

# **A Comprehensive Planning Model for Rural Settlements:**

## **Shunyi Project of China as a Case**

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**This paper explores the comprehensive planning method and process for rural settlements within the context of China.**

**Based on the field survey and door-to-door interview at five typical Beijing rural villages, it is argued that the planning for rural areas must give full respect to the existing social and cultural attributes of rural life and not just the criteria of environment and landscape. With this precondition, local residents' participation processes would enable the planning to be oriented towards local needs, capacities and the perspectives of local people and the adoption of community values within the policy process.**

**On the other hand, the China's experiences point to the importance of the city government's leading role in upgrading rural areas. In this context, one important mission of the rural planning is, for each investment and construction nurtured back to the countryside by the city, to conduct reasonable guidance and control to avoid inefficient investment and redundant construction, and also to prevent the encroachment of farmland and woodland.**

**With the consideration of connecting the above local participation and governmental leadership, the paper examines the proper rural planning methods and process, to improve rural transportation and circulation, improve public utilities and facilities, establish a land-use planning control and development rights transfer system, and intensify and release the construction land in a micro spreading renewal model of the rural settlements.**

### **1 Background: Problems and Challenges of Rural Planning and Construction in China**

In the recorded history of over 3000 years, Chinese society has been endowed with the distinct imprint of agricultural civilization. It was not until the middle of the nineteenth century that China had to face the surroundings in the progress of industrialization and urbanization. After more than one hundred years' wars and turbulence, China stepped into a rapid urbanization period in the recent 30 years finally. The percentage of urban resident population in China surged from 20.6%<sup>I</sup> to 49.7%<sup>II</sup> during 1982-2010 based on the census statistical data.

In the process, the old agricultural civilization tradition of China is confronted with the challenge of the contemporary abrupt change in the urban and rural areas. At present, over 220 million rural people leave their registered permanent residence for more than half a year in China<sup>III</sup>, most of whom are young and middle-aged labour force flowing into big cities for better job opportunities and life quality. This trend brings great challenges to both cities and countryside: for cities, since it is difficult to provide sufficient and fair job opportunities and public service facilities in a short period, the migrant labourers flocking into cities often cause various social problems; in the meanwhile, for the countryside, the drain of labour force leads to the abandonment of farmland and the stagnation, even decline of rural development. Therefore, the development and construction of rural settlements has become one of the most important issues of the contemporary China.

It is in this context that the School of Architecture, Tsinghua University has carried out a series of comprehensive planning, design and research work to several rural cases of Shunyi District on the outskirts of Beijing under the entrustment by Beijing Municipal Commission of Urban Planning since 2005. Based on these projects, the discourse tries to put forward the comprehensive planning theory and method for rural planning and design which can be applied to the improvement and development of rural settlements in the rapid urbanization region of the developing countries.



Figure 1: Problems and challenges of China rural settlements

## 2 Investigation Contents and Methods of Rural Planning

### 2.1 Building the household information data-base by door-to-door visit

Comparing with those in cities, the residents in rural settlements have less public and collective consciousness, but stronger independence on the basis of family. Therefore, any planning and construction involving public factors must be based on fully understanding and respect of the willingness of each family.



Figure 2: Door-to-door visit of the rural planning investigation

The project team has carried out door-to-door visit and mapping covering the whole rural settlements for the preliminary investigation. Several investigation teams interviewed each family to get general information of the family, measured and took photos of house sites and house arrangement and use situation, and recorded and compiled the information in a uniform format.

Detailed information acquired via the door-to-door visit includes:

- (1) Population – names, sexes, ages, work & education backgrounds, work/school places and commuting modes of all the family members and closely related persons;
- (2) Economy – income and details thereof, expenditure and details thereof, consumption and investment, record of the important fixed assets with respect to the whole family and each family member;
- (3) Spatial inhabitation – whether the house is permanent, temporary, deserted or extra, total floor area, building time, feature and quality of each house, habits and willingness of habitation and house building;

The project team record the information above on the basis of the farmer's house site, and establish a spatial information database with “household” as the unit for the entire rural settlement as the basic platform of the subsequent planning, design and construction.<sup>IV</sup>



Figure 3: Household information data-base for rural settlement

## 2.2 Investigation and exploration involving the whole village area

Besides the investigation of each family, the comprehensive grasp of the overall status-quo within the village is indispensable, including:

- (1) Status-quo of land use – delimitation, function examination and category definition of each piece of land;
- (2) Status-quo of transportation and circulation – the analysis of accessibility, and investigation of the internal road system and parking lot/garage;
- (3) Status-quo of municipal infrastructure – the investigation of distribution networks, station and running of water supply & drainage, electric power, telecommunication, energy, environmental sanitary, disaster precaution, etc. ;
- (4) Status-quo of public service facilities –the investigation of arrangement, location and running of public management, commerce, finance, medical & health care, culture and education, etc.;
- (5) Status-quo of economy and industry – village’s collective fiscal revenue and expenditure, and economic aggregate & ratios, industry type, output value, profit and employment opportunity of each enterprise in the village.



Figure 4: Investigation and exploration involving the whole village area

## 2.3 Communicating between the government and the village

Different from the urban planning, the investor of rural planning is usually government, while the beneficiary is grass-root villages. The two parties are separated. Thus, the planner plays an important role between them.

For one thing, the planner shall explain to villagers the importance of intensive land use and protection of the countryside environment, which is to implement the definition and limitation of rural areas set by the planning from government.



Figure 5: Various kinds of public participation during the project

For another, the planner shall protect the legitimate development right of the rural villages and build a compensation mechanism when the development is limited for villagers. Therefore, the participation from villagers is essential in the whole rural planning procedures. The project team has made the exhibition, explanation and discussion during the work to fully incorporate villagers' willingness in the planning.

### 3 Improvement of rural public service & municipal infrastructure based on social objectives

In view of experience and trend in the world, the main support of the development and construction of rural areas is from subsidies and nurturing of national and local governments. Since 2006, China, as the last country which imposes agricultural tax on farmers, has cancelled the agricultural taxation of 2600 years, and arranged various agricultural subsidies from national finance, which indicates that China has gradually transitioned from the time of "exploiting farmers" to that of "nurturing farmers".<sup>V</sup> In that process, the improvement and construction of rural infrastructure based on the public finance investment is a significant part of nurturing rural areas by urban areas.

Hence, a major mission of the rural planning and design is to reasonably guide and control the funds and projects for nurturing the rural areas to avoid the Inefficient money input and wasteful redundant construction.

#### 3.1 Improvement of rural public service facilities

The low population density of rural area leads to the insufficient service recipient of public service facilities with difficulties in running. Thus, the planning of rural public service facilities focuses on the establishment of a joint construction & sharing mechanism among multiple villages and towns in the area. Instead of the pursuit of all facilities in one village, the planning aims at complete sets of facilities in a certain area, and allows the sharing of the facilities in all the villages within the area via convenient public transportation networks, thus avoiding the redundant construction of facilities.

Take the case of educational facilities: so far, the number of pupils in a single village makes it difficult to build a primary school in each village. Therefore, it is recommended that several villages jointly found and share a primary school in the area with convenient contact and appropriate service radius, and school buses transport children and parents between schools. Accordingly, junior & senior high schools, vocational & technical schools shall be provided within larger areas. Other cultural, sport and major commercial facilities can also adopt such a staggered layout and joint construction & sharing mechanism.

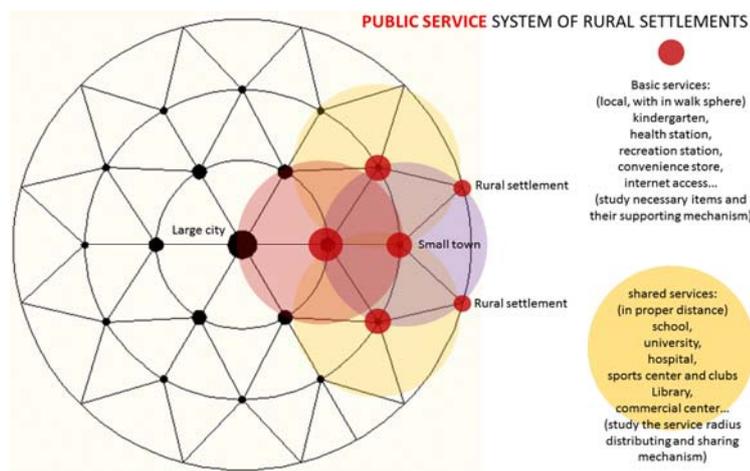


Figure 6: Regional joint development and sharing mode of public service facilities in rural areas

There are still some public service items which are necessary and basic facilities for short distance, namely the ones that must be set in each rural settlement. Take the medical & health care facilities for example: the absence of village doctors causes the impossibility of prevention and curing of many villagers' diseases in an early stage, and further the dramatically increased loads on big cities' hospitals after their flocking there for aggravated illnesses. In this planning project, village clinic is re-established in each village and taken charge by the town and county's doctors alternately. In terms of the running effect after establishment, the village clinic has become the occasion of the villagers' frequent clinical examination, medicine procurement and even gathering for chatting, showing effective performance in providing primary medical, health care and referral of cases for the villagers. In addition to medical & hygienic facilities, a network of

supermarkets and convenience chains rooted in rural areas has been planned and established under the support of the government, while the many young educated officials sent to rural area have brought computer and Internet technology into application, perfected the means and methods of villages' management and enhanced the communication of the villages with the outside world.

### 3.2 Improvement of rural infrastructure utilities

The construction of various infrastructure services in rural areas is an important precondition for the life quality's enhancement and the economic development in rural area, and also a key investment trend of governmental finance nurturing rural development in China over recent years.

The planning of road traffic improvement in rural areas means the adjustment and reconstruction of road system within villages, as well as ensuring the villages' convenience and access to the outside world. This aims at making the logic of the road system more distinct, the street sections more reasonable and the roadside auxiliary facilities more complete, meeting fire fighting and first aid demands, and eliminating flood and inland inundation. The principles for planning and design include: making full use of the existing roads, avoid large-scaled filling & evacuation, and minimum touch to the existing things such as resident's courtyard and daily life due to road alteration.

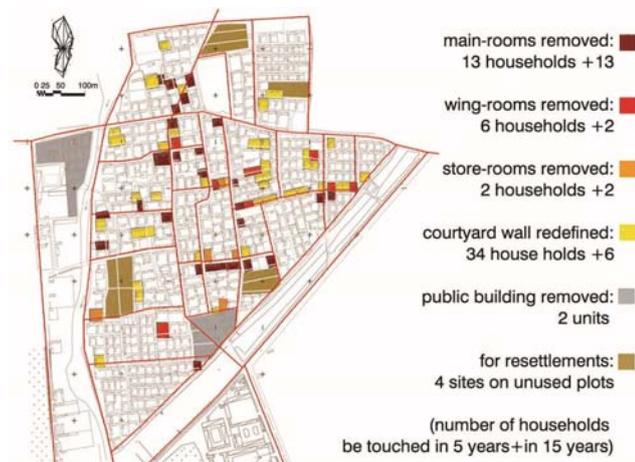


Figure 7: Road system reconstruction and its impact evaluation

The construction of the public infrastructure in rural areas is often combined with the alteration of the roads. As to water supply and draining, the work contents mainly involve the addition of standby wells for livelihood, changing of old water supply pipe system, installation of water meters for the residents, charging of the domestic water consumed beyond the rated amount, layout of sewage pipeline for separated draining of raining water and wastewater, construction of sewage treatment facilities suitable for the villages and recycling of used water for greening and irrigation.



Figure 8: Sewage treatment plant pilot of constructed wetland

With regard to energy, environment and sanitation, the work contents comprise the installation of flushing toilets, setting of garbage collection points and regional garbage pickup and transportation system. For

power and telecommunication, the work items mainly contain the renewal of power & communication facilities, realization of village-wide coverage of wireless network and erection of solar street lamps.

The suitability of technologies plays a crucial role in the planning and establishment of the public infrastructure above. Some technologies have become quite mature and widely applied, while some are still being piloted in the project for summing up experience and finding out possible problems.

#### 4 Land use planning and control based on environmental objectives

As shown in the statistical bulletin from the Ministry of Land and Resources, the total area under cultivation in China had reduced from 130 million hectare in 1996<sup>VI</sup> to 122 million hectare in 2008<sup>VII</sup>, very close to the warning value of 120 million specified by the Chinese government, thus having great impact to the food security of China and even the whole world. Apart from cultivated land, other lands like woodland, pasture land and water area are also eroded. Moreover, the basic substances of natural environment that human being lives upon are confronted with serious threats brought by urbanization.

In addition to the expansion of the land used for urban construction, the out-of-control increase of the land for rural construction is also responsible for the environmental crisis above. China still has about a half population living in the countryside and the rural population have the habit to renew or reconstruct their houses periodically due to the cultural custom, even the villagers working in the cities often invest their incomes got from the cities to the reconstruction of their houses in the village. However, in constructing new houses, old houses are usually left there instead of being wrecked for re-cultivation, so the residential land in rural area is continuously expanding. Besides, rural industrial land is increasing greatly in recent years. The village industry, established on inconvenient transportation and location disadvantage, usually enhances its market competitiveness by adopting the way of high energy consumption, high pollution and the extensive use of the construction land. The approval and leasing of the construction land now becomes a major source of rural incomes. The accumulated nibbling of the rural residential land and industrial land above constitutes one of reasons of obvious abatement of the nationwide cultivated land and others.<sup>VIII</sup>

In rural planning, it is necessary to set up the growth boundary for the rural construction based on the principle of intensive land-use, attempt to use the current construction land or abandoned land, and finally make the construction land per person no more than 150 m<sup>2</sup> which is now regulated by the Chinese government.

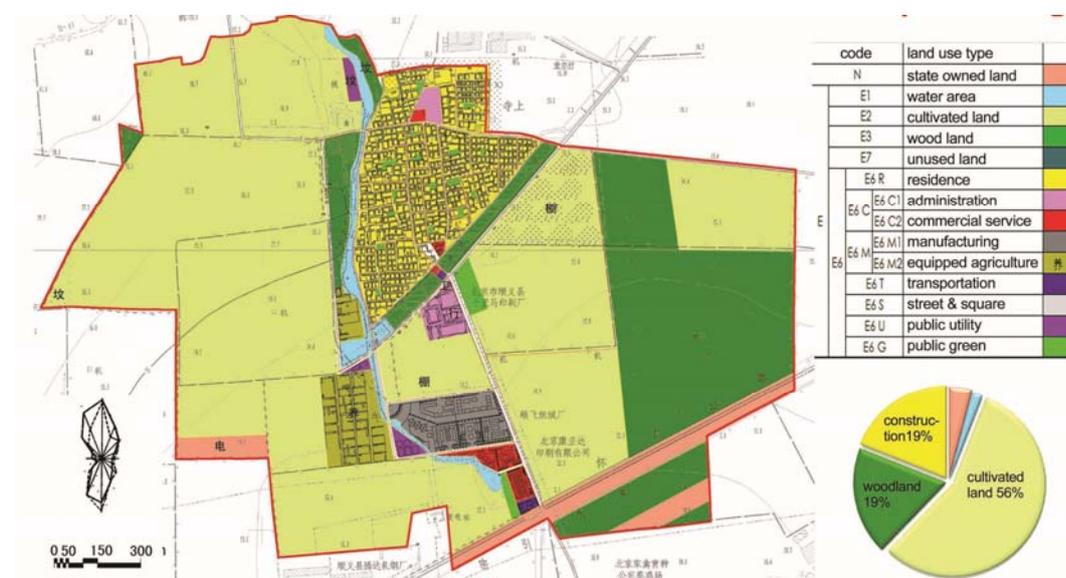


Figure 9: Rural Land Use Planning and the Construction growth boundary setting

The villagers often feel an antagonism for this planned construction land control from a superior authority. After the planning was approved, the case village where the project is carried out still built the workshops for the investment outside the construction growth boundary, which soon was examined and punished for violating the planning. The village cadres expressed their confusion in this regard. This triggered the project team to think it over and put forward the idea that the management and control of the rural construction land can only be realized on the precondition of the implementation of overall urban-rural land

compensation mechanism. To be exact, comparing with the method in the city that the government seeks for development by land assignment, the farmers' collective organization whose land assignment right for construction and development right of this part are deprived of for the sake of the city and village's overall benefits shall be compensated or transferred in an appropriate manner.

In the middle of the last century, the western countries adopted welfare compensation and transferring policy to those suffering losses, for example, Transferable Development Rights (TDRs) and Purchase of Development Rights (PDRs). The policy tools or the market tools, to some degree, enable the agricultural land and ecological land which were limited for development to share the benefits getting from land development with cities.<sup>IX</sup> Recently, some Chinese scholars have calculated the unused value of the rural land by using CVM (Contingent Valuation Method) and TCM (Travel Cost Method) developed by European scholars<sup>X</sup>, and furthermore tried to establish a system of city-to-village land development rights transfer suitable for China's actual conditions.

## 5 Renewal of Rural Settlements and Release of Construction Land based on Economic Objectives

In addition to the infrastructure construction supported by the government and land development rights transfer system, another important objective is how to keep the economic growth vitality of rural areas at all levels.

### 5.1 The micro-spreading renewal mode of rural settlements

Besides livelihood improvement and environmental protection, the villagers and the villagers' collective organization lay more hope in obtaining more construction land through planning for non-agricultural programs' arrangement and the countryside's economic development. This becomes a long-term, rugged target in rural planning on the premise of maintaining the original construction land without expansion.

According to investigation, the status-quo of each house site area is much larger than the requirements specified by the national and local government, wherein the average house site area of single plot in the outskirts of Beijing is over 400m<sup>2</sup>, twice as much as the local standard. Furthermore, there are increasingly deserted or vacant house sites in countryside with the drain of labour force. Another investigation from Chinese Academy of Sciences shows that the empty land in Chinese rural areas due to migration of farmers has taken up 76000km<sup>2</sup>.<sup>XI</sup> This all indicates the renewal and reconstruction of rural settlements within the original location has the potential of construction land release.

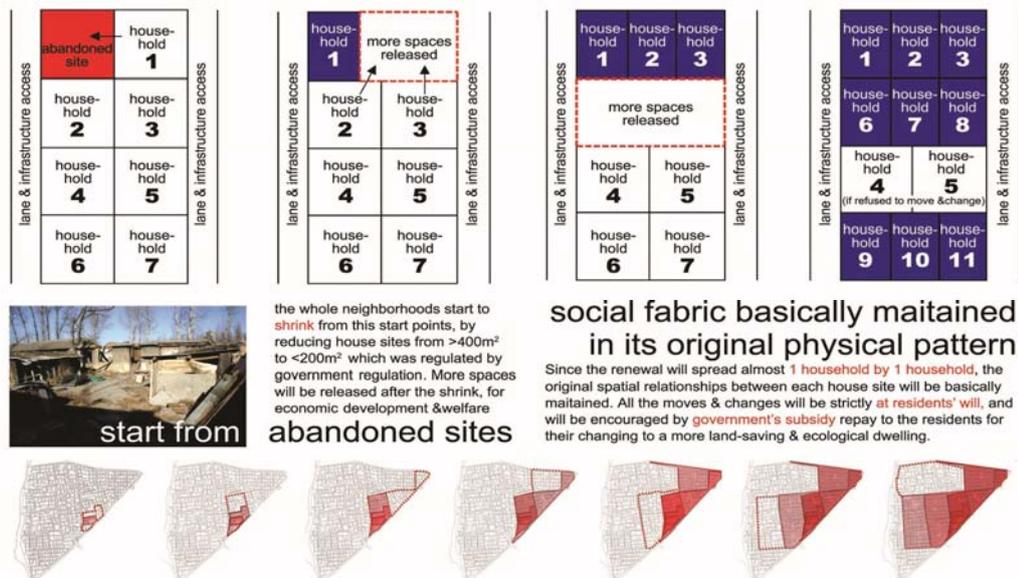


Figure 10: Intensification and Release of Construction Land Use in Micro-spreading Renewal Model

The project team tries to put forward a micro-spreading renewal model in rural planning, namely by taking the common vacant house site as a start point, construct a new land-saving & ecological farmhouse, let the farmers nearby settle there to release more spaces, and then construct two new units of dwellings to allow two families nearby to move in, and so forth, make the renewal involve the whole settlements finally, thus

the land used can shrink to 1/2-2/3 of the original area by centring on the start point, in this way to release construction land resources for suitable country industry development. This model can avoid the problem of “completion of new dwelling, but old dwelling remaining intact” in the model of construction of new dwelling in another location, and also have the advantage of following the original road infrastructure and basically keeping the original neighbourhood and social structure with regard to spaces. However, the difficulty lies in the prolonged land revenue cycle due to low renewal speed, further resulting in insufficient impetus of the investors, and also the increased construction cost due to small scale of renewal in the beginning stages. Therefore, to realize this renew model, the formulation of corresponding policies and provision of fiscal support are also indispensable.

## 5.2 A demonstrated farmhouse built as start-up project of the renewal

The initial start-up project of the micro-spreading renewal is listed into the governmental highlight projects by Beijing for investment and construction. The project team built a new energy-saving farmhouse in a vacant courtyard of the pilot village.

The floor area and the land area of the demonstrated farmhouse are both 200m<sup>2</sup>. To reduce the spatial suppression and in adaptation caused by the shrink of house site to the residents, cast iron railings without visual obstacles are adopted along the side of the yard facing streets, thus to further expect to bring more open and new lifestyle to the villagers.

The architecture pattern takes the traditional farmhouse mode into full consideration, namely three rooms, southern exposure, square structure and reasonable shape coefficient. The rooms are all provided with external-wall insulation, roof solar heat collection system, yard rain water collections system and other energy-saving, environmental-friendly measures.

The start-up farmhouse built is mainly used for demonstration to the farmers to get improvement comments, and trial-run of various equipment, clarification of expenses for equipment construction, installation, utilization and maintenance so that the villagers can make comparison and selection in future house building and also the government can establish related subsidy, assistance policies by referring to them.



Figure 10: Demonstrated pilot farmhouse

## 6 Conclusion

Relying on the research and practice of the project team above, a planning & construction model of rural settlements responsive to rapid urbanization regions can be concluded. The model, based on the three basic goals and values of environmental protection, social equity and economic development, is led and invested by the governmental bodies of various levels on the premise of “City back Seeding Countryside”. The contents include land use planning and control, circulation and infrastructure improvement, public services improvement, community renewal, housing construction and other fields.

The task forces of the project are composed of personnel from multiple departments and specialties, including the governmental officers of various levels for policy making, implementation and advancement, the architects and engineers for providing relevant specialized solutions and technical support, and the planners for making a highly comprehensive output integrating benefit claims of various parties and the engineering & technical solutions of various items.

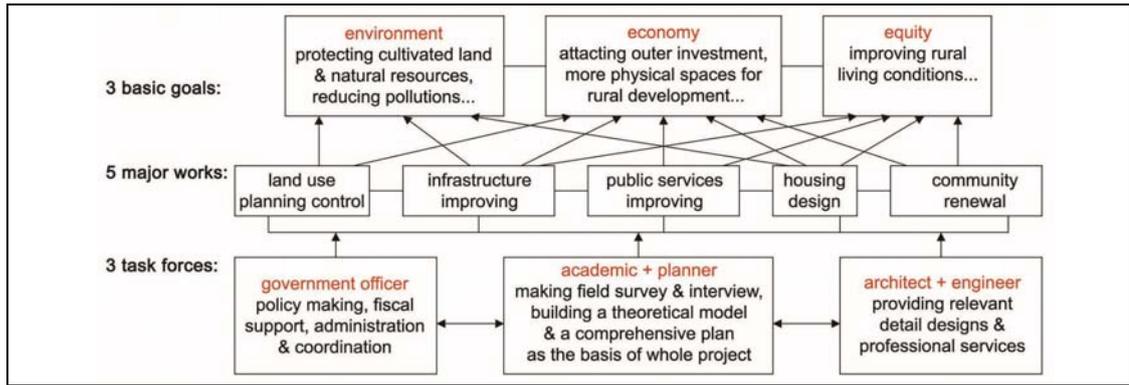


Figure 11: Illustration of basic model of Shunyi rural planning project

## Notes

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