

Sustainable Development of Affordable Housing under the Background of Rapid Urbanization

The Strategy of Intensive Land Use in Nanjing



Di Guo

PhD, Lecturer

School of Architecture, Southeast University, China

Introduction

The aim of this paper is to show the main problem of affordable housing construction in Chinese big cities, based on the experience from Nanjing. The intention is further to suggest some strategies of how to intensively use land in affordable housing construction.

1 Shelter Situation Analysis

1.1 Basic General Data

Geography and Administration

The People's Republic of China lies in the east of Asia. China is a country with a vast territory. It has an area of over 9,600,000 square kilometers.

China is a socialism country with its own characteristics. It is one of the developing countries. It consists of 34 provinces, autonomous regions, and municipalities directly under the Central Government.

Demography and Health

China is one of the largest countries in the world, which has a population of more than 1.3 billion. In 2009, the urban population reached the amount of 629 million, and the urbanization rate increased to 46.7%. In order to support the overall process of modernization in China, the urbanization rate will increase to 75% in about 40 years.

In 2009, the Chinese average life was 71.8 years of age, reached the level of moderately developed countries. Medical and public health undertakings in China have made remarkable achievements. In 2009, the total health expenditure of China reached 1.6119 trillion CNY, 1,192 CNY per capita health expenditure.

Economy

In 2009, with the world still haunted by recession, the GDP value of China was 33.5353 trillion CNY, up 8.7%, this figures outperformed all the other countries, including India. Disposable income of urban residents increased by 8.8% over the previous year.

1.2 Shelter Related Fact and Figures

Access to Shelter

China's average housing prices have topped the world when compared to average incomes. According to statistics of 2009, the average annual income of Nanjing residents amounted to 23,123 CNY (\$3,416). If a couple wanted to buy a second-hand apartment about 100 square meters on loan, they needed to save money for nearly 30 years without spending a penny as the price would now be 1.5 million CNY. The same situation is happening in other first-tier cities.

In 1998, affordable housing beginning its rapid development nation widely. According to policy requirements, the city in which the ratio of the house-price and the income is up to six should construct affordable housing. From 1999 to 2001, the investment of affordable housing construction accounted for the proportion of residential investment respectively to 17%, 16% and 14%. In some cities, more than half of the total housing construction is affordable housing construction, which playing a major role in solving the housing difficulties of low-income families. The main types of affordable housing in China are 1

bedroom apartment and 2 bedroom apartment, about 60-80 square meters / set, low-rent housing is about 40-60 square meters / set.

From 2002 to 2008, total national investment in affordable housing completed the amount of 482.52 billion CNY, accounting 5.63% for the total investment in residential; total new construction area completed the amount of 331,925,000 square meters, accounting 8.12% for the cumulative new residential construction area; cumulative actual sales area completed the amount of 249,606,000 square meters, accounting 7.76% for the actual sales of residential area. If estimating each set of affordable housing is 60 square meters by an average, China would have provide for 5.53 million low-income families with housing, accounting 9% for the total households of urban residents. In addition, there are 512 cities have established low-rent housing system, has started construction and acquisition of low-rent housing, which having a stock of 53,000 units about 293.68 square meters in floor area, providing for 547,000 low-income Families with low-rent housing.

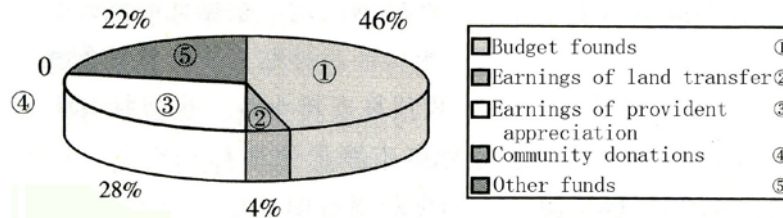


Figure1: Distribution ratio of low-rent housing in China in 2006

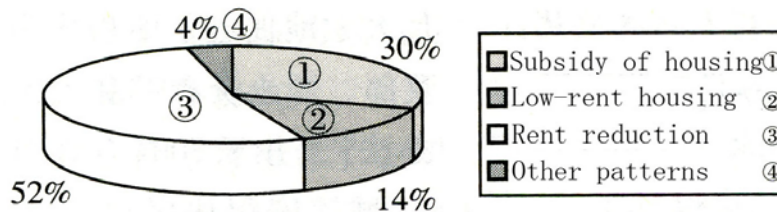


Figure2: Funding resources of low-rent housing in China in 2006

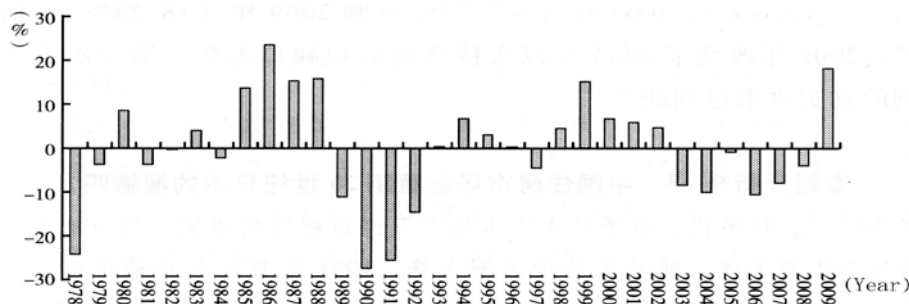


Figure3: Real gap index of housing supply and demand in china

The latest statistics show, to 2008, the investment of affordable housing and low-rent housing in China growth about 30%, far higher than other investments. From 2010 to 2012, the next three years will witness an increase of 2 million units for low-cost housing, 4 million units for affordable housing, and 1 million units of Slum Improvement Project. The total investment will reach 900 billion CNY, including 600 billion for affordable housing construction, 215 billion CNY for low-cost housing and 101.5 billion CNY for shantytowns.

Table1: Affordable housing construction situation of some Chinese cities in 2009

City	New housing area (10,000 square meters)	New affordable housing area (10,000 square meters)	Proportion
Beijing	2750	1150	41.8
Tianjing	1800	605	33.6
Shanghai	2000	400	20
Nanjing	1120	291.4	26
Hangzhou	650	171.5	26.4
Wuhan	1028	728	70.8
Shenzhen	1216	228.4	18.8
Guangzhou	1180	100	11.8
Xi'an	900	207	23
Chengdu	1051	100	9.5

Access to and cost of Basic Services/Infrastructure

According to statistics, from 2000 to 2009, the investment of national urban public municipal infrastructure in fixed assets increased from 189.1 billion CNY to 903.9 billion CNY. In this ten years, the investment of city municipal infrastructure in fixed assets averaged accounting 5.86% for the total fixed asset investment over the same period.

In 2010, the Chinese government launched one economic stimulus plan named "4 trillion investments". Among it, there will have 2.3 trillion CNY invest to highway, railway infrastructure, post-disaster reconstruction and affordable housing construction.

Access to and cost of Education

From 2004 to 2008, China's public finance spending on education increased from 4,000 billion CNY to 9,700 billion CNY, the proportion of financial education expenditure to total expenditure increased from 14.9% to 16.3%.

In 2010, the Chinese government will increase financial fund for public education, the proportion of public education fund expenditure to gross domestic product (GDP) will increase from 3.48% in 2008 to 4%, and the amount of education budget will be about 2,000 billion CNY to 3,000 billion CNY.

1.3 Housing Policy

30 years reform and opening up, China has nearly 300 million people into the city. Such a huge process of urbanization, we have not the phenomenon of large number of slums, which is a great achievement. The reason is that China has a history of 56 years of government housing allocation.

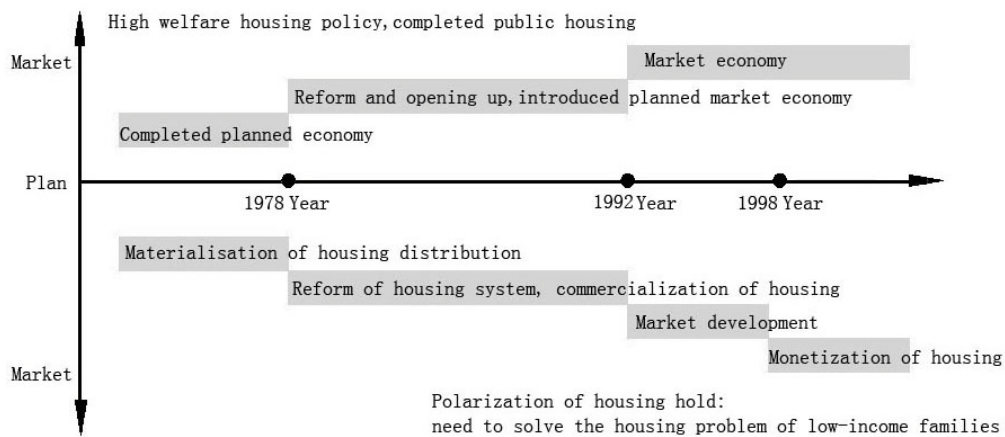


Figure4: Urban housing policy of China

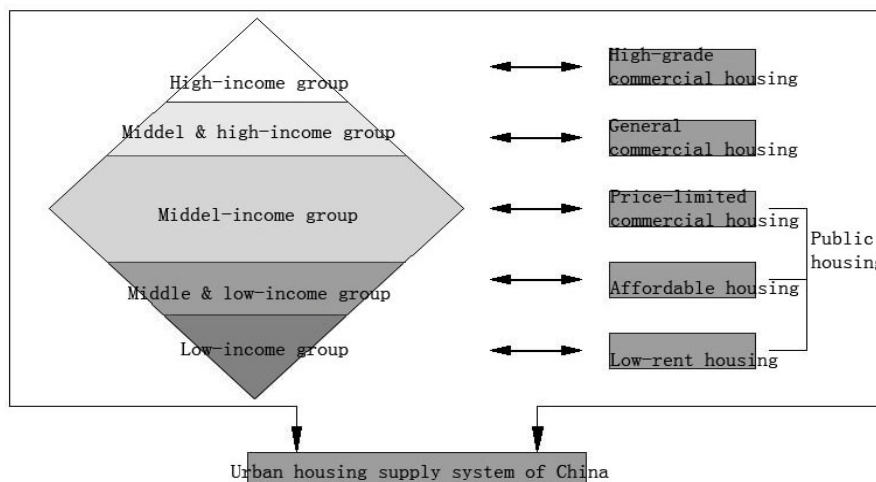


Figure5: Urban housing supply system of China

In 1998, the Chinese government began to establish a multi-level housing supply system gradually. Affordable housing is main part of the system, and to different income families there are different housing supply policies: for minimum-income households, the government provides low-rent housing or units, for low-income families, they could buy affordable housing and for high-income families, they purchase commercial housing at market price.

At present, housing provident fund system, affordable housing system and the low-rent housing system have together constituted Chinese urban housing security system as the main content.

1.4 Actors in Shelter Delivery and their Roles

The Chinese Government is the main responsible body of housing security. As socio-economic macro-control and management, the Central Government (Ministry of Housing and Urban-Rural Development) is responsible for the promotion of social progress and protection of realizing basic rights of all people.

Local governments are important implementers of housing security system, which carry out relevant policies and measures in place, promote affordable housing construction smoothly.

Enterprises of real estate development undertake the building work of affordable housing. Under the guidance of government, exert their professional ability of organization, construction and management; contribute to effectively solve the problems of family housing.

1.5 Shelter Design

China is now in the stage of rapid urbanization. Due to profit restrictions, land prices, expected exploitation appreciation and other factors, a large number of affordable housing construction lands are selected in city outside or edge area. However the majority of jobs are still concentrated in the inner city itself, low & middle income groups have to spend more time and costs in commuting. At the same time, the overall traffic of the city will increase and more traffic jams will happen. Compared with the inner city, the fringe areas have relatively few job-opportunities, and all supporting services are inadequate, social and cultural life are also very lacking. Therefore, a large number of affordable housing which has

been built is in the situation of poor traffic, poor service facilities, poor satisfy of need, resulting in inconvenience to the residents of affordable housing.

On the other hand, independent and concentrate construction is the main way of Chinese affordable housing development. On the surface, it is facilitate to implement and operate that build the affordable housing concentrate in some specific regions of city. However, this kind of concentrate construction would aggravate the spatial agglomeration phenomenon of low-income groups.

The Chinese government have defined the area of affordable housing clearly: the area of low-rent housing is no more than 50 square meters; the area of affordable housing is about 60 square meters. That is, the minimum living space per capita of affordable housing is about 16 square meters to 18 square meters, probably no more than 60% of the local per capita housing area. Most Chinese cities do not have systematic and detailed standards corresponding to the planning and design of affordable housing. All kind of housing shares the same standards of commercial housing, so it is failure to reflect the character of affordable housing that is social protection.

In China, the real estate developers operate the construction of affordable housing, in the way that the price is limited by the Government, therefore the construction quality is difficulty to guarantee in the context of trying to reduce the cost of building. In order to increasing construction quality and construction speed of affordable housing, the Chinese government now learn from Swedish experience, actively prepare for the industrial construction of affordable housing, and make it as a demonstration project to speed up the promoting process of the whole society.

2 Organisation

Southeast University is one of the key universities administered directly under the Ministry of Education. Dating back to the early years of last century (1902), Southeast University is one of the oldest institutes of higher learning in modern China. The School of Architecture of Southeast University (SEU-ARCH) was founded in 1927; it is the cradle of modern architecture education in China. Many famous Chinese architects and architectural educators have taught and directed the

School over the course of its evolution, and made significant contributions to the development of architecture and architectural education in China.

Being a first-class architectural education and research institute, SEU-ARCH plays an important role in Shelter Design and Development. On the one hand, over 80 years, SEU-ARCH has taught and trained nearly 3000 senior architects, which now hold posts in universities, Bureau of Planning Management, Bureau of Housing Management, institutes of architectural & design, real estate company, etc. Many of them became excellent professionals at management level with responsibility for affordable housing projects, policies or programmes, and deal with or have responsibility for capacity building and change in their organizations. On the other hand, many scholars in SEU-ARCH devote their selves to relevant research of Shelter Design and Development, and make certain achievements in this field:

- Reviewed the experience of affordable housing design and development of other countries and areas such as Sweden, Singapore and Hong Kong.
- Mastered one-hand information's (data and analysis) of the affordable housing situation in several Chinese big cities, such as Nanjing, Tianjing, etc.
- Published relevant works and articles in important academic periodicals every year, effectively promoting the research and practice of affordable housing, in the respect of management, planning & design, and evaluation, etc.
- Cooperated with Bureau of Housing Management to establish the standard and technique specification of affordable housing.
- Cooperated with institutes of architectural & design to participate in city affordable housing, post-disaster aid project (including master plan, village plan, and shelter design) for the deluge area in Jiangxi Province, for the quake area in Sichuan Province.

3 Shelter Problem

The previous analysis has discussed the basic situation of Chinese affordable housing construction, in which the issue of land use and its optimization strategy is the focus content of this article. Land is the most fundamental human resources, and the basic element of residential planning. In China, high speed of urbanization process will inevitably bring about a large number of land occupation, and the conflicts of compete for land between construction and farming have become increasingly prominent. Chinese farming land decreases by 530,000 hectares per year, and the contradiction between population and arable land is more acute. At

the same time, inefficient use of construction land seems a general phenomenon in China, the surveys on part of the urban land use show that about 4% -5% of urban land is idle, and 40% are in inefficient use. That is, intensive use of land should be an inevitable choice.

The volume of housing construction has accounted for a significant proportion, in the total amount of construction (already accounted for 30% of the amount of urban land use), which is the building types of largest land use, and should give priority to domestic research so as to realize sustainable development of urban. For long term, the construction of affordable housing will be a large family of land use in urban housing construction. As the embodiment of social justice and national welfare policy, it is important of intensive land use strategy of affordable housing construction to realize sustainable social, economical and environmental development.

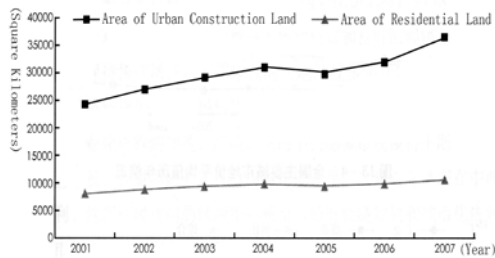


Figure6(left): Urban Construction Land in China

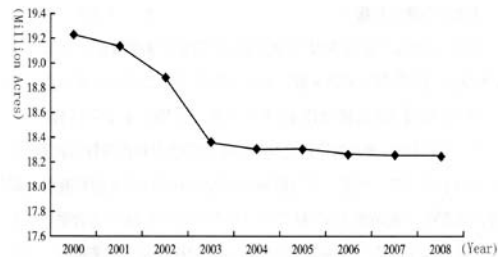


Figure7(right): Arable Land in China

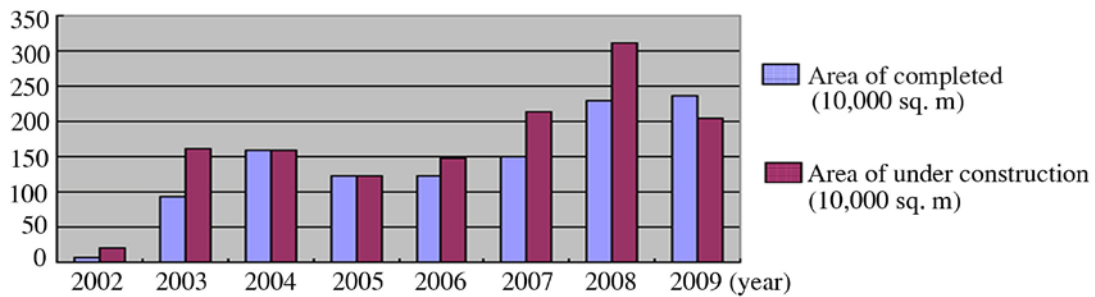


Figure8: Affordable housing in Nanjing

The situation in China cities is very different; therefore the writer takes Nanjing as an example to discussion. Construction of affordable housing in Nanjing is in the forefront of among major cities. 2002--2009, from a general trend point of view, construction of affordable housing in Nanjing in residential construction increased year by year the proportion of total construction of affordable housing in

11,289,400 square meters. 1.38 million families lived in affordable housing. But still there are many land use issues.

The land use problem of affordable housing construction which this article concerned lies in the following three aspects:

Problem 1 – Space Distribution

- To the administrative division, affordable housing development is in the state of imbalance spatial distribution. In the urban area boundary, affordable housing was distributed around the high-speed city loop-line. At the same time, the distribution of existing affordable housing also showing characteristic of making up a cluster.

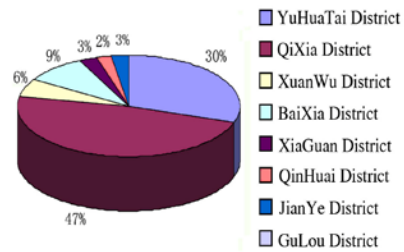
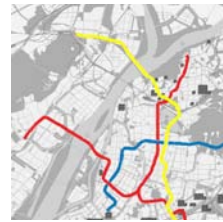
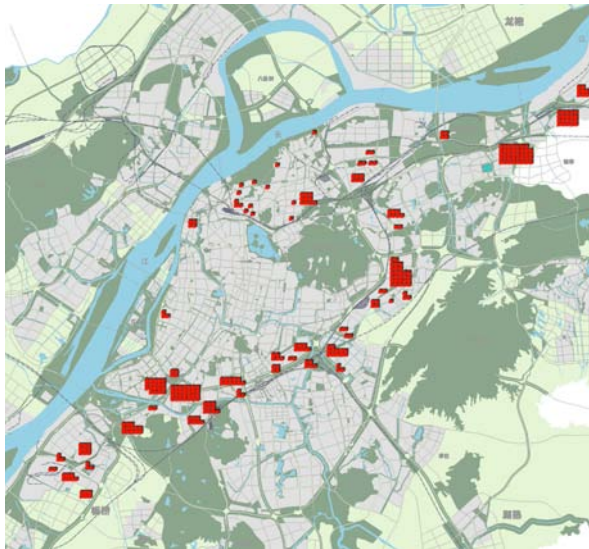


Figure9(left): Affordable housing spatial distribution in Nanjing

Figure10(right up):Subway line and affordable housing

Figure11(right down): Affordable housing in administrative district division

- Ribbon Distribution on the edge of the main city is not conducive to the low-income families. For low-income groups, the main city center is still the most important employment center, and in the future this concentration of employment conditions in the future will further deteriorate. Jobs continue to gather in the main city center area, employment and residence could not be evacuated to new city, or the edge of the main city at the same time.
- Main roads are cross-border traffic on the edge of the main city , traffic accessibility is poor. The distance from the inhabited area of low-income people to the city center is more than 15-20 km; it is already hard to reach by walking or bicycle. Public transport, especially metro is undoubtedly the best selection. From this point of view, large-scale, rapid public transport-oriented suburbs, and new

cities development -- TOD model-driven development of affordable housing is more reasonable and realistic.

- Supporting services are inadequate; it is inconvenience to the low-income residents. Compared with inner city, the supporting services of city fringe areas are inadequate, social and cultural life are lacking. Therefore, a large number of affordable housing built has poor traffic, and service facilities can not satisfy the needs of the residents, resulting in inconvenience to the residents of affordable housing.
- Large-scale construction affordable housing intensively increased the phenomenon of residential differentiation. Designate a regional in some parts of a city to construct affordable housing in concentrated form. Apparently, it is easy to operate, but on the other hand this kind construction will aggravate the agglomeration of low-income, strengthen spatial differentiation of different social stratum.

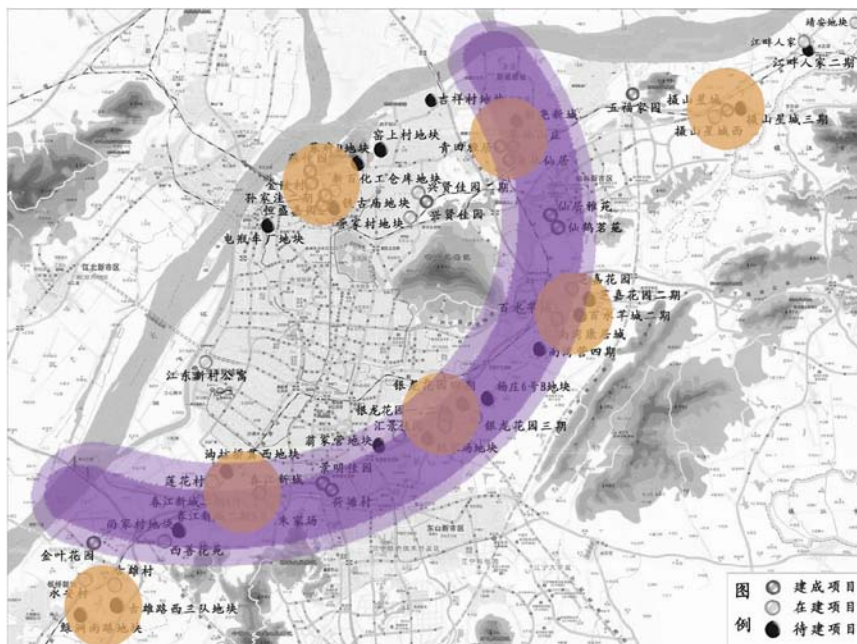


Figure12: The characteristic of affordable housing spatial distribution in Nanjing

Problem 2 -- Construction Mode

- The strength of development--Most land of affordable housing is allocated by the government; the intensive use of land is not high in the case of away from market constraints. The construction of affordable housing has not reached the required strength level, which cause the land values are not fully. Therefore, it is not conducive to the sustainable development of affordable housing construction and

the harmony and progress of society. Intensive high-density land use could increase the economic benefits of land use, but also could prevent over-developed of land resources.

The average floor area ratio of China Mainland city is only 0.78 (2006), in comparison, Japan is 2, China Taiwan is 1.2 and Hong Kong is 1.6. Therefore a serious waste of land that is the status of China urban land use. Moreover, expansion of urban land in China faster than urban population growth rate. This has fully demonstrated China's land too fast urbanization, urban land marginal benefit greatly decreased, and the large number of cultivated land occupation, a direct threat to China's food security.

On the other hand, Most built affordable housing away from the urban district, low floor area ratio and inconvenience traffic is difficult to form a community in long-term, not only increase the municipal investment and influences the matching and efficiency of public buildings in turn. Furthermore, all these affect the life quality of residents, and then create a vicious cycle. For example, the average floor area ratio (FAR) of Nanjing affordable residential districts is about 1.5-2.0, a few are higher than 2.0, compare to Hong Kong: low, medium and high density residential plot ratio limits for the 3:5:8, and Singapore: the floor area ratio of HDB housing estates located in different sections is not the same, generally between 2.8-3.5, and Xia Men (a south China city) : combination of urban functions, and floor area ratio of above 2. 5.

- Integrative use of land --Now there are some contradictions between the function division and of the land utilization in overall urban planning, which mainly reflected that in the overall planning of urban has defined clearly on the function of construction land, and so it is impossible for some type of urban construction land to be used synthetically. Being as one kind of special product, affordable housing is constructed by the Government, and it could be built in the way of building complex. It can not only satisfy the original rule of the land use planning, but also solve the land requirements of affordable housing. Furthermore, it can not only increase the efficient of land use, but also consistent with the concept of appropriate mixture city function.

Problem 3 – Policy Organization

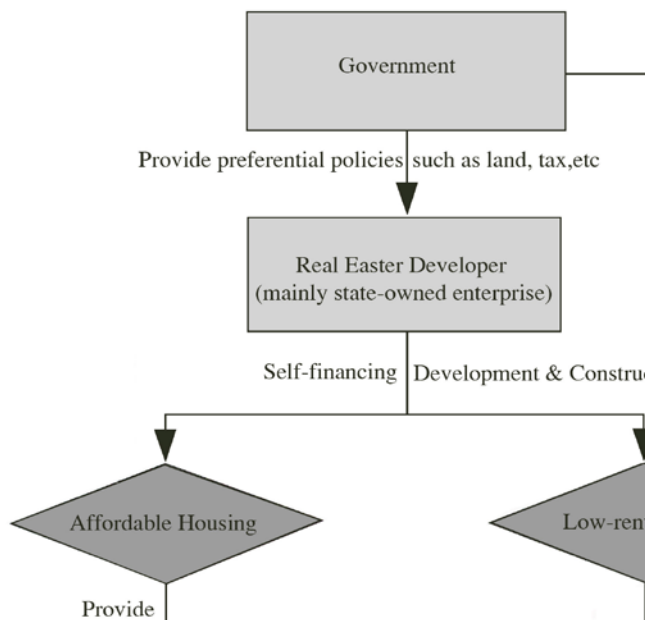


Figure 13: The Policy Organization of affordable housing in China

- Lack of comprehensive development plans of affordable housing--Public housing construction have not formed a complete set of sustained public housing development, which led to the arbitrariness and blindness of public housing construction.
- Vacancies in public housing management agencies --The construction, operation, management of public housing involved in all aspects of social operations. It needs professional management body responsible for, and coordinate all resources and relationships. In China the national administrative institutions are responsible for the plans of public housing development, the developers are responsible for building, and there is no professional management body responsible for the overall development and construction of public housing.
- Not formed a complete operation system of affordable housing construction --In China, it has not yet formed a perfect system of public housing construction and operation, mostly showing up to the single participation subject of public housing

construction, less dynamism of policy support, low efficiency of construction operations, lack of systematic and so on.

4 Proposal for Change and Improvement

4.1 Strategies for Organization of Policy System

The proposal for change and improvement should include two aspects. At first, a complete operation system of affordable housing construction should be built. Secondly, technical strategies should be inducted to make the system operate successfully. The technical strategies involve method and strategy of land use, land-saving planning and economy quantitative. Therefore this paper try to put forward some planning and design patterns to guide practical project in the future, even promote affordable housing construction in Nanjing.

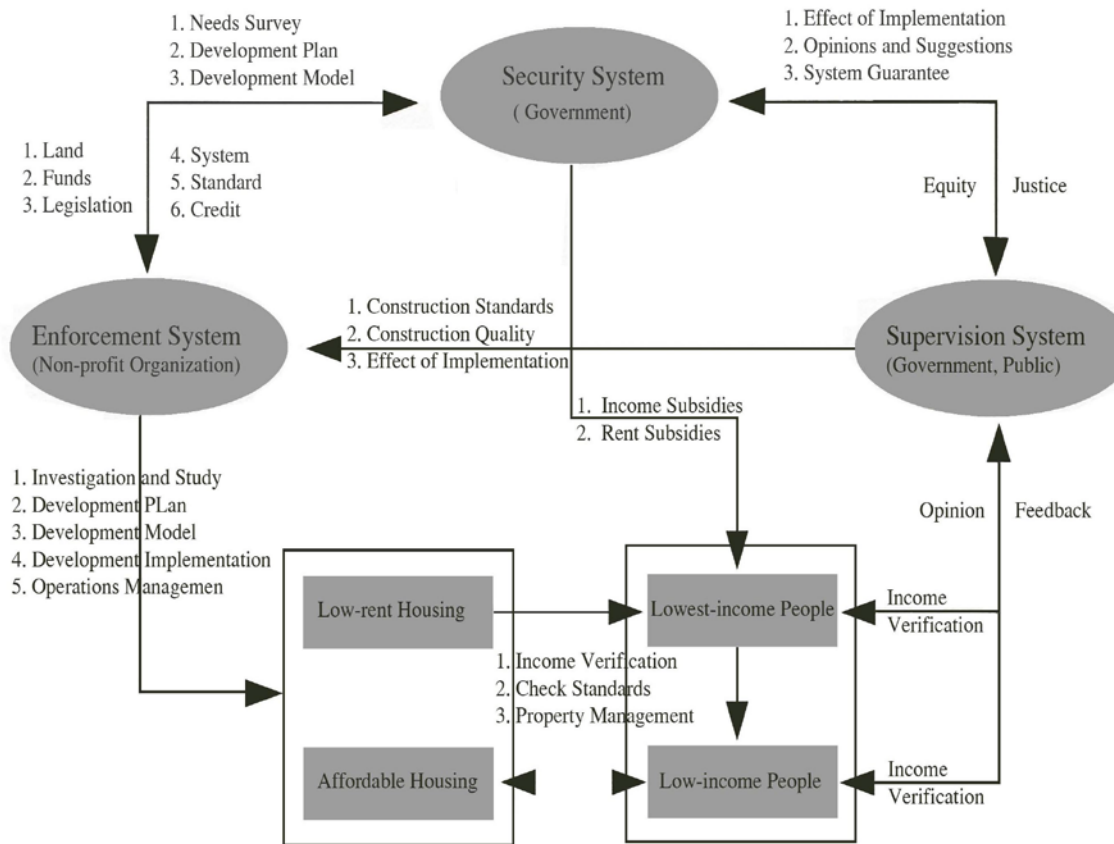


Figure14: Proposal for a complete operation system of affordable housing construction

4.2 Strategies for Optimization of Space Distribution

- **Attach importance to planning control of affordable housing construction**

For affordable housing construction in Nanjing, the establishment of a reasonable and effective affordable housing construction planning, and the coordination of relevant departments of the special planning are of great importance. In the coordination arrangements process of all space elements, through urban planning we can resolve the problem of constraints to space resources allocation under different spatial policy guidance. These planning control including to determine such mandatory level indicators as the location, size and indicators of public welfare facilities, to determine the units ratio, construction standards and indicators of mixed living standards in the detailed planning level.

- **Promote "residential community – basic community" organization mode**

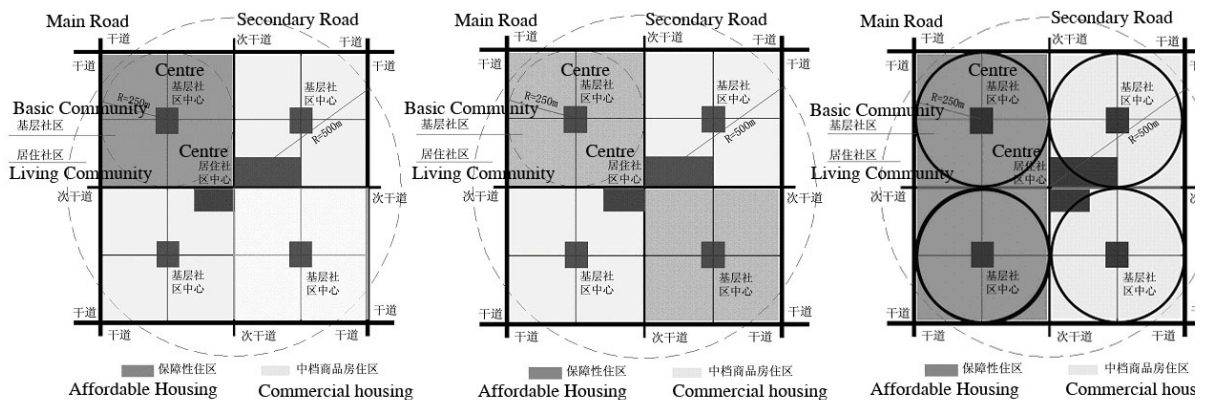


Figure15: The organization mode of "living communities – basic community"

A residential community is an area enclosed by the city roads or natural geographic boundaries: its main function is residence, its core is the community centers, its service radius is about 400-500 meters and its population size is of 30,000 people. "Residential community" has relatively better facilities at community level, to provide residents with a more integrated and comprehensive services of daily life. To choose the affordable housing land in the "residential community", people can share the facilities at the community level. From the view of planning control, the government should have unified arrangements to construct these facilities in commercial residential development. Affordable housing can "borrow" these public facilities as much as possible to reduce their

own construction, thereby reducing the pressures and operating costs of affordable housing construction.

- **Implement principle of centralized and distributed combined construction**

The relative mixture layout of different residential types has become an important relative new concept in residential housing development. In affordable housing construction, implement the principle of "concentration" and "distribution" combination could be a main construction

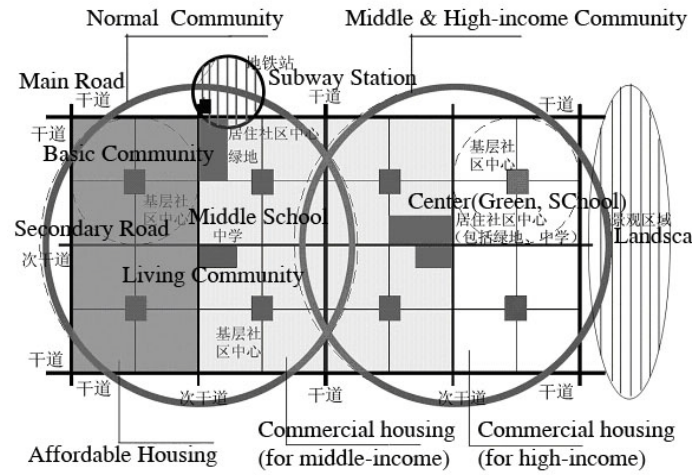


Figure 16: Mixed construction mode

means. In accordance with the pattern of "big scattered, small centralized", the spatial distribution and appropriate scale of construction could be reasonable controlled, then promote social equity and integration. According to the actual situation of Nanjing, in the spatial distribution of affordable housing construction, we should use "great fusion" approach, in the larger region to promote relative mixture layout of various types, various levels and various groups, so as to promote the integration of all sectors of society, overcome the problem of poverty concentrated, and avoid social exclusion and isolation. At the same time, taking into account the different income levels, different consumption affordability and different lifestyle of different classes, we could provide for the residents of different income groups in the community suitable living conditions through the use of "small concentration" approach.

- **Strengthen the guide role of public transport**

To use TOD (that is the "Transit Oriented Development") mode, we could arrange affordable housing along the public transport concentratedly. It is conducive to full play the guiding role of public transport, to improve travel efficiency, and save land and energy effectively. Taking into account the low-income people are dependent on public transport mostly, we should comprehensively consider the role of public transport and other infrastructure support conditions to land-use and

transport and land-use. Tseung Kwan O in New Territories, is one of the recently developed new towns in Hong Kong, more than 80% of the population lives along the rail traffic within 500 meters. Its experience shows that metro rail could drive the development of new-town could take into account both the needs of land development and the sustainable development of transport systems. Furthermore, to construct high-rise and high-density public housing combined with new town development could not only promote urban development but also solve housing and employment for the low-income.

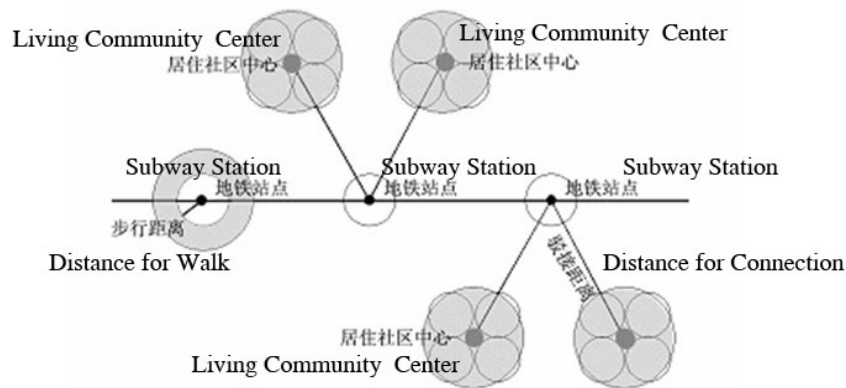


Figure 17: Site selection integrated with transport

4.3 Strategies for Intensive Construction Mode

- Use high-rise building as the main type of affordable housing construction**

Using high-rise residential building as the main type of affordable housing construction could ensure the annual supply and reduce the consumption of land resources. According to the requirement of "indicators of per capita land use control" in the "Urban Residential Design Standards", take Nanjing as an example, the per capita area of land for multi-storey residential flat is 19-26 m²/person, the per capita area of land for high-level residential flat is 15-22 m²/person, the difference is 4 square meters / person. If all residential construction area in Nanjing of affordable housing is 2 million square meters per year, then the figure for estimated number of new residential households each year is about 33,000 the population is about 110,000. Calculating with per capita land use control index, the high-rise residential can save nearly 44 hectare construction land than multi-storey residential, the effect is more evident.

At the same time, high-rise residential means the concentration of urban residential population, while this kind of residential mode helps intensively arrange parking place, primary schools, kindergartens, and other ancillary markets and construction of urban public Infrastructure, improve its efficiency of use and reduce the construction amount of urban infrastructure and public buildings, and land consumption, finally cut down the investment of urban construction and public facilities.



Figure18 (right) : Take high-rise building as the main type of affordable housing construction

Figure19 (above) : Integrated construction with high-rise and multi-storey building to enhance the FAR (floor area ratio)

- **Use layout of enclosure and improve the livability of east-west housing**

In north-south lighting determinant layout, we could appropriately and partly introduce east-west housing, or at end of the unit before and after the dislocation, or constitutes enclosure by tower mode. All those could help to increase building density in case of keeping the original residential sunlight, improve land use efficiency, and promote the intensification process of urban land use.

Through appropriate optimal design strategies, some issues such as shortage winter sunshine, strong summer sunshine and inadequate ventilation could be effectively resolved. One strategy is "block", means enhance heat preservation and isolation measures of wall and windows such as to add a laminated insulation or increase the thickness of insulation. The second strategy is "shade", means take partial shade measures to increase the shading coefficient. The third strategy is "best use", means combine with window-shade, balcony or even the east-west side wall used for stationary form of solar water heaters, solar photovoltaic panels and other facilities.

- **Realize multiple-use of outdoor space**

Open and public use of the ground floor could play a similar role to the outdoor environment in the aspect of outdoor environment quality. It is useful in the improvement of outdoor environment and the shaping of external space. In high-rise housing, the area loss of ground floor was small comparing to the total construction area. Meanwhile, the overhead ground floor could be conducive to the air circulation of building, improve the microclimate environment of the overall living area, could be conducive to the organization of visual landscape, expanding perspective space. In addition, we can use part of it as a leisure and communication activities place without strong sunshine and raining to meet the needs of residents in their daily lives. Also it could be used as other assistant residential space according to specific circumstances such as entertainment, fitness, parking and small supermarkets.

Public places on the roof with good accessibility have the same functions and environmental features. In the premise of ensuring the quality of outdoor space, in the process affordable housing construction, we could use such methods similar to overhead ground floor or make the roof public and open to increase area of per capita outdoor place, breaking the floor area ratio limits of plane.



Figure20: The mode for multiple-use of outdoor space

- **Mix the function of land to enhance the intensive level of land use**

Mixed land function is an ideal state of urban land-use, is an essential means and an inevitable result of sustainable urban development. Enhance the degree of land

mixed use would not only encourage intensive land-use, but also conducive to the implementation of various public facilities, reflecting the priority principle of public interest. For example, we could add business functions and sports facilities to residential land, add living and service facilities to industrial land, so as to solve the inconvenience caused by single land function. In the mixed use of various types of land, municipal utilities land, and transportation facilities land, we could install indoor sports facilities, community centers, subway entrance and so on.

Table2: Affordable housing projects integrated with transport in Xiamen

Projects	Construction Areas (10,000 m ²)	FAR	Construction Mode
Guanyinshan Apartment	8.24	6.99	With bus junction station
Gulou Apartment	8.22	6.40	With bus junction station
HubinRoad Apartment	40.20	5.20	With bus junction station
Canlin Garden	9.80	2.57	With bus center station
Qianpu BRT Station	5.59	2.69	With BRT station
Jiagen BRT Station	7.69	3.08	With BRT station
Xike BRT Station	11.84	4.20	With BRT station

Since public transport is most major travel tools for low-income families, if the location of affordable housing at or near the rapid public transit, it could be beneficial to the residents, and further would expand their employment opportunities. Therefore, a community integrated with residential, services, employment, and transportation is an integrated efficiency and resource conserved mode of affordable residential community development.



Figure21: The affordable housing projects "QianPu BRT Station" in Xiamen

References

Pengfei Ni

2009 Annual Report on Development of Housing Market in China(2009-2010).

Beijing: Social Sciences Academic Press

ISBN 978 7 5097 1172 9.

Fang Cai

2009 Report of China's Population and Labour.

Beijing: Social Sciences Academic Press

ISBN 978 7 5097 0936 8.

Jingsong Chen

2006 Social Housing Wave, Comparative Research on International Model and China Low-income Housing Project. Beijing: China Machine Press

ISBN 978 7 1111 7958 0.

Qiang Li

2007 Study on Major Social Issues and Solutions in Chineses Urbanization Process. Beijing: Economic Science Press

ISBN 978 7 5058 7857 0.

Jianting Wang

2008 Study on Intensive Land Use of China's Cities.

Tianjin: Nankai University Press

ISBN 978 7 3100 3030 9.

Xiaolan Tang

2007 Study on the Phenomenon of Residential Polarization in Urban.

Nanjing: Southeasti University Press

ISBN 978 7 5641 0928 8.

Ministry of Construction P.R.China

2007 Study on the multilayered system of housing security.

Beijing: China Architecture & Building Press

ISBN 978 7 1120 9794 4.

Di Guo

Paul Reeves

2005 *An Introduction to Social Housing.*

Oxford: Elsevier Butterworth-Heinemann

ISBN 0 7506 63936.

Sam Davis

1995 *The Architecture of Affordable Housing.*

California: University of California Press

ISBN 0 520 20885 4.

Xigang Zhu

2002 *Urban Space Concentration and Decentralization.*

Beijing: China Architecture & Building Press

ISBN 9 787 1120 5070 3.

Baode Bi

2006 *Land economics.* Beijing: Renmin University of China Press

ISBN 9 787 3000 6903 6.

Charles Correa

1999 *Housing and urbanisation.*

New York: Thames & Hudson Press

ISBN 0 5000 28210 0.

Linfeng Wen

2007 *Public Housing in China.*

New York: China's Development Press

ISBN 9 787 8023 4014 5.