Sustainable thinking of rural housing in eastern Henan under the context of new countryside

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Abstract. Rural housing occupies an absolutely dominant position in rural construction. Due to the lack of effective supervision, guidance and training mechanism, the construction team's professional quality is low in the context of new countryside. The owner's cognitive level is not high. As a result, the rural housing in the east of Henan Province has many problems. This paper studies the existing problems of rural housing in eastern Henan province and puts forward the solutions. Such as formulating the supervision system of rural construction, perfecting the guiding mechanism of rural housing, training professional construction team, and improving the cognitive level of owners.

1. Introduction
A central conference on urbanization has concluded, pointing out that urbanization is the only way to complete the building of a moderately prosperous society in all respects and accelerate socialist modernization, and that urbanization is an important way to solve the problems of agriculture, rural areas and farmers [1]. Urbanization is about "reducing farmers", but China's urbanization is by no means eliminating the countryside. Minister of Agriculture Han Changeful said that in 20 years, China's urbanization rate may exceed 70%, and there will still be about 450 million people living in rural areas. Urbanization should drive the construction of a new countryside, not replace it. The so-called "de-rural" is not in line with China's national conditions [2].

In addition, the State Council's "Regulations on the Planning and Construction of Villages and Towns" and "Regulations of Henan Province on the Planning and Construction of Villages and Towns" provide guidance on the construction of villages and towns. The two regulations mainly focus on the macro level of village planning and management. On the micro level of housing design and construction, author analyses the problems existing in the rural areas of eastern Henan and tries to find out solutions.

2. The current situation of rural housing construction
With the adjustment of rural industrial structure, the gradual prosperity of farmers and the change of production and life style. Some new situations appear in the construction of rural housing.

2.1 Construction scale -- large quantity and fast speed
In China's rural areas, the main direction of capital construction investment is residential construction and Henan is no exception. Rural residential buildings always account for more than 90% of rural buildings and rural residential construction plays an absolutely dominant role in rural construction [3]. According to the 2013 edition of Statistical Yearbook of China (Henan), in recent years, the change of housing area per hundred households owned by rural residents (Table 1), as well as the comparison of...
the change of housing area per hundred households owned by rural residents and urban residents. The speed of rural housing construction is very fast and has surpassed that of urban residents (Table 2).

| Year | 2000 | 2005 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|
| Area | 639  | 1208 | 1373 | 1358 | 1448 | 1491 | 1779 | 2060 |

| Year | 2000 | 2005 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|
| Cities | 30.8 | 32.3 | 31.9 | 32.8 | 33.3 | 34.1 | 34.7 | 34.7 |
| Rural | 23.1 | 27.2 | 34.7 | 36.5 | 38.5 | 38.5 | 38.5 | 38.5 |

2.2 The main body of construction -- small cottage become the mainstream
According to the 2013 edition of China (Henan) Statistical Yearbook, the per capita income and expenditure in rural areas of Henan doubled in 2012 compared with 2007, among which the income increased from 5,197 yuan in 2007 to 9,829 yuan in 2012, and the expenditure increased from 3,107 yuan in 2007 to 7,852 yuan in 2012. Recent years, villagers are richer than before and they like comparing with each other. The houses built in the eastern countryside of Henan are almost 2-3 floors. The building surface is 3-4 wide and the depth is 10-13 meters.

2.3 Construction technology -- popularization of brick-concrete structure technology
As buildings in rural eastern has gradually become the first choice to build model of villagers. Brick structure in rural residential construction has gradually been eliminated. Instead, the structural stability and durability are much improved brick structure technology, ring beam, constructional column, cast-in-place floor or roof. As the representative of the brick structure technology is widely used in the process of rural residential building. A few residences use external brick concrete internal frame or full frame structural system.

2.4 Construction mode -- mainly self-built mode
At present, although the living conditions in the rural areas of eastern Henan have been greatly improved, the operation and operation mode of the rural construction market have been followed for many years. This has not really achieved meaningful changes.
Rural housing construction based on "self-construction" is a construction mode that ADAPTS to farmers' production and living conditions as well as natural environment conditions. It is realized by the way that mason or carpenters assist family members as the main body of decision-making and "experience passed down by masters" leads the construction process.

2.5 Function change -- Single residence turns to function diversification
Due to the change of energy and water supply mode, the kitchen function in rural houses in eastern Henan Province has been gradually compressed. Especially, the utilization of some clean energy makes the kitchen develop in the direction of cleanliness and miniaturization. Some rural houses have appeared small kitchens similar to urban families [4].
Most rural houses have dual functions of production and living. But the proportion of farmers' productive functions and living functions is changing with the changes of The Times.

3. Rural housing construction defects
Because artisans and owners who have never been in contact with the formal building design industry and the formal building construction industry. They are fundamentally unaware of whether the house they want to build is the most reasonable in design, the most economical in cost, the most convenient in use and the safest in structure. In the process of building rural houses, there are many problems that could have been avoided, which cause inconvenience or loss of future life and production.
3.1 Material selection -- strong randomness, improper material
In the process of building rural houses, although there is a general regularity in the selection of materials, it will always be disturbed by the owner's personal will, resulting in improper materials. If some owners will be two floors of small building foundation cushion layer selection of reinforced concrete cast-in-place and the thickness of 30 cm. Some owners will be free to increase the amount of tensile reinforcement in the lower part of the lintel or thickening, resulting in the potential risk of excessive reinforcement damage of the beam body in the future. Some owners adjust the amount of cement mortar indoor and outdoor plastering. Some owners will be internal wall tiles for external wall or external wall tiles for internal wall. Some owners freely adjust the concrete pouring way and maintenance time. Some owners of the masonry material of scientific masonry, wood anti-corrosion, insect control measures, brush coating requirements ignored. Some owners use granite floor tiles for indoor paving, causing radioactive pollution.

3.2 Construction technology - irregular and humble:
According to the current "Henan village and market town planning and construction management regulations" the 19th provision, the construction of two floors and two floors above the building residential construction must have a county level above the construction administrative departments issued by the construction qualification level certificate of the construction unit. Then they can undertake the corresponding construction tasks with the qualification level. It is strictly prohibited to undertake construction tasks without a license or beyond the prescribed scope.

However, the rural people in the eastern part of Henan are accustomed to hand over their own buildings to the small rural contractors, who are all unqualified, simple tool and simple equipment. Construction professional level is not high. They are organized by the villagers themselves, lack of proper professional assessment and training of construction. Construction worker is handled in residential foundation setting, main body structure safety, floor structure, pouring mound of wall of build by laying bricks or stones wall technology, concrete and maintain, steel’s correct places, moisturproof layer cushion and wall body or roofing plastering a lot of respects. They often ignore relevant professional and construction operation standard.

3.3 Residential design -- strong randomness
Rural residential design is much by owner autonomous design. Lack of involvement of architectural design professionals, when owners design their own residential strong at random, they won’t think of their own family structure and the change, the actual use function of the specific requirements of housing, the shape of their homestead plots and the restriction of construction and surrounding environment conditions, such as size. Only based on their own simple experience or the neighbor's house as a reference and blindly start building.

At present, there are many problems in the design of rural residential buildings. Such as indoor and outdoor floor elevation is not reasonable. Storey height is generally too large. Energy saving effect is poor. Some safety measures are missing. There are some defects in stair design. Planar function partition is unreasonable. Room ventilation and daylighting ability is bad and so on. Countries should give guidance on the design level and design strength tilt to rural residential design. On the residential design approval in accordance with the provisions of relevant regulations to strengthen supervision, according to local characteristics and the villagers' life and production characteristic, they are designed with local architectural culture characteristics, low cost, easy maintenance, high safety and livable CunZhai is possible. [5]

3.4 Residential function -- lack of function and poor quality of life
Rural housing construction excavation and utilization of the local climate, environment has good suitability of the traditional low-cost energy-saving ecological technology, through innovation and improvement, and with the brick and concrete structure technology is very good combination, which
improve the comfort of rural houses and rural houses energy-saving emission reduction has a very important significance. [6]

In addition, the diversification of eastern rural residential function, especially the emergence of professional family residence, type of pure living surrounding villagers residence is a great disturbance, such as chicken farmer family in noise, dust, odor, handling, storage and transportation of waste and disease prevention and control and communication, etc. They have larger impact on the surrounding residents. Residential buildings with different functions live together, the mutual influence. Interference are needed to be guided and resolved at the level of planning.

3.5 Housing culture -- sublation and inheritance
Through the long-term use of farmers, the rural residences in the eastern part of Henan Province have integrated certain historical traditions, folk culture, regional characteristics. This even have certain hierarchical concepts and symbolic meanings. It is an important way to ensure the cultural inheritance and regionalism of the construction of the traditional farmhouse to excavate some forms and elements that can be applied to the construction of the new farmhouse. [7]

Under the self-built model, the new rural housing in eastern Henan Province is obviously ineffective in inheriting the existing regional features and breeding new regional features. The reasons mainly include the following two aspects: first, economic conditions; second, artisans blindly seek economic benefits, so they don't want to do the outstanding but useless work. If the brick carving adornment of the place of cornice, mountain flower, roof ridge outside the building, door and window, the mouth of bright window adornment processing, still suit to use on the brick mix structure building. [8]

4. Conclusion
In line with the purpose of people-oriented, relevant government departments should actively guide the villagers of the construction of ideas and actively help the villagers building behaviour. Such as providing design drawings, training and the formation of rural construction team, etc. Let the villagers realize that his own architectural behaviour is a social and the country's behaviour rather than a simply individual, free behaviour.

In the context of the new countryside, we should not only do a good job in the construction and management of big cities and small and medium-sized towns, but also do a good job in the planning and construction of the countryside, so as to truly change the appearance of the village, improve the quality of life of the villagers and realize the social benefits and comprehensive benefits.

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