Rural Construction and Ecological Environment Optimization in Northwest China Based on Sustainability

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Abstract. With the rapid development of rural urbanization, rural areas, especially in northwest China, have been exposed many problems. Living quality cannot be guaranteed. Environmental quality is deteriorating. Rural development has encountered the unprecedented problems and challenges. Under the background of the integration of urban and rural areas, the development of rural areas is also in a dilemma. In this research, based on the actual situation of Guanzhong region in Shaanxi Province, the rural villages are classified according to their resources, environment and formation time. At the same time, combined with previous literature, a group of villages has been selected as object to conduct on-site investigation and analysis including ecological environment, planning layout, public space, building energy saving and so on. Hopefully, the analysis of physical formation can makes people have a more in-depth understanding of sustainability. We are going to understand the problems encountered and solutions related in the sustainable development of rural areas from a critical perspective. By putting forward the corresponding strategies and development focus, a set of multiple sustainable development model for different types of villages has been summarized and proposed. Importantly, it can be some enlightenments for further studies.

Keywords: Rural village; community; transformation; sustainability.

1. Introduction

Generally, it is believed that sustainable development emphasizes the overall coordination of complex relations among ecology, economy and society [1]. With the rapid urbanization in cities of China, on the one hand, this trend has promoted the production efficiency; on the other hand, some contradictions caused in this special period has obstructed the sustainability [2].

Many researchers focus on the urban sustainability. However, as a matter of fact, rural sustainability is as important as it in cities. In 1992, the International Geographic Federation established the
Sustainability Committee of Rural Systems, focusing on the concept, objectives, structure and indicator system of rural sustainability [3]. Sustainability is a very macro concept that will be meaningless without concrete steps in specific context. For rural village, sustainability is considered as the inheritance and development of native features regarding history, culture, material and resource, which can keep rural villages energetic and animate along the development.

In China, the total area of rural residential land is much greater than that of urban land. Rural residential land was 16.5 million ha, 5.61 times the urban land in 1999 [4]. It is believed that the establishment of a correct incentive mechanism, innovative research and political will can enhance the synergistic interaction between agriculture and society, thus promoting the rural sustainable development [5]. Rural sustainable development is the key to the healthy and harmonious development of the whole society.

Rapid development of rural urbanization has not improved the living quality of villagers. Contrarily the gap between urban and rural development is generally increasing [6]. Because of the influence and limitation of natural environment, road-traffic conditions, water resource and farming culture, naturally rural villages are scattered in layout., rural areas, especially in northwest China, have been exposed many problems during this abnormal process. Poverty, labor loss, inferior quality of education, disappearance of local features and disorderly large-scale rural residential construction are all common, which directly impacts the sustainability of rural areas negatively. Rural community development depends on education to improve villagers’ cognition and employability [7]. Rural transformation and revitalization is needed to counter unorderly urbanization and problems arose [8].

In October 2008, the Chinese government unveiled a plan regarding to rural revolution. It holds that China has entered a new era that industry promotes agriculture, accelerating the transformation of traditional agriculture and eliminating urban-rural dual structure. As a result, a new integrated system of development involving cities and villages can be established.

As a typical representative of northwest rural area, Guanzhong region is located in the middle of Shaanxi province, which is composed of 5 municipalities: Xi’an city, Xianyang city, Baoji city, Weinan city and Tongchuan city. The total land area reaches 5.55 square kilometers (Fig.1). From the perspective of population urbanization, the total number is approximately 22 million, of which rural population is 12.3 million. The concept of “Guanzhong” originated in the Warring States Period of Chinese history, which has been enjoying its fertile land and excellent agriculture conditions. Since ancient times, there has been the capital of 13 dynasties, which has gradually become the center of Chinese ancient Yellow River culture.

Nevertheless, like many other western rural areas, Guanzhong region is now suffering labor loss, extensive construction, resource starvation, deterioration of ecological environment and many
accompanied social issues [9-10]. With the thoughts changing, the dependence of rural land, especially relatively barren land, is becoming weaker and weaker. Conversely, this weakening ideal has not impeded residential land sprawl. Migrant worker are still willing to convert part of the farm land to residential land, using their savings made in cities to build houses in villages. During this process of large-scale rural residential construction, a lot of problems related to planning and architecture has been exposed. One of the biggest problems is unclear positioning of each village, which leads to inappropriate planning and architectural form. For rural villages, the lack of planning is a very extreme performance of unclear positioning, but it is really commonly happening [11]. Accompanied problems includes unreasonable space setting and disordered land use. In addition, insufficient use of local culture and material in Guanzhong region is also obvious. For one thing, it leads to the oneness of rural villages. For another, it has hindered the heritance and development of local culture and material [12].

Compared with some successful samples of traditional villages, such as Dangjia village and Yuanjia village, most of the villages in Guanzhong region do not have the unique context including natural resource, culture, history and even policy supporting, which cannot be developed and transformed in this way as a result. Hereby a new model of rural village development especially regarding to physical formation that is suitable for the vast majority of ordinary villages should be put forward on the basis of living environment and sustainability.

2. Methodology
From the perspective of research method, this thesis is a qualitative research, which adopts literature review, classification, field investigation and interview, selecting a group of villages near Liquan County as the research objects. Based on the understanding of sustainability in rural area, the development situation and transformation of village planning and architectural design will be discussed from a critical perspective. The impetus of new rural construction comes from economic stimulus, political support, cultural influence and environmental improvement [13]. Combined with different village characteristics (environment, resource, formation period, etc.), the technical roadmap for each village can be summarized as below:
3. Results
The basic unit of vernacular society in China is village. The scale of village varies from a couple of households to hundreds of households. One of the most obvious characteristics is the relatively independent social circle [14].

In this survey, 3 different types of villages in Liquan County have been selected according to previous classifications. Liquan County is located in the middle of Guanzhong Plain, namely Weihe Plain, which is 28 kilometers far away from Xianyang city and 55 kilometers far away from Xi’an city. Because of the clear leading industries, centuries-old history and convenient traffic, villages in Liquan County are very representative, no matter newly built villages or naturally traditional villages. Fig. 4 shows the general locations of each village. They are Bai village, Nanqi village, Dujia village and Jiuxian village respectively.

![Fig. 3 Locations of Liquan County](image1)

![Fig. 4 Locations of the Selected Villages](image2)
3.1. Questionair

We designed a questionnaire to investigate the basic information of each household, to know about the work of their family members’ and their attitudes towards village planning and design. The survey was conducted with field investigation on the weekends. A total of 108 villagers from different households and villages were surveyed face to face randomly with the questionnaire. The basic information for all respondents is presented in Table 1.

In order to ensure the randomness of samples, we randomly chose different families and interviewed in their homes. This sample consisted of 50 men (46.3%) and 58 women (53.7%), roughly indicating the division of labor within the family that women take on more housework. Regarding the age of respondents, the proportion of age between 22 and 40 of Bai village is 47.5%, significantly higher than Jiuxian village (30.0%), Dujia village and Nanqi village (25.0%). Besides, the proportion of age over 60 of Bai village is 10%, which is markedly lower than Jiuxian village (27.5%), Dujia village and Nanqi village (42.9%).

Table 1. Basic information of respondents

| Item       | Group                              | Bai village | Jiuxian village | Dujia & Nanqi village |
|------------|------------------------------------|-------------|-----------------|-----------------------|
|            |                                    | Number      | PP (%)          | Number               | PP (%)    | Number   | PP (%)    |
| Gender     | Male                               | 18          | 45.0            | 19                    | 47.5      | 13        | 46.4      |
|            | Female                             | 22          | 55.0            | 21                    | 52.5      | 15        | 53.6      |
| Age        | <22                                 | 5           | 12.5            | 5                     | 12.5      | 2         | 7.1       |
|            | 22-40                               | 19          | 47.5            | 12                    | 30.0      | 7         | 25.0      |
|            | 40-60                               | 12          | 30.0            | 12                    | 30.0      | 7         | 25.0      |
|            | >60                                 | 4           | 10.0            | 11                    | 27.5      | 12        | 42.9      |
| Work       | Families with at least a migrant worker | 17          | 42.5            | 29                    | 72.5      | 24        | 85.7      |
|            | Families without migrant worker     | 23          | 57.5            | 11                    | 27.5      | 4         | 14.3      |
|            | Agree to carry out professional planning for village | 38          | 95.0            | 34                    | 85.0      | 23        | 82.1      |
| Planning   | Disagree to carry out professional planning for village | 2           | 5.0             | 6                     | 15.0      | 5         | 17.9      |
|            | Agree to carry out professional design for own house site | 29          | 72.5            | 22                    | 55.0      | 19        | 67.9      |
| Architectural design | Disagree to carry out professional design for own house site | 11          | 27.5            | 18                    | 45.0      | 9         | 32.1      |
3.2. On-site Investigation

3.2.1. Bai Village. Bai village is 15 kilometers away from Liquan County in the east. As a representative of new rural community, Bai village has won a lot of titles, such as “demonstration village” “ecocivilization village”. Along its development, it can be found that local enterprises is the most important driver that leads to the rapid development. A large amount of capital injection from the government and companies makes it a successful agricultural experience community.

In the process of on-site survey, the author visited the village committee and planning exhibition office, specifically realizing the planning strategies and design contents. Meanwhile, we interviewed 40 local villages randomly, asking them about the basic families’ information and attitudes towards rural construction of Bai village.

As a new type of rural community, the planning scheme is designed by famous planning institute. It holds a concept of community agriculture, land intensive development and large scale land management. Strategically, clear industrial planning has been put forward. Besides, basically 3 intensive development principles have been proposed: agriculture gathering to community, industries gathering and large scale land management. In the aspect of building pattern, it belongs to the combination of Tang dynasty style and traditional Guanzhong residence. In addition, the new plan has proposed part of multi-story apartment blocks for those villagers who do not need courtyard. Compared with natural village, the planning of Bai village is advanced owing to clear functional zoning, landmark building, open space and good public service facilities. In terms of road structure and open space, roadside parking is no longer been used. Instead, parking system has been established combined with dispersed open space.

3.2.2. Jiuxian Village. Jiuxian village is located to the southeast of Liquan County, which has good economic conditions and environmental resources owing to fruit tree planting and Tang dynasty culture respectively. Differently, Jiuxian village is a merged village including 4 natural villages. In the process of on-site survey, we focus on 3 aspects including physical formation, building passive design and public service facilities and selected 40 households as the research object, interviewing the villagers about some basic information of their living environment.

3.2.2.1 Physical Formation. As a matter of fact, the development of Jiuxian village is a kind of Spontaneous regeneration without planning. Normally buildings face to either north or south direction along the road. Jiuxian Village includes 4 natural villages (Xincheng village, Xiejia village, Nancheng village and Liujun Village) (Fig. 5). It worth mentioning that the public service facilities including primary school are well established.
3.2.2.2 Building Passive Design. The traditional building external wall is without window. Along its development, now people are more likely to adopt the wall with big window resulting from the needs of day lighting. Similarly, the cortile has been set up much more windows to introduce more day lighting. Fig. 6 shows the comparison of different scale of windows in cortile about introducing day lighting.

![Fig. 6 The Comparison of Different Scale of Windows in Cortile about Introducing Day Lighting](image)

In terms of air flow, considering the building depth, the straight and smooth corridor can introduce air flow efficiently from the entrance to back yard. (Fig. 7) Besides, Shaded outdoor buffer zones (porch, patio) oriented to the prevailing breezes can extend living and working areas in warm weather.

![Fig. 7 Analysis of Ventilation](image)

It is also very common to use plant materials (bushes, trees, ivy-covered walls) especially on the west to minimize heat gain (if summer rains support native plant growth). For each rural household, planting tree on the west of courtyard is also regarded as a smart method to reduce heat gain.
3.2.2.3 Public Service Facilities. As previously mentioned above, Jiuxian village has a long history with rich conventional culture. Unfortunately, it is difficult to know about its culture and history simply from observation because of the lack of cultural area and landmark for displaying. One thing that worth mentioning is the development and utilization of primary school in Jiuxian village. Huge village scale and good economic quality offers good conditions for developing public service facilities. Importantly, it guarantees adequate teaching resources and school facilities.

3.2.3. Nanqi Village and Dujia Village. Nanqi village and Dujia village are located to the north of Liquan County similarly, which stand for the most typically natural villages. Compared with Jiuxian village previously mentioned above, they are both relatively barren in resource including human resources and natural resources. We research them mainly from physical formation, public service facilities and building material. Based on the similar restrictive conditions, we regarded them as a whole object that interviewed 28 local villages randomly, asking them about the basic families’ information and attitudes towards rural construction.

3.2.3.1 Physical Formation. Both of them are now experiencing spontaneous regeneration without planning. Normally buildings face to either north or south direction along the road. During the interview with local villagers, most of them think that facing to the south can better access to natural sun light. Interestingly, they are not quite familiar with Fengshui theory.

During the random visit of 28 rural residences, 24 of them are completed after 2003. In the process of interview, they shows a high level of satisfaction with their living environment. Because of poor economic condition, another 4 residences have not been rebuilt or transformed during last 40 years. For the spontaneously built residence, the economic situation of families differ greatly in traditional rural areas, which leads to the differences of the living conditions. Besides, there have been much changes about architectural form, not limiting in conventional layout. Among these changes, courtyard always plays a significant role involving vegetable planting, crop airing, family activity and landscape. Fig. 9 shows different architectural forms involving single courtyard and double courtyards.
Entrance space play a significant role in rural life. As transitional space, it connects the internal private space and external open space. In terms of function, basically it is used to stack agriculture facilities and crops. Additionally, entrance space can act as exchange space for villagers to communicate. (Fig. 10b) Most importantly, with the increasing demand for vehicles, as main space for parking, it is become more and more important in villagers’ daily life. (Fig. 10a) For temporary use, such as parking visiting relatives, mostly they adopt the way of roadside parking, which greatly block the vehicles moving. (Fig. 10c) To some degree, it shows an unreasonable road structure of natural villages.

![Fig. 10 Entrance Space in Dujia Village](image)

3.2.3.2 Public Service Facilities. Village committee is the political center of whole village, which acts as a multiple functional role involving conference room, library, office of village affairs, policing, entertainment and sports activities. (Fig. 11b) Most of the public service facilities are gathered in village committee. However, some feasible elements, such as accessibility, have not been taken into consideration. Therefore, the comprehensive utilization rate is low, which can be regarded as a kind of abandoned condition. (Fig. 11a)

![Fig. 11 Village Committee of Dujia Village](image)

In the process of on-site survey, it is known that every village has its own primary school. However, the number of local students has dramatically decreased from hundreds to dozens of people. Actually that is not because the reduction of village population. More and more parents are willing to send their children to the adjacent town or Liquan County for studying. As a result, the primary schools in villages are suffering from the abandoned condition.

3.2.3.3 Building Material. Compared with the old house, the new rural house has achieved some progress regarding to building materials, building structure. Traditional loess mixed straw is replaced by concrete and brick. Fig. 12 shows the transformation and replacement of building material.
4. Analysis and Discussion
Based on the questionnaire and on-site survey, 42.5% of the respondents of Bai village exist at least a migrant worker in their families, which is the lowest proportion compared to Jiuxian village (72.5%), Dujia and Nanqi village (85.7%). (Fig 13a) It roughly indicates that the development of villages is negatively correlated with the proportion of migration work of villagers. We found that overwhelming majority of villagers agree to carry out professional planning for the villages. Among them, the proportion of Bai village is 95%, which is obviously higher than the proportion of Jiuxian village (85.0%), Dujia village and Nanqi village (82.1%). (Fig 13b) Professional planning contributes to village development, enhancing the attractiveness of villages and providing more employment opportunities. As a result, more villagers are willing to stay in the rural villages. However, the villagers keep a conservative attitude on whether to design buildings professionally and systematically or not. Among them, 72.5% of the respondents living in Bai village agree to take professional design for their own house sites, which is slightly higher than Jiuxian village’s (55.0%), Dujia village and Nanqi village (67.9%). (Fig 13c) The main reasons are that respondents are basically satisfied with their living conditions and worry about increasing potential construction costs.

Fig. 12 The Transformation and Replacement of Building Material
**4.1. Positioning and Policy**

In rural area of China, basically new rural community still belongs to the scope of rural community. The establishment of new rural community is to better serve the local villagers. Compared with urban community, it aims at offering a harmonious environment for villagers to conduct rural production and living activities. Bai village is a representative of new rural community, which shows a general concept of urban-rural integration. From the planning itself, it is really excellent and advanced. In the context of policy supporting, it is believed that this planning has proposed a sustainable way of development. However, based on the realities of rural villages in northwest China, some issues about feasibility and applicability need to be discussed.

The so-called advanced planning which has been paid much attention, will take up a lot of resources. With limited income and resources of Chinese context, this development pattern will restrict other ordinary villages. As a matter of fact, most villages are ordinary without too much money invested and resources. In order to guarantee their development in a sustainable way, simple development pattern of urban-rural integration does not begin to be enough. From the survey, it can be seen that the loss of youngster labor is a very common problem occurred in natural villages even including merged village with good economic condition, like Jiuxian village. To some extent, the trend of migrant workers is inevitable unless huge capital injection and company investment. Apparently, it is not possible to build every village as new rural community in this way.

Therefore, combined with HE Xuefeng’s opinion [15], on the one hand it is necessary to keep villages attractive by building new rural community, which has good quality of infrastructure and rural perception. On the other hand, urban-rural dual structure is able to bring opportunities to the most ordinary villages. Importantly, urban-rural dual structure literally guarantees the reversibility of life style. According to the present situation, this multiple system can be sustainable.

**4.2. Economy**

For new rural community, mostly it adopts a development model of large-scale management and large-scale land circulation. For people who is living in new rural community, this development model eliminates the dependency of villagers on land. Under a good economic environment, this development model is feasible and sustainable because of the unique rural industries and rural experience. However, as previously mentioned, for those most ordinary villages, small peasant economy and rural community economy play an irreplaceable role. In Guanzhong region, specifically in Liquan County, fruit tree planting and traditional handcraft is possessed of great potential to organize rural community economy.

For example, in the survey of Nanqi village, there are 3 neighbors who plant fruit trees and crops in a piece of land together. One of the same characteristics among these 3 households is only the elderly and children are left in the village. In Taiwan, there are a lot of instances about the elderly who grow a
large piece of land, especially in highly mechanized region. What’s more, the productive efficiency of the elderly can be even higher than that of youngster owing to strong local feelings and focus. Combined with these relevant cases of South Korea and Taiwan and observation of on-site interview, it is believed that the elderly has the ability to plant and conduct related management well. In Nanqi village, the fields of these 3 households are close to each other which makes it relatively easy to manage in a group. For one thing, this collaborated pattern can bring more economic benefits and promote productive efficiency. For another, it can strengthen the link between neighbors and relatives.

By interview, it is known that new rural residence in natural village is designed and built all by local craftsman. Compared with before, now the craftsman who manage construction individually, has organized some small-scale union for communication and even collaboration. On the one hand, through interactive communication, some conventional handcrafts and skills can be better developed and inherited, which makes it possible to obtain a win-win situation. On the other hand, professional collaboration and folk organization will have positive effects on establishing industry standards and principles.

Essentially, these collaborative economic pattern can be regarded as prototypes of rural community economy. For rural villages in northwest China, especially the natural villages, rural community economy has shown strong competitiveness and superiority.

4.3. Physical Formation

4.3.1. Planning Layout. By comparison of Jiuxian Village and Nanqi Village, Jiuxian Village is more energetic and competitive. Through the integration of multiple neighboring natural villages structurally, originally scattered villages are connected together. For natural villages which are not planned systematically, this merged layout can indirectly affect the development of villages regarding to their physical formation. In addition, the phenomenon of large-scale rural residential construction and unreasonable residence scale can be suppressed.

![Fig. 14 The Integration of Natural Villages](image)

Firstly, spatial integration makes natural villages competitive under urban-rural dual structure, which is a kind of intensive development pattern. Besides, the optimization of space has positive effects on setting up public service facilities. In terms of rural community economy, spatial integration is able to create more opportunities for its development. More importantly, the connected natural village ensures original social relationship. Meanwhile the social circle is being enlarged gradually through breaking the closure of natural villages [16]. Fig. 14 shows the evolution of integration of natural villages and the generation of Jiuxian village.

4.3.2. Public Open Space. The public space is the stage of the daily activities of the villagers. Many activities like production, daily communication and traditional culture will be carried out inside it. Public open space in the village has its own unique form and cultural texture no matter in new rural community
like Bai village or in natural village like Nanqi Village. It can generate a strong sense of belonging and identity while fulfilling the needs of villagers’ daily life [17].

As an important measurement index of living environment, the establishment of public open space differs in scale and function. The open space in Bai village is well designed. According to its planning scheme, huge-scale public space is set up with planning axis, such as public square. Based on road space, linear open space is built systematically. For Bai village, much like a city, this kind of linear open spaces is more focused on its commercial value. Differently, it can be regarded as transitional space connecting either agricultural experience park or eco-park to point open space. To be specific, mostly point open space is the entrance space in front of each household.

For natural village, such as Nanqi village and Dujia village, point open space plays a much more significant role compared with other levels of open space. Because it is more close to villages’ daily life and it can provide leisure space for neighbors. Through observation in Nanqi village, it can be found that communication between neighbors is conducive to the formation of better interpersonal relationship. Besides, good interpersonal relationship is the basis of rural community economy. To a certain extent, planning of a cluster of residences should pay more attention on point open space where the most dynamic activities in natural village happens.

However, it is not very optimistic that villagers have not pay much attention to these spaces. That is to say, most of the spontaneous point open space, especially the space in front of each rural house, is not fully used or even abandoned, which indirectly leads to some severe problems, like roadside parking. (Fig. 15)

![Fig. 15 Abandoned Point Open Space in Dujia Village](image)

For large-scale merged natural village, like Jiuxian village, both of point open space and linear open space can have good effects on activating road space. On the contrary, diverse road space will generate more public open space in shape compared with straight road space. With the loss of youngster labor, normally there are only the elderly and children living in the villages, so it is necessary to concentrate on the design of open space, which can provide interpersonal communication and social activities.

4.3.3. Architectural Design. Different from the city, the construction of rural areas should pay more attention to the protection of resources and the use of resources. As previously elaborated, intensive development would benefit the protection and use of resource. For a single rural residence, house layout should adopt small width and large depth. On the one hand, it reduces the waste of rural land under the context of massive construction. On the other hand, it is conducive to generate courtyard space[18].

While expressing traditional image, the building layout should offer people much more conveniences. One of the most obvious changes is the transformation of toilet. In Dujia village, there are still more than half of the families using outhouse (Dry Toilet). However, for the newly built rural house, most of them have been equipped with toilet inside the house. In addition, people adjust the building layout around the courtyard based on their own living and productive needs. The size of the room becomes
more reasonable. In terms of building passive design, there are some improvements as well. Skylight and corridor would be helpful to introduce day lighting and air flow.

4.4. Public Service Facilities

In this research, 3 basic kinds of public service facilities involving educational facilities, medical & health facilities and sports & entertainment facilities are realized. For new rural community, such as Bai village, its superiority is reflected on complete public service facilities. However, the relevant existing problems analyzed above are obvious for natural villages. In simple terms, the construction of public service facilities including infrastructure is a kind of scale-effect. That is to say, public service facilities can be fully utilized and supported economically only when its scale reaches a certain level.

4.5. Building Material

Because of relatively low income, people living in natural village rely on their own funds to rebuild and repair residence. Therefore, the design and construction should be feasible and practical, cutting down the costs as much as possible. One important way is to use local material. Most importantly, it is a smart and sustainable strategy. Basically, economy and operability is the main reason for the selection of building materials and the replacement of materials determines the structure and style of the building [19]. The abandonment of loess and rammed earth technique mainly results from value orientation. Traditional loess mixed straw stands for the old and outdated. For newly built residence, loess material is replaced by concrete and brick. It is worth noting that this kind of replacement of concrete and brick can be regarded as ecological and sustainable as well owing to the use of local material and improvement of techniques. Firstly, the brick normally comes from the nearest brick factory. By obtaining raw material locally, costs are reduced as much as possible. Besides, composite material that putting loess into concrete makes local residence more regional and identified. Last but not least, local wood and straw is still utilized as parts of the building. As a result, local materials are widely used even though the main building material is replaced.

5. Conclusion

5.1. Positioning

As previously stated, the development way of rural village must not be a single model, because mostly different villages has different development directions and goals. For a small of villages, a large number of capital operation and characteristic industry is reasonable and effective. The living quality of villagers has been significantly improved in these villages, such as Bai village (NRC) and Yuanjia village (Tourism Village). For traditional natural villages, smart transformation and regeneration of economic structure and physical formation will be helpful to find a sustainable way of development.

5.2. Supporting Policy

Considering about mitigating urban problems and improving rural continuity, we agree with the opinion of keeping the reversibility of urbanization. In the context of huge population of rural migrant worker, now the most important thing is to guarantee their basic rights. Because of the restriction of household registration and economic condition, it is not possible to offer these migrant workers enough living quality and assurance in cities. Therefore, the rights of villages, rural housing ownership, homestead usufruct and land contracting & management, should be protected, making these rural migrant works able to come back and to restart their agricultural production. As a result, combined with different types of rural villages, a multiple policy system should be formed, which is made up of urban-rural integration structure and urban-rural dual structure. For now China, this is a sustainable strategy that plays an important role in keeping social stability.
5.3. Economy
Similarly, the structure of the economy should be diversified. Although large-scale management and large-scale land circulation actually has promoted the development of some villages, small peasant economy and rural community economy is still irreplaceable for ordinary villages. More importantly, specifically rural community economy has showed its strong competitiveness according to previous investigation and analysis.

5.4. Planning Layout
Generally, the integration of natural villages that becomes bigger in scale and size is regarded as a smart and sustainable way of development. As an outward manifestation, the transformation of planning layout will bring some derivate advantages involving infrastructure construction and intensive land use.

5.5. Public Open Space
Based on the investigation and analysis of population structure in rural village, it is believed that point open space, namely small-scale open space, is more important especially for traditional natural villages. It can create much more opportunities for local villages. Besides, it is also a significant index for measuring living environment. For new modern rural community, undoubtedly, big scale public open space is efficient to improve living standards.

5.6. Public Service Facilities
Basically, public service facilities are accompanied with open space, which is able to introduce more villagers. The utilization rate of these facilities is quite low especially in traditional natural village. However, it has ability to offer basic security and assurance. That is to say, these facilities can be used whenever the local villagers are in need. For another, public service facilities are enjoy its scale effect, which means the bigger scale will bring much more benefits.

5.7. Architectural Design
While retaining traditional architectural form, the layout has changed a lot. Along it changing, entrance space and courtyard is always important functionally. Some improvements directly impact the quality of living environment, such as the setting of toilet. Although vacancy rate of rural residence is still very high, the size and scale of room becomes more rational. In terms of building passive design, it has been paid more and more attention and some improvements has been made as a result.

5.8. Building Material
On the one hand, traditional loess mixed straw is replaced by concrete and brick. On the other hand, construction technique is improved. To some extent, it is not a purely contemporary replacement, some local materials has still been used and economic and environmental principles have been taken into consideration.

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