

# Planning mode of the “urban-rural-field-garden” for the new suburban countryside in the Chengdu-Chongqing region of China

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Received 27 October 2014, www.cmnt.lv

## Abstract

In China, the construction of a new countryside necessitates the successful implementation of strategic goals that are in line with recent urbanization and the integration of urban—rural development. As a typical site of urban—rural integration planning, the Chengdu-Chongqing region has become the “Overall Urban-Rural Comprehensive Matched Reform Experimental Zone”. In line with this aim, this study proposes the “Urban-Rural-Field-Garden” planning mode that is suitable for the construction and development of the new suburban countryside in the Chengdu-Chongqing region. We base our analysis on the current state, problems, and the requirement for new urbanization and integrated urban—rural development. We then analyzed the constitutional content, function, organization, layout, form, and guarantee mechanism of the proposed mode. Finally, we determined the general applicability of the proposed model given the construction areas of the new countryside, which differ in terms of dominating type, to provide references for the determination of a suitable mode for new countryside construction in other Chinese regions.

Keywords: New suburban countryside, planning mode of “Urban-Rural-Field-Garden”, new countryside construction, new urbanization in China, urban—rural development

## 1 Introduction

The Chengdu-Chongqing region in China is a national pilot area for comprehensive urban and rural reform. Its dual structure characteristic (urban—rural) has generally generated problems nationwide. Thus, the planning for new rural areas requires active exploration and innovative practices. This approach enhances the significance of new rural planning and overall urban—rural development in the region, as well as in other parts of the country. Based on current urban and rural development within the Chengdu-Chongqing region, we aim to facilitate the healthy development of urban and rural areas. Our proposed approach can be a good example to be followed in future developments.

In this study, we analyze the characteristics and problems of the new suburban countryside in the Chengdu-Chongqing region. Subsequently, we present the “Urban-Rural-Field-Garden” planning mode according to the requirements of new countryside construction. We also

examine the materials, safeguard mechanisms, and supporting mechanisms of the construction. In addition, we study cases involving different kinds of new suburban countryside to establish a suitable mode for the new countryside. This mode benefits urban—rural development and depends on the countryside environment. In sum, this study may act as a reference for the development of the Chengdu-Chongqing region and of other areas in China.

## 2 Analysis of the planning mode of the new suburban countryside

The planning mode of the new countryside should satisfy the requirements of scale operation. Furthermore, the new rural planning mode should be capable of adapting to the natural environmental conditions of mountainous rural areas and should comply with the requirements of local agricultural production. In line with these requirements, two main types of planning models are proposed, namely, centralized and distributed topologies.

TABLE 1 Centralized Topology and Distributed Topology

Planning Mode	Base Formation	Best Practice	Mode Advantage	Mode Disadvantage
Centralized Topology	The ideology and planning methods for rural areas are similar to those for urban areas. The land is intensively used for construction.	Farmers concentrate residential- and agricultural-scale activities.	Intensive land use and scale benefit; clear planning structure and orderly distribution; the highly efficient configuration of public service facilities.	Unsuited housing form; imperfect policy measures.
Distributed Topology	The ideology and planning methods for the land: Rural construction lands are integrated and farmlands are protected.	Traditional model: Construction land was scattered throughout the village.	The protection of cultivated land; the linkage of production and living spaces; beautiful farmland and woodland scenery; stage construction.	Inefficient land use and industrial development; imperfect policy measurements; costly construction.

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### 3 Constitution of the planning mode for the new suburban countryside in the Chengdu-Chongqing region

The features of the new countryside planning mode are as follows:

The new suburban countryside has a good foundation for economic development in terms of social economic infrastructure. Furthermore, it is easily affected by social and economic development. This new countryside is advantageous in terms of industrial restructuring.

The new suburban countryside is uniquely advantageous with respect to the geographical conditions for development.

The rural scenery at the Chengdu-Chongqing region is greatly enhanced by its landscape features, farmland and forest landscapes, rural lifestyles, ecological villages, and countryside landscape environments. These variables support the natural resources through tourism activities such as agricultural tourism, rural tourism, and village resorts.

The overall layout of the new suburban countryside is clustered. Furthermore, this layout covers the construction features of the living environment in the mountain.

The planning mode of the “Urban-Rural-Field-Park” considers the planning of a new suburban countryside. The overall layout is clustered as well. This planning mode includes living, job, agricultural supply, and holiday functions. The unit of living function must be modelled as a centralized topology, whereas the remaining units are presented as distributed topologies. The basic layout “House-Garden-Field” is then established. In this mode, the relationship between the farmers and the land is the most important aspect. Farmers can reap the benefits of land consolidation, enjoy their lives while developing agricultural production.

#### 3.1 CONSTITUTION OF THE “URBAN-RURAL-FIELD-PARK” PLANNING MODE

The planning mode of the new suburban countryside includes three kinds of features, namely, functional attributes, layout forms, and farmer—land relationships. It also consists of four types of dominant function development: agricultural production, the agriculture industry, industrial development, and leisure tourism. The villages in this mode must consider the unit of living function to address the livelihood problems of farmers.

The unit of rural living function complies with the requirements of modern rural life and the corresponding living habits.

The unit of rural job function postulates that once land is consolidated, farmers can obtain jobs in the villages.

The unit of agricultural supply function ships agricultural products to cities as soon as possible and generates jobs for farmers.

The unit of holiday function aims to generate an idyllic environment, to provide ancillary services, and to enhance the life experience of citizens. This unit can also provide numerous jobs to farmers.

The pattern layout forms are as follows:

(1) General layout form: “Cluster Style”. This planning layout considers the characteristics of the local natural

conditions, including reasonable intensive land use, industry type, and distribution form to determine a pattern of moderate concentration.

(2) Basic structural unit: “House-Garden-Field”. “Houses” have leisure and residential functions. They display a community-type architectural layout. “Gardens” have tourist and industrial development functions. Moreover, ancillary park spaces belong to the construction unit. “Fields” serve as agricultural land or lands for forestry and landscaping. In the basic structural unit, either a “garden” contains a “house” or a “house” contains a “garden”.

(3) Establishment of a location calculation model. The mode for location calculation is described as follows:

If a random variable  $x$  is the position reference number for  $\mu$  and the scale reference number for  $\sigma$ , then its probability distribution and probability density functions are expressed as:

$$f(x) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$$

The random variable is known as a normal random variable. The location calculation model conforms to this variable in this study. Its distribution rule is written as:

$$X \sim N(\mu, \sigma^2)$$

If  $\mu = 0, \sigma = 1$  then the standard normal distribution is expressed as:

$$f(x) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{x^2}{2}\right)$$

(4) Basic elements of the pattern layout

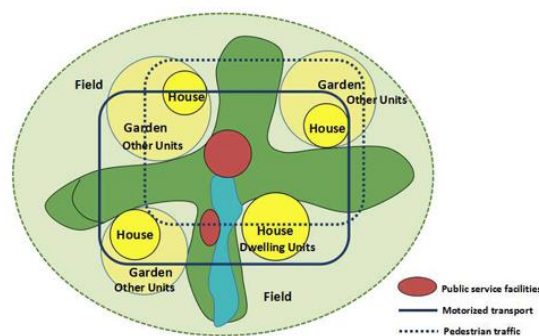


FIGURE 1 Urban and Rural planning model basic layout

- 1) The residential land in the village is concentrated. Meanwhile, function units are constructed as per the “House-Garden” mode. Their locations in the village are discrete.
- 2) The construction unit is characterized by land conditions, industry type, and the radius of agricultural cultivation.
- 3) The environment of the construction unit is enhanced in the village, including farmlands, holts, rivers, and ponds. The unit is also appropriate for the terrain and displays landscape features.
- 4) Each construction unit can be reached through the main road, which is the route followed in production and in daily life. Each unit is linked through the landscape walking and public service systems.
- 5) The public active zone is composed of the main

countryside landscape. In this zone, one can enjoy holidays and the rural scenery. Public service centers are located at the intersection of the public active zone and the roads.

3.2 SAFEGUARD MECHANISM OF THE PLANNING MODE OF THE “URBAN-RURAL-FIELD-PARK”

This planning mode includes the policy of the “overall urban-rural development experimental zone”, land circulation systems, land consolidation policies, and safeguard systems.

Various planning processes should be coordinated to guide village construction, such as village-level land use planning, village planning, and industry development planning. Most of these plans have their own functions. In village-level land use planning, land use must be restricted. Village planning management and rural planning generate the foundation on which new rural areas are planned. Industrial planning guides industrial development. Therefore, these plans should be connected to serve as a basis for planning and as indemnification in rural planning.

The advantages of the village in terms of resources facilitates the planning of industrial development. This planning also guides the industry in terms of optimized transformation. The “garden” in the “Urban-Rural-Field-Park” planning mode is the space in which the primary industry is integrated with other industries and vice versa. In addition, the “park” or “garden” can not only handle the production capacity of high-quality agricultural products, but it can also accommodate tourism functions. Therefore, this mode can guide industrial development and act as the foundation on which the sharing of urban—rural spaces is planned.

The planning for public services includes the basic planning of rural services and of urban—rural public services. Environmental landscape planning is basically concerned with natural environment production and with improving rural living environments. This planning mode also supports industrial development and tourist vale for urban and rural residents.

4 Study of the applicability of the planning mode of the new “Urban-Rural-Field-Park” countryside

4.1 STUDY OF THE APPLICABILITY OF THE AGRICULTURAL PRODUCTION MODE

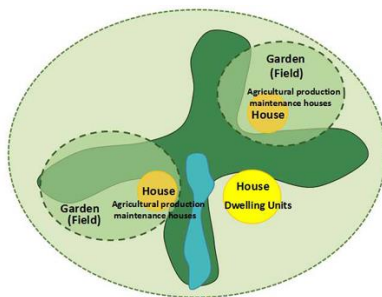


FIGURE 2 Agricultural production rural planning

TABLE 2 Planning Mode “House-Field”

<b>Function</b>	Function type: Agricultural production mode. The Baiguo agro-ecological park is a typical case. Functional unit of living: Farmers reside in a centralized living area with multi-story residential buildings.
<b>Layout</b>	“House-Field (Garden)”: Aquaculture parks and plantations are constructed in the village, and farmers live in new houses.
<b>Farmer—land Relationship</b>	“Plantations with farmer” mode of rural cooperative joint-stock.
<b>Mode Evaluation</b>	Land use is intensive. Each unit combines the scattered layouts of agriculture and forestry landscaping. Cooperatives are innovative.

4.2 STUDY OF THE APPLICABILITY OF THE AGRICULTURAL INDUSTRY MODE

Analysis of the applicability of the planning mode “House-Field-Garden (Park)”:

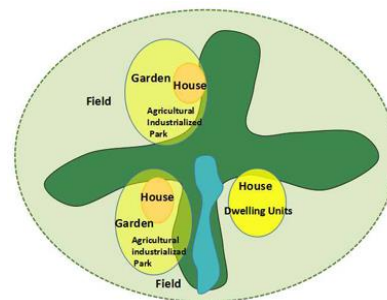


FIGURE 3 Agricultural industrial rural planning

TABLE 3 Nanxin in Chengdu

<b>Function</b>	Function type: Modern urban agriculture; agricultural production and product processing. Functional unit of living: “1 + 4” strategy or the construction of one industrial park and four residential areas.
<b>Layout</b>	“House-Garden-Field”: Three function units comprise one industrial park, which houses residential areas.
<b>Farmer—land Relationship</b>	Farmers are encouraged to seek employment and to become entrepreneurs in the industrial park.
<b>Mode Evaluation</b>	Living units are centralized, whereas other units are scattered; residential units are adjacent to the industrial park; the industrial development of modern agriculture is promoted.

4.3 STUDY OF THE APPLICABILITY OF THE INDUSTRIAL DEVELOPMENT MODE

Analysis of the applicability of the planning mode “Garden (House) -Field”:

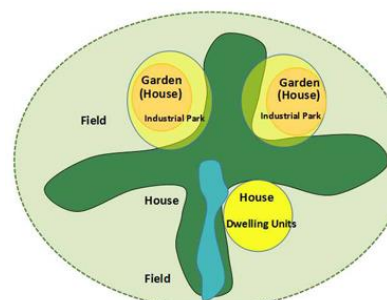


FIGURE 4 Industrial development rural planning

TABLE 4 Hailong in Chongqing

<b>Function</b>	Function type: Industrial development; the construction of industrial parks. Functional unit of living: Phased construction of the houses of farmers; low-rise houses.
<b>Layout</b>	Industrial zones in central and western parts; farmland in the eastern part; industrial parks and residential areas are combined.
<b>Farmer—land Relationship</b>	Farmers are encouraged to seek employment in the industrial park.
<b>Mode Evaluation</b>	Industrial parks and residential areas are mixed; efficient use of land; risk of overpopulation and environmental damage; the mode of “village committee + company + investors”; the income of farmers is increased; industrial upgrading is promoted.

<b>Farmer—land Relationship</b>	Farmers are guided with respect to the operation of ponds for tourism.
<b>Mode Evaluation</b>	Rural and pastoral layouts are combined, as are living and production spaces. This mode is suitable for the habits of farmers; it offers leisure travel services and promotes the development of fisheries and tourism. Thus, the living conditions of farmers are improved.

4.4 STUDY OF THE APPLICABILITY OF THE LEISURE AND TOURISM MODE

Analysis of the applicability of the planning mode “House-Garden (Park) -Field”:

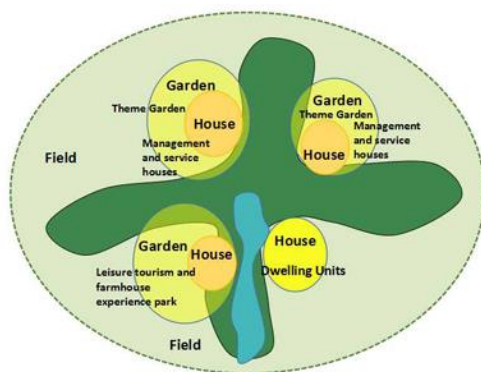


FIGURE 5 Leisure Tourism rural planning

TABLE 5 Dadi in Chongqing

<b>Function</b>	Function type: Reliance on tourism in the fish farming industry and leisure tourism in the villages. Functional unit of living: The new houses of farmers are clean and neat.
<b>Layout</b>	The houses of farmers are located near the ponds. The ponds are included in tourism to the hilly terrain.

5 Conclusions

Overall urban—rural development in the construction of new rural areas is complex, and the present study cannot cover all aspects of the new rural planning process. However, the “Urban-Rural-Field-Park” planning mode is an innovation in this regard.

With the development of a new suburban countryside in the Chengdu-Chongqing region, the planning for new rural areas has developed rapidly and fruitfully. However, this planning process is limited in terms of the understanding and application of macro policy, usage of rural land, different urban—rural land spaces, optimized transformation of industrial structures, and enhancement of public services. Thus, the best planning mode must be determined to overcome these issues.

The “Urban-Rural-Field-Park” planning mode for the new suburban countryside is established based on the resultant features of the planning for the new suburban countryside in the Chengdu-Chongqing region. The proposed mode is suitable for this region and meets the requirements of overall urban—rural development. Moreover, we examine the aspects of content, safeguard mechanisms, and support systems.

The planning mode of the “Urban-Rural-Field-Park” can be considered in the study of the layout of “House-Garden-Field” planning. Hence, the study results can be applied to different types of new suburban countryside, and the planning mode can be adapted for various types of rural planning.

Acknowledgements

Project supported by the National Science Foundation for Distinguished Young Scholars of China (Grant No.51208530)

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*Planning Mode of Suburban New Countryside-Taking Chongqing City as a Case on Study.* Thesis for master degree of Chongqing

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