Honghe City, and Zhaotong City in Yunnan, the sample of Miao settlements in Changning is small and relatively concentrated, and their spatial and cultural characteristics are more distinguished.

With the acceleration of urbanization and the completion of poverty eradication in China, traditional ethnic settlements have faced a change. The production, lifestyle, and values of traditional settlements have been affected. The settlement space, which carries the structure and emotions of traditional Chinese rural society, is gradually disintegrating from the inside (Zhang, 2022). The Miao settlements in Changning face the same situation, with a shift in production from subsistence farming to integration into the social division of production; this has led to changes in the lifestyle and spatial needs of the Changning Miao ethnic group. Therefore, it is important to analyze the settlements' spatial characteristics, find the internal logic between representation and culture, and provide guidance for the Changning Miao settlements in the change process to preserve their ethnic culture and traditional settlements.

Figure 1: The Dashuitang settlement in Changning

Figure 2: Members of the Changning Miao ethnic group dancing to celebrate the New Year

Photo: Mao Sang 2021

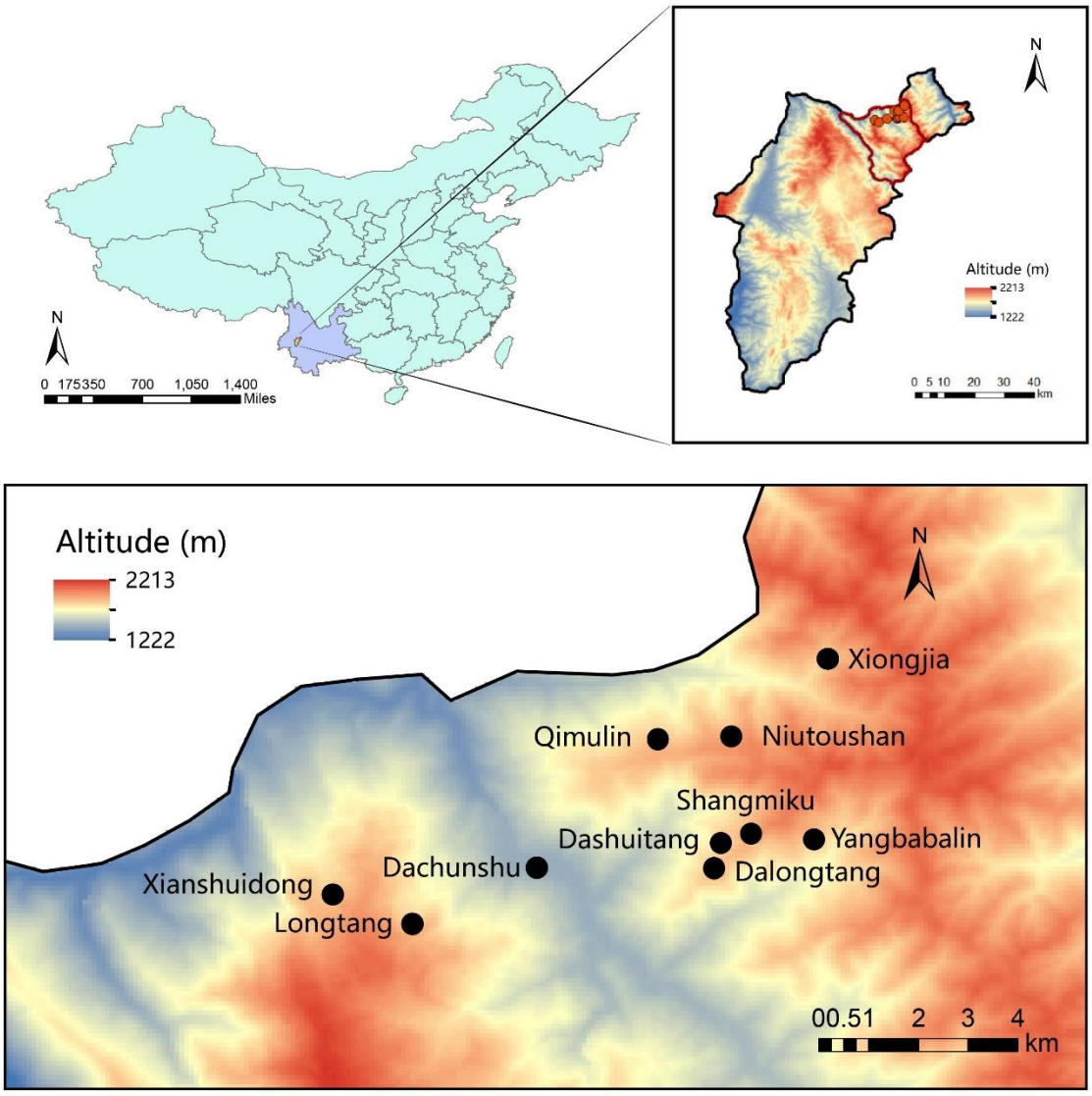

Figure 3: Map showing the location of Changning Miao ethnic group settlements

2. Literature Review

Traditional ethnic villages are an important part of China's traditional villages and an essential element for transmitting the culture and customs of ethnic minorities. Since the first list of traditional Chinese villages was published in 2012, research on traditional villages by Chinese scholars has multiplied. Research perspectives on ethnic minority settlements are diverse, but studies on Miao settlements have mainly focused on the southeastern region of Guizhou Province.

Regarding research methodology, the existing studies are mainly based on the "3S" technology method (i.e., remote sensing, geographic information systems, and global positioning systems). In terms of specific data analysis, the nearest-neighbor index method, kernel density analysis, and network dimension analysis (Yang et al., 2021) have also been used to study the spatial characteristics of all Miao settlements in the region at a macro level (Lei et al., 2022). Analysis of individuals or groups of villages at the micro level is mainly based on GIS spatial analysis, combined with field surveys and visual results for spatial characterization (Xie & Bao, 2017). An in-depth study of marriage, culture, and social relations in Long Horn Miao village argues that the Miao settlement space is the result of the productive practices of the community of inhabitants (Su, 2018). Scholars have also conducted studies of architectural and environmental camping (Zhou, 2016), spatial differentiation of the tourism economy (Li et al., 2021), and analysis of public space characteristics (Zhou et al., 2020). Data show that Miao settlements in southeastern Guizhou Province tend to choose higher-lying ridge locations as gathering places, with altitudes ranging from 500 to 1,000 meters, slopes of 5°–15°, and areas blocked to traffic (Yang et al., 2021). The core of the spatial characteristics is centered on a field, with the landscape as the backbone (Feng et al., 2019), and groups of buildings are assembled in single or multiple clusters with little open space between buildings, forming a compact spatial feature (Xie & Bao, 2017). The natural geographical environment plays a fundamental role in the spatial distribution pattern of Miao traditional settlements, the Miao culture and Miao population distribution play a decisive role, and the backward level of economic development and closed transportation conditions play a protective role (Su, 2018). The historical and social factors of the Miao ethnic group and the local geographical and natural environment work together to make the Miao villages in the same region identifiable and share common characteristics.

Research on the Miao ethnic group in Changning began in 2006 after their ethnic costumes were listed on the National Intangible Cultural Heritage List. Therefore, research has focused on the current situation and development of their ethnic costume culture, with no research on their geography or space. The spatial distribution of traditional ethnic minority villages is essentially a question of the formation and continuity of ethnic communities. There is an intrinsic logical relationship between the spatial characteristics of the settlements, their productive units, and their cultural contents. The spatial distribution of traditional ethnic minority settlements is a question of forming and continuing ethnic settlements. Based on the above, this study takes the consistency of the characteristics of Miao settlements as an initial point to analyze the spatial characteristics of the Miao settlements in Changning and the reasons for their formation, which will provide a scientific reference for the cultural conservation and sustainable development of Miao settlements in Yunnan.

3. Methodology

The research data comes from three primary sources. Firstly, it comes from textual materials, the leading source being local county documents and archival materials, such as annual statistical documents in each village. Secondly, it comes from information on the space, maps, and coordinates of the settlements. The map information was obtained from Google Earth, Google satellite maps are loaded by GUGUGIS map downloader, and these maps with coordinate systems are used for raw image data analysis. The elevation and slope data were obtained from Geospatial Cloud Data (www.gscloud.cn). Thirdly, it is from basic information obtained through field surveys and interviews.

The downloaded map was loaded with ArcMap software and geometrically corrected, coordinated, and aligned according to the administrative map provided by the Baoshan Bureau of Land and Resources. A combination of map sampling, manual visual interpretation, and field survey was used to obtain information on environmental elements such as buildings, fields, roads, mountains, and forests. The spatial analysis of the settlements was carried out based on the maps drawn, and the principles of the spatial layout of the Changning Miao settlements in terms of the family units were determined in conjunction. The core buildings in each family unit were abstracted as points on the map, and information on their orientation and slope was analyzed to interpret similarities and differences.

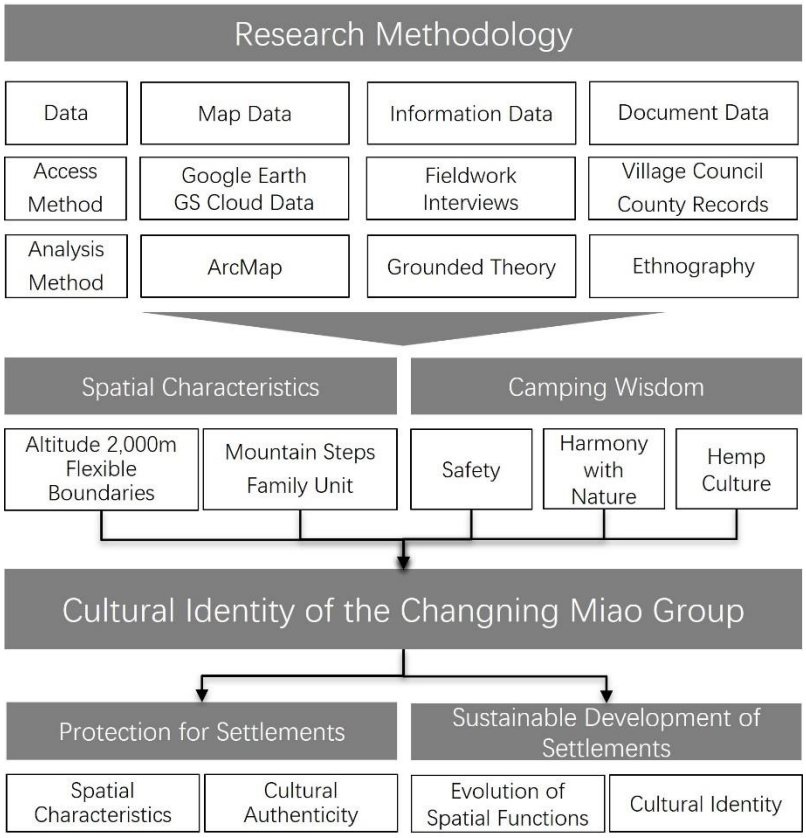

Figure 4: Research framework

Following a data collection method based on grounded theory, with an emphasis on reflection and evaluation during the research process, the following questions were focused on during the field research.

- What is the underlying social process of spatial identity formation? How does this process emerge?
- How do the actions of the research subjects construct these social processes?
- How do the local Miao ethnic groups talk about this process? What is emphasized, and what is left out?

This study adopts a combination of ethnographic research and study of the spatial pattern of settlements. The historical origins, cultural content, and production and lifestyle of Miao ethnic group are analyzed through literature and fieldwork to seek the existence of an inherent logical relationship between the spatial characteristics, the Miao ethnic group, and the cultural contents of the settlements.

4. Background of the Changning Miao settlements

4.1 Overview of the study area

The Changning Miao group live mainly in the valley and surrounding areas on the east side of the Lancang River and are administratively part of Daping and Tupitai villages in Guojie Yi Miao Township, Changning County, Baoshan City, Yunnan Province. The township is 358 square kilometers, with an average temperature of 15.9 ℃, an annual rainfall of 775.8 millimeters, and an altitude of 1,100–2,857.6 meters. There are 11 administrative villages under its jurisdiction, with a total population of 23,633, of which 1,289 are Miao, mainly in the villages of Daping and Tupitai.[3] Daping village is located 5 kilometers from the township government and is divided into 25 groups according to natural settlements. There are 695 Miao residents living in the area, mainly in seven settlements: Dachunshu, Xianshuidong, Dalongtan, Longtan, Shangmiku, Yanfgbabalin, and Dashuitang.[4] According to the fieldwork, there are another four households with 18 Miao people living in Shangmiku village and one household with two Miao people on Xiagoujie Street, which are not included in the sample for the analysis of Miao settlements because of their scattered location and small number. Tupitai village is 13 kilometers from the township government and has ten groups, with 545 Miao residents living in three settlements: Qimulin, Niutou Shan, and Xiongjia.[5]

Climatically, the territory of Changning County has a generally subtropical monsoon climate. However, it is influenced by the altitude and the direction of the mountain ranges, showing meteorological variation with altitude. The region is divided into the lower tropical, temperate, calm, and alpine zones according to altitude. The summers are influenced by the Indian Ocean monsoon and the Pacific monsoon, with abundant rainfall, and the dry season is from November to April, with less rainfall accounting for about 15% of the year's precipitation. The mountain ranges in the area are part of the Himalayan Transverse Range, which generally extends from north to south and is influenced by the southwesterly monsoon, hence the more abundant rainfall on the western and southern slopes.

Regarding natural and economic resources, Changning County has 3.08 million acres of woodland within its borders, with a forest cover of 65.3%. The topographic soil is mainly red loam. The natural vegetation is dominated by Yunnan pine, with a mixture of coniferous and broad-leaved tree species

[3] From Changning County Goujie Township government website: http://www.yncn.gov.cn/info/3957/49978.htm

[4] From Daping Village Committee: Basic information about the Miao ethnic group in 2021

[5] From Tupitai Village Committee: Village basic information in 2021

(Compilation Committee of Changning County, Yunnan Province, 2019). The Miao settlements in Changning are all located on the east side of the Lancang River, and there are two rivers in the area, the Huihuojie River and the Xinchang River. The main road in the region runs north to Dali Shuixie Township and south to the Lancang River and across the bridge to Changning County. The Miao residents are mainly engaged in farming, with 1.7 acres of land per person and 7.6 acres of walnuts. Grain, tobacco, walnuts and animal husbandry dominate the region. The sites chosen for the Miao settlements in Changning are all on the east side of the Lancang River. When the southwesterly monsoon hangs over the Lancang River, it carries away ample water vapor blocked by the steep slopes. The cold air rises quickly to form rainfall, giving the settlements a steady and ample water source.

4.2 Vertical spatial characteristics of the Changning Miao settlements

The siting of settlements relates to natural surroundings and adaptation needs for human survival. The Miao people's history of migratory hardship and social factors made them very cautious about the location of their settlements. The study analyzed the location of the Changning Miao settlements in terms of vertical spatial characteristics, planar spatial characteristics, and boundaries by mapping the location of the 10 villages based on map data and field research.

The Miao settlements are all in alpine mountains in the vertical direction. Their elevation data are significantly higher than those of the Han and Yi settlements in the same region. The average elevation in Daping and Tupitai villages is about 1,600 meters, and the highest elevation in the region's mountains is 2,500–2,600 meters. There are 10 Miao settlements in the area of Goujie Township, all located in the alpine mountains. The altitudes are 1,550 meters at Dachunshu, 2,050 meters at Xianshuidong, 2,000 meters at Dalongtan, 2,000 meters at Longtan, 2,000 meters at Shangmiku, 2,100 meters at Dashuitang, 2,250 meters at Yambabalin in Daping village, 2,000 meters at Qimulin, 2,050 meters at Niutoushan and 2,200 meters at Xiongjiazhai in Tupitai village. Most of these settlements are located in areas with altitudes of 2,000–2,300 meters, in the high-altitude zone of settlements in the same region.

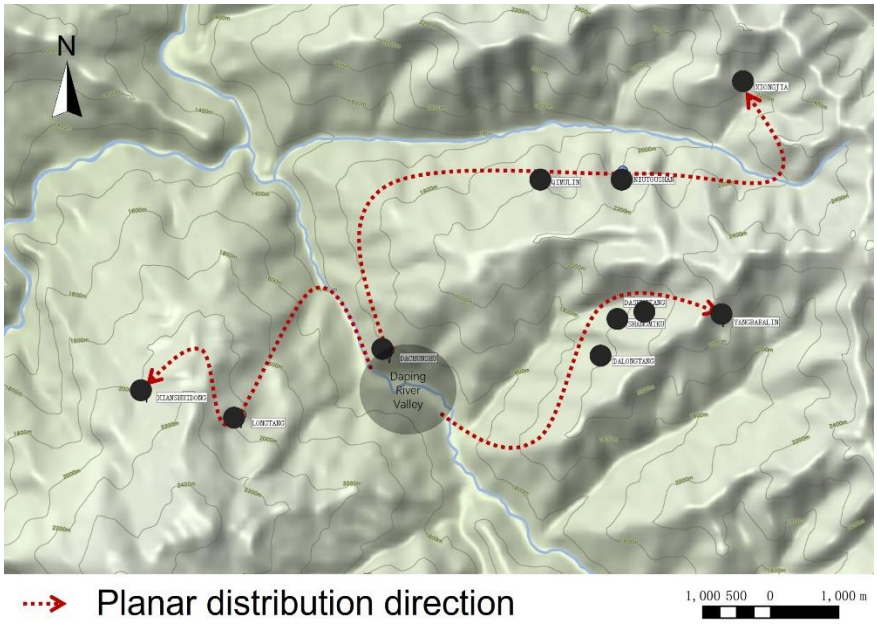

Figure 5: Spatial characteristics of the location of the Miao settlements

4.3 Planar spatial characteristics of the Changning Miao settlements

In the horizontal direction, the Miao settlement is centered on the river valley area of Ta Ping village, following the topographic elevation of the mountains and extending outward in parallel along the contours. Figure 5 shows the linear distribution of settlement sites along three orientations. The first starts from Dachunshu, circles upward along the road to the 2,000-meter contour line to Qimulin, and then extends eastward along the contour line to Niutoushan and Xiongjia settlement. The second route starts from Miku Mountain and goes to the 2,000-meter contour to reach Dalongtan, then follows the contour to Shangmiku, Dashuitang, and finally up again to Yambabalin at 2,200 meters. The third starts from Taping village and winds up through several natural villages to the 2,000-meter contour to reach Longtan and then extends northwest along the contour to Xianshuidong.

4.4 Boundary characteristics of the Changning Miao settlements

The concept of boundary arises when the scope of a settlement is delineated. The settlement is enclosed by boundaries, as shown in Figure 6 and Figure 7, where four elements—the mountain land, buildings, fields, and roads—make up the Changning Miao settlements. The settlement boundaries are

naturally divided by the topography of the mountains and forests. Factors such as the slope and orientation and the roads become controlling factors for boundaries. Areas with steeper slopes, unsuitable for a productive life, and areas with backward slopes with poorer light and temperature conditions constitute the natural boundaries of settlements. Roads determine the boundaries of boundary development, as areas too far from roads are less accessible. The Miao settlements generally have no distinct boundaries, with the mountains and fields blending naturally to form a flexible natural boundary of the building, mountain, field, and road elements.

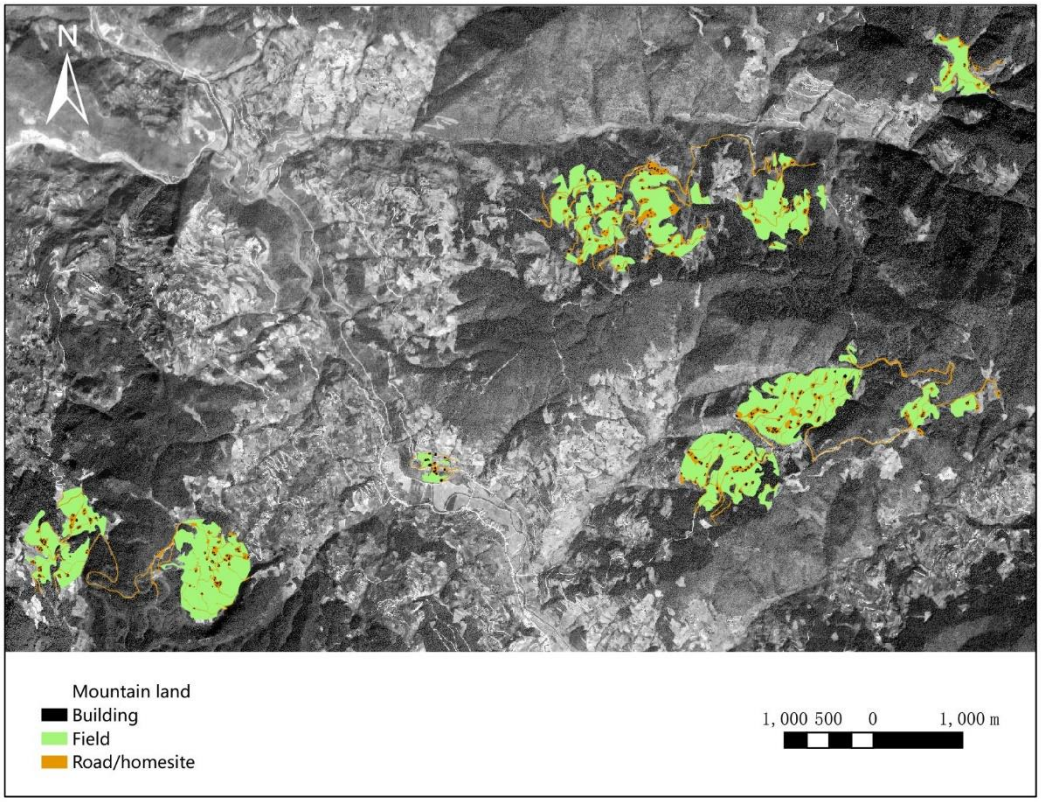

Figure 6: Map of Changning Miao settlement boundaries

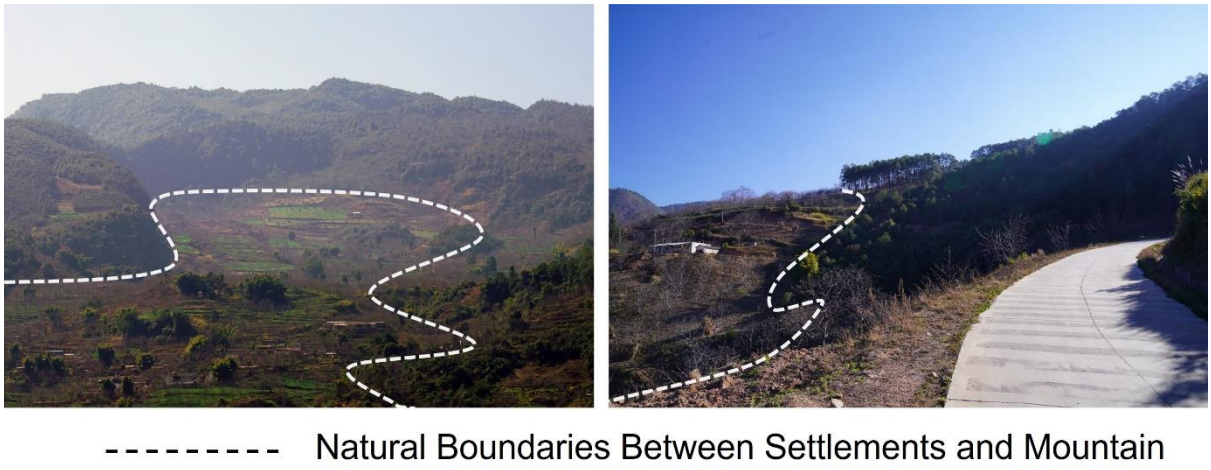

Figure 7: The Changning Miao settlement boundaries divided by steeper slopes and backward slopes

5. Analysis of the spatial structure of the Changning Miao settlements

The Miao settlements gradually expanded in the reproduction process, forming scattered but orderly building clusters. The settlements are built as family units, with several brothers of a family often living close to one another, forming a cluster of buildings. When there are too many family members and not enough land to use, some family members will look for suitable land for farming along the roads around the village and re-situate to build a new family unit. Following this logic, through field research and analysis of map data, an analysis of the spatial structure characteristics within the Miao settlements was drawn up, focusing on three aspects: the building units, the spatial characteristics of the house buildings, and the distribution characteristics.

5.1 Spatial characteristics of the buildings of the Changning Miao settlements

For indoor lighting and heating requirements, most buildings in the settlements are set against the ridge of the mountain, rising with the mountain in steps. Specifically, in terms of topography, the buildings are primarily located on ridges in a convex form. As the buildings are set back against the ridge, they generally have no fixed orientation and are mainly based on facing the sun toward the exposed valley. As shown in Figure 8, the buildings in the settlement move up the hillside in steps, generally with three terraces. The lower terrace retains the traditional two-story stilt style of Miao architecture, with the bottom floors housing livestock such as cattle, chickens, and geese and the upper floor being a semi-open functional

space. The middle terrace is generally the same height as or slightly lower than the upper floor and is used chiefly as a courtyard for drying cereals, hemp stalks, and clothing. The higher terraces are the principal locations for the 2–3 story dwellings. Some families also build functional rooms such as kitchens and toilets on the side. The roofs of houses on low-lying sites are always shorter than those on higher sites, which brings in the best light and meets natural heating and drying needs.

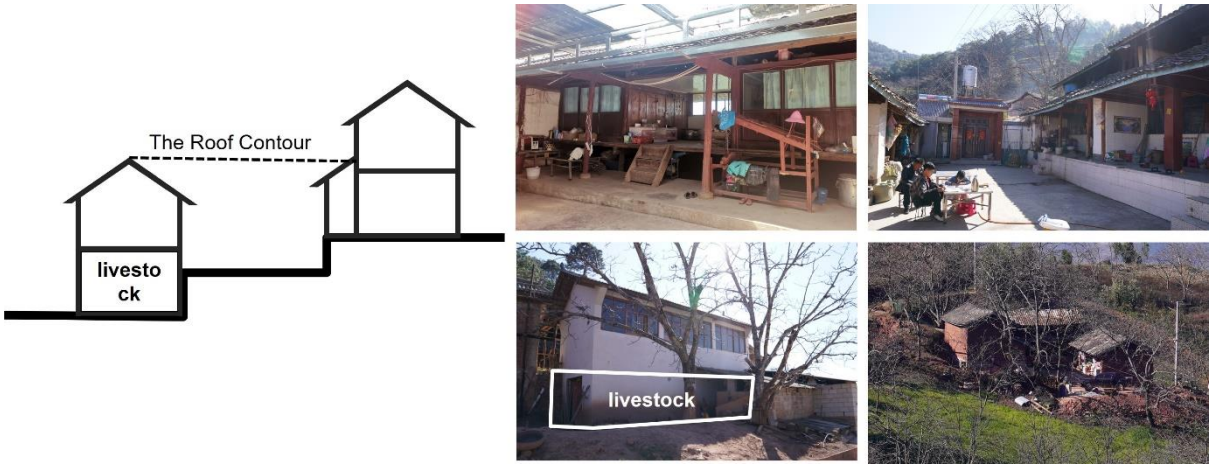

Figure 8: Diagram of the spatial characteristics of the buildings

5.2 Characteristics of the family unit in the Changning Miao settlements

The Changning Miao family unit usually occupies all the functional spaces for their production and lifestyle, consisting of buildings, fields, and auxiliary roads. This covers an area of between 10 and 30 acres, as shown in Figure 9. The family's fields surround the buildings, which are presented on the hillside mainly in the form of a combination of slopes and terraces. There is good accessibility between the dwelling buildings and the fields, mainly through self-built roads and gentle slopes for easy passage and access by the residents. As shown in Figure 10, the majority of family units are located on slopes of 10°–20°, with some of 20°–30°. The self-built road is connected to the main road and extends toward the contour, connecting all family units on the same line. The Miao ethnic group have reduced the slope and increased accessibility within the family unit by building roads and leveling the slope. The family unit areas are bounded by roads and heights, with natural transitions forming natural boundary barriers through inaccessible heights. These barriers do not adhere to a specific shape and blend with the environment to form an unobtrusive division, constituting a random and ordered spatial structure between family units.

Several family unit areas of fields, buildings, and roads are interconnected and, together with the surrounding mountains and forests, make up the Changning Miao settlements.

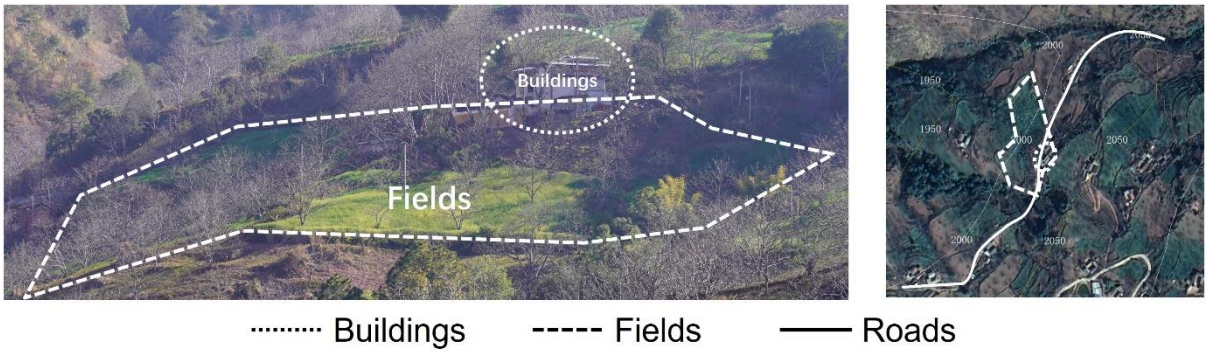

Figure 9: Diagram of the family unit area

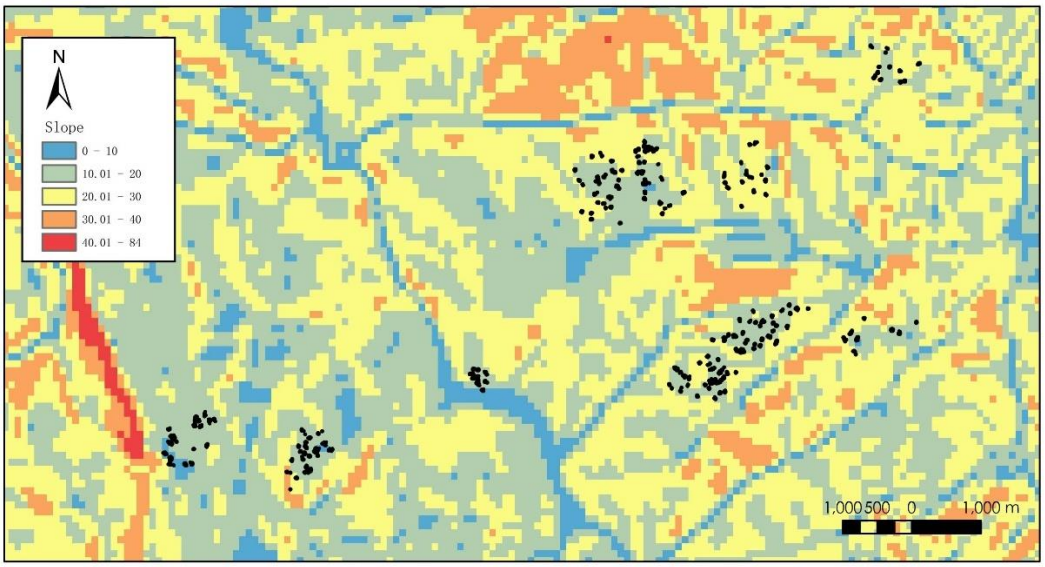

Figure 10: Diagram of the slope of the Miao settlements in Changning

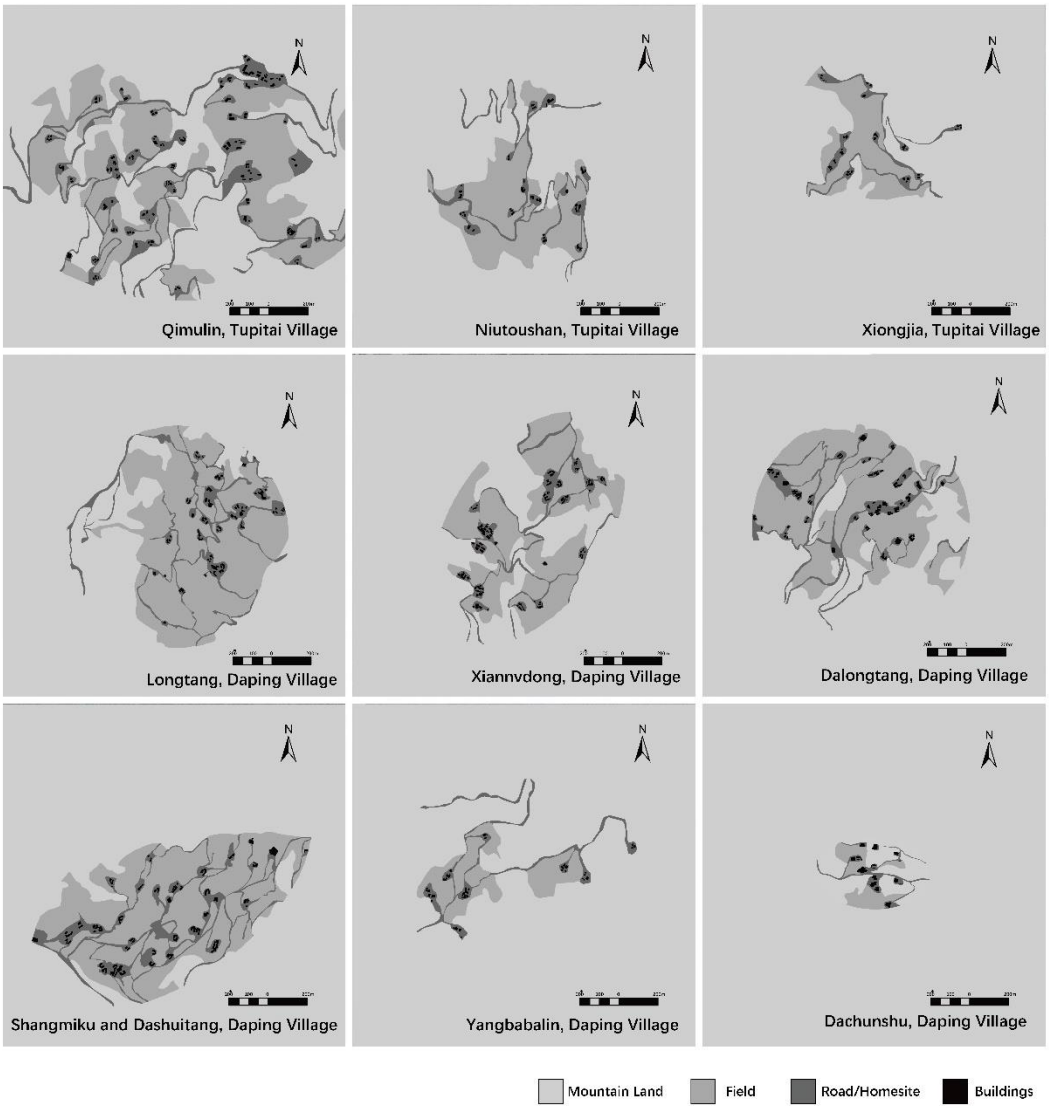

Figure 11: Distribution of family units in the Changning Miao settlements

5.3 Characteristics of the distribution of buildings in the Changning Miao settlements

As shown in Figure 11, the density of buildings in the Changning Miao settlements is relatively low, showing a more even scattered distribution with a slightly inconspicuous clustering toward the main roads. The overall distribution of family units is on the axis of the main road, with branch roads extending naturally along the contours and main roads. The main road winds up the hill from southwest to northeast, as shown in Figure 12 for the Shangmiku and Dashuitang settlements, with the building units distributed roughly linearly from south to north along the 2,000-meter, 2,100-meter, and 2,200-meter contours, with the roads connected to the houses by self-built dirt paths. This distribution is a combination of the regional topographical complexity of the landscape and the sociocultural attributes of the Miao ethnic group. As

mentioned earlier, the family unit area generally consists of larger fields. Although the Miao inhabitants live next to each other and have very close community ties, their housing groups are relatively large in distance from each other. They are loosely distributed on the map, with each building group relatively evenly spaced from neighboring groups.

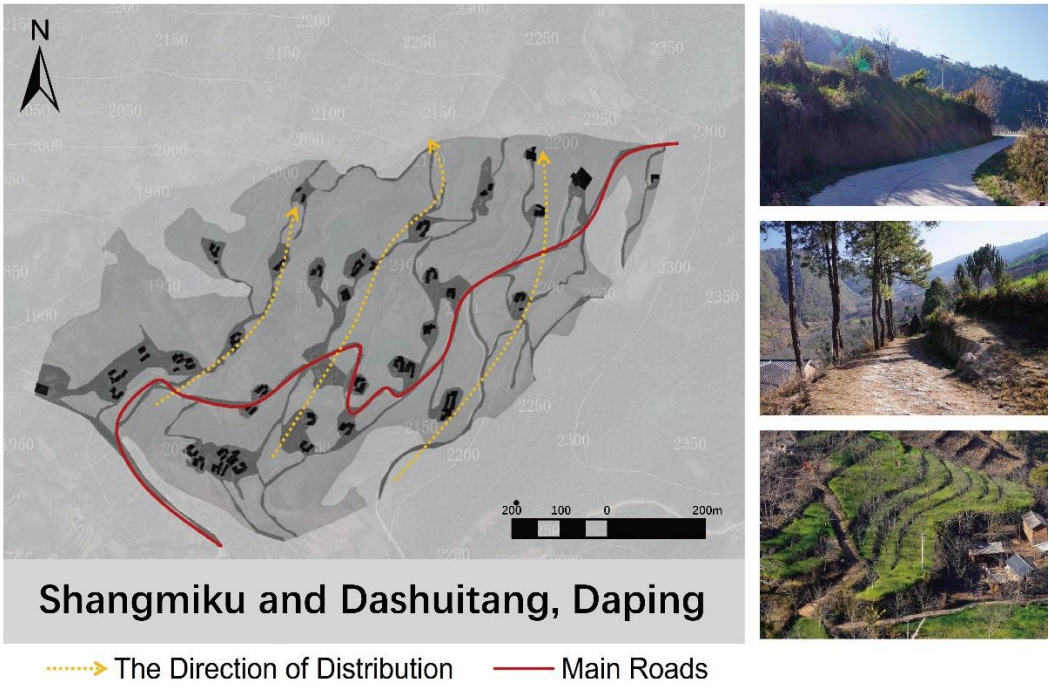

Figure 12: Diagram showing the distribution of family units in the Shangmiku and Dashuitang settlements

6. Wisdom of camping among the Changning Miao group

At the end of the Qing Dynasty, Yunnan's ethnic minorities were suppressed by the Qing government, forcing the Miao in the Wenshan area to start migrating southwestward again. According to the Miao elders of Daping village, they migrated here because of the "Red and White Flag Incident." The Miao who migrated to Changning were backwards in productivity and lived mainly on agriculture, animal husbandry, and hunting. They were often bullied and plundered by the local Yi and Han groups and "lived in abject poverty" (Compilation Committee of Changning County, Yunnan Province, 1990). For a long time, the Changning Miao lived a closed and conservative life, maintaining a subsistence smallholder economy with the family as the production unit. After 1980, economic development and frequent exchanges with the outside world led to changes in the production and way of life of the locals. Production methods changed

from subsistence farming to integration into the social division of labor. The young generation chose to work to generate income, while the others who remained in the area were organized and led by the government to grow cash crops such as tobacco and walnuts.

Figure 13: The Changning Miao ethnic group planting tobacco and hemp

6.1 The wisdom of conceding productive space based on safety principles

The Changning Miao ethnic group has reduced conflicts with other ethnic groups by giving up their living space. The history of the Miao is one of burdensome migrations, every significant migration being either to avoid conflicts or an unnatural migration forced upon them after losing a war with another ethnic group. During migrations, the Miao ancestors mostly avoided the fertile plains and lived in the more secluded mountainous areas for safety. The uncontested barren land at high altitudes and the natural resources of the mountains and forests gave the Miao—who are good hunters—enough to live on and be safe. These are the experiences of dealing with life that are inherited from the Miao ancestors, and the Miao ethnic group living in Changning has likewise inherited such experiences. The proximity of war and the unfriendly attitudes of other local ethnic groups made the Changning Miao group more cautious in selecting the site of their village. For security purposes, the Changning Miao exchanged a buffer zone of safety by conceding areas with more privileged natural resources. The Miao, who have just migrated to Changning, have been made to live on the barren, cold, but better-secluded slopes above 2,000 meters in altitude. Here the average annual temperature is below 14°C, and the fields are mostly less productive due to the temperature. Most of them have flourished here, and a few groups have since gradually relocated, through intermarriage and other means, to the vicinity of the river valley, where it is more accessible and more

comfortable in climate. They gathered at the lower altitude of the Dachunshu settlement, forming the distribution of the ten existing natural Miao settlement sites.

6.2 The wisdom of building in harmony with nature

The Miao people of Yunnan Province are known as the "Gaoshan Miao," meaning those who live in the mountains at high altitudes. Mountains have an irreplaceable place in their hearts. A song of the Changning Miao says, "As long as there are green mountains, the Miao family will always thrive." The traditional way of life, production, and spatial construction of the Changning Miao are based on the mountainous environment. The most basic form and essential feature of the settlement space is the family production unit with fields, roads, and buildings as elements, which eventually form a settlement consisting of four elements—mountains, fields, roads, and buildings—in the surrounding mountains. The building wisdom of the Changning Miao ethnic group shows in its ability to make the best use of natural conditions and resources in the face of complex topographical conditions. Under demanding natural conditions, they chose a ridge with a suitable slope and built stepped buildings. At the same time, these buildings are divided into functional zones to create a clean and hygienic production and living space. The security obtained through the concession of space, on the other hand, prevented the Miao families from having to gather together to defend themselves against external forces. As a result, they can cultivate the land around their houses, allowing for maximum labor-saving in a mountainous area. They also use the natural resources of the region's mountainous terrain, raising poultry and livestock and hunting to maximize their resources for survival. In the more than 150 years since they migrated here, the Changning Miao ethnic group has made full use of the area's natural conditions, using their ethnic heritage and building a settlement in harmony with nature.

6.3 Spatial characteristics of Miao cultural identity

The ethnic identity of the Miao is closely linked to the production of space and is centered on the cultural identity of hemp. The Miao in Yunnan refer to hemp as a "medicine primer," and they carry the seeds wherever they go. In one interview, an old man surnamed Yang said the older generation told them that the first thing the gods sent to the Miao was hemp. They believe that hemp is the only thing that can draw them back to their ancestral homeland, and that their ancestors would only recognize them when wearing hemp. In the past, the ability to make hemp and clothes was the most critical factor in evaluation of a Miao woman's ability, and those with excellent skills obtained a higher social status and more respect.

Hemp-growing, hemp-making, garment-making, and embroidery took up most of Miao women's daily productive lives. In the Changning Miao family unit area, hemp is grown in a field close to the house, and hemp-related production activities, such as hemp-making, weaving, and embroidery, are mostly carried out indoors in a semi-open space known as the *matang*. This ethnic identity, with hemp culture at its core, has profoundly influenced the functional design of the Miao settlement in Changning, giving it a unique and identifiable spatial character.

Figure 14: Changning Miao woman weaving hemp in the semi-open space

7. Conclusion

Compared to the spatial characteristics of the Miao settlements in Guizhou Province, the Changning Miao settlements inherited the flexible boundary demarcation and the practice of building on hills based on the principle of orientation toward the sun. The siting and spatial characteristics of the Changning Miao settlements have changed as they have adapted to the local environment and climate of Yunnan Province. Firstly, the water resources brought by the Lancang River and the subtropical monsoon climate allowed these settlements to build without relying on water. The Changning Miao settlements are mainly composed of mountain, field, road, and building elements, centered on the river valley of Daping village, extending outward parallel to the topographic elevation of the mountain range, and located in alpine mountains at an altitude of 2,000–2,300 meters and a slope of 10°–30°. Secondly, the dramatic elevation changes in the Himalayan fold zone accentuate the mountainous character of the settlement. As the buildings in the settlement move up the mountain terrain step by step, the characteristic expression of stepping extends from the terraces (Su, 2018) to the interior of the building space. The first step is a building that retains the function of stilt-style architecture, with the bottom space used to store livestock and the upper floor

generally a semi-open space without doors or windows. The second step is generally a square courtyard. The third step is the principal house building, which mainly houses living rooms and bedrooms. Thirdly, the life wisdom of the Changning Miao ethnic group, which was gradually developed during their migration process based on the principle of safety and moderate space concessions, made it unnecessary for them to live in close clusters to defend themselves and their homes. Compared to the compact, clustered architecture of the Miao villages in Guizhou (Xie & Bao, 2017), Changning Miao settlements are built based on family production units. Each family unit area contains buildings, fields, roads, and all the means of production gathered together to maximize productivity in the mountainous space. The family unit area is based on the axis of the main road. It extends naturally along the contour and the main road, showing a more even scattered distribution, with a slight insignificant clustering toward the main road. The Miao ethnic inhabitants' identification with their own culture is the core factor influencing the spatial characteristics of the Miao settlements in Changning. Their experience transforming nature and living in harmony with it has led to the wisdom of building adapted to the mountainous environment. Based on cultural identity and the unique regional environment, Changning Miao settlements show spatial characteristics that distinguish them from Miao settlements in other areas and other ethnic villages in the same region, which makes them recognizable. Interviews with local people and field research revealed that the Miao settlements in Changning are now beginning to show a tendency to converge on central functional spaces. When building new houses, the Miao tend to swap land with other villagers to build near schools, settlement centers, or other functional spaces for easy access. Due to improved building techniques, new houses no longer need to be built as steps upward. Changes in the way of life and production have led to a gradual change in the spatial demands of the Miao minority in Changning, and their spatial differentiation will gradually adapt. Analyzing the spatial characteristics and commonalities at this stage, and analyzing the reasons for their formation, can provide a theoretical and practical basis for preserving the authenticity of the settlements in the process of their sustainable development and is significant for the conservation of the Miao settlements in Changning.

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