STUDY ON THE HOUSING SUPPLY AND PUBLIC PROGRAMS IMPACTS ON THE HOUSING DEVELOPMENT IN YINCHUAN CITY, WESTERN CHINA

The city of Yinchuan, located in western China, is experiencing unprecedented housing boom in recent years that imposes great challenges on the sustainable housing development. Based on the analysis of housing supply in the city, this study aims to examine the effects of city’s public programs on the housing development in the market-oriented context by comparing housing expansion with planning intentions. The main findings are: 1. large public housing projects and key facilities are main government’s programs in promoting private housing development; 2. the distribution of some public projects was not consistent with planning intentions, thus might contribute to undesirable housing development that seen in the imbalance between the east and west. In order to efficiently manage the housing pattern, we suggest promotion of public developments in the west for improving the private housing investment.

Keywords: housing supply, housing development, urban expansion, public programs

1. Introduction

In China, the marketization of urban housing began with the economic reform of 1978 and advanced greatly with the “Housing Reform” of 1998. Yinchuan, a city located in western inland China, is experiencing unprecedented housing development recently. The growth is particularly evident in mushrooming of large gated communities on the peripheries. These proliferating projects are seemingly spreading in an unordered pattern and are consuming substantial amount of green and farm lands.

1.1 Previous studies

Urban sprawl and unregulated urban developments in developed countries have been widely discussed. Factors frequently criticized for stimulating sprawl are transportation infrastructure, housing mortgage policies, economic growth as well as planning and zoning control. For instance, it was found that land use regulations that mandated low densities have caused sprawl. Also, it was argued that in the Japanese Senbiki system, the UPA (Urban Promotion Area) drawn by the local planning authority provided lavish urban expansion room, in addition to the public investment projects permitted in the UCA (Urban Control Area), thus sprawl was encouraged rather than halted. The study by Sorensen revealed that Land Adjustment as a planning tool might accentuate sprawl in metropolitan and local scale due to its spatial location and implementation process.

Since 1980s, marketization of urban housing has become an important topic in China. The emerging pro-growth feature of local governments, brought by the administrative decentralization, the “Land reform of 1988” and the “Fiscal reform of 1994” (1), was usually argued as the engine behind the rapid development. Ineffective planning control was discussed as well, however, these studies mainly analyzed the housing growth with an analysis framework of the housing system transition or actors behaviors in an institutional and social-economic context. Empirical studies on the effects of public projects on the housing development are still absent. Moreover, previous studies were on a national scale or focused on the mega-cities in the eastern coast, but very few probed into the inner land cities.

1.2 Study purpose

A few previous studies reviewed the housing development progress in Yinchuan. However, these studies did not analyze factors that affect the housing development or discussed specific measures that could efficiently guide the housing development.
toward a more sustainable pattern. Thus, our study aims to offer a more comprehensive approach in understanding the urban housing expansion from the perspective of city management. The purpose is to: 1) reveal critical housing issues in the city by analyzing the housing supply in relation to the population change; 2) examine the impacts of public promoted programs on the expansion of housing development; 3) evaluate the effectiveness of these programs in achieving the intended housing development pattern. Finally, the implications of managing market-based housing development are discussed.

1.3 Study area

Yinchuan is the capital of Ningxia Hui Autonomous Region. The municipality is comprised of three urban districts, two rural counties and one county-level satellite city, in an administrative area of 9,025.38 km² and with a population of 2.13 million (2014). The urban built-up area of the city is 148.6 km² (2014). In this study, we focused on the Central Urban Area (CUA), designated by the city’s Master Plan of 2007-2020. The CUA is located on a plain between the Helan Mountain and the Yellow River and is delimited by the loop highway in approximately 400 km² (Fig.1). It is a home to more than half of Yinchuan’s population, and it has been under major urban development and planning control. For the purpose of this study, housing development data of the CUA from 1980 to present was obtained and analyzed by GIS.

2. Housing supply in Yinchuan city

2.1 Marketization of housing development in Yinchuan city

Modern housing development in the city started after the establishment of the socialist state in China in 1949. At first, urban housing was developed based on the “work unit” system. In this system, “work units” were allocated to each city according to the central economic plan, and later developed by state enterprises or public institutions with workplaces and houses for the employees in an enclosed territory (WUD). Thus, housing was a “welfare” service rather than a “commodity”. The marketization of housing in China was gradually pushed forward after the economic reform of 1978. According to the housing policies, the alteration of development types (Fig.2) and project volume (Table 1), the marketization of housing in Yinchuan can be divided into three phases:

(1) Public domination in transition to marketization (1980-1999)

Since 1978, with the promotion of market economy and administration decentralization, local governments have gained more autonomy to organize the urban development. As a result, a transitional housing mode - “unified development” (UD) was introduced in 1980, by which housing was planned by the city and was carried out by developers subordinated to the government. The completed houses were usually sold to state-owned enterprises or institutions. In 1988, the national congress legalized the “paid transfer of lands”, allowing private developers to invest in housing based on market mechanisms, thus initiated the “commercialized housing development” (CD). However, in Yinchuan, according to the data of 1997, 73.90% of annual constructed housing floor area was still public investment, WUD and UD were dominant (Fig. 2 - 1980-1999).

(2) Rapid growth of market-based development (2000-2007)

In the Notice No. 23 of 1998 - “Further facilitating housing commercialization”, the State Council announced its decision to terminate the welfare housing system until 1999 and to create a diversified provision system with commodity housing as a main source. The decision marked a major turning point towards market-oriented housing in China and greatly facilitated the commercialized housing development. In 1998, the investment in urban housing in Yinchuan increased 89.5%, while the share of public investment in 2000 had fallen to 26.63%. Thus, from this period, less than a quarter of housing came from the public sector and was carried out by developers subordinated to the city’s strategy “Big Yinchuan” in 2002, rapid housing development was launched and the growth of investment in

<table>
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<tr>
<th>Year</th>
<th>WUD</th>
<th>UD/CD</th>
<th>USD</th>
<th>CD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-1999</td>
<td>28</td>
<td>610</td>
<td>3500</td>
<td>60</td>
</tr>
<tr>
<td>2000-2007</td>
<td>20</td>
<td>1,311</td>
<td>5,908</td>
<td>280</td>
</tr>
<tr>
<td>2008-2014</td>
<td>42</td>
<td>1,449</td>
<td>10,155</td>
<td>249</td>
</tr>
</tbody>
</table>

Table 1 Volume of housing projects in each period (housing unit)
housing was up to 67.81% in 2002 and 69.83% in 2003.

(III) Booming of housing development (2008 ~)

A primary target of the city’s "Dually Cozy City" development strategy of 2006 was to make Yinchuan the most livable city in the north-west China. As a result of city's efforts to improve the investment environment, housing development boomed. The annual increase of housing investment was kept at 20% since 2008, thus in 2014 the annual housing construction area reached 17.86 million m² – triple compared to 2007 and nearly 12 times of 1999. Moreover, the volume of the housing projects was significantly enlarged (Table 1) – more than 10% of the housing projects have over 2,000 units, which was accompanied by abrupt increase of housing price - 18.22% in 2008 and 23.61% in 2009.

2.2 Housing supply and population growth in the city

During 1981-2014, the stable increase of urban population was accompanied by a growth of urban housing construction (Fig. 3). However, since 2002, the housing projects a much more rapid growth than the population, probably due to the promotion of development by financial and housing policies, as well as the improvement of individual living space. The data shows that particularly after 2010, the population increase has been slow while the housing construction kept growing significantly. Moreover, the growth of housing has been consistent with the economic growth (GDP). Yet, it could be seen that the GDP is slowing down in recent years while the housing is still increasing. Thus, it seems that developed housing have already exceed the demand for residential space (Table 2), nevertheless more houses are under construction. Currently, the control of excessive housing seems to be an urgent issue for the city. Thus, our study on the effects of public sectors in housing promotion is aimed as a base for improving the housing policies for Yinchuan city.

3. Housing promotion and control in Yinchuan’s CUA

In this chapter, we reviewed the city’s intentions in the domain of housing promotion by analyzing master plans and housing plans produced in the three periods. Moreover, the development control in the city is discussed.

3.1 Urban structure and local context of the Central Urban Area

The historic areas of the CUA were the “Old Town” (O.T., 678 A.D.)-a traditional trading center east of the main canal Tanglai, and the “New Town” defense fort (N.T., 1739 A.D.)-7.5 km west of O.T. In 1958, after the construction of the Baolan railway west of the historic areas, a new urban area Xingshiqiu was planned as an industry, education and administration core to accommodate the "work units". Thus, a structure of “Triple Cores” was formed.

In 1992, a High-Tech Zone was designated between O.T. and N.T., which became the “Forth Core” of the CUA. In the next 10 years, the urban area was administratively and functionally divided into two parts: the West that included Xingshiqiu and N.T., and the East based on the High-tech Zone and O.T. In 2002, in order to support the rapid urbanization brought by the “Big Yinchuan”, the urban districts were enlarged and re-demarcated into West, Central and East parts, separated by the Baolan railway and the Tanglai canal. Thus, the urban structure of the CUA began to transform towards a “Triple Agglomerations” structure. Currently, the West functions as an industrial and education core, the Central is focused on administration and business, and the East is trade and distribution center (Fig. 4).

Before 2002, the population of the former East district was slightly larger than the West (272,783 and 211,114 respectively in 2000). After the urban area was re-demarcated into “Triple agglomeration”, the East continued to house a larger population (the population of the East, Central and West was 725,200, 299,200 and 349,100 respectively in 2014). Yet, in the last decade the increase of population has been almost the same in the three agglomerations. In regards to the economy, the West has led the development in this decade (the GDP per capita in the West, Central and East was 74,944, 54,007 and 57,699 yuan in 2014). While the economic development trend of the three agglomerations was similar, the Central shows slightly higher GDP growth and likely a greater economic potential (Fig. 5).

3.2 Housing promotion area in the city plans

( I ) 1981-2000 Master Plan and the revised plan of 1994

In the Master Plan of 1981, the idea was to distribute new housing in the northern parts of Xingshiqiu and in the surroundings of O.T. and N.T. Meanwhile, redevelopment of the historic towns was encouraged. When the plan was revised in 1994, new housing was planned east of the new forth core - High-tech Zone and its southern outskirt (Fig. 4 - 1).

( II ) 1996-2010 Master Plan and new designated mix-use zones

(Data source: statistics of Yinchuan urban districts 2002-2014)
In the master plan of 1996-2010, the intention of balancing housing in the East and West agglomerations is clear: in the east, renovation of old housing and four clusters of new housing developments in the outskirts of O.T. were planned; in the west, new housing projects were concentrated north of Xinshigu and N.T. By 2010, the East and West had about equal amount of housing that accommodated 380 and 350 thousand residents respectively. In 2002, the city decided to direct new developments into the Central agglomeration. Thus, a New Urban Zone (NUZ, 2002) functions as a civic center for 90,000 residents, and an Economic & Technology Development Zone (ETDZ-3, 2003) were designated to the Central district (Fig.4-Ⅱ).

According to the 2007-2020 Master Plan, subsequent housing plans and revised master plan of 2010, the city planned the housing based on the “Triple Agglomerations” structure (Fig.4-Ⅲ). The main strategy was to: 1) focus on the Central by promoting expansion in north-south direction; 2) prioritize the West by improving old housing in Xinshigu and develop new housing north of the West agglomeration; 3) control the East by restraining developments in O.T., promoting redevelopment of the shanty houses of the south and expand only in the north. Therefore, from 1981, the plans have continuously targeted in spatial balance of housing between the west and east.

3.3 Housing development control system

In China all urban land is owned by the state and only local governments are authorized to expropriate rural lands and lease the land to developers. Since the first City Plan Act of China was enacted in 1989, the planning regulation has been the main tool to control the housing development. According to the Urban and Rural Planning Act of China (2007) and the Urban and Rural Planning Ordinance of Yinchuan (2010), “Note on the Project Planning Condition” issued by the City’s Planning Bureau is necessary for obtaining the land use right. In principle, the reference for issuing a note is the city’s plan, according to which parcels designated with detailed regulation conditions (land use type, FAR, etc.) can be leased. Developers seek profitable sites based on market trends, but the development site settled in the end might be influenced by government’s intentions. On the other hand, after 2002 targeting inward investment and revenue of land-leasing, the government turned towards adjusting plans to meet requirements from developers. For example, in 2012, the city invited one of the biggest developers in China, Wanda, to develop a mega-complex in the city. As a result of negotiations, the Government Hall of the West district, which was built in 2005, was demolished to make room for the new Wanda Complex. Thus, the application for a note involves complicated bargaining between developers and governments in the market economy.

4. Effects of public programs on promoting housing development

The fact that dominant housing projects were organized by the public sector enabled urban planning to easily control the housing developments. However, the direct intervention of public sector in housing weakened significantly after 2000. In this chapter, we examine the effects of the public programs that were promoted by the local governments on the housing expansion, in the new context of market-oriented development.

4.1 The role of public housing projects in housing promotion

After 2000, the local (city and district) governments are mainly involved in two types of housing projects: a) social housing planned and financed by the local government with priority of land allocation (usually large scale, Table 1); b) major investment-invited projects proposed by local governments and financed by private developers. The second type is usually a large mix-used complex supported by preferential terms.

4.1.1 The effects in the new planned development zones

We found that after the planning of NUZ and ETDZ-3, large social housing projects were the first to be developed by the city. After the social housing was developed, other facilities like schools, commercial service and public transit, as well as private housings, followed (Fig. 6). This indicates the city’s intention of using social housing projects to lead housing development into the targeted areas. The insertion of social housing signaled to developers that infrastructure and facilities will soon be provided nearby thus, private housing investment was promoted.
4.1.2 Public housing projects and housing expansion

After 2000, a notable proportion of the large social housing projects were located in the Central agglomeration, according to the planning intentions. Considerable proportion was developed in the East as well, while the West agglomeration had much less developments (Table 3). As social housing projects progressed in the designated zones and peripheries of the Central, they were followed by private projects in the surroundings. In the east, social projects were mainly located at the frontier. Some of these projects were even developed as a leapfrog, which allowed private projects to be developed as an infill urban area. Most of the social projects in the east were distributed as residential clusters with around 5,000 units each. Given the role large social projects played in leading the housing expansion before, these clusters will probably promote further expansion to the east. Similarly, major investment-invited projects may have same impacts on promoting developments, as some of these projects were planned together with facilities. For example, one project with 10,000 housing units located in the east, contains one key primary school, one park and several commercial complexes with offices (Fig. 7 -down). The project is expected to become a new urban node and may attract more housing investment into this area in the near future. However, in the west, both public and private projects were relatively scattered (Fig. 7).

4.2 Public facilities as triggers of housing development

In 2002, a key high school was relocated from O.T. to the southern farmlands (No.1 in Fig.9). This triggered a massive expensive housing development in its vicinity, called “School District Housing” (Fig.8-left). The trend continued with another two key schools from O.T. being relocated to the periphery in 2005 (No.3 in Fig. 9) and 2008 (No.6 in Fig. 9), while one school from N.T. was relocated in the southern outskirt in 2006 (No.4 in Fig. 9). The relocation of these high schools was observed as a trigger of housing development around the new sites. Moreover, since 2002, waterways in the city were restored and several large parks were developed around the channels. This spurred development of high-class gated-communities around the new parks, such as “No.1 site of lake viewing”, “Families intimate with water”, “Garden on the precious lake shore”, etc. (Fig.8-right). It seems that development of attractive public amenities was effective in inviting private housing supply.

Majority of key facilities developed after 2000 were located in the east and central areas, while most developed schools and

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<th>Table 3</th>
<th>Distribution of public housing projects</th>
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<td></td>
<td>West ag.</td>
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<tr>
<td>2000-2007</td>
<td></td>
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<tr>
<td>project</td>
<td>3,840</td>
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<tr>
<td>Mean volume</td>
<td>860</td>
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<td>2008-2016</td>
<td></td>
</tr>
<tr>
<td>project</td>
<td>13,415</td>
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<tr>
<td>Total house unit</td>
<td>1,677</td>
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major government promoted commercial establishments (floor area more than 40,000 m²) remained in the east (Fig. 9). The imbalance of housing market between east and west has been intensified, which is evident in the enlarging gap of residential land price. Comparison revealed that O.T., areas around the Lake Park, NUZ and east of the Park, had outstanding increase in land price (more than 1800 yuan/m²) between 2001 and 2013. Other central areas and areas around O.T. also experienced substantial rise (more than 1000 yuan/m²), while the west saw relatively small increase (less than 800 yuan/m²). In 2013, the land price in O.T. tripled in comparison to Xinshiqu (in 2001 the difference was 2:1). It is likely that the imbalanced distribution of the amenities is one major reason of this exacerbating gap of market prospect between the east and west.

5. Housing development and urbanization

In this chapter, we evaluated the housing expansion in relation to the urban planning (Table 4) and discussed the significance of public programs in managing housing issues.

5.1 Housing expansion and growth control

During 1980-1999, all housing projects were confined to the planned area. In 2000-2007 over 10% were developed outside the planned growth boundary and mainly concentrated in the east agglomeration (Fig.10-Ⅱ). After 2007, only 5.50% of all the projects were developed beyond the planned boundary of 2010 plan. However, we found that in the 2010-2020 plan, the eastern boundary of the 2007 plan was expanded to include developments carried out before. Thus, physical regulation alone may not be efficient in controlling the housing development.

5.2 Housing development and residential zoning

During 1980-1999, in line with the planning intention, redevelopments were carried out in the historic towns and new housing developments progressed in Xinshiqu, the High-tech zone, and around the historic areas. Housing projects were predominantly developed on the planned residential land (Fig.10-Ⅰ). However, during 2000-2007, only 59.92% of all the projects were developed on designated residential land with another 6.20% located in new planned zones. Housing projects grew fast in the areas around O.T. while lands planned for residences in the west agglomeration were not fully developed (Fig.10-Ⅱ). Thus, the intended housing balance between the east and west was not achieved. From 2008, more than 80% of all the projects were developed on designated residential lands. Facilitated by the central government’s policy of “Dilapidated housing redevelopment” (2008) and the city’s “urban renewal” program (2013), redevelopment projects have been vigorously carried out in Xinshiqu and in the “urban villages” south of the historic areas (Fig.10-Ⅲ). The focus of housing supply was successfully oriented to the Central agglomeration, where a number of new housing projects are burgeoning. Yet, the idea of controlling the east expansion is still not successful because housing development is continuously encroaching the east lands.

To tackle the excessive housing, in Nov. 2015 the province issued a notice for the cities to urge consumption of housing stock. The measures focused on land supply control and purchase of commodity housing to be used as social housing. In 2015, the Housing Bureau of Yinchuan halted the development of social housing for low income families. By looking into the inner spatial distribution, we suggest that more critical issues for the city seems to be restraining the further eastern expansion by channeling attractiveness to the central and west area. The local context was similar in the East, Central and West while the planning condition is more favorable for the Central and West. For instance, in the field survey of 2015 we found that some leapfrogged new-built social housing projects in the east can only be accessed by unpaved roads. However, the east is still preferable for developers and residences. While high vacancy in the new projects in the Central agglomeration was observed, the population density of O.T. has been around ten times of that in the new developed central areas. In a new Shequ (community) comprised of 13 housing projects around park, low occupancy rate was reported. For example, in one project of 808 housings completed in 2011, only 146 have been occupied in 2014. Thus, it is considered that distribution of large-scale public housing and key facilities have contributed to the imbalanced housing development and population distribution in the market-oriented periods. It is necessary to distribute more public programs into the west areas today. Developing a more comprehensive strategy, by cooperation between public sections in charge of decision-making of the significant public programs, may help to achieve the desired housing development spatial pattern.
In this study, we examined the impacts of the public programs on the market-based housing development in Yinchuan city. Moreover, we evaluated the effectiveness of these programs in achieving the intended housing development pattern.

The main findings are: 1) In the market-oriented period, local governments still can lead the housing development by using large public housing projects and attractive facilities. 2) However, the distribution of these projects and amenities was not consistent with the spatial intentions for housing development. This fact might have contributed to undesired development pattern seen in the imbalanced expansion between east and west areas. 3) The study suggest that in order to efficiently guide the housing supply of the city, a more comprehensive public program location strategy is needed.

This study only explored the effects of the spatial location of the public programs in the housing development and merely evaluated the effectiveness from the viewpoint of urban planning. Further studies are necessary to clarify the decision making mechanism in site allocation of these public programs.

Notes
(1) Fiscal reform: in 1994, the State Council redistributed tax-sharing between the central and local governments and enabled the central government to gain more tax revenue. This facilitated local governments in acquiring fiscal revenues from land transfer fee. In 2003, Yinchuan government reformed the city’s tax-sharing system similarly, which fueled district governments’ interest in promoting housing development and land expropriation.
(2) Documents includes Yinchuan housing development chronicle I (1980-1989) and II (1990-1999), documents of housing policies and plans issued by the city government. Housing development data including location, year and housing units of each project from 1980 were obtained from: city’s construction archive and housing chronicle, maps of housing projects (2005, 2014) published by Housing Bureau, maps of social housing projects and lists of completed commercialized projects by the Housing Bureau, site plan of projects under construction from the Planning Bureau. Also, site visiting and field survey of projects that lack precise records was conducted in 2015, March assisted by arterial photos.
(3) Social housing: social housing was launched in Yinchuan since 1994. There are two types of social housing – affordable housings for low income and resettlement housing for the families whose houses was demolished by city’s public projects, usually farmers whose lands were expropriated.

6. Conclusion
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References
和文要約

中国西部に位置する銀川市は、近年、市場ベースの開発により大量の住宅供給が進んでおり、これらを持続可能な開発へと誘導するための効果的な手法が求められている。本論では、住宅開発の動向から、銀川市の公共施設整備が市場ベースの開発にどのような影響を与えているかを調査解析し、1）大規模な公営住宅開発および教育施設や公園などの公共施設開発が市場ベースの住宅開発を誘発させていること、2）公営住宅開発と公共施設開発の市街地周辺部での立地や東部旧市街地周辺への集中などにより市街化のスプロールや住宅開発の偏在といった課題が生じていることを確認した。こうした課題に対し、西部への公共整備など計画的な公共プログラムが必要と考えられる。

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