A Study on the mode of home-based care for the rural areas in Guanzhong, Shaanxi, China

Tongtong Ji¹, Zhichun Yu¹
¹ School of Human Settlements and Civil Engineering, Xi’an Jiaotong University, Xi’an 710049, China
Zhichun Yu: yu.zhichun@mail.xjtu.edu.cn

Abstract. At the beginning of the 21st century, China has entered an aging age, and the growth rate of the elderly has become one of the fastest in the world. In fact, the number of elderly people in rural China is higher than that of urban elderly. As the area of cultivated land in rural areas decreases year by year, the rural labour force shifts to cities. Most of the rural areas in China show the status of “hollow villages” with only the elderly. Influenced by the traditional Chinese Confucianism, home-based care is the most accepted way for elderly in rural China. The rural residence is dominated by traditional dwellings and newly built dwellings. Such dwellings cannot meet the living needs of modern elderly people, and have produced different old-age care problems in rural areas. The traditional courtyard residence form is still widely used in rural Shaanxi. Taking Shaanxi rural villages as an example, this paper summarizes and analyses the architectural characteristics, space, mode and modern living conditions of traditional dwellings in Shaanxi, and proposes the rural home care mode and living unit in Guanzhong, in order to relieve rural social problems brought by “empty nesters” and laid the foundation for the issue of rural pensions.

1. Introduction
China began to enter an aging society in 1999 and it became the first country in the world with a population of over 100 million. In Shaanxi and even China, the aging of the rural population is more serious than that of urban areas. According to statistics from Shaanxi Province, as of 2015, the population of the province aged 60 and over was 6.011 million, surpassing 6 million for the first time, accounting for 15.86% of the resident population and an increase of 1,121,300 compared with the sixth population census in 2010. The rate of increase in the elderly population continues to accelerate.

Shaanxi Province is located in the north western part of China. The economic and cultural development is lagging behind. The problem of rural pension is very prominent, but its cultural heritage is profound. The traditional forms of rural residence in Guanzhong, Shaanxi Province are mainly residential houses. The types of residential forms are rich and varied, and they take different forms according to regional climate, culture and economic differences. In rural areas of Guanzhong, the elderly are accustomed to living in the ancestral homes of the generations. Rural old-age care and residential buildings have a very close relationship. Home-based care is still the primary choice for supporting the elderly in rural areas of Shaanxi, and the reasons can be divided into economic and cultural as well as the three aspects of the house site. The rural area has a relatively simple source of income, the home-based pension is the most economical and practical option for the elderly in terms of social pension and intervention in pensions; China has been deeply influenced by traditional
Confucianism for thousands of years, although With the changes of the times, the inheritance of Confucianism to the city has disappeared more and more, in the rural areas where the underdevelopment and the relative information are relatively closed, the influence of Confucianism is still far-reaching, and traditional ideas such as “nurturing children to prevent the elderly” and “falling leaves return to the roots” restrict the promotion of the social pension model in rural areas, most elderly people believe that accepting social pension is the performance of the family's children unable to support the elderly. In the “face society” of China, this is a major event affecting the face of the elderly.

Due to the limitations of development, the traditional residential houses in Guanzhong did not take into account the use of “long life cycle”. With the aging of rural areas, rural traditional dwellings no longer meet the daily use of the elderly, and the newly built dwellings are monotonously imitated. The city has a great impact on the physical and mental health of the rural elderly. In today's increasingly serious aging, rural old-age mode of home study is particularly important.

2. Overview of Guanzhong District, Shaanxi Province

From north to south, Shaanxi can be divided into three major natural areas: the northern Shaanxi Plateau, the Guanzhong Plain and the Qinba Mountain. The Guanzhong area is a warm temperate semi-humid gas, and the Guanzhong area is flat and is one of the most prosperous areas in China's history.

2.1. Traditional rural residential mode in Guanzhong, Shaanxi

2.1.1 Guanzhong Courtyard residential mode

The traditional rural dwellings in Guanzhong are based on the form of “Siheyuan”, which is characterized by regularity, narrowness and symmetry. In the general case of traditional dwellings in Guanzhong, the width is 9.9 meters and the depth is greater than the width. This scale is due to the hot and dry summer in the Guanzhong area. The Guanzhong traditional residential courtyard adopts a narrow north-south layout. This layout can make both sides The house is in the shadow and has reached the effect of summer cooling, but this also will affect the indoor lighting; the Guanzhong area has a long winter cycle and low temperature, the narrow enclosed courtyard space, and the thick wall can keep warm in winter. The Guanzhong residential courtyard consists of a gated house on the street, a side house on the two sides, an office building in the center, and a main building, and is surrounded by high walls and wall doors. Guanzhong traditional dwellings follow the construction rules of

![Figure 1. Guanzhong area](image-url)
“Harmony between heaven and man” and “Respect for seniority”. The main house is generally the core of the entire courtyard, and the Xiazi house sub-district is mostly occupied by the younger generation. The biggest feature of Guanzhong traditional buildings is the single-sloping roof. The drought in Shaanxi is less rainy. The single-sloping roof can introduce rainwater into the room, which is conducive to the collection and preservation of rainwater. The back wall of a single-sloping roof is generally high, which is good for windproof and warm in winter and against wind and sand. The traditional residential building materials in Guanzhong are affected by the area. The building materials of the dwellings are mainly loess, wood, stone and brick.

![Figure 2. Traditional Guanzhong Courtyard residential](image)

### 2.1.2 Guanzhong cave dwelling mode
In the central and northern parts of Guanzhong, traditional rural dwellings are mainly cave dwellings. In the north of Guanzhong, there is less rain and drought, and the loess layer is thicker, creating a unique Guanzhong cave dwelling. The cave dwellings are divided into independent cave dwellings and sinking cave dwellings. According to the building materials, they can be divided into masonry caves and loess cave dwellings. The biggest feature of the cave dwelling is that it is warm in winter and cool in summer. The traditional cave dwelling space is from the appearance of a round arched door with high arches and high windows. In winter, the sun can be further penetrated into the inner side of the cave dwelling. The solar radiation can be fully utilized, and the internal space is also arched, which increases the vertical space inside, making people feel open and comfortable.

| Type of cave dwelling | Region | Image | Interior |
|-----------------------|--------|-------|----------|
| Independent cave dwelling | ![Map](image) | ![Image](image) | ![Image](image) |
| Sinking cave dwelling | ![Map](image) | ![Image](image) | ![Image](image) |
2.1.3 Newly built residential mode
With the continuous deepening of China's new rural construction, changes in rural production and lifestyle, rural dwellings have gradually evolved from traditional dwellings to modern dwellings. Guanzhong newly built dwellings are still affected by traditional dwellings. The area of rural dwellings in Shaanxi Province is occupied by “homesteads” (The homestead is a rural household or individual used as a residential base to occupy and use the land owned by the collective. It is a unique form of land distribution in rural China.). The standards of all counties in Guanzhong rural areas are 3 points (200㎡), and the length and width are mainly 10m*20m. In the transformation of modern dwellings, the reconstruction of traditional residential courtyards was followed, but unlike the traditional ones, the outer courtyard was combined with the inner space during the reconstruction, and some courtyards were enclosed inside the living space to obtain greater indoor area.

| Number | Layout | Facade |
|--------|--------|--------|
| 1      | ![Diagram](image1) | ![Facade](image2) |
| 2      | ![Diagram](image3) | ![Facade](image4) |

### Table 2. Type of newly built residents

3. Status quo of rural old-age living in Guanzhong, Shaanxi
Rural areas are different from cities. The rural living environment has a very good old-age basis, including spacious independent living spaces, open activities and public spaces, familiar neighborhoods, etc. Compared with institutional care, home care is more in line with actual conditions and needs of the elderly in rural areas, the quality of home care is the basis of living space, designed, living space suitable for life is the basis for the use of the elderly pension development in rural areas. Especially in the rural areas of Guanzhong, Shaanxi, due to the backward economic development, the rural pension level is relatively poor, and there are serious problems of old-age housing, and the status quo is very serious.

#### 3.1. Indoor status

**Bedroom:** The bedroom space is the most used space for the elderly, but the design layout does not take into account the use of the elderly, the bedroom is ventilated, poor lighting; The bedroom also bears the functions of the living room, dining room, etc., which causes the function of the bedroom space to be disordered; the living room of the old man is far away from the living space such as the bathroom and the kitchen, ignoring the daily use of the elderly.

**Living room:** The function of the living room in the modern Guanzhong residential area is at the entrance of the courtyard, which has the functions of a guest and a storage function. Most of the living room is too large, causing serious waste of space, and the entrance hall separates the indoor space from the outdoor space, completely ventilating and lighting the interior. The living room, which
located in the best place for lighting throughout the house, should be used to make it more accessible to the elderly.

Bathroom: The rural areas in Guanzhong have always neglected the design of the bathroom. Most of the residential toilets are located in front of the courtyard, and the entrance to the courtyard, it is very inconvenient to use, and the bathroom in front of the door is on the windward side, which will affect the indoor air.

Courtyard: The rural elderly are different from the urban elderly. The rural elderly are mostly farming when they are young. When they are old, they can't work in the ground due to physical problems, and the psychological will be low and other negative emotional problems. At this time, make full use of the advantages of the rural home courtyard, planted small crops in the courtyard, so that the elderly will be enriched in their later life. It can not only exercise the body but also prevent various mental illnesses of the elderly, so the courtyard is particularly important in the design of the home-based care space in the countryside.

3.1.1 The status of outdoor communication space and combination
Communication space: The communication space of traditional residential settlements in Guanzhong is mainly composed of streets and lanes connected with courtyards. The streets and lanes are in the form of "丁" and "卍". Planting pagoda tree outside the residence to form “HuaiYuan”, providing nodes for communication space, for people to stay together. The rhythm of new residential buildings is different, mainly with straight streets, lack of front space, lack of communication space, the comfort and privacy of front space is reduced, resulting in less communication behaviour of the elderly. The rural population has low mobility and has been in a relatively stable social relationship for a long time. Therefore, the demand for communication is far greater than the city, the lack of communication space, making this relationship increasingly thin, increasing the long-term living here, especially the elderly people's sense of emptiness and loneliness, is not conducive to the health of the elderly and is not conducive to the long-term development of rural social relations.

Composition relationship: The construction of new rural in Guanzhong area has destroyed the composition texture of original natural villages, replaced by serious homogenization, lack of neighbourhood atmosphere and lack of identification of neat new residential buildings. Ignoring the characteristics of the combination of traditional rural dwellings, blindly imitating the way of urban construction, the unique hierarchical relationship and neighbourhood combination in rural areas are reduced, the spatial rationality is absent, the pattern of life of the elderly generation is broken, the familiar neighbourhood groups are independent, so that the elderly lack of identity in life, increasing strangeness and aloneness.

4. The mode of home care for the aged in Guanzhong of Shaanxi
Traditional residence and newly built houses home care mode: At present, the new and old rural dwellings in Guanzhong are mixed, the spatial pattern is single, the traditional rural living habits of neighbourhood life are lacked, the courtyards are relatively independent, and the life is lack of intersection, which makes the residents lack the sense of belonging, and the neighbourhood relationship of "distant relatives are inferior to neighbours" can not be continued. The identity of new residential buildings makes the rural settlement lack of rhythm and space. On the basis of independent residential buildings, the new model combines individuals into a small-scale residential unit, making the unit intersect actively and passively in the long-term residential life, and forming a mutual-aid home care model through long-term neighbourhood contacts. Based on the living space, the traditional rural dwellings in Guanzhong will be transformed into aging ones, retaining the essence of traditional dwellings, optimizing the space and reorganizing the combination of courtyards. It can not only solve a series of social problems caused by the phenomenon of "empty nesters" to the greatest extent, but also maximize the richness of the elderly's life, embody their own value and make the best use of the neighbourhood mutual aid model. According to the current situation in rural areas, the elderly with different age and type of residence should be mixed properly. For example, the elderly living alone,
couples living, two generations living in the same living unit, in the life of the formation of mutual help model, two generations living to help the elderly living alone, couples living to help the two generations living, forming a virtuous cycle of mutual help old-age unit.

Figure 3. Home care mode for traditional residence and newly built houses

The interior space design of traditional residential buildings in Guanzhong should be based on different family structure, the actual living conditions of the elderly combined with the climate and environment of rural areas in Guanzhong, according to local conditions. Strengthen the indoor and outdoor barrier-free design, with the elderly bedroom as the center of rational planning indoor streamline and layout, increase bedroom lighting and ventilation, simplify bedroom functions.

Home care mode for cave dwelling: Because of its special structural form, cave dwelling houses are mostly built with the terrain and facing the South as far as possible. In relatively flat terrain, independent cave dwelling is constructed. The form of the cave in Guanzhong is flexible and changeable. According to the topography and usage, the form of the cave in the same village is quite different. Therefore, it is impossible to reconstruct the village unit like traditional dwellings in the application of home-based pension model. Independent old-age space is a feasible home-based pension model for cave dwellings in the future. Because the openings of each hole in the cave are basically the same, some will look for space at the bottom or side of the cave, and excavate smaller caves to be used as storage spaces, forming "L" and "十" shaped plane. Each hole can be connected to each other in the middle or at the end of the cave to form a suite.

Figure 4. Traditional cave dwelling layout

However, because the cave has a strong sense of space depth, small openings, resulting in poor indoor lighting, the lack of functional links between the buildings, the use of the elderly caused repetition of moving lines, complex and other inconveniences. The new home-based pension model takes two-hole kiln as a living unit, which ensures the convenience of the elderly while reducing the impact of different functional spaces, and separate the use space between the elderly and the younger generation, avoiding the contradiction caused by the different living habits of the two generations, and making the life of the elderly and the younger generation relatively independent and independent of each other. The courtyards of cave dwellings are mostly not hardened or afforested. The muddy courtyards in rainy days are not convenient for the elderly to walk. The roof space of cave dwellings often assumes the communicative function, making full use of roof space, strengthening neighbourhood communication, and forming a relatively independent and mutually supportive home care model.
5. Conclusion
The proportion of rural elderly population in Shaanxi and even China is far greater than that in cities. Through the study of the behaviour and usage of the elderly in the traditional residential building, the new residential building space and the traditional village, this paper refines the space to be reserved in traditional residential buildings, improving the design of space not suitable for the elderly, and establish a new combination and internal living unit model. It will provide new ideas for the future aging of rural houses and the solution to the problem of the elderly.

Acknowledgments
This work was supported by the Scientific research projects of National Natural Science Foundation of China (51671481). The authors thank the reviewers for their helpful comments and suggestions

References
[1] Mengquan Hao, 2017. Villages’ Residential Buildings-A typical case of typical traditional village houses in Meidaiqiao Village, Inner Mongolia. Journal of North China University of Technology. 5, 69-74
[2] Yan Xu, 2010. Analysis on Architecture Characteristics of Guanzhong Traditional Residential. Journal of Xi’an University of Technology. 2.3, 14-18
[3] Zhichun Yu, 2009. Research on Pattern of New Vernacular Dwellings in Guanzhong Rural Region of Shaanxi Province. Journal of Xi’an University Of Architecture And Technology. 2.4, 52-57
[4] Jie Zhang, 2017. A study on the Spatial Form of Traditional Dwellings in Guanzhong of Shaanxi Province – Taking Dangjia Village as an Example. Journal of Xi’an Polytechnic University. 2.3, 13-19
[5] Zhenlan Qian, 2010. Research on Rural Community Space Design in Northern Zhejiang Province by the Concept of “Basic Living Unit”. Journal of Zhejiang University. 3.3, 25-39
[6] Xiaodong Guo, The Spatial Distribution Characteristics and the Basic Types of Rural Settlement The Spatial Distribution Characteristics and the Basic Types of Rural Settlement. Scientia Geographica Sinica. 2013(1)
[7] Xinchao Niu, Study on Transformation and Utilization of Cave Settlements in Western Henan. Regional Architectural Culture. 2018
[8] Jingxin Guo, A study on the Environment Renovation of the Ancient Villages in Shanxi Province – Exporing the Residence Suitable for the Aged in Hougou Ancient Village. Journal of Taiyuan University of Technology. 2.4 27-30, 2.5 35-37