

# Research on the Protection and Development of the Cultural Landscape of Shaanxi Cave Dwelling

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**Abstract.** The cave dwelling is an important residential building in the Loess Plateau, which is the inheritance, development and evolution of the ancient human' cave life on the Loess Plateau, it is built along the mountain and underground of the Loess Plateau, it is a form of cave dwelling in natural loess, it has the advantages of warm in winter and cool in summer, fire prevention, noise prevention, land saving, economic and labor saving, etc., it belongs to the local traditional cultural heritage and should be protected and passed down. Based on the investigation and analysis of the current situation of the cave dwellings in Shaanxi, the paper points out that the development of the cave dwelling is facing a very embarrassing situation, this paper puts forward some ideas and countermeasures for the protection and development of cave dwellings in Shaanxi.

**Keywords:** cave dwelling, cultural landscape, protection and development.

## 1. Introduction

The cave dwelling is a unique residence form on the Loess Plateau in northern China; it is also a beautiful landscape of the Loess Plateau, which contains the historical legacy of the northern nationalities. The cave dwelling is a product of the Loess Plateau and a symbol of Shaanxi farmers. Cave dwelling is an important way of living in the Loess Plateau in northern Shaanxi, as a carrier, it inherits the harmony concept between people and the environment for thousands of years, and it produces a unique folk custom. However, with the continuous development of the economy and the acceleration of urbanization processes, the traditional regional culture of Shaanxi Province is being affected, due to the continuous improvement of people's living standards and the ever-changing changes, people's residences are also changing, the cave dwelling is gradually regarded as a symbol for poverty and backwardness, many people have begun to give up cave dwellings, this is contrary to the development level of local architecture, regional environment and local characteristics, therefore, how to protect and develop these traditional residential buildings has become an problem to be solved.

## 2. History and Current Situation of Cave Dwellings in Shaanxi Province

### 2.1 Survey of the Development of Cave Dwellings in Shaanxi Province

The historical development of the cave dwellings in the Shaanxi area is part of a long line of Chinese cave dwelling, during the Zhou Dynasty; there was a semi-underground cave dwelling in Shaanxi. From the Qin and Han Dynasties, it gradually developed into a cave dwelling in the whole earth, because the soil in the Loess Plateau is sticky, the soil structure is solid and has strong supporting force; these features not only make the cave more stable, but also make the excavation of the cave dwelling easier. In the middle of the Ming Dynasty, people began to build walls with stones. In the Late Ming and Early Qing Dynasty, local people built stone caves in the same way as the cave dwelling, from a mechanical point of view, the cave dwelling built with stones and bricks are more solid. At the end of the 20th century, especially since the reform and opening up, with the continuous improvement of people's living standards, colored tiles are used in cave dwelling for beautification and reinforcement. Cave dwelling also divides the rooms with different functions such as the office, as well as the new cave dwelling with the upper and lower floors, which are more comfortable and pleasant. Nowadays, in some areas in Shaanxi, whether the towns or villages, cave dwellings are still the main residence form.

Due to the different climates, topography, functional preferences, humanistic customs and local political and economic conditions, the shape of the cave dwellings is varied under various factors. From the perspective of structural form and layout, the cave dwelling mainly consists of a cliff-type, a sunken type that is perpendicular to the mountain surface, arched cave structure. Cave dwelling forms in Shaanxi province are in harmony with China's agricultural civilization, which is the choice of historical evolution. However, due to the instability of the climatic environment, the imperfection of the own function of cave dwelling, as well as the improvement of people's pursuit for aesthetic value, the protection and development of the cave dwelling in Shaanxi faces great challenges.

## **2.2 Analysis of Indoor and Outdoor Environmental Problems in Cave Dwellings in Shaanxi**

The Shaanxi cave dwelling is a native building that was born under the natural loess layer of the Loess Plateau and has a high folk value. However, due to the difference in the structure of building materials, when heavy rain or flooding appear, the water is difficult to evaporate, the humidity of the loess becomes larger, the collapsibility is affected, the stability of the cave dwelling is damaged, and the indoor water seepage or even collapse appear; because the quality of loess in each part of the cave dwelling is slightly different, after expansion caused by heat and contraction caused by cold and the pressure on the top of the cave itself, it may cause cracks in the cave dwelling.

If people do not go through research and professional detection of technology, unordered digging of the cave dwelling will cause the cave dwelling to fall; if the cave dwelling is not repaired for a long time or not lived for a long time, the cave dwelling is more likely to collapse; Because the factors such as cave span and burial depth have not been professionally treated, which will cause great harm to the cave dwelling, especially the row cave dwelling. The cave is excavated horizontally to obtain space, and the open surface is used for lighting, so it will appear dark and insufficient lighting.

Due to the limitations of natural factors and topography, there are still a series of problems in the residential system in the cave dwellings of Shaanxi province, for example: insufficient living area of the cave dwelling, unordered functional division, blurred dynamic and static zone, etc., There is a lack of systematic planning in power supply, communication, water supply, kitchen and bathroom, indoor and outdoor environment, heating, parking and fire protection. There is also a lack of corresponding policy protection for the surrounding environment of the cave dwelling, if the superior resources are not fully utilized or over-exploitation in the development process, it will cause certain damage to the residential system of cave dwelling.

## **2.3 Analysis of Conceptual Impact on the Development of Cave Dwellings**

People's values, consumption views and lifestyles have undergone great changes in the social development, the design and construction of cave dwellings were more focused on practical functions. According to the construction environment and living conditions before, under the background of modern economically developed society, the cave dwelling will look old, dull and lack beauty, many young people think that housing is a symbol of identity and that living in a building has an status, these wrong ideas have accelerated the cave dwelling faded from people's view.

# **3. The Necessity of Cave Dwelling Protection in Shaanxi**

## **3.1 The Development Way of the Cave Dwelling in Shaanxi**

The cave dwelling in Shaanxi is one of the most representative forms of residential building in the Loess Plateau, which is an important carrier for the rich regional culture and unique folk customs in Shaanxi. The unique historical and cultural style, together with the unique structural characteristics of the cave dwelling and the construction surrounded by nature, if it is planned, it can not only meet the basic functional requirements, but also increase the aesthetic value, and can avoid making cities and towns all look the same.

### **3.2 Analysis of the Sustainable Development Idea**

Since the construction of the cave dwelling use loess, the cost and transportation of the material during the construction of the cave dwelling are reduced, and the utilization of the land is also improved, the characteristics of the loess's small heat dissipation and large thermal storage coefficient make cave dwelling have a stable fluctuation of heat and cold, its advantages of ventilation, sound insulation, dry and wet adjustment, used in the cave dwelling most vividly, and it has achieved the effect of warm in winter and cool in summer and economic. After years of testing, we can see that the cave dwellings meet the basic needs of people's lives while conforming to nature, and integrate with nature, furthest maintain the original ecology of the natural appearance, and have simple ecological thought.

### **3.3 Analysis of Historical Culture and Folk Customs**

The cultural landscape of Shaanxi cave dwelling is a cultural activity that has been passed down from generation to generation by the people in Shaanxi after long-term production practice and social life, which not only reflects the rich life content of people, but also reflects the national cohesion of people in Shaanxi. There are many kinds of folk activities in Shaanxi, including paper-cuts listed as local precious cultural heritage in Shaanxi, Shaanxi yangko listed in the national intangible cultural heritage, etc., these cultural activities were born in the special architectural form of the cave dwelling, it has the straightforward and uninhibited features, and it is the wisdom of the working people of the Yellow Land. For northern Shaanxi cave dwellings, whether it adopt measures suiting local conditions, the construction concept based on the materials, the sustainable development ideas, and the natural folk culture born from the cave dwelling culture, there is a need to be protected and developed, and protection and development are imminent for the current situation of cave dwellings.

## **4. Protection and Development Measures of Cave Dwelling Landscape in Shaanxi**

### **4.1 Improve the Internal Living System of the Cave Dwelling in Shaanxi**

Rainstorms and unordered construction will cause problems roof of cave dwelling fall off or collapse. A layer of brick will be placed in the loess cave to ensure that the cave is in a stable state while being waterproof and moisture-proof. In order to solve the whole body affected by the destruction of a row of caves, it is also possible to reduce the pressure and reduce the damage by means of separate construction, for the lighting problem of the cave dwelling, we can increase glass area, reduce cave depth, interior decoration and painting to improve lighting in the cave, increase the heat gain effect of solar heat radiation in winter, some problems existing in the cave have been improved to the greatest extent.

### **4.2 Improve the External Residence System of Shaanxi Cave Dwellings**

Due to the improvement of the living environment, the cave dwellings in Shaanxi may face problems such as insufficient living space, unordered functional partitions, and incomplete communication facilities. In allusion to these problems, the following measures are proposed: for the case of functional partition chaos, we must carry out re-planning to improve residents' healthy and safe awareness, and separate human and livestock to reduce the route of bacterial transmission; For the case of insufficient living space, we can combine the cave and the bungalow, carry out a reasonable division of labor between storage and human settlements, while increasing the space, the courtyard layout is regulated; for the problem of incomplete communication facilities, it is necessary to use technical means and combine local terrain, climate, local network traffic, road traffic, heating facilities, water supply and drainage pipes, and Plan and control the drainage pipes, electrification and surrounding facilities.

### **4.3 Protect Surroundings of Cave Dwelling Landscape**

The government should strengthen the governance of the ecological environment around the cave dwelling. In the past, due to excessive reclamation, there have been serious sandstorms, soil erosion, and even landslides in Shaanxi. Therefore, relevant departments need to formulate some relevant environmental protection policies and increase research and investment on geological disasters, which is of great significance for the protection and development of cave dwellings.

Relevant departments and professionals should jointly plan and manage the cave dwelling and use the abandoned caves to gradually build ecological habitable zone. Moreover, reasonable site selection, unified planning, and the original scattered cave dwellings can be well clustered together, thus forming a concentrated living area. When constructing cave dwelling village, we must ensure that water, electricity, heating, and other supply and discharge systems are concentrated in one system, and the supporting facilities and outdoor environment is also planned. Using the trend of the mountain to plan the cave dwellings, or arrange them along the contours of the mountain, or build them under large slopes, so that they can be integrated with the earth and A unique cave dwelling landscape can also be formed on the Loess Plateau.

### **4.4 Prospects for the Development of Cave Dwellings in Shaanxi**

The traditional folk house form in Shaanxi is in a state of constant demise and destruction, under this background, we must coordinate the landscape resources and its surrounding environment, formulate a sound environmental protection plan, combine development with environmental protection, and return to nature, integrate with nature; strengthen the identification of cave dwellings in Shaanxi, develop a model of mutual integration of ecotourism and folk custom, use the good natural and humanistic environment in Shaanxi, and based on respecting history, ingeniously combine public places and landmark buildings in Shaanxi, develop a cave area suitable for vacation and experience the unique cave culture in Shaanxi, For example, North Shaanxi Yangge, paper-cut art, etc., make more people feel the history and culture characteristics of folk customs in Shaanxi, moreover, promote the communication and exchange of the cave dwelling culture in Shaanxi, promote the cave dwelling culture in Shaanxi, and create more opportunities and conditions for the protection of cave dwellings and the inheritance of cave culture.

## **5. Conclusion**

Cave dwellings are valuable heritages of Chinese architectural culture, which has always solved the living problems of people living in this land, and has the characteristics of ecological beauty such as energy saving, environmental protection and practicality. With the continuous improvement of the society, the cave dwellings should be redesigned and rationally reconstructed, while not affecting the protection of residential houses, it is necessary to actively explore new dwelling form of. At present, lack of resources, energy shortages and similar urban appearance, it is feasible to develop energy-saving ecological new cave dwelling in Shaanxi, we must take more measures to protect and develop the cave dwellings in Shaanxi.

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