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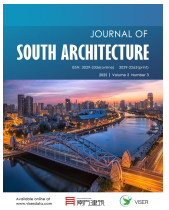

Research on the Evolution of Spatial Forms of Miao and Dong Ethnic Minority Dwellings in Southeastern Guizhou

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ABSTRACT: This study explores the specific manifestations and development trends of spatial form changes in Miao and Dong ethnic minority dwellings in the context of modern times, documenting the structural characteristics of traditional architecture in Southeastern Guizhou. Through field visits to typical Miao and Dong villages in the Qiandongnan Miao and Dong Autonomous Prefecture of Guizhou Province, along with on-site mapping of representative dwellings, as well as literature review, comparative analysis, and synthesis, the study finds that factors such as social development, changes in the natural environment, ethnic integration, technological advancements, and the modernization of lifestyles have triggered the dynamic evolution of the spatial forms of traditional Miao and Dong dwellings. This evolution reflects the adaptation of the Miao and Dong people to their ever-changing living environment and results from the interaction between tradition, multicultural influences, and modern technology. It also signifies the inevitable adaptation of traditional dwellings to the development of modern lifestyles.

KEY WORDS: Southeastern Guizhou; Miao and Dong ethnic groups; traditional dwellings; spatial form; dynamic evolution; development trends

Introduction

Traditional dwellings, as essential living spaces, embody the wisdom of the working people. Across all regions, people have created suitable living spaces by using locally available materials and adapting to the local context, based on their specific living and production needs. Consequently, compared to other architectural spaces, traditional dwellings are notable for their close connection to everyday life and productive activities. In particular, minority ethnic dwellings exhibit distinctive ethnic characteristics shaped by the unique lifestyles, customs, and beliefs of their inhabitants. China is home to a large number of ethnic minority groups, resulting in a rich diversity of minority dwelling forms. These dwellings not only embody unique historical and cultural connotations but also demonstrate significant artistic and technical value, makingthem valuable subjects of research.

With the progression of time and social development, the spatial forms of these dwellings have undergone dynamic changes driven by various factors, including changes in the natural environment, shifts in settlement patterns, and transformations in lifestyles. Our research team conducted field visits to typical Miao and Dong villages in Southeastern Guizhou, carried out on-site surveys of representative dwellings, and performed comparative studies using relevant literature. Through this process, we identified the characteristics of integration and continuous evolution in the Miao and Dong dwellings in this area. Therefore, this paper examines the evolution of these dwellings

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from the perspective of micro-level spatial forms, exploring the driving forces, specific manifestations, and development trends of their evolution within the context of contemporary society.

1 Early characteristics of the spatial forms of Miao and Dong dwellings in Southeastern Guizhou

1.1 Overview of traditional Miao and Dong dwellings in Southeastern Guizhou

The Miao ethnic group in Guizhou Province primarily resides in the Qiandongnan Miao and Dong Autonomous Prefecture in Southeastern Guizhou, with smaller populations in the Qiannan Buyei and Miao Autonomous Prefecture in southern Guizhou, the Qianxinan Buyei and Miao Autonomous Prefecture in Southwestern Guizhou, as well as in Tongren, Wuchuan, Weining, etc. The Dong ethnic group is also mainly concentrated in the Qiandongnan Miao and Dong Autonomous Prefecture. Consequently, the distribution of Miao and Dong dwellings in Guizhou corresponds closely with the settlement patterns of these ethnic groups, with a primary concentration in Southeastern Guizhou and a smaller presence in Southern Guizhou, Southwestern Guizhou, Wuchuan, Weining, and other areas [1]. In Southeastern Guizhou, the Miao and Dong ethnic groups are geographically intertwined (Figure 1), leading to mutual cultural influence, which is reflected in the spatial forms of their dwellings, showing a certain degree of similarity and integration.

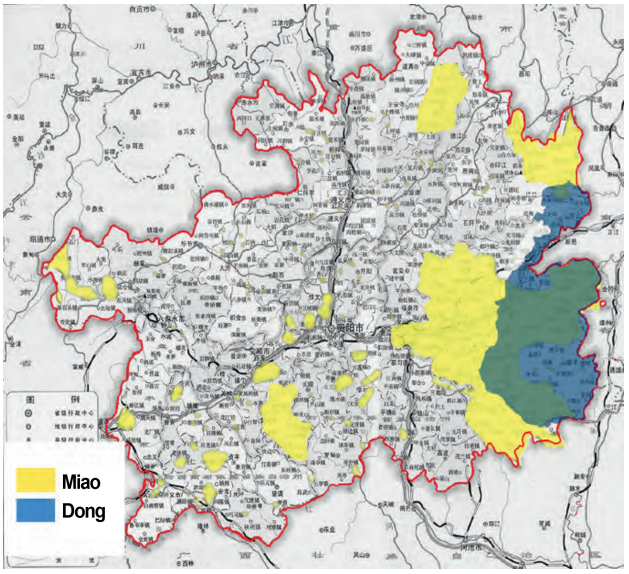


Figure 1 Distribution of Miao and Dongethnic groups in Guizhou Province

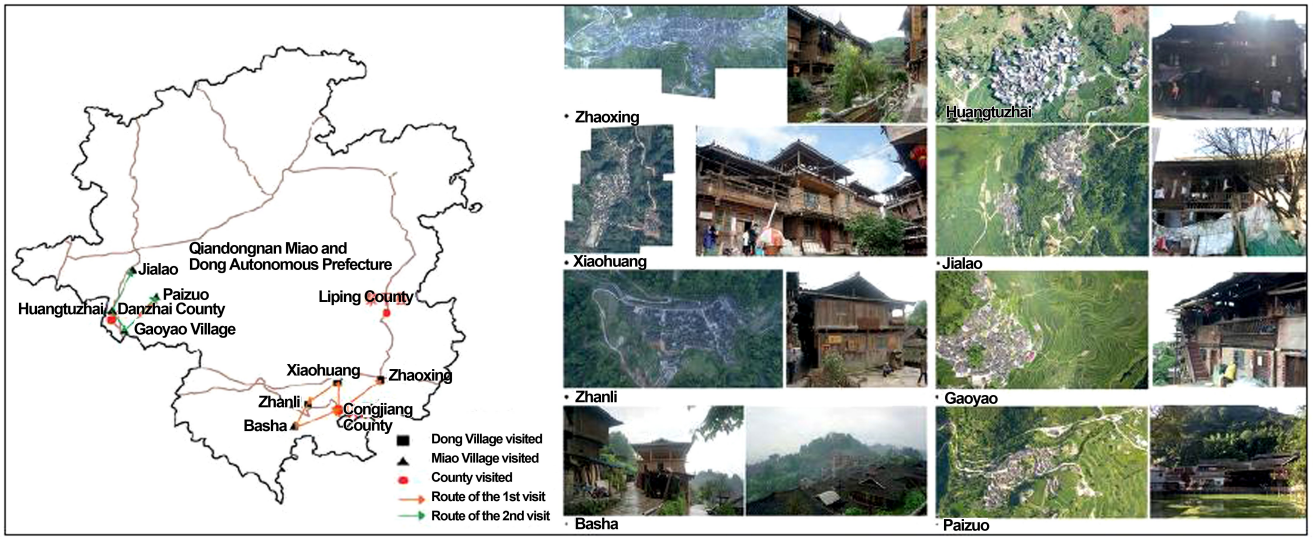


Figure 2 Survey routes and records of Miao and Dong villages and dwellings in Southeastern Guizhou

Our research team conducted field visits in the Qiandongnan Miao and Dong Autonomous Prefecture, focusing on Dong villages such as Zhaoxing Village in Liping County and Xiaohuang Village and Zhanli Village in Congjiang County, as well as Miao villages including Jialao Village, Paizuo Village, Huangtuzhai, and Gaoyao Village in Danzhai County (Figure 2). Through on-site measurements of representative dwellings, we identified numerous common characteristics shared by Miao and Dong dwellings inSoutheastern Guizhou. Additionally, with changes over time and shifts in living and production patterns, these traditional dwellings demonstrate a trend of dynamic evolution in their spatial forms.

1.2 Characteristics of the spatial form of traditional Miao and Dong dwellings in Southeastern Guizhou

Traditional Miao and Dong dwellings in Southeastern Guizhou follow the custom of "clan-based settlement", with villages often situated backing onto mountains and facing water, whether on mountaintops, hillsides, foothills, or flat valley areas. Miao settlements typically exhibit a centripetal structure characterized by "large-scale dispersion and small-scale concentration." For example, as shown in Figure 3, the Basha Miao village comprises five smaller hamlets arranged around Lushengping, the cultural and spiritual center of the community. Small squares are scattered within these hamlets, maintaining a stable social and family order while closely integrating living and production areas [2]. In contrast, Dong settlements are organized around the drum tower, following the traditional *dou* (斗, literally "household clan") units, and likewise feature "large-scale dispersion with small-scale clustering." The drum tower is the unequivocal center of a Dong village, embodying a strong sense of cultural identity and ethnic belonging, while residential and production activities are each concentrated within distinct zones [1] (Figure 4).

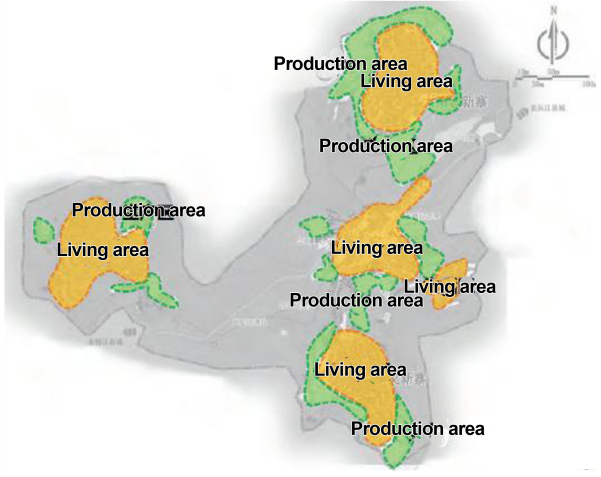


Figure 3 Settlement analysis of Basha Miao village, Southeastern Guizhou

Due to the geographic intermingling of Miao and Dong communities in the region, their traditional dwellings shareremarkable similarities in architectural form. Early Miao and Dong villages, built for defensive purposes, were primarily located in mountainous areas, and their traditional dwellings are predominantly standalone structures shaped by the terrain, preserving the principle of "occupying the sky rather than the ground" [3]. Vertically, both Miao and Dong dwellings typically feature "production spaces at the bottom, living spaces in the middle, and storage spaces in the attic". Horizontally, the bottom and attic floors are arranged flexibly, varying between households. However, the middle living level, as the core of domestic life, follows more consistent organizational patterns, with slight variations between the two ethnic groups. For the Miao, the central hall (堂屋 *tangwu*) serves as the primary space, with bedrooms, the hearth, and the kitchen arranged around it in a linear configuration. For the Dong, the hearth forms the center of the home, with a wide corridor (宽廊, kuanlang) at the front and bedrooms at the rear, creating a "front (wide corridor) - middle (hearth) -back (bedrooms)" spatial sequence [4]. In terms of detailed layout, both Miao and Dong houses feature corridor spaces where children can study and women can weave and socialize. In traditional Miao dwellings, this takes the form of an antechamber (退堂 *tuitang*) directly connected to the central hall. Due to its relatively small size, a porch bench with railing (美人靠, meirenkao) is often added to expand usable space (Figure 5). In Dong dwellings, a spacious wide corridor serves as an intermediary space connecting the hearth area and bedrooms and is one of the key social spaces in the home. When visitors arrive, long tables are set up in the wide corridor for banquets to host guests [5].

Figure 4 Settlement analysis of Zhaoxing Dong village, Southeastern Guizhou

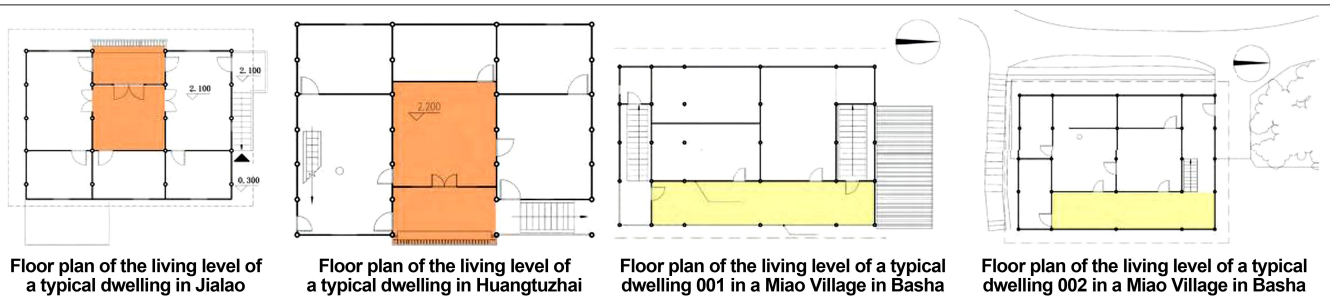


Figure 5 Convergence of spatial functions and layouts in Miao and Dong dwellings in Southeastern Guizhou
(5a/5b: Floor plans of the living level in traditional Miao dwellings; 5c/5d: Converging patterns in modern Miao and Dong dwellings)

In Southeastern Guizhou, the integration and mutual influence between Miao and Dong communities have also resulted in similarities within their residential spaces. For instance, field surveys conducted by our research team on two representative dwellings in Basha Miao village (Figure 5) revealed the lack of typical porch benches with railings and antechambers commonly found in Miao houses. Instead, they featured wide corridors typical of Dong dwellings as the primary intermediary space. This observation suggests that, with the passage of time, factors such as ethnic integration and the modernization of lifestyles have driven the ongoing evolution of traditional residential spaces.

2 Factorsbehind the evolution of Miao and Dong ethnic dwellings in Southeastern Guizhou in the context of modern times

2.1 Changes in thenatural environment

In Southeastern Guizhou, Miao and Dong communities traditionally established their villages near mountains and rivers, surrounded by abundant forest resources. Local timber was the primary building material. However, population growth and increased demand for residential space created tension between construction needs and the gradually diminishing forest resources. Concurrently, government regulations on ecosystem and forest protection, alongside heightened environmental awareness among the populace, led to timber scarcity. Hence, the inhabitants began exploring alternative building materials. With improvements in transportation infrastructure, new materials gradually became accessible for the Miao and Dong people, prompting a gradual and spontaneous evolution in the materials and construction methods of their dwellings.

2.2 Fusion of multiculturalism

Initially, Miao and Dong communities in Southeastern Guizhou lived in separate villages with relative independence and low productivity. With the advancement of the technological revolution and socio-economic development, the two ethnic groups started to engage in mutual interactions. Furthermore, increasing numbers of young people sought employment outside their home regions, leading to greater assimilation of Han culture into Miao and Dong traditions. Over time, this multicultural fusion became progressively apparent in the evolving spatial forms of their dwellings. The integration of traditional Miao and Dong architectural elements with modern residential design features gradually emerged [6].

2.3 Advancements inconstruction techniques

Advancements in construction techniques are primarily marked by the widespread availability of new building materials and the enhancement of modern construction methods. Previously, the Miao and Dong people believed that wooden structures were well-suited to the local climate as they resisted dampness. However, traditional wooden dwellings typically required long construction periods. Today, strict government regulations on timber have led to reduced availability and increased costs. In contrast, alternative materials such as brick, cement, and steel are more readily available, prompting the Miao and Dong communities to creatively integrate them with wood, evolving from purely timber structures to diverse hybrid structural forms. Additionally, improvements in modern construction methods have contributed to these changes. In the past, Miao and Dong villages were relatively isolated, and local craftsmen primarily specialized in wood con-

struction. As younger generations began working outside their villages, they acquired modern construction techniques, which expanded the options available for site planning and residential spatial design. The evolution of Miao and Dong dwellings reflects rational choices made by the inhabitants. Although advancements in construction techniques are not the sole factor driving changes in dwelling spaces, they are undoubtedly a necessary condition for such transformations[7].

2.4 Modernization of lifestyles

The traditional dwellings of the Miao and Dong peoples in Southeastern Guizhou are representative architectural spaces that have progressively formed over time in response to the natural environment. Spatial form serves as the carrier of daily activities, and changes in spatial form signify corresponding shifts in the lifestyles of their inhabitants, mainly manifested in two aspects. On the one hand, the Miao and Dong peoples actively make choices to adapt to modern lifestyles; on the other hand, cultural integration among various ethnic groups, such as the fusion of Han culture and other ethnic cultures, has taken place. The evolution of dwelling spaces enables the Miao and Dong peoples to meet their ever-changing living needs and represents their adaptation to an ever-evolving living environment.

3 Evolution of the spatial forms of Miao and Dong dwellings in Southeastern Guizhou in the context of modern times

Under the combined influence of natural environment, culture, construction technologies, and lifestyles, among others, the contradictions between traditional Miao and Dong dwellings and contemporary living needs have become increasingly apparent. As times change, the growing demands of modern life and the spatial limitations of traditional dwellings have driven the expansion and extension of living spaces. The collision between modern lifestyles and the functional layouts of traditional dwellings have led to a reconfiguration of spatial functions. Meanwhile, the extensive adoption of modernmaterials and construction technologies has facilitated a spiral pattern of evolution in traditional dwellings.

3.1 Growth of spaces

3.1.1 Enhancingland use efficiency: Vertical expansion

Traditional Miao and Dong dwellings are organized vertically as "production spaces at the bottom, living spaces in the middle, and storage spaces in the attic" (Figure 6). With population growth and rising lifestyle demands, the need for residential space has increased significantly. Vertically, these dwellings display two key features: spatial reconfiguration[6] and cantilevered extensions.

Spatial reconfiguration is particularly evident in the attic storage level. Simple wooden frames and planks can be added to subdivide the original attic, using the upper part for storage while converting the lower part into new living spaces. Alternatively, the truss unit configuration of traditional dwellings can be adjusted, and the overall building height increased, effectively dividing the vertical space into two complete floors[8]. Thus, living spaces in future Miao and Dong dwellings may be enlarged by adding extra stories (Figure 6).

Cantilevered extensions appear above the second floor, either projecting from the front and rear facades, the gable ends, or even on all four sides of the structure. These extensions create richly layered and spatially flexible architectural forms[9]. Additionally, the overhanging upper levels form sheltered gray spaces on the ground floor, which can serve as areas for social interaction and recreation. When the stilted ground level is also extended outward, it creates a composite secondary elevated space, thereby securing additional usable space beneath [8] (Figure 7).

3.1.2 Enhancing theflexibility of architectural layouts: Horizontal extension

The development and broad application of modern construction technologies have incrementally overcome the terrain constraints that previously limited the Miao and Dong peoples' traditional building practices. Horizontal expansion of residential dwellings has thus become increasingly feasible, supporting the preservation of the Miao and Dong tradition of clustered housing. This horizontal growth of Miao and Dong dwellings has given rise to new architectural forms, including the "I-shaped," "L-shaped," "Sanhe-style," "Sihe-style," and "row house" patterns (Figure 8).

3.2 Functionalreorganization

3.2.1 Functionaladaptability in modern times: Vertical functional reorganization

Historically, constrained by limited land availability, Miao

and Dong dwellings commonly employed a "people above, livestock below" functional layout, with living quarters situated on upper floors and animal stalls on the ground level. However, as lifestyles evolved—with reductions in livestock rearing, improvements in living standards, and increased concerns about fire safety—auxiliary structures began to be constructed around the main hall to serve as kitchens, livestock pens, and grain storage facilities. Themain hall was primarily reserved for human habitation, thereby establishing a clear "spatial separation between people and animals." Correspondingly, ground-floor functions gradually shifted from predominantly production-oriented uses to residential purposes (Figure 9).

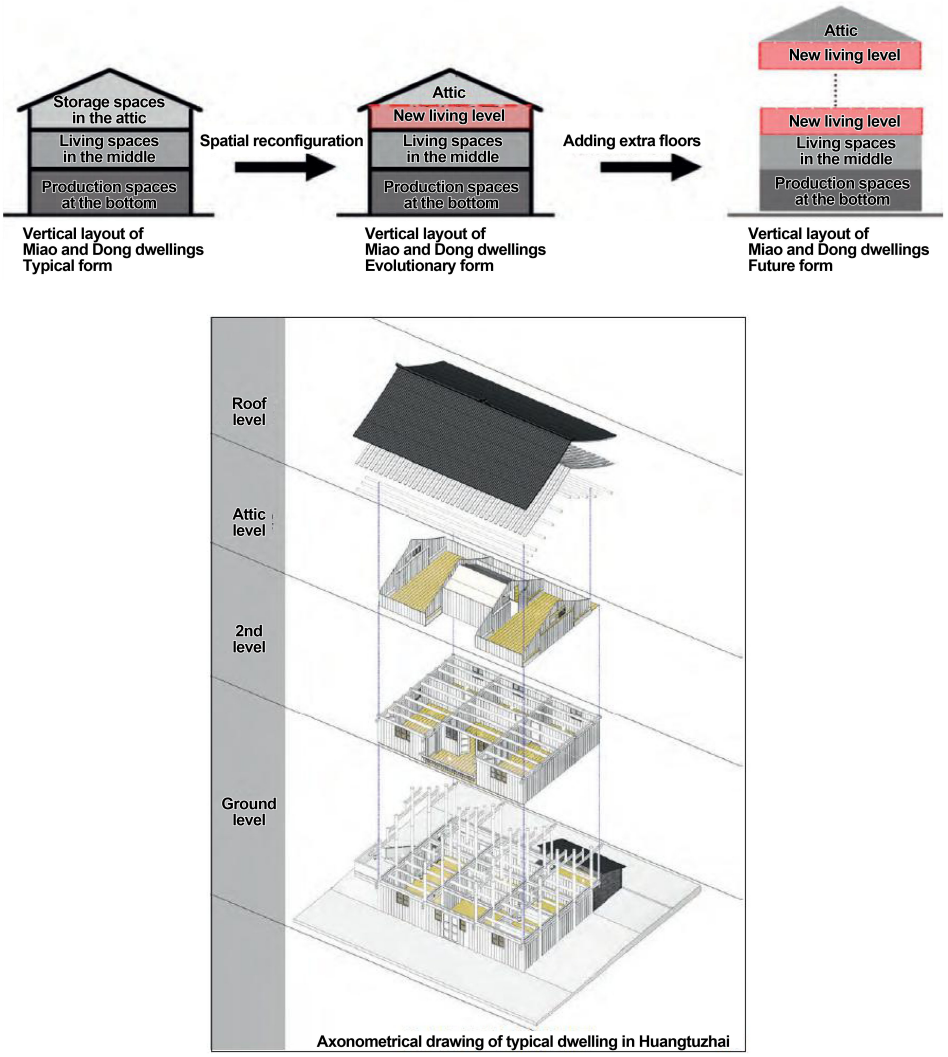


Figure 6 Vertical expansion and evolution of Miao and Dong dwellings in Southeastern Guizhou

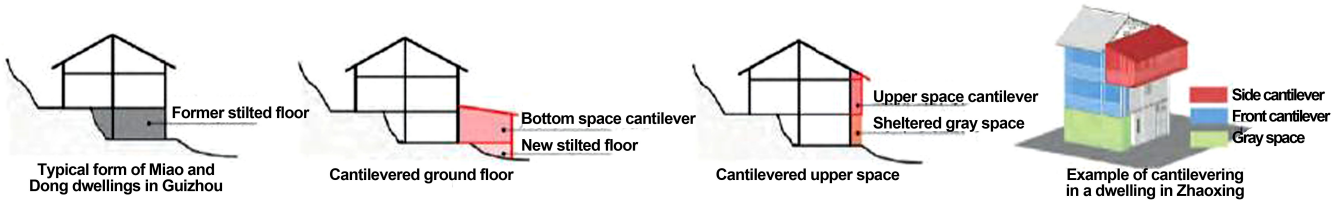
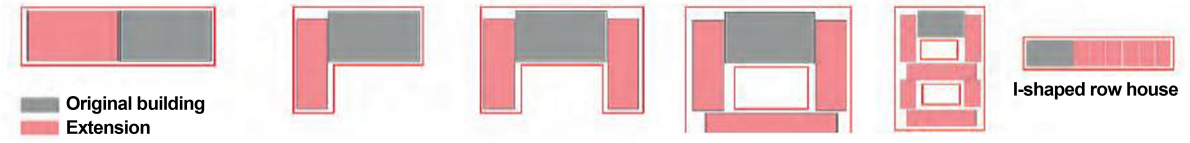
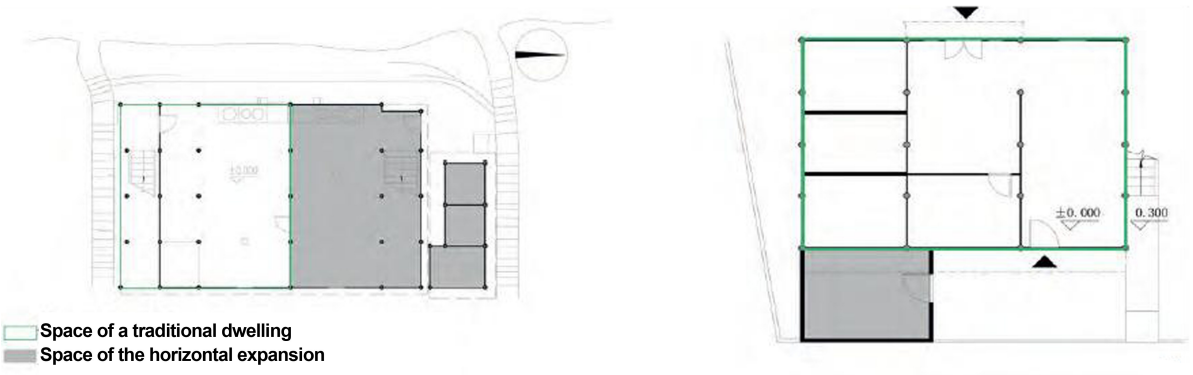


Figure 7 Cantilevered spatial extensions in Miao and Dong dwellings in Southeastern Guizhou



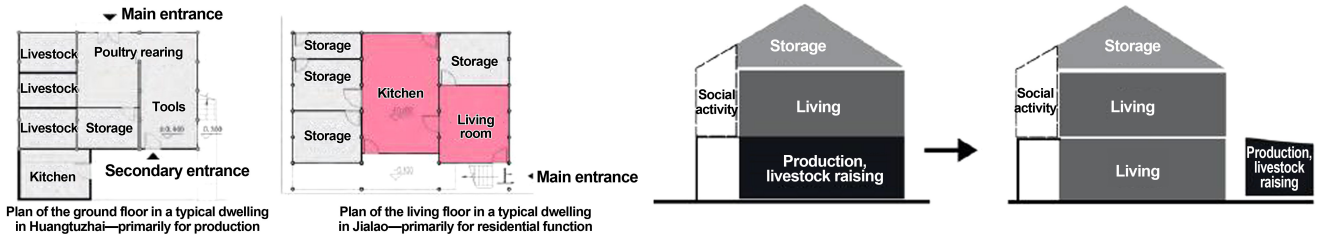
8a Diagram of horizontal expansion trends



Plan of the ground floor in typical dwelling 001 in a Miao village in Basha Plan of the ground floor in a typical dwelling in Huangtuzhai

8b Field measured case of horizontal extension

Figure 8 Horizontal extension of Miao and Dong dwellings in Southeastern Guizhou



Plan of the ground floor in a typical dwelling in Huangtuzhai—primarily for production

Plan of the living floor in a typical dwelling in Jialao—primarily for residential function

Figure 9 Evolution of vertical functional layout in Miao and Dong dwellings in Guizhou

(Left: Measured examples of functional evolution; right: Schematic diagram of functional evolution trends)

3.2.2 Functionalintegration in modern times: Addition and combination of functions on the floor plan

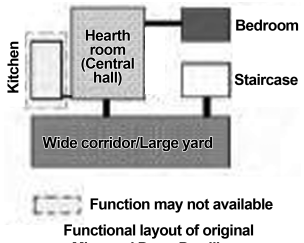
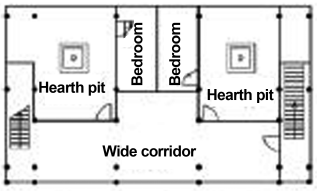
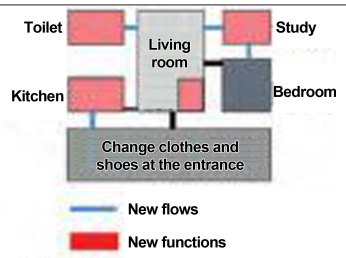
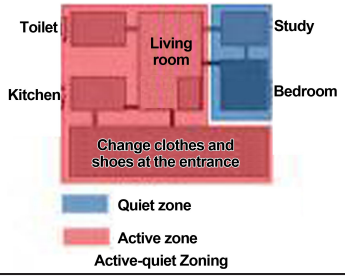
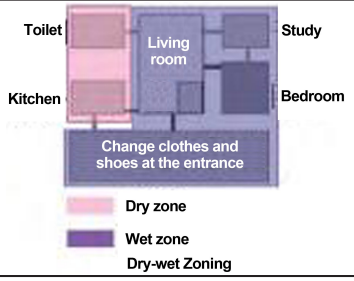
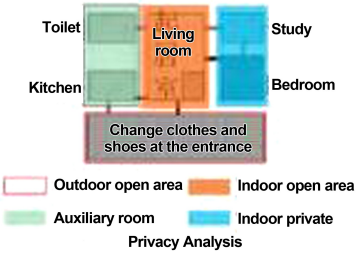
Traditional dwellings often centered around ceremonial spaces such as the central hall and hearth room, which linked bedrooms, kitchens, and other living and production spaces. The floor plan layout reflects the defensive needs of the cold-weapons era. As the Miao and Dong peoples encountered multiple cultures, their lifestyles gradually modernized, leading to changes in dwelling functions. For example, the demand for ceremonial spaces has declined, while practical living needs have increased, including: a growing desire for quiet, private study areas due to the pursuit of education and implementation of local compulsory schooling; shoe and clothing changes at entrances; the shift from traditional river washing to modern sanitary shower rooms; and the popularization of home appliances and the Internet, enriching leisure and entertainment for Miao and Dong people[8].

The traditional central hall and hearth room—core spaces of Miao and Dong dwellings—have disappeared over time, transforming into modern living rooms and kitchens. With wide used electricity, the old open hearth pits in hearth rooms have been replaced by electric heating tables[6]. Furnished with TVs, sofas, and other modern furniture, the hearth rooms now function as living rooms, closely resembling those in contemporary urban homes. Cooking is now conducted in separate kitchen areas, effectively reducing smoke damage to walls, greatly enhancing indoor comfort, and lowering fire risk.

Circulation flow has been optimized. Traditionally, Miao and Dong dwellings were arranged linearly due to defensive concerns, resulting in a sequential organization of interior spaces. However, this linear layout presents various inconveniences for modern living and increases interference between rooms. Therefore, future spatial organi-

zation of Miao and Dong dwellings could integrate modern residential concepts such as separation of active and quiet zones, dry and wet areas, and centralized horizontal and vertical circulation utilizing shared spaces (Table 1).

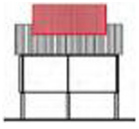
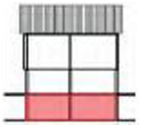
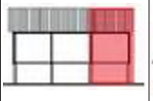
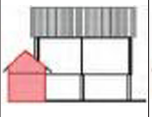
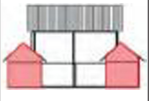
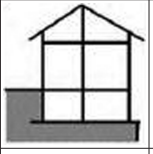
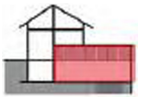
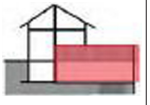
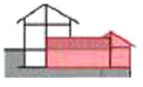
Table 1 Patterns and analysis of the evolution of functions on the floor plan in Miao and Dong Dwellings in Southeastern Guizhou

Functional layout of traditional dwellings—schematic diagram	Representative case	Derivative pattern
 Functional layout of original Miao and Dong Dwellings	 Pan Yun'an's residence in Tang'an Village, Liping County, Zhaoxing Town, Guizhou	 Layout of derivative functions on the floor plan
	Analysis of derivative patterns	
 Active-quiet Zoning	 Dry-wet Zoning	 Privacy Analysis

3.3 Evolution ofform

The expansion and growth of dwellings have broken the singular, standalone form traditionally characteristic of Miao and Dong houses. Different methods of vertical and horizontal extension of dwellings have produced diverse spatial hierarchies (Table 2). The fusion of ethnic cultures has prompted the Miao and Dong tomove beyond strict adherence to traditional architectural styles. Instead, they have incorporated modern elements or blended styles from other ethnic groups, resulting in overlapping architectural forms. At the detailed architectural level, modern materials such as aluminum alloy windows and contemporary railings have been introduced. In Miao dwellings, the "porch bench with railing" evolved from an open to a closed form, while Dong dwellings, which previously lacked this feature, have started to adopt it. These developments illustrate that, under globalization and modernization, cultural fusion has caused collision and blending in dwelling spatial forms, spontaneously generating new architectural typologies.

Table 2 Schematic diagram of the form evolution of Miao and Dong Dwellings in Guizhou

	Original	Vertical expansion			Horizontal expansion			
Front facade								
Side facade								
Method	Pile-supported style	Add middle floor	Add roof top floor	Second round of cantilevering	Modular linear expansion	L-shaped	Sanhe-style	Sihe-style
Remarks	Three-part facade	Expansion by adding, only local modifications relative to the original			Modular expansion	Featuring a side wing with a clear main-and-secondary hierarchy. Spatial form similar to traditional Han dwellings.		

3.4 Optimization of space

3.4.1 Material optimization and structural hybridization

Traditional Miao and Dong dwellings, located in mountainous areas rich in forest resources, are predominantly built with timber, which serves both structural and enclosing functions. With economic development and enhanced transportation, broader external contact has fostered the emergence of mixed construction techniques in these dwellings, such as "clay-brick ground level with wooden superstructures" and "reinforced-concrete foundations topped by traditional wooden structures" (Figure 10). Situated in humid mountain climates, Miao and Dong dwellings often use brick or concrete plinths to provide moisture protection, promoting structural stability and prolonging building lifespan [6]. Furthermore, modern aluminum alloy doors and windows are now gradually employed to elevate indoor comfort. This trend of hybrid material application offers practicality, durability, and cost efficiency. As a trend, the use of mixed materials make the engineering practical and cost-efficient, and the structure solid.

Figure 10 Example of newly built Miao and Dong Dwellings in Southeaster Guizhou

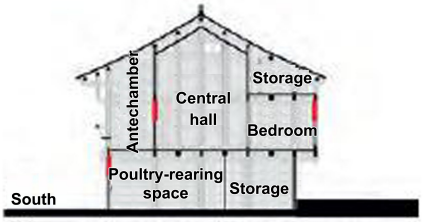
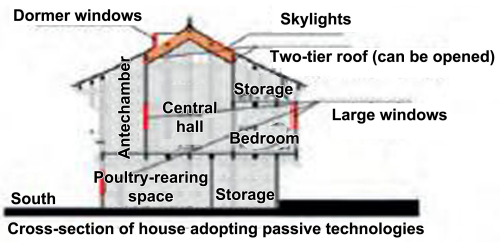
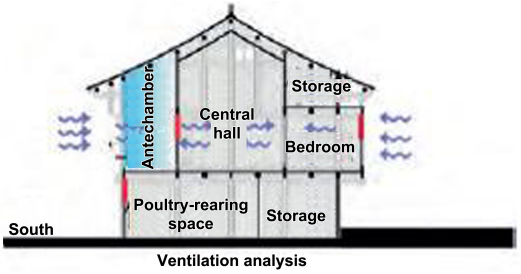
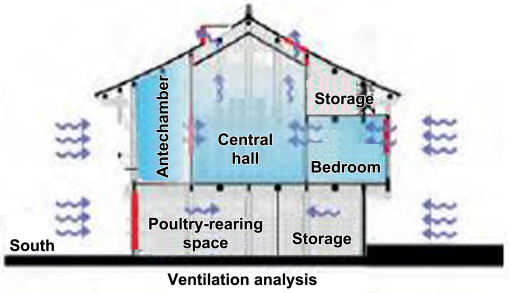
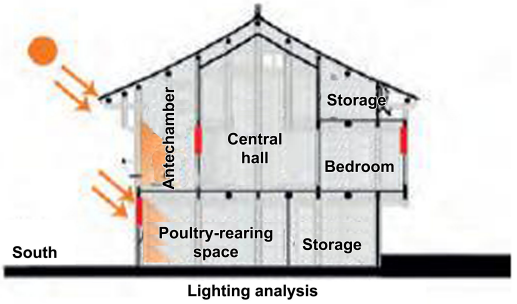
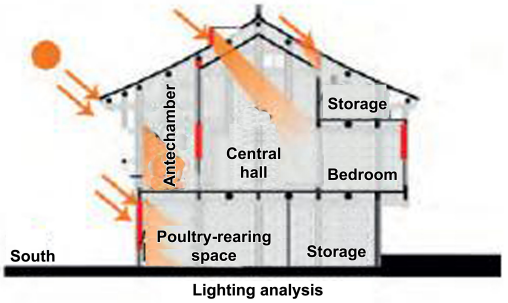
3.4.2 Application of technology

Traditional Miao and Dong dwellings have evolved over centuries to adapt to their natural environment and the lifestyles of their inhabitants. They incorporate considerable traditional green and energy-saving wisdom. Locally sourced wood and stone are used as construction materials, minimizing ecological impact; the design principle of "occupying the sky rather than the ground" conserves land through vertical layout; modular construction integrates structural works and finishing; raised floors boost ventilation, while deeply extended roof eaves provide effective shading.

Although passive sustainable strategies in Miao and Dong dwellings are relatively well developed, there remains significant potential for improvement, particularly in indoor lighting and thermal conditions (Table 3). Traditional Miao and Dong dwellings, built for defensive purposes, feature small windows that limit natural light penetration. Nowadays, with more stable and settled lifestyles, Miao and Dong households require better indoor lighting for reading, studying, and leisure activities. This can be achieved by enlarging façade windows and installing skylights, high side windows, or dormer windows to increase daylight access, as well as adding artificial lighting fixtures.

Regarding indoor thermal comfort for their dwellings, two aspects require enhancement, namely smoke ventilation and heating. The traditional hearth room contained a firepit burning charcoal or wood for heating, which lacked proper smoke ventilation, resulting in soot-blackened interior walls and reduced indoor comfort. Modern heating solutions rely on electricity, such as electric heating tables and space heaters, which are cleaner and more convenient. Cooking is confined to separate kitchens, often located in a side wing, equipped with exhaust ducts to safely remove smoke and fumes, thereby improving safety and hygiene.

Table 3 Comparative study of daylighting and ventilation between traditional Miao and Dong dwellings and passive-technology dwellings (using surveyed houses in Huangtuzhai as an example)

	Cross-section of traditional Miao and Dong Dwellings	Cross-section of derivative pattern
Green technology	 Cross-section of a dwelling in Basha Miao village, Guizhou	 Cross-section of house adopting passive technologies
Ventilation analysis	 Ventilation analysis	 Ventilation analysis
Lighting analysis	 Lighting analysis	 Lighting analysis

Conclusion

The spatial evolution of Miao and Dong dwellings inSoutheastern Guizhou is an inevitable outcome driven by the development of the times, changes in the natural environment, multicultural interactions, advancements in construction technology, and the modernization of lifestyles. The evolving spatiotemporal factors and enduring traditional elements constitutes two key forces that propel ethnic cultural continuity and social progress. This dynamic illustrates the adaptability of tradition to modernity, the integration of diverse ethnic cultures, and embodies profound cultural significance [10].

Over time, all phenomena—whether resulting from spontaneous or imposed changes—follow a dynamic path ofdevelopment. The spatial forms, construction techniques, and building materials of traditional architecture are continuously reshaped through cycles of transformation, variation, and assimilation, thereby maintaining their unique cultural identities and distinctions. Nevertheless, it is essential to acknowledge that although this spiral evolution is natural and unavoidable, if left uncontrolled, the distinctive ethnic and regional features of these dwellings may be severely diminished, leading to a homogenization commonly described as "thousand houses with one face." Such a trend would inflict irreversible damage on the preservation and development of traditional dwellings. Accordingly, scholars studying traditional dwellings should promptly document the evolutionary trajectory of ethnic architectural culture and explore design methodologies that balance the preservation of ethnic distinctiveness with the accommodation of contemporary living requirements. The aim is to safeguard the uniqueness of traditional dwellings while proposing pragmatic and well-considered strategies for adaptive renewal, thereby ensuring their sus-

tainable, healthy development.

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Sources of figures and tables

Figure 1: Redrawn by the authors based on the Fifth National Population Census and Huang Yunhuan's *Distribution Map of Ethnic Groups in Guizhou Province*;

Figures 2-5, 8 & 9: Measured and drawn by the authors and the research team;

Figures 6 & 7: Redrawn by the authors based on Gao Pei's *Study on the renovation of spatial combination model for traditional housing of xijiang miao village in Guizhou* [C], Proceedings of the Academic Annual Conference of the National Architecture Institute Of China. 2015;

Figure 10: Photographed by the authors and the research team; Tables 1-3: Created by the authors.

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