

RESEARCH ON THE SPATIAL LAYOUT AND MECHANISM ANALYSIS OF TRADITIONAL VILLAGE LANDSCAPE IN XUZHOU AREA

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ABSTRACT

This paper takes 22 traditional villages in Xuzhou City, Jiangsu Province, which have been selected into the list of traditional villages in Jiangsu Province as the research object, and uses field research, literature review, data analysis and other methods to analyze the spatial distribution and formation mechanism of traditional villages from the dimensions of location, terrain, and administration. The results show that: 1) The traditional villages in Xuzhou City are distributed in a "strip" shape in space as a whole, with the spatial layout characteristics of "strip distribution, overall cohesion, and local dispersion". The basic pattern of "strip" distribution of traditional villages in Xuzhou City is shaped by such factors as terrain characteristics and regional development distribution; 2) According to classification, the landscape mechanism of traditional villages in Xuzhou can be summarized into four forms: fishbone type, surrounded type, net type, and free type. Based on these three forms, rural settlements form the basic pattern of loose type, surrounded type, compact type, and intensive traditional village spatial mechanism in Xuzhou area.

Keywords: Xuzhou, Traditional villages, Space distribution, Form and mechanism

INTRODUCTION

From an anthropological perspective, cities and rural areas have vastly different connotations and extensions. The former, as a large-scale human gathering place, is a product of industrial civilization, while the latter, as a more dispersed settlement, is a continuation of agricultural civilization (Wang, 2019). According to the Evaluation and Identification Indicator System of Traditional Villages (Trial) issued by the Ministry of Housing and Urban Rural Development, the Ministry of Culture and other four ministries and commissions in 2012, traditional villages refer to those villages that were built at least before 1980, have well preserved historical buildings and traditional patterns, carry unique Intangible cultural heritage and have certain vitality. Traditional villages are the basic form of rural areas, and they are a material and spiritual form of existence formed earlier in the continuous continuation of long-term agricultural civilization. These rural settlements with unique regional characteristics and abundant natural resources have important social, scientific, and artistic values. In recent years, both the national and local levels have made improving the rural living environment an important aspect of social development.

As an important component of rural revitalization, the protection and revitalization of

traditional villages have received high attention from all sectors of society. The relevant policy documents of the central and local governments have pointed out the action path for protecting the style and features of traditional villages in China, and also provided innovative space for exploring the spatial distribution of traditional villages and promoting the protection and development of characteristic landscapes. Xuzhou is located in the southeast of the North China Plain and the northwest of Jiangsu Province. The Beijing Hangzhou Grand Canal runs through the city. The Longhai railway and Beijing–Shanghai railway two main lines meet here, Known as the "thoroughfare of five provinces", it has been the key to the north, the gateway to the south, the place of war and the gathering center of businessmen since ancient times. It is also the political, economic and cultural center of the Huaihai region. The regional location is extremely important. In 2020, Xuzhou City, Jiangsu Province, proposed to create a distinctive "characteristic village" through the rural revitalization plan. Traditional village landscapes in Xuzhou region have irreplaceable and non-renewable historical and cultural spatial resources. Analyzing and studying the spatial form and formation mechanism of traditional village landscapes in Xuzhou region is of great significance for exploring their essential features in the planning, protection, and development of characteristic rural areas in the new era. On the basis of further enriching the data, this study uses spatial analysis and other methods to study the spatial distribution characteristics and mechanism of traditional villages in Xuzhou from the perspective of space, explain the basic pattern of traditional villages in Xuzhou, and provide theoretical basis and technical support for the protection and development of traditional villages in Xuzhou.

Research objectives

To study on the spatial distribution form and mechanism of traditional village landscapes in Xuzhou area

LITERATURE REVIEW

From the current research on rural landscapes, there is a lack of a holistic design and protection concept based on reality. Landscape design is a complex category that intersects multiple disciplines. The concept of fuzzy landscape design was first proposed in China in the 1980s and 1990s. According to relevant literature review from search engines such as CNKI and Web of Science, research on traditional village protection and rural landscape design began early and has been increasing year by year since 2010. The relevant literature mostly studies a single village and a single theoretical and technical problem under a certain objective background, or analyzes and studies specific environments. The works mainly include a collection of doctoral papers, a collection of related landscape research papers, and a collection of landscape architecture design works. There is relatively little research on the specificity of rural regional characteristic landscapes or the concepts and models derived from design practices (Sun, 2015). Although there have been many research achievements in rural landscape construction, they mainly focus on the creation of local landscape characteristics, rural landscape protection, human settlement environment construction, policies and systems, development models, and other aspects (Chen, 2014). Overall, there is relatively little research on the organic combination of traditional village spatial layout theory and promotion practice.

Some countries such as the United States, Spain, Switzerland, France, Ireland, and others have put forward relevant systems for a long time, which are also relatively complete. They have appropriately protected historical ecological towns and ancient town buildings based on industrial development, and established a rural architectural heritage registration system (Duan, 2009). In the 1870s, American anthropologist Morgan conducted on-site investigations into the social organizations, customs, and social patterns of Native American settlements. The research

methods and methods of in-depth field visits made the research results simple and insightful. His book "Native American Houses and Family Life" (Morgan, 2005) provided detailed records, by examining the spatial layout of Native American villages and the regional and cultural identity at a certain stage of development. Overall, the institutional, theoretical research, and design practices of rural environments in foreign countries are relatively mature, and a relatively complete institutional system has been formed.

With the further deepening of traditional village research, Chinese scholars have gradually carried out research on the evolution and pattern of traditional village branches based on the specific characteristics of traditional villages in various provinces. On the one hand, research focuses on traditional villages in large regions and scales, emphasizing the overall macro pattern. On the other hand, research focuses on specific characteristic villages, focusing on specific micro patterns. For example, the doctoral thesis Research on Genetic Variation Mechanism and Restoration of Shaanxi Traditional Rural Settlement Landscape (Xiang, 2021), conducts a comprehensive and systematic study on genetic variation mechanism and restoration of Shaanxi traditional rural settlement landscape from the three dimensions of province, traditional rural settlement landscape culture Ecotope and single settlement; The doctoral thesis "Iterative Study on Village Landscape Changes in the Urbanization Process of Southern Jiangsu Province" (Zhou, 2006) exposed the changing texture of rural settlements in southern Jiangsu using sociology, ecology, geography, and planning studies; Taking the Nanjing Tulou World Cultural Heritage Village - Hekeng Village Tulou Group as an Example (Lu, 2019), uses a combination of qualitative analysis and quantitative calculation to obtain the dynamic changes in landscape resource characteristics, ecological environment status, landscape spatial pattern, and ecosystem service function value of Hekeng Village Tulou Group; The doctoral thesis "Research on Courtyard Architecture and Landscape Design in the Construction of New Countryside in Xuzhou Prefecture" (Tong, 2017), summarizes a more suitable rural residential and courtyard design model for the development of rural areas in Xuzhou. With the announcement of the list of traditional villages in Jiangsu Province, the pattern of traditional villages in Xuzhou area has become clearer and more complete, and it is timely to conduct comprehensive and in-depth research on them.

Several policy documents on the development of traditional villages have been released at the national and local levels, as shown in Table 1.

Table 1 List of Policy Documents for the Development of Traditional Villages

Time	Policy Document Name	Published part	Main content
April 25, 2014	Guiding Opinions on Effectively Strengthening the Protection of Traditional Villages in China	China Ministry of Housing and Urban-Rural Development, Ministry of Culture, State Administration of Cultural Heritage, Ministry of Finance	1. Maintain the integrity, authenticity and continuity of traditional villages. 2. Establish a protection management information system, and localities should urgently prepare and approve traditional village protection and development plans, increase financial investment, and provide fine technical guidance.

Time	Policy Document Name	Published part	Main content
April 14, 2022	Notice on the Demonstration of Concentrated and Continuous Protection and Utilization of Traditional Villages in 2022	China Ministry of Housing and Urban-Rural Development, Ministry of Finance	<ol style="list-style-type: none"> 1. To adhere to the people-centered development ideology, traditional villages as nodes, determine the protection and utilization of the implementation area in a series of points and lines according to local conditions. 2. Clarify the development positioning of villages in the region and the development of the timing, give full play to the advantages of history and culture, natural environment, green ecology, rural scenery and other characteristic resources, and actively guide and support the design of the countryside. 3. Increase technical guidance and promote the construction of traditional village protection and utilization projects as required.
April 14, 2022	Jiangsu Traditional Villages Protection Measures	People's Government of Jiangsu	<ol style="list-style-type: none"> 1. Promote the protection of traditional villages on the track of legalization and standardization. 2. form a relatively complete system of protection of famous historical and cultural cities, towns and villages
September 19, 2022	The Protection of Famous Historical and Cultural Towns and Villages in Xuzhou City	People's Government of Xuzhou	<ol style="list-style-type: none"> 1. Owners of historic buildings shall use the historic buildings reasonably in accordance with the law and be responsible for the daily maintenance, safety precautions and repairs of the historic buildings 2. Routine maintenance of historic buildings and minor repairs that do not involve the characteristics of the historic landscape should be implemented in accordance with the historic building protection plans and protection requirements in accordance with the law.

Source: Author

RESEARCH METHODOLOGY

1. Qualitative research methods. Mainly including:

1.1 This study is based on data such as the "Archives of Traditional Chinese Villages" and the "Registration Form for Traditional Village Survey" in Jiangsu Province. From 2018 to 2021, the Jiangsu Provincial Department of Housing and Urban Rural Development published 22 traditional villages in Xuzhou area in four batches for sorting and classification.

1.2 By conducting on-site research, literature search, and other methods to supplement and improve the data of traditional villages, research and collect the current situation of traditional village research areas in Xuzhou area, conduct on-site research and observation on the current situation of traditional villages in Xuzhou area, observe the appearance, and analyze its causes.

1.3 Through literature collection, interviews, questionnaires, and other forms, on-site research and observation were conducted on the current situation of traditional villages in Xuzhou area. Field visits and in-depth interviews were conducted on the current situation, time,

and landscape elements of traditional villages to obtain information on the current situation of traditional village landscapes.

2. Quantitative research methods. Establish a spatial database of 22 traditional villages in Xuzhou based on a geographic information platform, covering information such as regional location, elevation, and cultural attributes of traditional villages. Mainly including:

2.1 Through literature collection, interviews, questionnaires, and other forms, obtain information on the current situation of traditional village landscapes, and form an existing basic database of the current situation.

2.2 Collect the basic data of spatial distribution of traditional villages in Xuzhou, obtain the longitude and latitude coordinates of ancient villages on the Baidu Maps API coordinate picker, and draw the spatial distribution map of ancient villages in Zhejiang Province. By using geographic information systems and on-site research, we have sorted out the existing geographical location, environmental factors, population, user needs, etc., and accurately recorded and analyzed them in a digital way to obtain first-hand research data.

2.3 With the aid of the administrative boundary, MAP, digital elevation map and other data of Xuzhou city and county, the spatial distribution characteristics of traditional villages in Xuzhou area are statistically analyzed from multiple dimensions such as regional culture, economic development, cultural customs, population migration, traffic location and life concept, and the spatial mechanism is explained by using the Spatial analysis method.

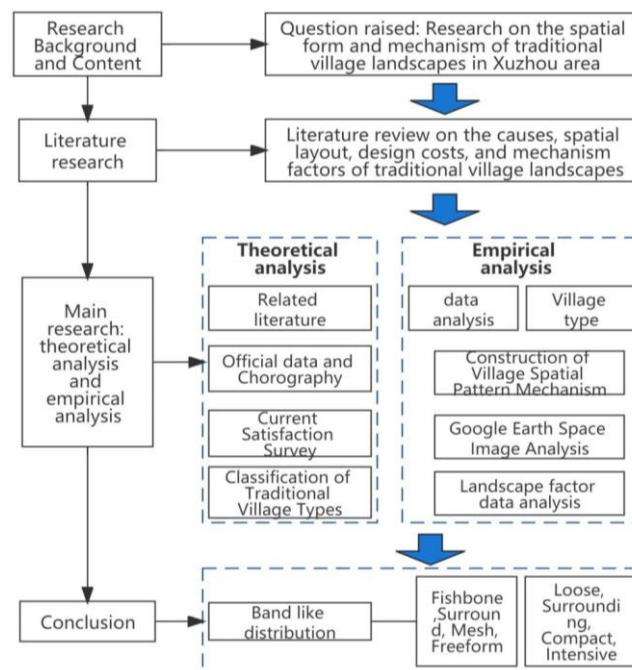


Figure 1 Research framework

Source: Author

RESEARCH RESULTS

1. Traditional spatial distribution characteristics in Xuzhou area

1.1 Distribution characteristics of traditional villages in the regional dimension

The distribution of traditional villages in 10 counties and districts under the jurisdiction of Xuzhou City was sorted out and counted (Table 1). In terms of quantity distribution, the cities with more traditional villages are mainly Tongshan District and Peixian County, accounting for

59.1% of the province's total. In terms of spatial agglomeration, traditional villages in the city as a whole exhibit a distribution pattern that combines two bands of agglomeration and dispersion (Figure 1). Among them, in the central and concentrated distribution around Xuzhou, in the border area of Xuzhou, it is distributed dispersedly, and in the east and south of Xuzhou sporadically. From the distribution map, it can be seen that there is a "one center, two belts" distribution feature. "One center" is the urban cluster of Xuzhou, which is mainly distributed in Tongshan District and Jiawang District; The two belts are mainly distributed in the surrounding areas of the western and eastern regions of Xuzhou. The terrain and landforms of traditional village clusters are diverse, including plain areas, hilly areas, and waterfront areas. The environment is rich and suitable for the development of various agricultural types, making it an important area for the layout of traditional villages.

Table 1 List, quantity and proportion of traditional villages in Xuzhou area

Secondary area	List of Traditional Villages	Number	Proportion
Tongshan District	Tashan in North Village of Liuquan Town, Wushao Village in Zhangji Town, Wanglou in Zhakou Village of Dapeng Town, Niyuan Village in Yizhuang Town, Zishan in Hanwang Village of Hanwang Town, Dongliang, Xiliang in Liangtang Village of Zhangji Town, and Dabei and Xiaobei in Beiwang Village of Hanwang Town	7	31.8%
Pizhou	Zhancheng Town, Shangcun Mountain, Guanhu Town, Zhuxian Village, Zhuxian Village	2	9%
Pei county	Datun Street Installation Village Anzhuang, Datun Street Songzhuang Village Songzhuang, Datun Street Anzhuang Village Digong Village, Gangshang Town North West Village, Yanzibu Town Luzhai Village Fanzhuang, Tiefu Town Yaozhuang Village Yaozhuang	6	27.3%
Jiawang District	Nanjianxi, Xuyang Village, Zhuyushan Street, Duhu, Caiwo Village, Zhuyushan Street, Fangshang Village, Qingshanquan Town	1	13.6%
Fengxian County	Zhanghoutun Village, Shouxian Town, and Xichenzhuang Village, Erba Village, Dashahe Town	2	9%
Xinyi	Fan Nan, Laofan Village, Gaoliu Town	1	4.5%
Economic-Technological Development Area	Xuzhuang Town Shanhuang Village Saint's Nest	1	4.5%

Source: Author

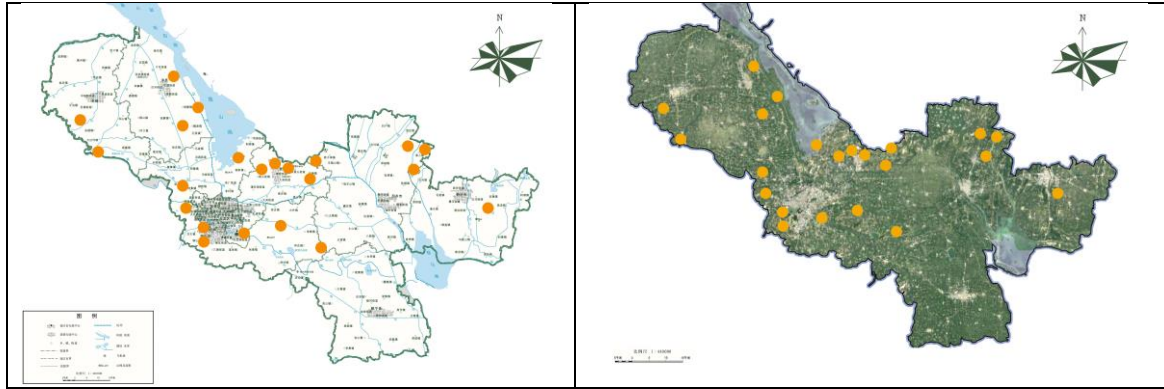


Figure 2 Comparison of the Distribution of Traditional Villages in Xuzhou Area

Source: Author

1.2 The Distribution Pattern of Traditional Villages in the Terrain Dimension

Elevation is an important indicator for evaluating the location, distribution, convenience of life, and environmental adaptability of traditional villages. The statistical analysis of the number of villages at different elevations (Figure 3) shows that the spatial distribution of traditional villages is significantly influenced by the terrain and topography. 22 traditional villages are concentrated at an altitude of 50-200m, accounting for 77% of all traditional villages. From the distribution pattern, below an altitude of 150m, the number of traditional villages increases with the increase of altitude and reaches its peak between 100-200m; Above 200m, the number of traditional villages decreases with the increase of altitude, while below 50m, there are only two traditional villages. This indicates that the distribution of traditional villages is not a simple linear relationship with elevation. Moderate elevation in the local area is conducive to the formation and preservation of traditional villages, while high or low altitude is not conducive to the formation and preservation of traditional villages.

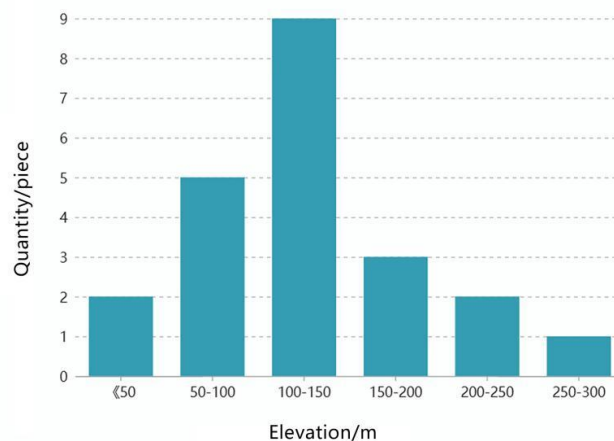


Figure 3 Distribution of Traditional Villages at Different Elevations in Xuzhou Area

Source: Author

1.3 Traditional Village Pattern under the Dimension of Administrative Region Boundary

A comprehensive comparison of the spatial distribution of traditional villages in Xuzhou area under different administrative boundaries of the city and county reveals that most traditional villages are located near the administrative boundary. From the perspective of the administrative boundary at the urban level, the traditional villages are concentrated in the urban area of Xuzhou and near the border. From the perspective of the administrative boundary of the county region: in a large agglomeration area, Tongshan District is relatively concentrated

around, and Jiawang District and Peixian are also relatively concentrated near the border. In addition, it is very obvious to see the characteristics of concentration near the junction of Xuzhou urban area and counties in Shandong Province, Henan Province and Anhui Province. This indicates that in administrative border areas, it is beneficial for the formation and preservation of traditional villages.

2. Spatial Mechanism of Traditional Villages in Xuzhou

2.1 Plain grid mechanism

Xuzhou is generally located in the southeast of the North China Plain. The terrain is mainly plain, and the plain area accounts for about 90% of the city's area. Therefore, the texture of most rural landscapes in Xuzhou has relatively unified commonness, and has typical texture characteristics of North China Plain, as shown in the following figure. This plain grid like mechanism is a typical northern rural landscape texture. The characteristics of this mechanism are similar to the rural landscape mechanisms in Shandong, central and northern Henan, Shanxi, Hebei, and other regions, reflecting the northern characteristics of Xuzhou in the Yellow River Basin. (Figure 4)



Figure 4 One of the types of rural landscape mechanisms in Xuzhou
Source: Author

2.2 The mechanism of rural landscape in hilly areas.

There are many hills and mountains of varying sizes in the central and eastern parts of Xuzhou. The elevation of hills is generally around 100-200 meters, and the area of hills and mountainous areas accounts for about 9.4% of the city. The hills and mountains in Xuzhou are roughly divided into two groups: one group is distributed in the middle of the city, and the mountains vary in height. Dadong Mountain in the middle of Jiawang District is the highest peak in the city, with an altitude of 361 meters; another group is distributed in the eastern part of the city, with the highest point being the Maling Mountain in the northern part of Xinyi City, at an altitude of 122.9 meters. There are many low mountains and hills scattered in Tongshan District and Jiawang District of Xuzhou City, which are called "small hills" by local residents. For example, Hanwang Town in Tongshan District and Tashan Town in Jiawang District are all towns with low mountains and hills. The rural landscape mechanism of these areas and towns has certain characteristics of hilly area landscape mechanism. (Figure 5)



Figure 5 The second type of rural landscape mechanism in Xuzhou
Source: Author

2.3 The landscape mechanism of waterfront areas.

Xuzhou is divided by the ancient Yellow River, forming the Yi, Shu, and Si River systems in the north and the Sui and An River systems in the south. Rivers crisscross the territory, lakes and reservoirs are scattered everywhere, the waste Yellow River runs through the east and west obliquely, the Beijing Hangzhou Grand Canal runs through the north and south, with Yi, Shu and Luoma Lake in the east, Xiaxing, Dasha River and Nansi Lake in the west. Xuzhou has two large reservoirs, five medium-sized reservoirs, and 84 small reservoirs, with a total storage capacity of 331 million cubic meters. It also has numerous water conservancy facilities such as bridges, culverts, canals, and gates, forming a water network system connected to rivers, lakes, canals, and reservoirs with multiple functions such as flood control, irrigation, navigation, and aquaculture. The water network system in Xichenzhuang, Erba Village, Dashahe Town, and Niyuan Village, Yizhuang Town (Figure 6), forms another category of rural landscape mechanisms in Xuzhou, and also reflects the transitional landscape characteristics of villages in Nanxiu and Beixiong, Xuzhou.



Figure 6 Rural Landscape Mechanism of Dasha River Basin in Xuzhou
Source: Author

Another kind of village is close to the mountain and water, not only near the bank of Weishan Lake, but also has many hills, forming a lot of unique rural landscape mechanisms. (Figure 7)

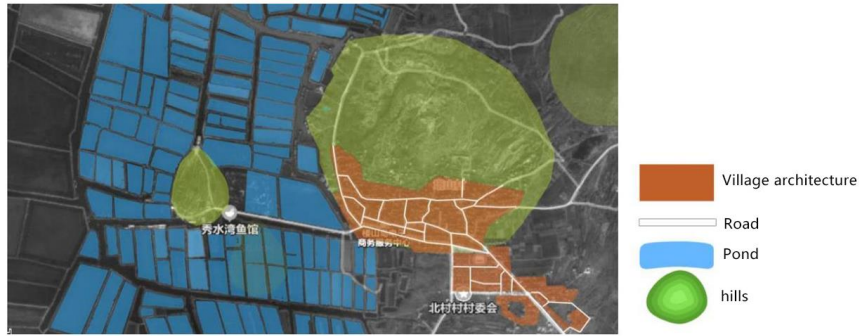


Figure 7 Rural Landscape Mechanism in the Old Yellow River Basin
Source: Author

According to the specific geographical location and spatial form, the spatial mechanism of traditional village landscapes in Xuzhou can be summarized into four forms: fishbone style, enclosed style, net style, and free style (Figure 8). On the basis of these three forms, rural settlements form the basic pattern of the spatial mechanism of traditional villages in Xuzhou area, which is loose, surrounded, compact, and intensive.

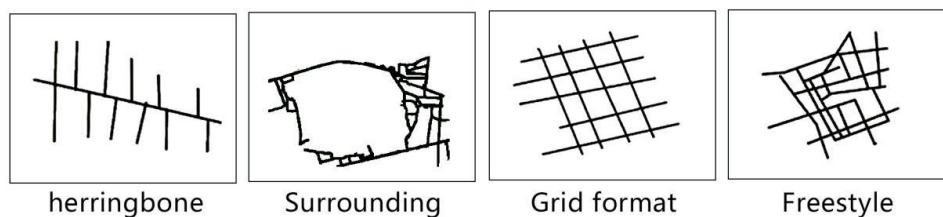


Figure 8 Spatial Mechanism and Layout Form of Traditional Villages
Source: Author

CONCLUSIONS

The traditional village agglomeration in Xuzhou area presents a natural geographical boundary effect as a whole, with a "strip" distribution and a layout pattern of "strip distribution, overall cohesion, and local dispersion". The densely distributed zone is mainly located in the critical transitional zone between Xuzhou urban area and county area, and along the transitional zone forms the agglomeration zone of Tongshan District and Jiawang District. Traditional villages are mainly concentrated at an altitude of 50-200m, which is suitable for the formation and preservation of traditional villages. Traditional villages are dense, accounting for 77% of all traditional villages. The traditional villages in Xuzhou area exhibit a significant administrative boundary agglomeration effect locally, with many traditional villages distributed near the city and county boundaries.

Traditional villages in Xuzhou are mainly distributed in plain areas, hilly areas, and waterfront areas. The landscape mechanism of traditional villages in Xuzhou can be summarized into four forms: fishbone, surround, grid, and free. Based on these three forms, traditional village landscapes form a basic spatial mechanism pattern of loose, surround, compact, and intensive.

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