PPP Framework for Public Rental Housing Projects in China

Ting LIU¹, Albert CHAN² and Shouqing WANG³

¹Research Assistant, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong, China, 999077, PH (852) 34008133; Ph.D. Candidate, Department of Construction Management, Tsinghua University, Beijing, China, 100084, PH (86) 010-62788036, FAX (86) 010-62773661, Email: shuimu fengjin@163.com

²Professor, Department of Building and Real Estate, The Hong Kong Polytechnic University, Hong Kong, China,999077, PH (852) 27665814, Email: albert.chan@polyu.edu.hk

³Professor, Department of Construction Management, Tsinghua University, Beijing, China, 100084, PH (86) 010-62788036, FAX (86) 010-62773661, Email: sqwang@ tsinghua.edu.cn

ABSTRACT

The Chinese government is conducting a large-scale public housing construction program and is faced with enormous financial pressure. The widely used PPP (Public-Private Partnerships) model in the field of infrastructure development provides an alternative and viable way to deal with housing issues.

This paper reviews the worldwide experiences of PPP in enabling shelter strategies and the current situation of affordable housing practice in China. Based on the review of pertinent literature, a PPP framework is designed for public rental housing in China. Under the proposed PPP framework, staff quarters in industrial park can be delivered through Build-Own-Operate method, public rental housing built on collective land of urban village can be procured on a leasehold basis of Build-Own-Lease, and while public rental housing built in mixed-income community by commercial developers can be transferred to public sector under a Build-Transfer (BT) model with cross subsidy. "Pathfinder" projects under the framework and a track on them are needed to further identify a best practice in China.

INTRODUCTION

Housing is a serious social problem in China. Decent housing program is one of the prioritized initiatives of the Chinese government in the "12th five year plan".

According to the guidance issued by the State Council, 36 million units of affordable housing will be delivered to middle and low-income groups during 2011-2015. By the end of 2015, about 20% of housing stock should be affordable housing, among which public rental housing is the dominant (GOSC 2011).

Housing is an important yet difficult problem for any country. The United Nation proposed an "enabling approach" to address the shelter problems, which transferred the role of government from the provider to the facilitator of housing. The enabling strategy requires the government to facilitate the actions of participation in housing sector, including commercial institutions, third-sector organizations, and low-income people themselves. The widely used PPP (Public-Private Partnerships) model in the field of infrastructure development provides an alternative and viable way to deal with housing issues.

WORLDWIDE EXPERIENCES OF PUBLIC PRIVATE PARTNERSHIPS IN ENABLING SHELTER STRATEGIES

Rationales for choosing PPP model in affordable housing. Affordable housing is social infrastructure. Several industrialized countries (the US, the UK, etc.) and some developing countries (Nigeria, India, etc.) have experimented partnerships in housing sector (The UNSHC (Habitat) 1993). The major driver for government to choose PPP model arises from funding gap (Winch et al. 2012). For developing countries like India, another goal for adopting PPP model in housing sector is to stimulate economic growth through large scale investment (Sengupta 2006). For some countries like Malaysia, gaining organizational reputation from PPP project is another motive for the public sector to engage in PPP model (Abdul-Aziz and Jahn-Kassim 2011).

Practices in different countries. Due to different political, economic factors and historical path, the practices and outcomes of PPP models in different countries vary.

The UK has extensive experiences in formal and legal partnership in the housing sector (Hodkinson 2011): Local government enters a 30-year PFI (Private Finance Initiative) contract with commercial institutions to purchase works and services of council housing; Consortium of private firms may include builder, facilities manager, bank, etc.; Output Specification and Payment Mechanism are the two core components of the PFI contract; The private sector provides up-front financing for the initial investment, and it is paid via a unitary charge monthly from local and central government.

The US and Canada have similar experiments (The UNSHC (Habitat) 1993): Local and state government, commercial institutions (private banks and other business) and third-sector organizations (neighborhood-based non-profit cooperatives or community development corporations) constitute a coordinating committee or board to provide capital and technical support to third-sector (non-profit) developers to build and operate social rental housing.

In Norway, Sweden and Netherlands, third-sector or non-profit organizations play an important role, and government provide long-term support like subsidy and guarantee (The UNSHC (Habitat) 1993).

In Kolkata of India, government and large-scale builders build up joint ventures to develop housing projects. Government holds less than 50% of the shares of the joint venture. Among all the units, at least 10%-15% are provided to middle and low income group on a leasehold basis for 99 years with restriction on any transfer (Sengupta 2006).

In Nigeria, more than 92.86% of affordable housing are Turnkey projects

(Sengupta 2006). They are designed and built by private sector and delivered to government through outright purchasing, installment payment or mortgage arrangement. The rest 7.14% are delivered under a site-and-service scheme. Private sector provides basic infrastructure and service for the plots of land provided by government. Eligible households build their own houses on the well-serviced land.

Outcomes in different countries. PFI council housing in the UK is not as efficient as anticipated (Hodkinson 2011). It takes 77 months on average to negotiate before signing a contract. It is 3 years longer than expected. Such delay in turn incurs substantial cost overrun.

Partnerships in the US and Canada achieved to meet the goals of stakeholders, but it is far from a success regarding to the limited scale of partnerships (The UNSHC (Habitat) 1993).

India is also facing a bottleneck on the scale of PPP housing, because commercial institutions lack access to large scale of land under the current land regulation (Sengupta 2006).

In Nigeria, PPP housing, especially the site-and-service-scheme is skewed to middle and high income groups due to corruption, thus making no significant contribution to housing low-income group (Sengupta 2006).

Limitation of PPP in practice. PPP in theory has the advantage of combining capital and expertise from private sector, and the accountability of public sector (Wang and Ke 2008). However, it also has limitations in practice:

(1) The complexity of PPP model in negotiation, financing and legislation, as well as government's lack of organizational capability, incurs a lot of hidden management cost. PPP model is not as cost-effective as anticipated (Hodkinson 2011).

(2) The affordability objective for low-income group is a contradiction to private sector's motivation to pursuit profit margin. Therefore it's difficult to scale up without appropriate and efficient government subsidy and support (The UNSHC (Habitat) 1993).

(3) Corruption does exist in PPP housing. It damages public interest through unfair resource allocation (Ibem and Eziyi 2011).

It remains to be seen whether and which form of PPP is feasible for affordable housing in Mainland China. What can be learned from the above experiences are:

(1) It's necessary to do sufficient groundwork to clearly identify the responsibilities of different parties in partnerships to reduce hidden management cost.

(2) Government subsidy system is important. It should be high enough to encourage private sectors to involve, but not so high to exhaust public revenue, in order to scale up affordable housing to a significant extend.

(3) Corruption should be eliminated institutionally. Affordable housing on a leasehold basis (like in the UK, US and Canada) is better in avoiding corruption than on a freehold basis (like in Nigeria).

THE PRACTICE OF PUBLIC RENTAL HOUSING IN CHINA

Targets well accomplished. The goal of completing 36 million affordable housing

units within five years was proposed in 2011, when there were 10 million units in construction, with a total investment of about RMB 1.3 trillion (MOHURD 2011). By the end of October, the number of new construction units in 2012 was 7.22 million, and 5.05 million units were completed, with a total investment of RMB 1.08 trillion (MOHURD 2012). At the end of November in 2013, the actual new construction of 2013 reached to about 6.66 million units, while the number of built units was 5.44 million, with a total investment of RMB 1.12 trillion (MOHURD 2013).

As observed from the above data, the Chinese government has well accomplished yearly construction tasks of affordable housing.

Local government faced with financial crisis. In spite of the success in construction completion on time, large scale investment and high-speed construction has led to tremendous financial distress for local governments.

In 2013, for example, the actual investment in affordable housing was RMB 1.12 trillion (MOHURD 2013). It accounted for about 2% of the total GDP of the country, which was RMB 56.88 trillion (NBS 2014). Government spent RMB 443.3 billion in affordable housing, which accounted for 3.4% of government revenue (RMB 12.91 trillion) in 2013 (MOF 2014).

By the end of June of 2013, the debt of Chinese local government had reached to RMB 10.89 trillion, and another RMB 2.67 trillion was guaranteed by local government. For local government, debt burden has exceeded fiscal revenue (RMB 6.90 trillion in 2013) (MOF 2014). The medium debt/GDP ratio of the provinces in China has reached to 31.4%, and the ratio in Guizhou Province is nearly 80%. Local governments are facing with financial crisis, and investment in affordable housing exacerbated the problem.

Infeasible cash flow of public rental housing project. Furthermore, the financial situation of public rental housing, the subject of affordable housing, is far from good.

According to the data from Vanke, the largest real estate company of China, the cash flow of public rental housing project is not feasible, see Table 1.

City	Beijing	Ningbo	Wuhan	Chengdu	Xi'an	Chongqing	Guangzhou
Year	20	157	63	45	123	49	22

Table 1.Payback Period of Public Rental Housing.

The average static payback period of public rental housing project of the above seven cities is 62.7 years. It is much longer than 15 years, which is the maximum term of operation loan from commercial bank. Thus, the cash flow of public rental housing project is not feasible.

Unanticipated demand risk. The cash flow analysis above is based on the hypothesis that the vacancy rate is 0. However, the actual application rate much lower than that. The first wave of Wuhan public rental housing delivered to public faced a vacancy rate higher than 65% (People's Daily 2012), and the rate was 90% (Yu 2012) in Zhengzhou.

Low application rate indicates a mismatch between supply and demand.

According to Vanke's investigation, low-income group expect a good enough shelter with low cost. The public rental housing in offer exceeds low-income families' expectation on price with an unnecessary high quality. Besides, the location of most public rental housing is too remote. Among the 12 projects (Changying, Changying Phase III, Dougezhuang, Haihu Village, Dayangfang, Runfenglingshang, YuanyangqinShanshui, Huihong Homeland, HuilongguanBaijia, Rainbow Homeland, QingxiuYayuan, Weishanyuan) under construction in Beijing, for example, 8 are outside the fifth ring road (Beijing is divided in 6 rings from inside to outside) (BPHC 2011).

Need for a specific PPP framework for public rental housing in China. Government is facing with heavy debt burden to fund affordable housing. Private sector's involvement is necessary to initial investment. However, low investment return with high demand risks makes public rental housing projects un-bankable.

Therefore, financing structure design to properly allocate risks between public and private sector is a question deserving research attention. Before that, groundwork is necessary to design specific PPP frameworks that would be viable in China, in order to figure out which kind of "pathfinder" projects should be prioritized.

The PPP framework designed for public rental housing in this paper includes two components:

(1) Design project portfolio to improve location and cash flow of public rental housing projects;

(2) Select procurement alternatives for projects with different types of portfolio.

POTENTIAL TYPES OF PUBLIC RENTAL HOUSING PROJECT IN CHINA

In order to improve low-income people's living conditions, the need is real to deliver adequate affordable public rental housing, within a reasonable distance to workplace.

Currently, most of collectively built public rental housing projects in China are constructed in plots of land far from down town. Projects under construction in Beijing are examples (BPHC 2011). They are far from working places of urban poor; therefore the vacancy rate is high.

Lian (2009) reported that, many newly graduated workers with low income live in informal shelters in urban villages near their working places. Therefore, urban village upgrading is an alternative way to benefit people living in informal shelters.

Besides, Industrial park is a place with high density of middle and low income workers. Staff quarters built by employers are encouraged by Chinese government.

Requiring private sector to deliver a certain proportion of affordable housing in commodity housing projects is another alternative way. The American and Canadian governments do it through land-use regulation with reward of density bonus (The UNSHC (Habitat) 1993).

Therefore, public rental housing in China may have four specific forms:

(1) Public rental housing collectively built in affordable housing community;

(2) Staff quarters in industrial park, with ancillary commercial facility if necessary;

(3) Public rental housing built on collective land in urban village reform, together with commercial housing and facility;

(4) Public rental housing built in mixed-income community.

Each form of the above public rental housing has its own specific characteristics in terms of publicity, stakeholders, property right and development process. Therefore, different procurement forms are needed for each of them.

Access to land is the precondition of delivery of affordable housing. Experiences in India show that, poor access to land is a bottleneck to affordable housing, and accordingly, government's support in getting land is a major attraction to private sector (Sengupta 2006). Similarly,

Land regulation may be attractive to Chinese government since it is an effective intervention to market, and it supports private sector through density bonus and cross subsidy without direct fiscal expenditure (The UNSHC (Habitat) 1993).

Based on the analysis above, government intervention in land delivery in China can be done in the following ways:

(1) Deliver land for staff quarters in industrial park, where workers gather;

(2) Combine the process of the urban village transformation with construction of a certain percentage of affordable housing, allowing the villagers and the original residents to stay in a familiar place;

(3) Acquire a certain proportion of units in housing projects for provision to low-income households, so that low-income groups can have a chance to live in a better location;

(4) Develop specific land delivery planning for affordable housing.

PROCUREMENT ALTERNATIVES FOR DIFFERENT TYPES OF PUBLIC RENTAL HOUSING PROJECTS

Some public procurement alternatives (Wang and Ke 2008) that may be suitable for affordable housing as social infrastructure are traditional procurement, joint venture, Build-Operate-Transfer (BOT, and other forms based on BOT, for example, Build-Own-Operate), and privatization. Public funding and control by administration are decreasing from traditional procurement to privatization, while risk transferred to the private sector is increasing.

Build-Own-Operate (BOO) for staff quarters in industrial park. Staff quarters in industrial park are mainly dedicated to staff working there. It's internal orientated rather than public orientated. Procurement form with more capital from and more obligations of private sector is appropriate for it. For example, Government award concession to a consortium of companies to build, own and operate staff quarters (together with some commercial real estate, if it's necessary for the cost-revenue balance).

One case developed in this pattern is the Xi'an public rental housing project in Qingdao, Shandong. The project started in March 2011, with a total investment of RMB 800 million, and a total construction area of 240,000 square meters. When completed, it's going to provide more than 3,500 units of public rental housing. It's located in the "International Ecological Wisdom City", an industrial park in Qingdao Development Zone, surrounding with businesses. This project was jointly developed by Qingdao HaixiUDIC (urban development investment company, it is a state-owned company), and two private companies, with concession from the local authority of Qingdao Development Zone. The two private enterprises invest more than RMB 600 million, which covers 75% of the total project.

Build-Own-Lease (BOL) for public rental housing built on collective land of urban village. In China, urban villages perform an important social function, as well as leading to serious social problems. They provide low-rent housing for low-income people, and also provide a stable income for landless villagers, with messy physical space and poor population management. Combining urban village reform with affordable housing development would improve original residents' living conditions and retain social function of urban villages at the same time.

Government shall acquire a certain proportion of affordable housing in urban reform project through land use regulation. Land in urban villages is collectively owned by all the villagers, while affordable housing built on that land is dedicated to the public. Local authority should take charge of public housing administration, while villagers retain their property rights, with private companies' cooperation in financing, designing, construction, maybe operation and maintaining as well.

One case undertaken under this pattern is the urban village reform project of Tangjialing in Haidian District, Beijing. In March 2012, the village and the Haidian District Authority reached an agreement to build 10 million square meters of public rental housing on the collective land. The village should lease them to the authority for RMB 50 million per year. The authority pre-paid RMB 500 million for 10 years. It's a Build-Own-Lease form.

Build-Transfer (BT) with cross subsidy for public rental housing built in mixed-income community. It is a common practice in China to build a certain proportion of affordable housing in commercial housing project. Private developers in China prefer sale to rent. Therefore, government should take over the property rights of the part of affordable housing. It's different to traditional public procurement in that, government attracts private developers to build affordable housing and transfer to public sector for free through land-use regulations and density bonus. It's actually a Built-Transfer model with cross subsidy.

Every newly developed housing project in cities like Beijing has a quota to build affordable housing dedicated to public.

Traditional procurement for collectively built affordable housing. Collectively built affordable housing projects may be un-bankable as illustrated in the cash flow analysis above. Therefore, it has little attraction to private sector. Government should provide investment funding for this type of projects. It can be delivered under traditional procurement like EPC.

CONCLUSION

Chinese Government is encountering with heavy debt burden to fund

Downloaded from ascelibrary org by UNIVERSITY OF BIRMINGHAM on 03/21/15. Copyright ASCE. For personal use only; all rights reserved

affordable housing. Private sector's involvement is necessary to initial investment. However, low investment return with high demand risks makes public rental housing projects un-bankable.

Therefore, groundwork is necessary to design specific PPP frameworks that would be viable in China, in order to figure out which kind of "pathfinder" projects should be prioritized.

Based on the current situation in China, there are four potential types of public rental housing projects, and three of them may be viable to be procured under PPP. Staff quarters in industrial park can be delivered through Build-Own-Operate method by private sector. Public rental housing built on collective land of urban village can be procured by local authority on a leasehold basis of Build-Own-Lease from village collectives (the property owner). Public rental housing built in mixed-income community by commercial developers can be transferred to public sector for free under a BT model with cross subsidy. Public rental housing collectively built should be procured under traditional method due to its poor cash flow.

It remains to be seen whether the above PPP framework is viable in practice in Mainland China. "Pathfinder" projects under the framework and a track on them are needed. Case studies of the pathfinder projects are helpful to further identify best practice.

ACKNOWLEGEMENT

Kindly thank Polytechnic University for the financial support for my study in HK. Thank also goes to Vanke for providing the data of public rental housing projects.

REFERENCES

- Abdul-Aziz, A.R. and Jahn-Kassim, P.S. (2011). "Objectives, success and failure factors of housing public: Private partnerships in Malaysia." *Habitat International*, 35(1), 150-57.
- Beijing Public Housing Centre (BPHC). (2011). "8 public housing projects acquired by Beijing Public Housing Centre." http://www.bphc.com.cn/jianshepingtai/hggzf/2011-12-02/226.html (Dec. 2, 2011)
- General Office of the State Council of the People's Republic of China (GOSC). (2011). *Guidance on Affordable Housing Construction and Management*, GOSC, Beijing.
- Hodkinson, S. (2011). "The private finance initiative in english council housing regeneration: A privatisation too far?" *Housing Studies*, 26(6), 911-32.
- Ibem. and Eziyi, O. (2011). "The contribution of public–private partnerships (PPPs) to improving accessibility of low-income earners to housing in southern Nigeria." *Journal of Housing and the Built Environment*, 26(2), 201-17.
- Lian, S. (2009). Ant Tribe: Record of Urban Village Inhabited by University Graduates, Guangxi Normal University Press, Guangxi.
- Ministry of Finance of the People's Republic of China (MOF). (2014). "Government revenue and expenditure of 2013." http://gks.mof.gov.cn/zhengfuxinxi/tongjishuju/201401/t20140123_1038541.html>(Jan. 23, 2014).

- Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD). (2011). "10 million units of affordable housing is going to be built this year: Construction funds will break RMB 1.3 trillion." http://www.mohurd.gov.cn/zxydt/201101/t20110111_201977.html (Jan. 11, 2011).
- Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD). (2012). "7.22 million units of affordable housing came into cunstruction and 5.05 million units completed from January to October." <http://www.mohurd.gov.cn/zxydt/201211/t20121108_211906.html>(Nov. 8, 2012).
- Ministry of Housing and Urban-Rural Development of the People's Republic of China (MOHURD). (2013). "Nationwide affordable housing construction task of this year fully completed." http://www.mohurd.gov.cn/zxydt/201312/t20131213_216546.html (Dec. 16, 2013).
- National Bureau of Statistics of the People's Republic of China (NBS). (2014). "GDP of 2013 (premilinary accounted)." (Jan. 21, 2014)">http://www.stats.gov.cn/tjsj/zxfb/201401/t20140121_502731.html>(Jan. 21, 2014).
- People's Daily. (2012). "The fist pilot of 899 units of public rental housing in Wuhan met a vacancy rate of 70%."<http://news.xinhuanet.com/fortune/2012-03/23/c_111691776.htm>(Mar. 23, 2012).
- Sengupta, U. (2006). "Government Intervention and Public-Private Partnerships in Housing Delivery in Kolkata." *Habitat International*, 30(3), 448-461.
- United Nations Center of Human Settlement (Habitat) (The UNSHC (Habitat)). (1993). *Public/private partnerships in enabling shelter strategies*, The UNSHC (Habitat), Kenya.
- Wang, S.Q. and Ke, Y.J. (2008). *Concession Project Financing (BOT, PFI and PPP)*, Tsinghua University Press, Beijing.
- Winch, G.N., Onishi, M. and Schmidt, S. (2012). *Taking stock of PPP and PFI around the world*, The Association of Chartered Certified Accountants (ACCA), England.
- Yu, J.X. (2012). "The vacancy rate of public rental housing in Zhengzhou is 90%." http://news.xinhuanet.com/politics/2012-04/02/c_122921271.htm (Apr. 2, 2012).