

Spatial Evolution of Rural Built Heritage Guided by the Construction of Cultural Routes

--A Case Study of Dongshiguyan Village in Beijing

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Abstract

Rural built heritage has time properties and spatial attributes as a carrier of historical memory and local culture. The evolution process has been continuously integrating rural life, production, and ecology elements, forming a built heritage system with inherent structure and organization. In recent years, "cultural routes", as one of the important turns in heritage conservation, advocates interpreting the association and integration of heritage elements from a multidimensional environmental perspective. By constructing cultural routes, the village clusters, neighbor landscape environments, transportation corridors, and cultural imprints become an organic system. On the one hand, it facilitates the classification and organization of spatial elements of village heritage under the goal-oriented approach; on the other hand, it strengthens the outreach effect of villages in order to realize the cultural linkage, economic symbiosis, and social integration of the area, which contributes to the holistic conservation and integrated development of heritage. The traditional Chinese village, Dongshiguyan Village, is located in the "the Western Hill-Yongding River Cultural Belt" on the North Road of Xishan Avenue (the Jingxi Trail, near the JingMen Railway and National Highway 109). It is a typical "place node" along with the "flow space". The interaction between cultural routes and the village in different periods is examined through literature, interviews, field surveys, and archival analysis. Furthermore, the symbolic intentions and spatial roles of their spatial elements are summarized. Finally, the spatial evolution characteristics of the built heritage of villages under the guidance of cultural routes are suggested to support heritage conservation and development.

Keywords

the cultural route, built heritage, Dongshiguyan Village, Jingxi Trail, spatial evolution

1. Introduction

The concept of "Cultural Routes" was emerged in the 1960s through the collaboration between ICOMOS, UNESCO, and the Council of Europe to explore the integration and valorization of cultural heritage across regions (Durusoy, 2014). In 2008, the ICOMOS Charter on Cultural Routes was considered and adopted by the 16th ICOMOS General Assembly. According to the Charter, the "cultural route" exists based on a specific route of exchange, which may be "land, water or other types" with clear boundaries. It mainly serves a particular purpose of cultural exchange or trade of products, with a long time forming a tradition and a cross-cultural or even cross-civilizational link across a vast geographical space (ICOMOS, 2008). Furthermore, it emphasizes that the independent cultural heritage needs to evaluate its relative value, emphasize the interactive, dynamic, and evolving relations among human cultures, and focus on culture's integrity (Ding, 2009).



Figure 1 Based on CiteSpace knowledge in the literature of cultural routes, the Keyword co-occurrence of villages (Source: author's drawing)

At the beginning of the 21st century, Chinese scholars introduced "cultural routes" into China (Yu, 2015). The core features of the cultural route formed by transportation, such as trans-regional, time continuation, spatial interaction, and systematism, make it essential to protect and develop the traditional villages and rural revitalization (see Figure 1). At present, most of the relevant domestic studies start from the "line" and take multiple villages as "points", which alongside the line as the carrier to make the combinational village types or judge the overall development vision and direction (Wang, 2015; Chen, 2019). However, the analysis of cultural routes is inadequate, especially the continuous influence of the change of routes on villages in a long period is less interpreted. For traditional villages with spatial and chronological attributes, the development and adaptation of routes in different periods support or impact the survival of villages, and the spatial evolution of villages thus presents specific developmental characteristics.

This paper takes Dongshiguyan Village alongside the Xishan Avenue in the Jingxi Trail as the research object, excavating the village's changes in the village and cultural route system from three aspects: social culture, industry, and spatial form (Chen et al., 2020). It summarizes the spatial evolution characteristics of the village and provides technical support for the subsequent conservation and development. At the same time, it is expected to update the values of heritage conservation and focus on the holistic and systematic nature of the built heritage of villages.

1.1. Overview of the route

Influenced by geological changes, the Guanting Mountain Gorge (also known as "Yongding River Gorge") became essential for access to the Western Mountain region. The records showed that the construction of the Jingxi Trail along this area started before the North and South Dynasties (Pan & Guo, 2016). After the Liao Dynasty, the western part of Beijing became a vital supply base for coal in the capital. Then with the transportation of coal and goods and passengers, the present Jingxi Trail was gradually formed (Lu, 2019). Continuing into the late Qing Dynasty, the ancient road in the west of Beijing has been undertaking essential transportation tasks: communicating with Shanxi and Inner Mongolia plateau externally; carrying out the functions of internal and external transportation; exchanging of goods and products; supporting religious activities and military defence in Beijing internally, where it is arching the east plain of Beijing (Lu, 2019).

The "Xishan Avenue" was the main route of the Jingxi Trail, where several vertical and horizontal branches connecting from north to south. Most of the coal and dried fruits produced in western Beijing were transported out of the mountains through this road. In contrast, the daily necessities of the capital were transported into the mountains from here; hence, the trade and transportation functions were evident (Que & Song, 2012).

1.2. Overview of the village

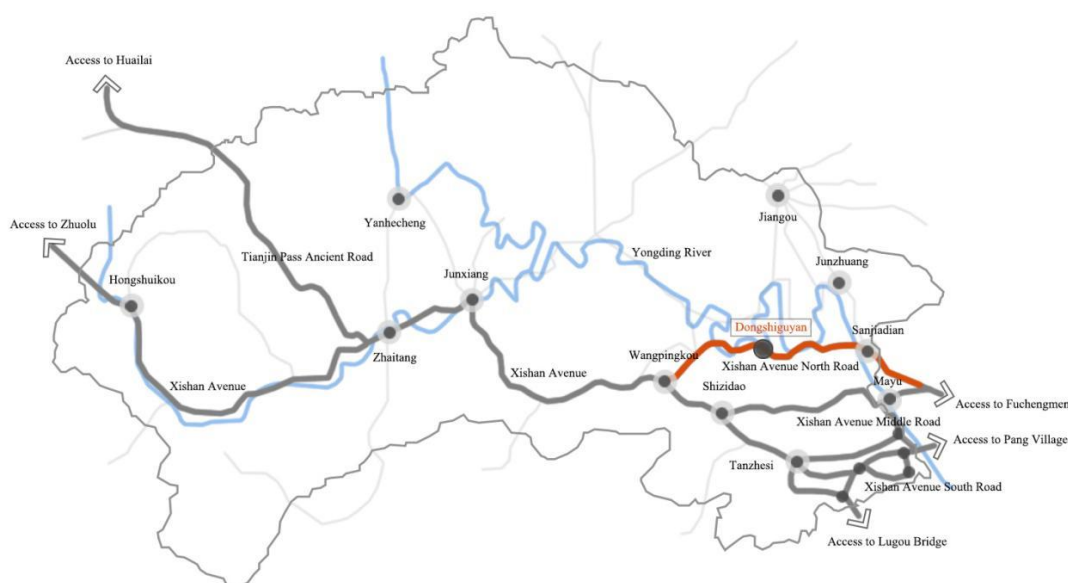


Figure 2 Location of Dongshiguyan Village on the Jingxi Trail (Source: adapted from Que & Song, 2012)

Dongshiguyan Village is located in the eastern part of Wangping Town, Mentougou District, Beijing. It is historically known as "Shikuya" and "Shiguya", also known as "Zhangjiadian". The village is crossed by the North Road of "Xishan Avenue" in the Jingxi Trail, as shown in Figures 2 and 3 (Digital Museum of Chinese Traditional Villages, <http://main.dmctv.com.cn/villages/11010900501/Index.html>). The village was formed in the Ming Dynasty, and it is recorded in the Ming "Wan Department Miscellaneous Records": "Shiku Mountain, 90 miles west of the county. The mountain faces the river, and the wall is a thousand feet, a path up, only a step, the most dangerous obstacle looking down on the river. There is a grotto, the name of the Bonjour Hall". It is also said that "the county is directly west of and five miles said MaGeZhuang and five miles said stone bone cliff and eight miles said WangPing village" (Shen, 1961), that is, the village began to exist based. The geographical pattern of the northeast facing the Yongding River and the west leaning on the Shifo Mountain laid the preliminary foundation for village farming. The village was built on the mountain's west slope, unfolding in a group shape along the ancient road. The residential buildings were mainly constructed according to the direction of the hill.



Figure 3 Location relationship between Dongshiguyan Village and the surrounding routes

(Source: Self-drawn by the author, self-photographed by the author)

2. History of the village

According to the field survey and literature, Dongshiguyan Village was formed because of Xishan Avenue, which emerged in Ming and flourished in Qing. Its evolution could be divided into four stages: village formation, development, decline, and reconstruction (see Figure 4). In the village formation stage, the spatial organization was relatively simple and strongly dependent on the ancient road. After entering the development stage, the new courtyards were mainly clustered on both sides of the ancient road. With the decline stage, the spatial form aggregation was weakened and developed to the peripheral weaving type. Finally, entering the reconstruction stage, environmental factors that influenced the space begins to appear, and more attention is paid to extensibility.

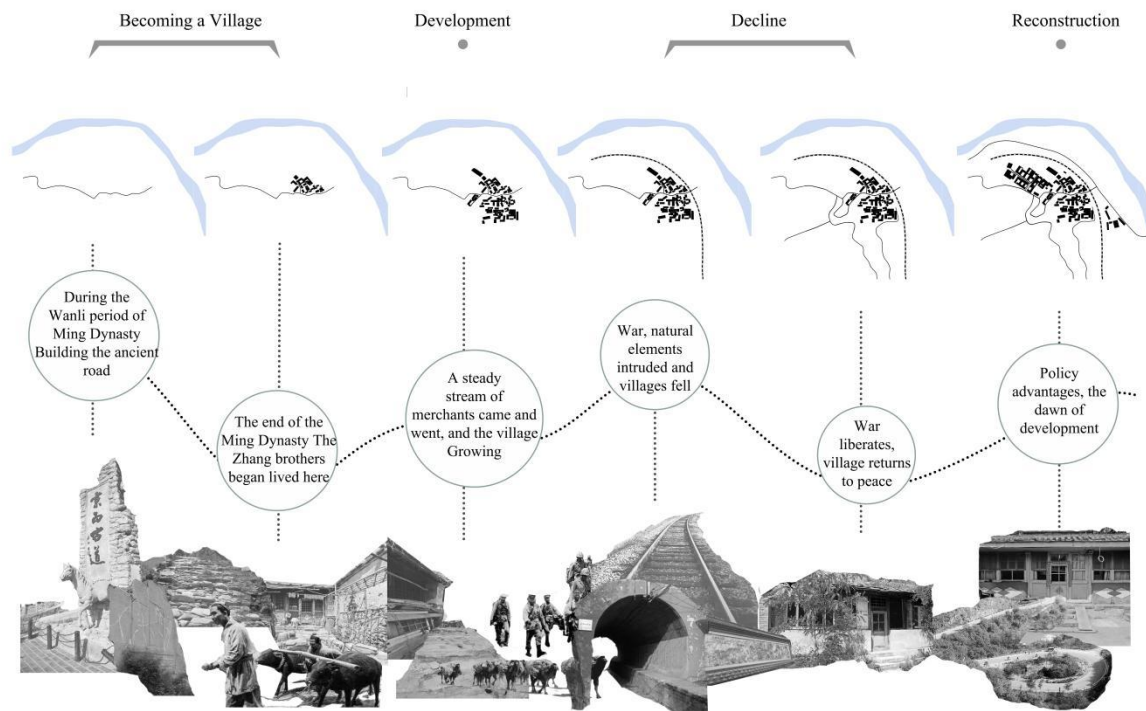


Figure 4 Evolution of village history and spatial form (Source: Author's drawing)

2.1. Becoming a village

During the Yuan Dynasty, the western part of Beijing became an essential base for supplying building materials and energy to the capital with its high-quality coal and timber resources. The development of the surrounding area flourished accordingly (Sun, 2018). Later, with the increase in the amount of coal used in the capital and the incessant demand of goods merchants, the interlocking development of the Jingxi Trail was further promoted, and the Guanshan Road, which was quite large in scale, was formed (Que & Song, 2012). However, the ancient people traveled only a hundred miles a day, and the food supplies on the road constituted an opportunity to develop a nascent culture, paving the way to create villages. Later, during the day-to-day transportation of goods, the population continued to gather, a variety of service-oriented spaces were formed along the way, and the development of trade and commerce culture flourished (Yin, 2001). Eventually, in the late Ming Dynasty, two brothers with the surname of Zhang came to settle here, and trade and farming culture developed in parallel, and the village Beidian space were then spawned, marking the formation of Dongshiguyan Village. As can be seen, the spatial form of the village at this time was based on the parallel development of many aspects of people's lives, commerce, and farming culture.

2.2 Development

With the merchants coming and going through the ancient roads, the trade culture of Dongshiguyan Village became increasingly prominent. The village development entered an intense period. Spatially, the village expanded southward across the ancient road, forming the Nandian parallel to the Beidian and further extending to the periphery in the form of social interactions such as folk marriages and gatherings.

Accordingly, "Zhangjiadian" was given a spatial and geographic meaning far beyond its single one and became the spiritual support of the surrounding area.

2.3 Decline

After experiencing the rapid development brought about by the location advantage of the ancient road, the village tended to function in a stereotyped way. Due to the geographical location, it was not easy to be affected by the external environment in the industrialization era; thus, the village development declined (Sun & Zhai, 2020). At the beginning of the twentieth century, the state organized the construction of the Jingmen Railway, and Dongshiguyan Village, along its branch line, the Menzhai Railway, was significantly affected in terms of spatial form and industry. On the one hand, the railroad spatially blocked the connection between the village and the outside world, reinforcing the village's closedness, leaving only a culvert as a channel for internal and external communication. On the other hand, the demand for labor and food during the railroad construction promoted the industrial development of Dongshiguyan village, and coal transportation became the daily life of the villagers after its completion. The state of semi-agriculture and semi-labor was maintained until around the 1930s. After that, wars and floods broke out one after another, and the village was seriously disturbed. The everyday life and production of villagers came to a halt, resulting in profound population loss in the village.

2.4 Reconstruction

At the end of the twentieth century, the country developed, and the inter-regional connection network was gradually built. The construction of National Highway 109 became an important channel to connect Dongshiguyan Village with the outside world. Meanwhile, after entering the twenty-first century, the rich culture in traditional villages has been brought to the public's attention, and the national policy strongly supports its development and protection. The busy daily work and short holidays have made suburban tourism attractive to the public, and the villages have ushered in a new development period. Dongshiguyan Village has been selected as one of the fourth batches of "Chinese Traditional Villages" because of its many monuments and has become a fundamental object of protection and development.

In addition, the new National Highway 109 expressway currently under construction is scheduled to open in 2023, crossing the Mentougou District from east to west. And it is becoming the first expressway connecting the western part of Beijing with Hebei Province. More convenient transportation services and diverse cultural intermingling will bring a new driving force for changing "cultural routes".

Table 1 Stages of village evolution in Dongshiguyan Village (Source of the chart: compiled by the author)

Evolutionary Process	Evolutionary Dynamics	Stage characteristics
Village Formation	The demand of the Jingxi Trail for passenger and merchant exchanges	The social network is single, and the spatial composition is relatively simple.
Development	Further development of the Jingxi Trail, social interactions between	The social network is gradually complex, and the spatial function tends to be complete.

	villages	
Decline	The construction of the Menzhai Railway, war, and the impact of natural factors	Transformation of transportation means reduces the relevance to the village, and spatial development is limited.
Reconfiguration	The construction of National Highway 109 and the new situation of village development	The emergence of new ways to connect externally and the continued strengthening of external concerns

3. Interaction of cultural routes and village space

Historically, Dongshiguyan village was developed by the ancient road and complemented the Jingxi Trail. On the one hand, as the ancient route along the "point" to undertake the "line" of supply function, together constitute the culture route. On the other hand, it continuously integrates the village's living, production, and ecological elements. It organically connects with other routers in the vicinity to build a daily life culture of continuous development, which gradually grows in the endogenous externalization. In short, the development and change of the cultural routes promote the generation of the village's inner structure and organizational relationship. At the same time, it also supports the life base of the village and constitutes the essential support for the continuous development of the village forward.

Table 2 Support and impact of the line on village development in terms of culture, industry, and space
(Source of the chart: compiled by the author)

Category	Routes	Representational Imagery	Spatial bearing elements	Impact on the village
Culture	Jingxi Trail	Commercial Culture	Nandian, Beidian, the ancient road remaining in the village	The base core of village development, giving rise to village culture
	Menzhai Railway	Coal Memory	The Menzhai railway line passing around the village and the surrounding lookout space	The continuous renewal of village culture
	National Highway 109	Tourism Culture	Historic resources such as cliff carvings, Nandian and Beidian	The continuous renewal of village culture
Industry	Jingxi Trail	Commercial Dining	Historic resources such as ancient stone mills, Nandian and Beiji Roads	Support the formation and development of villages
	Menzhai Railway	Coal Industry	The Menzhai railway line passing around the village	Bringing a glimmer of life to the village in the trough

	National Highway 109	Tourism Industry	Historic resources such as cliff carvings, Nandian and Beidian	New development in a new era
Space	Jingxi Trail	Centripetal Pattern	Ancient roads and flood ditches surviving in the Nandian, the Beidian, and the village	Forming the base pattern of village development
	Menzhai Railway	Railroad Landscape	Menzhai railway line and culvert at the entrance of the village	Limit the development of village space while forming a unique railroad landscape
	National Highway 109	External Connections	Village entrance culvert	Expanding village space

3.1 Cultural intermingling: externalization and endogenization, close connection

Culture is the base of the formation and development of the village. As a carrier of the built heritage of the village, Dongshiguyan Village has continuously absorbed and internalized the newborn culture during the route changes and incorporated it into its development system, presenting a solid connection and vividly demonstrating the diversity and inclusiveness of the national culture (Lin et al., 2020).

The village in its infancy was dominated by the trade function of the Jingxi Trail, which was a component of the line's post station function. It continued to develop until its heyday when the trade culture of the Jingxi Trail formed the spiritual support of the village, and the commercial space represented by Nandian and Beidian formed the main body of the village. Later, influenced by transportation changes, coal transportation entered the railroad period, the ancient road gradually faded out of people's view. Furthermore, the village depended on railroad development, and villagers mostly made their living from coal, engaged in coal transportation, or engaged in railroad workers' catering service. In contrast to the villages of the ancient road period, the commercial space in the village gradually declined, and the space construction centred on the ancient road began to extend outward. Finally, during village tourism development supported by 109 National Road, new transportation methods strengthened the connection between the village and the outside world. Due to the continued attention of national policies on rural heritage, the village development gained a new life, continuously integrating its tourism resources and integrating into the regional tourism development with "points", attracting many tourists' attention.

Compared with other villages influenced by a single factor, the village culture of Dongshiguyan Village presents a positive characteristic. Under the stimulation of various external agents, it is natural to avoid harm and give positive feedback. In turn, the externalized and endogenous cultural intermingling is realized, forming a close interaction and supporting the development of the village.

3.2 Industrial change: multi-level, multi-faceted, and interdependent

If "culture" is the core, "industry" is the inexhaustible power of village development. In addition to the primary industries, mainly agriculture, the cultural routes, which have been performing specific functions for a long time, have given rise to various industries due to the traffic demand. They have contributed to the prosperity of the villages along the routes. Since the beginning, Dongshiguyan Village has been started as an agricultural and commercial village. During its development, multiple industries have emerged, presenting a multi-level, multi-faceted, and interdependent industrial development system with the corresponding elements as carriers.

Historically, the industrial development of Dongshiguyan Village is divided into three stages, namely, commercial catering, coal industry, and tourism industry. The three correspond to the Jingxi Trail, the Menzai Railway, and the 109 National Road, respectively, which reflect the assertive outreach and dependence of the village's industrial development. The commercial and catering industry in the period of the Jingxi Trail, with the ancient road, the Nandian, and the Beidian as carriers, developed by relying on the passenger traffic of the Jingxi Trail, and the present elements still exist, and present the humanistic memory of "Zhangjiadian". The coal industry is dependent on the construction of the Menzhai Railway, and the villagers make a living by half-farming and half-labour, supporting the development of the village. At the end of the twentieth century, Beijing suburbs tourism is prevalent, relying on the 109 national highway Dongshi ancient rock for "cliff stone carvings", "horseshoe nest", and so on into the people's view.

Later on, with the construction of the new highway 109 and the development of the whole area tourism under the sub-district planning of Mentougou, the village tourism industry will continue to strengthen and usher in another climax of village development.

3.3 Spatial penetration: old and new are the same structure, weaving, and interoperability

The influence of cultural routes on villages is internalized and externalized during the long development process. The spatial pattern is constantly adjusted according to the changing needs of the time, either in terms of function or form, showing the characteristics of new and old isomorphism and interweaving (Figure 5), among which the influence of the Jingxi Trail on the village space is the most significant.

Under the influence of the trade culture dominated by the Jingxi Trail, the village is divided into north and south, with the ancient road as the axis, and a flood relief ditch on the south side (shown in Figure 6), which is a historical relic. Due to the influence of the mountainous terrain, the village, while maintaining a large contact surface with the ancient road as far as possible, has a doughnut shape and develops in a direction perpendicular to the ancient route to facilitate the development of the village by serving the ancient road. Most of the small streets and alleys are perpendicular to the ancient road and communicate with each family and courtyard. The residential buildings in the village are distributed with primary and secondary road networks. The two sides of the ancient road and the part near the ancient road are mainly open to the ancient road. And the courtyard farther away from the ancient road is more built according to the terrain, following the topography. The historical buildings "Beidian" and "Nandian" still exist today are located on both sides of the ancient road and open to the ancient road. In addition, the village's main access points, daily gathering spaces, and squares are all located along the ancient road.

In general, the village space relying on the ancient road shows a particular centripetal nature, and the ancient road is the core and foundation of the village development.

The Menzhai Railway passes around Dongshiguyan Village, showing an encircling relationship with the village. As far as the development of the village is concerned, the Menzhai Railway hinders the possibility of the eastward expansion of Dongshiguyan Village, so that the subsequent construction of the village is mainly located on the west side of the railway line. And due to the elevated railroad, the flat ground through the railroad needs to pass through the culvert, which also caused less village entrance and exit. However, the railway line passing through the village has created a fantastic railroad landscape for the village while hindering the development of the village, especially in the open area such as the old road. As the intersection of the railroad and the ancient road, the culvert has become a place of daily communication. And it has been given a specific symbolic meaning. 109 national road runs parallel to the Menzhai railroad in the area of Dongshiguyan village, which is located east of the railroad and is not connected to the village sightline and can be reached by the culvert. Therefore, its impact on the spatial layout of the village is small, and it is only used as an external connection.

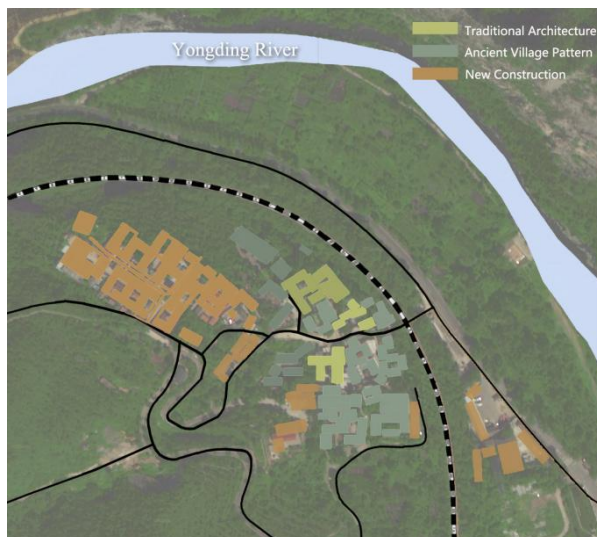


Figure 5 The spatial layout of the old and new intertwined (Source: Self-drawn by the author)



Figure 6 Southside of the ancient road flood relief ditch (Source: Author's photo)

4. Spatial evolution characteristics of Dongshiguyan village under the guidance of cultural routes construction

By collating the history of the village, understanding the interactive influence of the cultural routes and the village, and referring to the recorded history of the village, it is concluded that the spatial evolution of Dongshiguyan Village under the guidance of the construction of the cultural routes is characterized by the following development.

4.1 Gathering spatial pattern under the route orientation

As a direct factor in the formation and development of Dongshiguyan Village, the trade culture of the Jingxi Trail was deeply reflected in the spatial form of the village, and there are still many remnants. The

"Beidian" part of the village was formed in response to the trade culture. With the development of trade on the ancient road into a prosperous period, the "Nandian" was emerged, forming the initial spatial pattern of the village (Figure 7). Afterward, due to the influence of traffic changes, the "commerce transmission" of the villages along the route no longer existed. Still, the new railroad did not break the initial pattern of the villages. Further, it expanded the spatial layout centered on the ancient road while strengthening village boundaries. The guidance of the ancient road and the railroad's restriction have defined the village's structure. The multidimensional interaction between the village space and the ancient road under the characteristics of trade and commerce has shown a specific development of agglomeration. The formation of trade and commerce culture far exceeds the influence of material space on people, which also determines the continuation of the village spatial pattern.

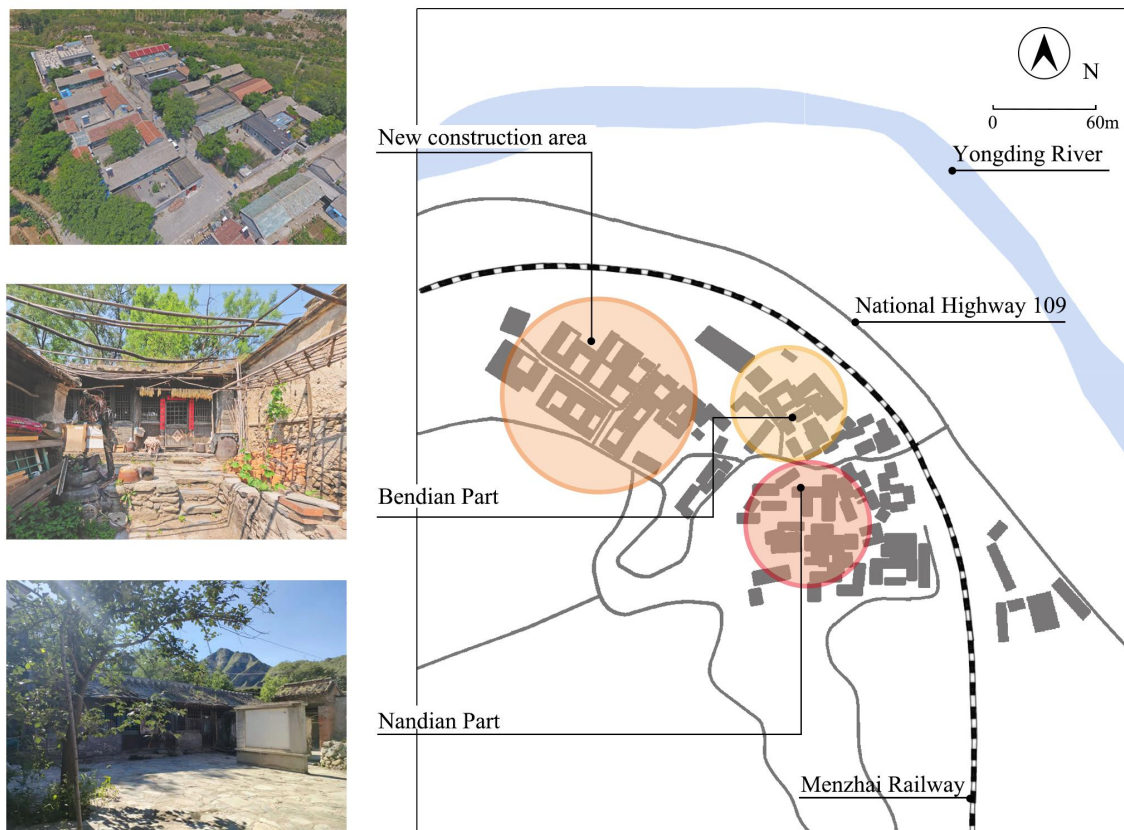


Figure 7 Village space diagram (Source: Self-drawn by the author)

4.2 Outreach spatial development of both fragmentation and opportunity

Looking back at the development history of villages, they have developed in a tortuous manner under the stimulation and interference of external factors. In the face of critical external factors, the villages are actively integrated while being restricted, organically integrating the external environment with the village space to realize the internal adaptation of the cultural landscape and the natural environmental pattern. In the face of external opportunities, they mostly take the vision of the general environment, link themselves with the whole, seize the opportunities and strive to build a cultural community. Specifically, after the decline of the function of the ancient road, the villages in the relationship with the Menzhai Railway, the artistic synergy is achieved by way of industry isomorphism, and then the railroad landscape into the village's cultural category. In spatial form, the overall development of the village is in the form of a ring, and the culvert becomes the imaginary externalization of the "village gate" (Figure 8). In this

period, based on trade and commerce, external factors continue to push the spatial extension. The space for trade and business carried by the ancient road gradually declines and becomes a functional place for the new culture. The disturbance of the village by environmental factors begins to appear.



Figure 8 The "village gate" of the culvert (Source: Author's photo)

Left: The existing abandoned ancient road runs parallel to the main road that continues to the culvert;

Right: The culvert space formed by the intersection of the railroad and the ancient road

4.3 Open spatial pattern of multicultural interaction



Figure 9 Evolution of the function of public space (Source: Author's photos)

Left: The Beidian building that used to assume the function of commerce;

Right: the villagers' activity center today

From a long term perspective, although a combination of factors influences the spatial evolution of traditional villages, it is essentially a debugging of constantly changing functions (Wang & Ruan, 2009). In the initial period, under the influence of the trade function and passenger traffic of Jingxi Trail, the village site, spatial form, and courtyard architecture were all aimed at convenient service. And "the road was the street", and trade type public space was formed on both sides of the ancient road. With the decline of the ancient road, the Menzhai railroad became a direct factor dominating the development of village space. Because of the influence of the topography, the village space texture changes little. Still, the public space created based on the continuation of the ancient road culture, the line of sight mainly intersects

with the railroad, and the railroad has become an important cultural landscape of the village. The original public space on both sides of the ancient road gradually evolved into people's daily lives, such as Figure 9. The renewal of the functions along the route and the phenomenon of exchange between different cultural groups on the road are the three main factors in understanding and preserving the cultural route, which feeds into the development of the route and intervenes in the representation of the surrounding environmental imagery (Zhang, 2014). In general, the historical evolution of the spatial form of the village and the surrounding environment at different times are "interactive" developmental patterns.

5 Conclusion

As the carrier of the built heritage of villages, traditional villages are complex organic living organisms whose formation and development is a spatial and temporal dynamic process that includes both "protection" and "development" (Yang, 2020). Based on the construction orientation of cultural routes, this paper compares the characteristics of the spatial evolution of Dongshiguyan village based on the overall vision of the route change in each period. It summarizes the supporting elements of the cultural base. Cultural routes are dynamic and adaptable, and through integration into the external environment, the renewal and development of the village can be achieved. Through research and analysis, relevant suggestions are made for its subsequent development.

(1) Keeping up with the times and holding on to the cultural core

Building heritage is an essential material basis for cultivating cultural confidence and identity. Constructing a heritage space system is necessary to build a Chinese civilization identification system and realize national cultural security (Yang, 2020). For traditional villages with many elements of cultural heritage preserved, they are a witness of history and a source and support of the village spirit, as they have gathered the wisdom and efforts of the ancestors. In the subsequent development of the villages, we should take the preservation of the village heritage as the premise, summarize the heritage value, and update the "internal" village dwelling subjects, spatial functions, and usage methods in response to the requirements of the changing times, to achieve effective interaction with space. In the current period, under the development of the whole area tourism, the primary trend of village development is the service type space such as tourist gathering and distribution, folklore display, and transportation hub (Xu, 2017).

(2) Resource linkage, synergistic overall development

The traditional villages represented by Dongshiguyan Village are primarily based on cultural routes, and the interpretation of the connotation and extension of "culture" along the space is critical. The development of villages should be based on a holistic view, considering the route and other villages and towns along the route, forming a synergy, enhancing the complementarity between them, unifying external resources, linking resources well, and driving their progress with an outward pull.

This paper takes Dongshiguyan village as an example. It makes a corresponding study on its spatial evolution characteristics to support its subsequent heritage protection and development. At the same time, it is expected to draw more scholars' attention to the holistic and systematic development of the built heritage of the village in relevant studies.

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