Study on the Development of Settlement Spatial Form of Famous Historical and Cultural Villages in Mentougou District of Beijing

Chenglin Gao

1 PHD. Teaching in the major of environmental design in School of Landscape Architecture (Beijing University of Agriculture), Beijing, 102206
*Corresponding author, e-mail: chenglingao@126.com.

Abstract. As the earliest batch of villages that are awarded as “famous Chinese historical and cultural villages” by the Ministry of Construction and the State Administration of Cultural Heritage, these villages in Mentougou District are pioneers and representatives of famous historical and cultural villages in Beijing. This paper selects Lingshui village in Mentougou District, Beijing as the research object, taking the evolution of settlement spatial form, the construction system and the internal planning as the research points. Then, by analyzing the evolution law of traditional settlement form and the combination relation of spatial model under the natural form, so as to connect the layout, sequence, basic organizational form and network characteristics of each node. In this way, to highlight the overall planning and leading role of management, thus promoting the systematization and standardization of conservation planning, regional system as well as constructional development of famous historical and cultural villages in Beijing.

1. Introduction
Famous historical and cultural villages are an important part of historical and cultural heritages in China. Beijing, as a famous historical and cultural city in our country, it has been constantly exploring the protection of famous historical and cultural cities, towns and villages in the practice of urban planning. The famous historical and cultural villages truly records the formation of settlements in different regions and nationalities as well as the historical process of evolution. Accordingly, their traditional architectural style, excellent architectural art, traditional folk customs and primitive spatial form are of great significance in both research and influence. The researches that took the name of “famous historical and cultural village” started in the 1990s, in which the establishment of protection system of famous historical and cultural villages in China written by Liu Peilin was one of the earliest research results, the paper put forward several relevant selecting conditions, such as the villages whose historical environment and style were better preserved, those with long history and some historical sites were well preserved, those with special historical memorial value and corresponding memorial signs, all of these conditions laid a foundation for the selection criteria of famous Chinese historical and cultural villages in later period. [1] The unique settlement spatial forms, living characteristics, regional landscape and natural features of famous historical and cultural villages not only reflect the formation and evolution of human settlement morphological structure in different periods, different regions and different development stages of economy and society, at the same time, they also record the local architectural style, landscape graphic structure model, spatial pattern and so on, which have important value in urban landscape. [2] In terms of the study on the evolution of spatial form of historic and cultural villages in Beijing, especially the
natural evolution, it can be found out that the spatial sequence distribution factors transmit the
distribution rule of rural settlement form, which makes people have a deeper understanding of the
natural evolution mechanism on rural settlement form. Therefore, it is particularly necessary to grasp
the urban-rural relationship from the perspective of spatial form relationship, which is also of great
significance to deepen the study of planning scale in human residential environment during the
sustainable development.

2. Settlement Spatial Development of Famous Historical and Cultural Villages
The traditional nature of famous historical and cultural villages settlement is generated since its
establishment and has been promoted and discarded continuously in the long-term development, the
two points are taken as its basic attributes, among which the most important one is "site-specific".[3]
The evolution of its space is restricted by multiple factors, it is mainly determined by the change of
space and the interaction between environment and urban-rural areas. However, the development
structure of modern society is the main driving force that affects the change in spatial structure of rural
settlement, the transformation of rural form has changed from single city agglomeration to spread to
rural areas. [4]Moreover, the village and town pattern of “large dispersion and small concentration” in
rural area has changed into more concentrated urban and rural spatial pattern. During the whole
process, the change between concentration and decentralization are basic forms in spatial structure
evolution of rural settlements.

2.1. Change in Regional Activities of Settlements
The site selection of rural settlements is influenced by various factors, which can be divided into two
major categories: natural factors and unnatural factors. The two kinds of factors interact with each
other, so that influencing and determining the material form of settlement after its landing. Rural
settlement is a living organism, both the site selection and the expansion are dynamic evolution
processes, the dominant factors and the weight of each factor are different in different periods. When
the productivity level is extremely low, the natural factors play a decisive role in the relationship
between human and land; with the gradual improvement of productivity level, the ability for human to
transform nature is enhanced, then the economic and social factors replace the natural influence, thus
becoming the power in determining the construction of settlements; as settlements enter the period of
stable development, the economy, society and nature reach to a relative equilibrium condition, so as to
maintain the evolution of settlements.

2.2. Expansion of Complex Regional Structure
As the daily living place of rural residents and the base of agricultural production activities, the village
is in the position of objective organizer in regional activities. The labor force renewal and the activity
change of users directly determine the density, the scale and the settlement structure of village space.
[5]The rapid expansion in economic activity scale of villages, the connection of each space develops
from pure transportation to information, communication, material, culture, etc., the expansion of
settlement scale and the change of internal land use structure have caused changed the spatial location
of internal functional lands, in addition, the distribution of regional structure has tended to be
centralized and merged.

2.3. Homogeneous Network Spatial Structure
After entering the society with new technology and high consumption, the way of rural. social life and
communication activities has undergone fundamental changes, coupled with the introduction of
modern production technology and the introduction of foreign capital, resulting in the rapid
development of new-type villages.[6] So the traditional space are renewed, and the new spatial
structure is established, the spatial structure of rural settlements enters into the process of
homogeneous and decentralized development. Urban and rural residents require a more natural living
environment, better coordination of function and labour division between urban and rural areas has
been achieved. With the support of modern network, independent rural settlements have formed the
network-type rural settlements, the distribution of villages develops to the homogeneous direction,
thus forming a relatively stable spatial structure.

3. Analysis on the Spatial Form Model of Lingshui Village Settlement in Beijing

3.1. Impact Factors in Spatial Form of Lingshui Village Settlement

Geographical condition is the key factor in determining the spatial form of Lingshui village. Located in a mountain village in the far suburb of Beijing, backed by Lianhua Mountain, being close to the Qingshui River in front (Figure 1). The buildings are concentrated in the center of small mountainous basin, and the village is surrounded by large areas of fields, what’s more, the braided rivers on the north and south sides of the village meet in the southeast part. Lingshui village relies on its natural environment and regional cultural characteristics to develop tourism, gradually building infrastructure and tourism service facilities, the village mainly develops to the southeast and southwest directions. Transportation links between Lingshui village and the outside world affect the distribution of land types with greater dependence on traffic in village settlement. In 2005, Lingshui village was listed as the second batch of famous historical and cultural villages approved by the State Council. Through the tourism planning in town region, the newly-built tourism and sightseeing routes connect all the villages of Zhaitang town.[7] Lingshui village is located in the range of its radiation line, in the position that is close to the location of original external transportation routes inside the village, a tourist reception center is established.

![Figure 1. Location map of Lingshui village in Beijing (Figure source: Zhou Shangyi, Su Xian, Hong Ruizhe; “internal spatial structure and evaluation of village settlement”)](image)

3.2. Spatial Construction System of Lingshui Village Settlement

With the change and development of the density, scale and settlement structure of village space, the context structure (road and boundary) has become the most important part of spatial form in village settlement, and the linear space of each space in organizational village connects the inner and outer roads, including mountains, rivers and urban roads, thus forming the architectural texture. In terms of the spatial distribution of buildings in the village settlements(Fig. 2), it is usually at the edge of residential land of the village, forming a band-like structure. With the expansion of housing area and the improvement of housing environment, the internal change of village settlement texture will be brought about. Through the marginal integration, the internal and external space environment are imported into each other organically.[8] In addition, the spatial resources and infrastructure construction in land use authority are increased, which makes the village settlement form expanded.
3.3. Relationship between the Internal Spatial Pattern of Lingshui Village

The formation of Lingshui village is a process from point to surface and from simple to complex. Courtyard, streets and square space of nodes together constitute the integrated system of ancient village spatial form, mainly including three major levels (Figure 3, 4, 5): courtyard, street and overall village space. Street space is the main place for villagers' external links, communication activities and commodity trading. According to the terrain and the needs of villagers' production and life, a relatively complete road system is gradually formed, at the same time, the development of street rank, street evolution and overall spatial sequence gradually forms a mechanism system from the single space to the compound space, and finally to the integrated space. The spatial form and structure of "front street - middle street - rear street - laneway - courtyard" is different from primacy to secondary in rank, which reflects the influence and effect of human participation behavior on the change of spatial sequence.

The village's overall space is composed of various forms of space, with rich regional levels and orderly order. It not only meets the villagers' homes in the village as a relatively independent, self-sufficient small peasant economic unit, but also the villagers' production activities place. Village
space construction is mainly self-construction, and house designers, builders, and users can maintain a high degree of consistency, so that various types of space in the ancient village can meet the needs of the villagers themselves and show good suitability. The streets, squares, and regional spaces of the village show a rich sequence relationship. The relatively stable area of the village's spatial structure in the central area, the edge area is dynamically changing, and the filling area is the connection area between the two. The three areas present a composite dynamic organization.

4. Enlightenment of Settlement Spatial form Development to Village Landscape
In the fields of cultural heritage, the protection, renewal and development of settlement landscape, historical and cultural village is undoubtedly a very important proposition. Through carrying out analysis on the evolution law of traditional settlement form and the composition relation of spatial model under the influence of natural environment factors, it can be seen that the spatial form of village settlement should be gradual and orderly processes. These processes can be reflected in the material landscape of village, a large part of which comes from the adaptive transformation to the original built environment conducted by residents in the village. Actually, the evolution process of spatial form is a continuous coordination of nature, in which the effect generated from natural form is dual, and it has a certain impact on its evolution mode, construction system and internal pattern. Through analyzing on the evolution law of traditional settlement form under the influence of natural environment factors, it is found that there is a kind of mutual restriction relation existing between each traditional settlement and natural environment, only the village landscape with map effect that are evolved from famous historical and cultural villages are real natural village landscape. Influenced by the traditional historical geography on concepts of landscape profile and landscape overlap, Chinese traditional settlement landscape system highlights the relevance among "information element", "information point" and "information corridor". In addition, it emphasizes on the growth and adjustment of village form depending on different internal and external driving forces, when landscape element maps that construct time series are on the same building facade or building plane, this superposed village landscape is really worth protecting. The landscape protection system adapted to the renewal of settlement form has a profound guiding effect on the conservative planning and tourism development.
planning of historical and cultural settlements.

5. References

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