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Abstract

The Chinese social welfare urban housing system established in the 1950s had transformed into a market-oriented housing system through Housing Reform from 1978 to 1998. Large amount of commodity housing was intentionally constructed after 1978, so were the majority of former public housing purchased by employees of state-owned enterprises. By far the Chinese housing system is dominated by private housing. The issues discussed in this dissertation is in the domain of private housing, for the significant amount of housing units it involves.

Facing the increasing need for housing renewal in rapid urbanization, a dualistic system consisting of private urban housing renewal consisting of marketized Old City Renewal (OCR) and government voluntary Dilapidated Urban Housing Renewal (DUHR) has been established in China since 2015. This study concentrates on the latter DUHR mode, which has not drawn so much attention as the OCR mode in academic research. There is no doubt that DUHR could eliminate currently diagnosed dilapidated buildings in the short term. Nonetheless, such movement guided by radical administrative subcontract is also related to a variety of social, economic, and physical environment issues. In related studies, the variety of proposals to improve livability in old residential areas are not well integrated with financing pattern and operation mode, thus being unrealistic to be referred to in practice. Therefore, this research argues the necessity of constructing an inclusionary program, which takes a comprehensive and integrated view of the economic, operational, and physical environmental aspects, when identifying problem and exploring solutions in housing renewal study.

The purpose of this research is to improve the current DUHR mode from the perspective of financing pattern, operation mode, and physical environment design strategies. The hypotheses are that the inclusionary program could improve DUHR mode from three aspects, and the experience from Japanese Condominium Complex Reconstruction (CCR) system could be applied to China in forming the inclusionary program. And the research questions are: 1) Why is Japanese CCR system

comparable for Chinese DUHR system? 2) What are the problems with the current DUHR system, in terms of its financing pattern, operation mode, and physical environment design strategies? 3) What aspects from the Japanese CCR system can be referable to deal with the problems with Chinese DUHR system? 4) Is the Japanese experience summarized from question 3) applicable to the Chinese context?

Responding to the research questions, a three-phase research strategy is developed: 1) The first phase is a comparative study to clarify the referability of Japanese CCR to Chinese DUHR; 2) The second phase uses a typical case to identify the defects of Chinese DUHR, then Japanese experience in dealing with similar problems is summarized from a case study of CCR projects in Tokyo. 3) The third phase uses a simulative reconstruction project in the Chinese context to testify the applicability of Japanese experience to China.

The referability of Japanese CCR and Chinese DUHR system is examined by comparing the economic development, urbanization process, land system, housing system, ownership pattern and morphology of Chinese residential area and Japanese condominium complex, problems with old residential areas, and housing renewal system in other Asian countries/regions. It is concluded that, the Japanese CCR mode utilizing AFRC forming reconstruction union could be referable for the Chinese DUHR in Yangtze River Delta Area.

Using the Jinshou Project, which is an average case in Zhejiang Province, the problems with current DUHR are identified. Through analyzing the statistics of project funding, this research argues that the DUHR mode completely relies on public funding, and is hard to tackle with the increasing number of dilapidated housing. For operation mode, by analyzing the project procedures, questionnaire to homeowners, and semi-structured interviews with government officers and homeowners, it is concluded that, DUHR is a top-down system between government and homeowners; homeowners' decision is still largely influenced by local government's preference. Regarding improvement to physical environment, through field observation and questionnaire, it is argued that the current DUHR mode only tackle safety issues within single building plot, while hardly affect the physical environment on residential area and urban scale.

According to the problems identified in Chinese DUHR, sixteen reconstruction projects completed in Tokyo are used as a sample to summarize the experience of Japanese CCR. The analysis of financing pattern and operation mode of Japanese cases is based on documentary study of project reports. For physical environment, field observation is conducted after a background study of project reports. Several preliminary recommendations for Chinese DUHR are generated from the Japanese case studies.

Based on the preliminary recommendations, a simulative reconstruction project is used to testify the applicability of Japanese experience to China. The simulation results indicate that the financing pattern, operation mode, and design strategies in Japanese CCR could be applied to Chinese DUHR. And the final recommendations for DUHR are:

For financing pattern,

1) Include DUHR projects in the housing market, especially those projects with good marketability.

2) Allow increase of floor area in reconstruction projects, and use the increased floor area to balance the reconstruction cost. Give FAR bonus for providing open public space in dense built-up area.

3) Use public money only as incitation to promote reconstruction projects, instead of building a government voluntary system totally relying on government funding.

For operation mode,

4) Construct a legal framework on reconstruction like the AFRC law in Japan which ensures the project could be proceeded smoothly.

5) Make official reconstruction manuals that present a clear process for homeowners to follow, as well as for local government to supervise. Break down a project into four stages including initiation, preliminary investigation, formal reconstruction plan making, and implementation.

6) Give homeowners the right to initiate a project. Let homeowners take part in the investigation, planning and decision-making process.

7) Educate homeowners their rights and responsibilities of owning their property. Encourage homeowners to form groups to study reconstruction strategies, and involve third-party consultants to help homeowners' decision making.

For improvement of physical environment,

8) Include multiple buildings instead of single buildings in a project, to create higher flexibility in rearranging building volumes and space between buildings, as well as in providing diversified facilities.

9) Integrate residential area reconstruction projects with larger scale urban renewal plans, reconsider the connection of the residential area with its urban surrounding, and improve the boundaries of gated territories.

These recommendations should not be taken separately, but integrated with each other to form an inclusionary program. This inclusionary program, with a clear focus on district improvements, which is learned from Japanese CCR system, has proved to be effective in dealing with the issues in current Chinese DUHR system. And this program is expected to create a process to balance the interest of different stakeholders, and a manner to bring bottom-up approach to private housing renewal in Chinese cities.

博士論文概要

本研究は、酷く老朽化した建物 を都市住宅へと改良する政府主導の方法である中国の「危房改造システム」を資金パターン、策定過程、デザイン方法、物的環境の観点から改善する試みである。

1950 年代に確立された中国の福利型都市住宅制度は、1978 年の住宅改革によって市場主導の住宅制度へと転換された。中国における現在の都市住宅供給システムでは、民間住宅が主導的な地位を占めている。本研究で議論される問題は、この民間住宅の領域に関するものであり、関連するかなりの住宅数を対象としている。

急速な都市化の進行に伴う住宅更新に対するニーズの高まりにより、2015 年以降市場主導の「旧城改造」(OCR) と政府主導の「危房改造」(DUHR) による民間都市住宅更新に関する二元的制度が構築された。本研究では、新しい「危房改造」の更新方法に着目しており、2015 年に実装されてから学問領域においてはあまり注目されてこなかった。

「危房改造」の更新方法が、近年老朽化した建物を短期的に建て替えられることに疑いはない。それでもなお、このような革新的な行政の下請けにより主導された運動は、社会的、経済的そして物的などの多様な環境問題に相互に関連している。古い住宅地区の居住性を改善するための様々な提案は、策定過程と資金パターンについて十分に統合されておらず、そのためこれらの提案は実務において参照するには非現実的である。したがって、本研究では、包括型プログラムを開発することの必要性を論じるものであり、そのプログラムとは、住宅更新研究における課題の明確化と解決策の提示を通じた、経済的、組織的、物的環境の側面からなる幅の広い統合された視点を提供する包括型プログラムである。

本研究の全体目的は、資金パターン、策定過程、物的環境のデザイン方法の観点から、近年の「危房改造」の更新方法を改善することである。本研究の仮説は、包括型プログラムは 3 つの観点から「危房改造」を改善し、日本の分譲住宅団地の建替システムから得られた知見は、包括型プログラムを確立することにより、中国に適応可能であるということである。

1) なぜ、日本の分譲住宅団地の建替システムが、中国の「危房改造」と比較可能であるのか?

2) 資金パターン、策定過程、物的環境のデザイン方法に関する、近年の「危房改造」システムの有する問題とはなんであるか?

3) 日本の分譲住宅団地の建替システムのどのような側面が、中国の「危房改造」システムの問題へ対処するために参照されうるのか?

4) 上記の日本モデルは、中国の文脈に適応可能であるか?

本論文は、3つの部と8つの章から構成されている。導入部である1章から3章は、研究背景の記述、研究課題の設定、仮説の提唱、理論的ギャップの発見、研究方法の枠組みの確立を構成している。主要部である4章から7章は、4つの研究課題に対応している。8章は、本研究の全体を総括し、結論を述べる。

1章では、研究全体の一般的な背景を説明し、課題と目的の設定、仮説の提示、既往研究を要約することによる「包括型プログラム」の定義を行う。本研究のねらいは、中国において不動産産業の定常的な成長によって最も発展している地域である長江デルタにおける都市住宅の「危房改造」システムを構築することである。

文献調査を通して、2章では、都市デザインの観点から都市更新と住宅更新の理論的議論を行う。まず、西洋諸国と中国における都市更新と住宅更新に関する理論と実践の進化をレビューし、近年の中国における住宅更新の実践に関する諸問題を概観した。次に、近代中国での住宅地計画・設計標準の進化を調査分析し、後の章で詳細に述べられる80年代後半から90年代初頭にかけて建設された住宅の物的環境特徴の全体像を把握した

3章では、研究課題に答え、そして仮説を立証するために本研究がどのように構成されているかを論じている。

4章「Comparability of Japanese Condominium Complex Reconstruction and Chinese Dilapidated Urban Housing Renewal」は、第一の研究課題に対応しており、中国の住宅地区と日本の住宅団地における経済発展、都市化のプロセス、土地と住宅のシステム、所有者パターン、形態を比較し、さ

らにはその他のアジア諸国と地域における古い住宅地区および住宅高お新システムの問題を比較している。その結果、日本の建替組合を結成するマンションの建替え等の円滑化に関する法律を活用した分譲住宅団地の建替方法は、長江デルタ地域における中国の「危房改造」にとって参照可能であることを結論づけている。

5 章「Identifying Problems with Chinese DUHR, Jinshou Project as a Case Study」は、第二の研究課題に対応している。本章では、「危房改造」の典型事例である浙江省の「金寿新村プロジェクト」を対象とし、資金パターン、策定過程、物的環境の観点から中国の「危房改造」システムの欠点を明らかにする。この事例の代表性は、近年の状況とそのプロジェクトにおいて採用された方策の典型性に基づいている。まず、資金パターンの問題点は、事業資金の統計データを分析することで明示した。次に、策定過程に関する問題点は、事業手順、住宅所有者へのアンケート結果、地方政府と住宅所有者への半構造インタビュー結果を分析することで明らかにした。最後に、物的環境の問題点は、現地での観察調査と住宅所有者へのアンケート調査により明らかにした。結果として、現行の「危房改造」システムは、地方政府の資金に大きく依存しており、経済的に持続可能でないことが明らかになった。「危房改造」は、地方政府から住宅所有者へのトップダウン型システムであり、住宅所有者の意思決定は、地方政府の意向によって非常に影響を受けている。また、近年の「危房改造」では、個々の建物のみを対象とした容易な課題への対処のみであり、住宅地区や都市スケールにおける物的環境へはほとんど影響していない。

6 章「Financing Pattern, Operation Mode, and Improvement to Physical Environment in Japanese Condominium Complex Reconstruction」では、第三の研究課題に対応している。5 章で明らかにした「危房改造」の問題点に応じて、すでに竣工している東京の 16 の建替事業を、日本の分譲住宅団地の建替に関する知見を整理するための事例として用いた。日本の事例の資金パターンと策定過程の分析は、事業報告書の文献調査に基づいている。物的環境の分析については、事業報告書での事前調査後に現地での観察を実施した。その結果、日本の分譲住宅団地の建替ではこれら 3 つの側面が統合されていることが明らかになった。建替費用は、政府の補助金に依存せずに、保留床を活用し事業内でバランスを保っている。日本の分譲住宅団地の建替は、トップダウン型の支援と指導を含めたボトムアップ型のシステムである。物的環境の改善は、個々の建物に対処するだけではなく、一般的に容積率制限の緩和をもたらす都市空間へ貢献している。これにより、中国の「危房改造」に対するいくつかの先行的な提案事項が、この日本の事例分析から導き出された。

７章「Simulation Project and Recommendations for DUHR」は、第四の研究課題に対応している。中国への日本での知見の適応可能性を証明するために、先行的な提案事項に基づいた建替シミュレーションを行った。その結果、日本の分譲住宅団地の建替における資金パターン、策定過程、デザイン方法は、中国の「危房改造」に適応可能であることを明らかにした。そして、周辺の建物と敷地を含めた地区改善の包括型プログラムが、証明された提案事項を用いることで構築された。

上述した分析と調査結果を通じて、８章では本研究の総括を行う。近年の「危房改造」システムは、将来の住宅更新数の増加に対処できないことは明らかであり、日本の分譲住宅団地の建替システムは、中国の「危房改造」にとって一つのプログラムであることが証明された。

余剰の容積率の適切な量を許可することは、所有者間での経済的にバランスの取れた事業を可能とするであろう。そのことは、個々の建物よりも地区レベルでの改善へ焦点を当てることにつなげて行かなければならないけれども、古い都市空間の物的環境の再配置と改善により柔軟性をもたらすであろう。このような条件下においては、住宅所有者らが建替事業にさらに参画し、決定を行える可能性を 広げるであろう

「危房改造」システムの改善のためには、資金、組織、物的環境の側面を幅広く統合する包括型プログラムを開発することが、その実用性のためだけではなく、これらの３つの側面が相互に支え合い、効果を向上させ合うであろう 事実のために必要不可欠である。

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I am extremely grateful to my parents and my wife. Your unconditional love and constant encouragement gave me the bravery to overcome all the problems and difficulties.

Authorship declaration

I hereby certify that the dissertation I am submitting is entirely my own original work except where otherwise indicated. I undersigned declare that this work has not previously been submitted for a degree or a diploma in any university.

管理

Guan Li

2020.02

Contents

Chapter 1　Research Background and Purpose

1.1 Research background

1.1.1 Dilapidated urban housing in China

	1978		1995		2002		2010	
Public	State owned company housing	60%	State owned company housing	45.6%	Rental housing	15.6%	Rental housing	11.0%
	Municipality	20%	Others	11.2%				
	Total	80%	Total	56.8%	Total	15.6%	Total	11.0%
Private	Inherited	20%	Inherited	3.3%	Former private housing	9.8%	Former private housing	11%
			Self-constructed	6.4%	Former company housing	61.4%	Former company housing	40%
			Purchased	31.0%	New commodity housing	7%	New commodity housing	38%
	Total	20%	Total	40.7%	Total	78.5%	Total	89%
Others	-			2.5%		5.9%	-	

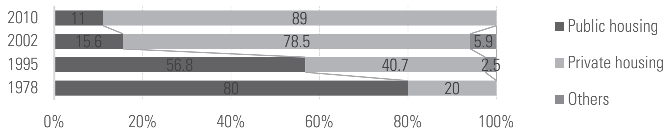

Figure 1-1 Constitution of Chinese urban housing stock in China in 1978, 1995, 2002, and 2010 (This figure shows the general trend of housing stock transition, the percentage is calculated based on main cities mentioned in various literature. Source: Wang, 1995; Zhao and Bourassa, 2003; National Bureau of Statistics of China)

The Chinese social welfare urban housing system established in the 1950s transformed into a market-oriented housing system through a step by step housing reform from 1978 to 1998. Large amount of commodity housing was intentionally constructed in Chinese cities after 1978, so were most former public housing purchased by employees of state-owned enterprises. By now an urban housing provision system dominated by private housing has been established in China. (Figure 1-1) The issues discussed in this dissertation belong to the domain of private housing, for the significant amount of housing units it involves.

Due to a variety of reasons—low design standard (Lue et al., 2001; Qu, 2011), poor construction quality before the 1990s (Zheng, 2009), and residents' improper usage (Suo, 2013)—an increasing number of buildings constructed during early 1980s to early 1990s are faced with ageing of facilities, outdated layouts, and most importantly damage of building structure. The term "Dilapidated"[1] infers that the building structure has been seriously damaged or the load-bearing component is in danger and may at any time lose the stability and load-bearing capacity.

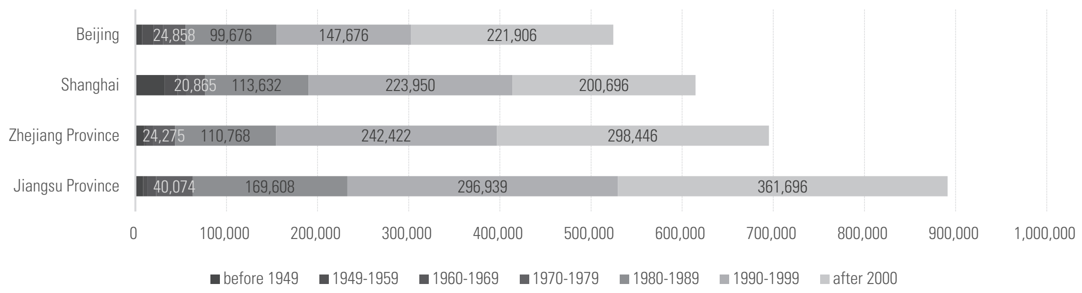

Figure 1-2 Constitution of urban housing stock by year of construction in Beijing, Shanghai, Zhejiang Province and Jiangsu Province (by households, Based on National Bureau of Statistics of China's 1% sample survey)

Since residential buildings were constructed in different stages of Housing Reform and under different technical conditions, their current physical states are varied. This study focuses on private housing constructed during early 1980s to early 1990s, which is the beginning stage of Housing Reform. In many cities and regions, residential buildings constructed during this era take approximately 1/4 of the whole housing stock (Figure 1-2).

1.1.2 OCR and DUHR: A dualistic system of private urban housing renewal in China

Under the Chinese urban renewal framework before 2015, dilapidated housing areas on best sites would undergo Old City Renovation (OCR, "旧城改造") before long, which is a marketized process that the local government first requisitions properties from homeowners, and then sells the land to developers[2]. Developers may maximize their benefits by building high-grade residences or

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[1] A detailed explanation of this term is made in section 1.5.2.

[2] The land price offered by local government is a result of 1) land expropriation fee, 2) resettlement fee, and 3) construction expense of infrastructures. (Hu and Ni, 2008)

approximating the FAR limit[3] (Figure 1-3) restricted by urban planning, and homeowners may luckily receive generous compensation[4]. Currently there is no direct expression of "OCR" in national laws and regulations in China, but relevant laws and regulations have made corresponding provisions on the meaning of OCR, so that OCR projects have a legal foundation[5].

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[3] The FAR limit varies from city to city, location to location. For example, in central area of Hangzhou, the limit could be 4.5, in Shenzhen, the number could be as high as 6.0. Government's planning of FAR limit takes into consideration the profit space for developers, and maximum population density of a region (Liu et al., 2010).

[4] The compensation in OCR projects is based on floor area of old property. The compensation factor depends on the development level of different cities, competition between developers, and gaming between property owners and the developer. In Zhejiang Province, the factor has normally reached around 1.2, which means homeowners may get a new property 1.2 times the floor area of their old property for free, regardless of the condition of old property. The highest compensation factor across the country is in the most rapidly developing city Shenzhen, with a number around 1.6.

[5] In *Law of the People's Republic of China on Urban and Rural Planning*, Article 29 states that "… In the construction and development of a city, priority shall be given to the construction of infrastructure and public service facilities, the relation between the development of new areas and the reconstruction of the old ones shall be properly handled, and overall consideration shall be given to the daily lives of the migrant workers in the city and to the need of the economic and social development and of the villagers' production and daily lives on the periphery of the city …", Article 31 states that "… In the reconstruction of an old urban area, attention shall be paid to preservation of the historical and cultural heritage and traditional style and features, rational determination of the scale of demolition and construction, and planned reconstruction of the places where clusters of dilapidated houses are located and the infrastructures are outdated …"

In *Regulation on the Expropriation of Buildings on State-owned Land and Compensation*, Article 8 states that "… Where, for public interests such as safeguarding the national security and promoting the national economic and social development, it is necessary to expropriate a building under any of the following circumstances, the people's government at the city or county level shall make a decision to expropriate the building: … (5) necessary for the rebuilding of an old urban area where dilapidated buildings concentrate and infrastructure lags behind as organized and implemented by the government according to the relevant provisions of the Urban and Rural Planning Law; … (6) necessary for any other public interest as prescribed by a law or administrative regulation."

The *Law of the People's Republic of China on Urban and Rural Planning* summarized the purpose of OCR as improving the backward urban infrastructure and public facilities in the name of public interest. Based on that, *Regulation on the Expropriation of Buildings on State-owned Land and Compensation* provided legitimate the expropriation and compensation process, which is one of the most important issues in urban renewal. Besides, each province and municipality has made further and more detailed regulations such as *Implementing rules on the Dismantlement of Urban Houses (《城市房屋拆迁补偿安置细则》)* and *Administrative Measures on the Dismantlement of Urban Houses (《城市房屋拆迁管理办法》)*. The construction of new buildings, though not regulated in these laws, must comply with the land zoning and FAR specified in local governments' urban planning.

While for other old residential areas located in the old city area without the optimal marketability[6], developers seldom show interest[7], and few substantial measures could be taken. Such residential areas in the inner city gradually turn into the leftovers in housing market, with their physical condition deteriorating. Yet these residential areas are still to a large extent occupied, due to the convenient transportation and amenities of the inner-city area, homeowner's limited economic condition, or the aging of residents.

Figure 1-3 High-density residential area in redevelopment project of Zhongyuan Liangwancheng in Shanghai (Photos by author, 2010)

Figure 1-4 Collapse of an early 1990s commercial residential building in Fenghua, Zhejiang Province, 2014 (Source: Shi, 2014)

Recent years, frequent collapse accidents in these areas[8] have caused wide public concern, urging

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[6] Though not of the best marketability, these residential areas are usually also located in the inner-city area, with relatively more convenient accessibility and amenities compared to new developments in the peripheries or new towns.

[7] Under the OCR mode, land price has reached an extraordinarily high level due to the growing compensation rate for original homeowners.

[8] On April 4th, 2014, a five-storey condominium building constructed in 1994 collapsed in Fenghua, Zhejiang Province, killing one person while six others were injured. Five days after the collapse, deputy director of the subdistrict, who oversaw the renovation in that area, was found dead in suspected suicide. Such cases have drawn widely concern in Chinese society, and urged the government to take steps.

the central government to carry out concrete policies. In mid-2015, State Council enacted *Guiding Opinions of the General Office of the State Council on Renovating Dilapidated Housing and Improving Supporting Facilities (《国务院关于进一步做好城镇棚户区和城乡危房改造及配套基础设施建设有关工作的意见》)*, establishing a new mode of private urban housing renewal, under the name of Dilapidated Urban Housing Renovation (DUHR, "危房改造"). Working as a complement to OCR, the DUHR mode is a government voluntary mode relying on public funding, that focuses on housing renewal issues excluded from OCR projects. According to administrative files on DUHR on all levels from nation to district (Figure 1-5), all Class D Dilapidated Housing[9] in metropolitan areas should be evacuated by the end of 2017. Under such guideline, local governments all set out a three-years construction scheme from 2015 to 2017, which means a total number of 18 million housing units will be involved from 2015 to 2017 across the nation. With local governments obeying this schedule and competing to accomplish the administrative assignment, a government-dominated movement of renewing urban dilapidated housing takes place.

[9] The definition and classification of Dilapidated Housing is explained in detail in 1.5.2 Terminology.

	OCR 旧城改造 - Old City Renovation		DUHR 危房改造 - Dilapidated Urban Housing Renewal
1990.04 Nation	Urban Planning Law 《城市规划法》		
2008.01 Nation	Urban and Rural Planning Law 《城乡规划法》		
1991.01 Nation	Regulation on the Dismantlement of Urban Houses 《城市房屋拆迁管理条例》		
2004.03 Nation	Procedure on the Dismantlement of Urban Houses 《城市房屋拆迁工作规程》		
2011.01 Nation	Regulation on the Expropriation of Buildings on State-owned Land and Compensation 《国有土地上房屋征收与补偿条例》		
Since 1990s Province	Implementing rules on the Dismantlement of Urban Houses 《城市房屋拆迁补偿安置细则》		
Since 1990s Municipality	Administrative Measures on the Dismantlement of Urban Houses 《城市房屋拆迁管理办法》		
		2015.06 Nation	Guiding Opinions of the General Office of the State Council on Redevelopment of Shanty Areas and Dilapidated Buildings and Improving Supporting Facilities 《国务院关于进一步做好城镇棚户区和城乡危房改造及配套基础设施建设有关工作的意见》
		2015.06 Province	Notice of the People's Government of Zhejiang Province on Comprehensively Advancing the Work of Renovating Urban Dilapidated Housing 《浙江省人民政府办公厅关于全面推进城镇危旧住宅房屋治理改造工作的通知》
		2015.08 Municipality	Implementation Opinions of the People's Government of Zhoushan on Advancing the Work of Renovating Urban Dilapidated Housing 《舟山市人民政府关于推进城镇危旧住宅改造工作的实施意见》
		2015.11 District	Implementation Measures of Dinghai District on Renovating Urban Dilapidated Housing 《定海区城镇危旧住宅改造工作实施办法》

Laws

Figure 1-5 Laws and administrative files related to OCR and DUHR

In this way, a dualistic system of private housing renewal is established in China (Table 1-1). On one hand, there is the fully marketized OCR approach led by local government and property developers, which squeezes land value of the best sites; on the other hand, there is the government dominated voluntary DUHR mode, which aims to eliminate the life risks caused by collapse of buildings excluded from OCR with the help of public funding. This study focuses on the latter DUHR mode, which has not drawn so much attention as the OCR mode in academic research.

	OCR 旧城改造 - Old City Renovation	DUHR 危房改造 - Dilapidated Urban Housing Renewal
Targeted areas	Dilapidated areas with the best marketability	Areas excluded from OCR projects
Initial goal	To optimize the urban function in old city area through redevelopment, and to renew its physical environment	To eliminate the life risks caused by collapse of buildings
Stakeholders involved	Local government Developer Homeowner	Local government Homeowner
Profit for local government and developer	Yes	No
Rely on local government's re-planning	Yes	No
Rely on public appropriation	No	Yes

Table 1-1 Differences between Chinese OCR and DUHR

1.2 Problem statement

There is no doubt that DUHR movement could eliminate dilapidated buildings in the short term. Nonetheless, following a series of swiftly carried out files from nation level to district level (Figure 1-5), such movement guided by radical administrative subcontract is also related to a variety of social, economic, and physical environment issues. For example, governmental financial support plays a significant role in DUHR, enabling local government to negotiate with homeowners, and driving homeowners to reach an agreement with local government. However, even in relatively developed coastal regions, the fund could be very tight. And the amount of appropriation is likely to be reduced after 2017, when the three-year (2015-2017) plan comes to a close. Aside from economic issues, under the government-dominated operation mode, homeowners' original will may not be consistent with local government's preference, and therefore be neglected in the projects. Furthermore, the solutions on physical environment provided by local government only focus on single dilapidated buildings, while the overall environment in old residential areas is disregarded.

1.3 What is an inclusionary program

1.3.1 Related academic achievements in the past

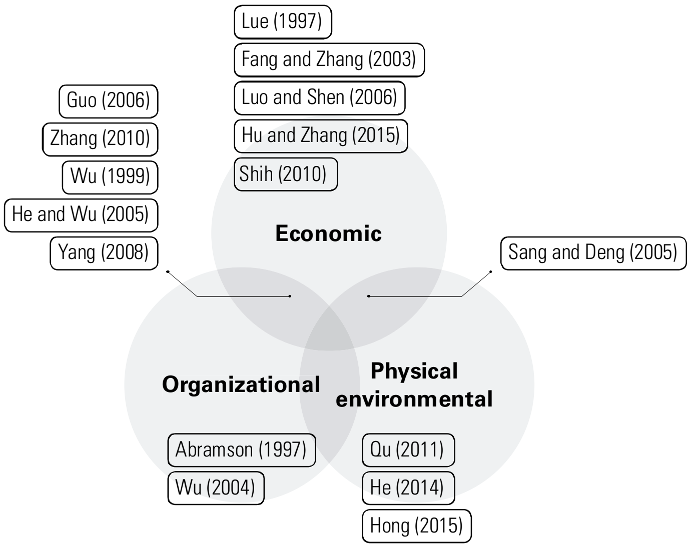

Figure 1-6 Summary of related studies

Research on the government voluntary DUHR mode is still scarce in China, due to the fact that DUHR policy is relatively new, and accordingly the first DUHR projects were just completed in 2016. Among related studies, the OCR mode has been under research ever since the nation-wide urban renewal and housing reform took place. The related studies could be categorized into three fields (Figure 1-6):

Economic: Interest balance of different stakeholders in OCR

Lue (1997) observed that the growing real estate industry undermined OCR's initial intention to maintain original residents on site while redeveloping the old city. It also has been widely acknowledged that local government and developers profit themselves from the emerging real estate industry, and it is local elites that have benefited more than local residents (Fang and Zhang, 2003; Luo and Shen, 2006; Hu and Zhang, 2015). Shih (2010) argues that Chinese laws have promoted the booming of real estate industry and laid foundation for disputed relocation. To sum up, local residents with limited power and privileges could not get a profit in proportion to local government and developers from urban renewal.

Organizational: Residents' rights and needs in top-down OCR projects

Abramson's (1997) and Wu's (2004) studies showed that residents' needs are neglected in the top-down OCR operation mode and rapid relocation, which is also related to the intention of OCR, because "public interest" could be a vague term without a clear standard. Guo (2006) and Zhang (2010) suggested cooperation of multiple stakeholders in China's increasingly complicated social structure. Wu (1999), He and Wu (2005), and Yang (2008) studied the possibility of using public participation to balance stakeholders' rights in urban renewal. To sum up, related studies have analyzed the disregard of resident's needs in OCR, and proposed new strategies to balance the rights of different players.

Physical environmental: Improvement of built environment in old residential areas

Previous studies on the physical environment in old residential areas have been held on different scales. On a building scale, Sang and Deng (2005) explored partial extension of multi-storey apartment building constructed in the 1970s and 1980s. Qu's thesis (2011) synthesized the modification of dwelling unit layouts with reinforcement of building structure. On a neighborhood level, He (2014) evaluate the effectiveness of community public space in renovated residential areas. Hong (2015) studied the renovation of outdoor public space for the convenience of aged residents.

1.3.2 Definition of inclusionary program

It could be summarized from previous studies that:

1) Financing pattern lays the foundation for OCR projects. Interest balance between different stakeholders determines the feasibility, and applicable physical design strategies for a project. Under the government dominated OCR operation mode, homeowners are receiving increasingly higher compensation, while still have little power in determining their new living environment, except for selecting the location and house type.

2) However, although a variety of proposals have been given for improving the livability in old residential areas, previous studies on physical environment are not well integrated with financing

pattern and operation mode. For example, Sang and Deng's (2005) proposal of unit area increase, improvement of thermal property, facade, kitchen and restroom was not linked with a feasible financing pattern. Qu's (2011) proposal of improving the layout of old residential units by merging adjacent residential units did not include a possible operation mode among homeowners or residents. The gap between different aspects of housing renewal makes previous achievements unrealistic to be referred to in practice.

Focusing on the new DUHR mode, this research argues the necessity of constructing an inclusionary program. The word "inclusionary" has profound meanings in the field of urban design indeed. In "inclusionary zoning" or "inclusionary housing", it refers to a policy that require developers to provide a certain proportion of housing units in their development projects for sale or rent at a price below market rates. By providing affordable housing for diverse social groups, producing economic opportunity for low-income residents, and creating mixed-income communities, this "inclusionary" aims to increase the number of affordable housing and promote social integration in a city.

Another level of its connotation is as "inclusionary" literally infers, to involve multiple stakeholders as much as possible, including the government, developer, homeowners, and tenants. This level of "inclusionary" is an approach to tackle the problems in urban renewal from the perspective of operation mode.

However, instead of focusing on social inclusion, this research is applied to the extent of private residential areas in China from multiple angles. The intention of creating an inclusionary program here is to bring a process to balance the interest of different stakeholders, and a manner to bring bottom-up approach to private housing renewal in Chinese cities. So taking into consideration of the weaknesses in previous studies related to Chinese housing renewal, "inclusionary" in this research is defined as:

> a comprehensive and integrated view of the economic, operational, and physical environmental aspects, when identifying problem and exploring solutions in housing renewal study.

The three aspects are taken equally important in this program, not only are they the means to accomplish one another, they are also the final goals in housing renewal projects. These three aspects provide a framework in following chapters this dissertation.

1.4 Research purpose

The overall purpose of this research is to improve the current DUHR mode from the perspective of financing pattern, operation mode, and physical environment design strategies.

The hypotheses are that the inclusionary program could improve DUHR mode from three aspects, and the experience from Japanese Condominium Complex Reconstruction (CCR) system could be applied to China in forming the inclusionary program. This research attempts to answer the following questions:

1) Why is Japanese CCR system comparable for Chinese DUHR system?

2) What are the problems with the current DUHR system, in terms of its financing pattern, operation mode, and physical environment design strategies?

3) What aspects from the Japanese CCR system can be referable to deal with the problems with Chinese DUHR system?

4) Is the Japanese experience summarized from question 3) applicable to the Chinese context?

1.5 Research scope and terminology

1.5.1 Research scope

The scope of this dissertation could be defined by three boundaries:

Land type and ownership type

The first boundary of this research is set by the land type and ownership type of old residential areas. This study focuses on housing areas constructed on urban land, while rural area housing such as rural-urban fringe zone (城乡结合部) and urban villages (城中村) will not be included. Another related policy named Dilapidated Rural Housing Renovation ("農村危房改造"), which deals with dilapidated housing on rural land by granting monetary subsidy, will not be discussed in this dissertation, due to the different land system and housing system of urban and rural area in China. (Table 1-2)

Besides, the concentration of this research is on commodity housing (private housing), which plays the dominant role in Chinese housing system as explained in Subsection 1.1.1. In addition, this study only pays attention to legal urban housing that have been approved by municipality, while illegally self-constructed housing (自建房), which is another serious issue in Chinese cities, will not be discussed.

	Urban housing	Rural housing
Land ownership	- State owned - Individuals are granted with use right, which could be transferred	- Village collectively owned - Villagers apply to village for land use right for free (a welfare system) - Land use right cannot be transferred to individuals outside the village collective
House ownership	- Owned by individuals - Could be transferred	- Owned by villager - Cannot be transferred to individuals outside the village collective

Table 1-2 Comparison of land ownership and house ownership in Chinese urban and rural area

The DUHR mode

The second boundary is that, among the dualistic system of urban commodity housing renewal consisting of OCR and DUHR (as stated in Subsection 1.1.2), this study focuses on the DUHR mode.

The relationship between "棚户区改造 (Shanty Area Renovation)" and "城市危房改造 (DUHR)" needs to be clarified, since these two terms usually appear simultaneously in administrative files[10]. To address this, it is necessary to talk about the definition of "棚户区" and "城市危房".

The term "棚户区" is not clearly defined in any law in China. However, it was mentioned several times in a series of administrative documents. For example, *《国务院办公厅关于促进房地产市场健康发展的若干意见（国办发[2008]131 号）》* mentioned "城市棚户区" as "危旧房、筒子楼"; *《关于推进城市和国有工矿棚户区改造工作的指导意见(建保[2009]295 号)》* and *《关于做好城市和国有工矿棚户区改造规划编制工作的通知(建保[2010]58 号)》* referred "城市棚户区" as "城市和国有工矿棚户区". Based on the documents above, one thing clear about "棚户区" is its land type, because "棚户区" could only exist on urban land, not rural land. So neither "城中村" nor "农村危房" will have anything to do with "棚户区". However, in terms of what a "棚户区" is like, the criteria is relatively vague. In practice, it usually refers to areas with poor building quality and public facilities (usually one or two-storey buildings, because "棚" in Chinese means shack). Many of them were constructed by nation-owned firms in the 1950s and 1960s as company housing for their employees.

Regarding the term "（城市）危房", it is also not defined in any law, but it has a more clear definition by *Provisions for the Administration of Urban Ramshackle Houses (《城市危险房屋管理规定》)*, which will be discussed in detail in Subsection 1.5.2. In practice, "（城市）危房" could include both one or two-storey buildings and four to six-storey condominium buildings.

Then speaking of "城市危房改造" and "棚户区改造", these two terms are identical in terms of their operation mode, because they are all government dominated effort to deal with the old and dilapidated housing areas, without the involvement of developer currently. But the target area of "城市危房改造" and "棚户区改造" could be a little different, considering the minor differences between "棚户区" and "城市危房".

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10 For example, 《国务院关于进一步做好城镇棚户区和城乡危房改造及配套基础设施建设有关工作的意见》 stated that "... 包括城市危房、城中村在内的各类棚户区住房 1800 万套（其中 2015 年 580 万套），农村危房 1060 万户（其中 2015 年 432 万户） ..."

Geographical boundary

Last but not least is a geographical definition. Since China is a vast country with unbalanced economic development and diverse social conditions (Figure 1-7), the adaptable strategies for housing renewal may vary from region to region. This study focuses on the DUHR in Yangtze River Delta Area (YRD, 长江三角洲), which is the most developed region in China, with its real estate industry growing steadily (Figure 1-8). This area is also where new pilot policies could usually be adopted in China.

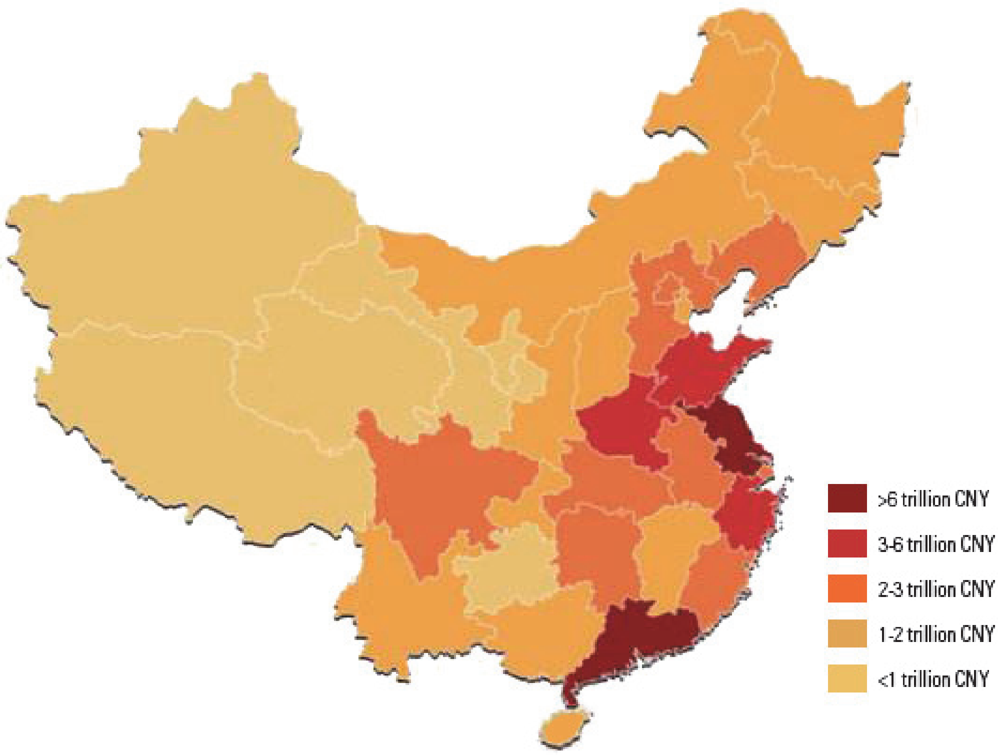

Figure 1-7 Yangtze River Delta Area in China's urban agglomerations (Upper, source: Fang, 2015) and the GDP of different provinces in China in 2015 (Lower)

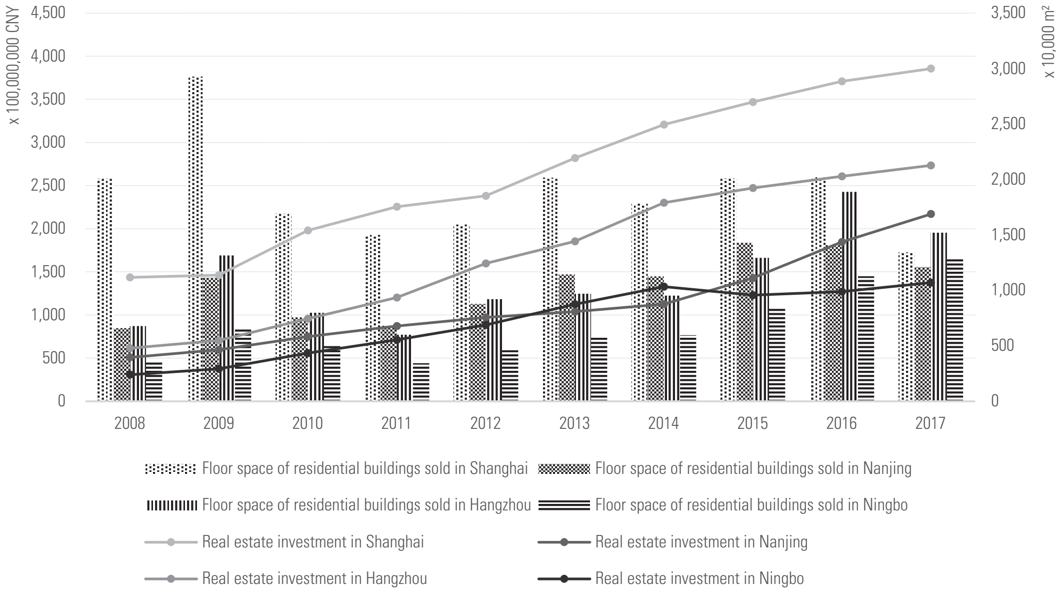

Figure 1-8 Real estate investment and floor space of residential buildings sold in four main cities in Yangtze River Delta Area (Source: National Bureau of Statistics of China)

1.5.2 Terminology

(1) Residential Area and Condominium Complex

The Chinese term "residential area" (小区, or 居住区) and the Japanese term "condominium complex" (分譲団地) make definition from the perspective of ownership and morphology.

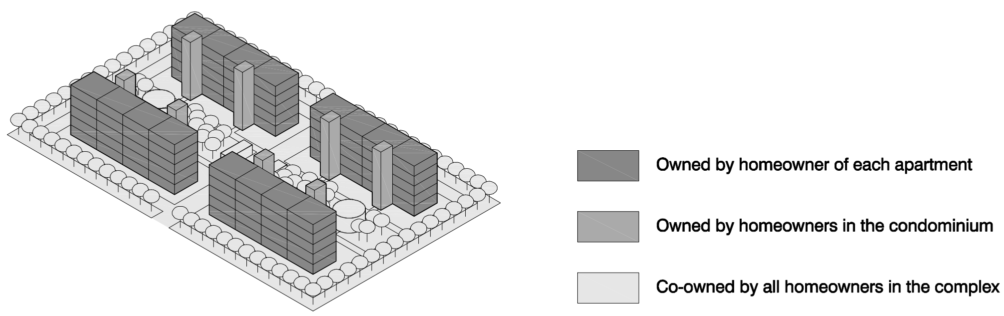

Figure 1-9 Ownership model and morphology of Chinese residential area and Japanese condominium complex

In the Chinese context, residential area, in a broad sense includes both private urban housing and public rental urban housing. For the purpose of this study, residential area only refers to private urban housing (商品房, or 私房). Today it is constituted of 1) private housing inherited from ancestors, 2) former state-owned company housing that were purchased (privatized) by employees during Housing Reform, 3) new commodity housing that were constructed and sold after Housing Reform. According to Chinese *Property Law (物权法)*, the dwelling units are outright owned by each homeowner, the common space of a building is owned by all homeowners in the building, the amenities is the residential area are collectively owned by all homeowners, and the land use right of the residential area is co-owned by all homeowners (Figure 1-9).

From a morphological point of view, Chinese residential area may refer to traditional neighborhoods of courtyard houses or row houses, and gated or half-gated communities consisting of multi-storey apartment buildings with amenities. In this dissertation, only the latter will be included, which is the most common urban housing type in Chinese cities. The evolution of its physical planning and design norms will be explained in detail in Section 2.2.

As for Japanese condominium complex, *Article 65 of Act on Building Unit Ownership, etc. (建物の区分所有等に関する法律)* defines this type of housing complex as:

1) Morphology: two or more buildings are located in a single housing complex;

2) Ownership: the apartments are outright owned by each homeowner; the land and ancillary facilities are co-owned by the homeowners.

Its morphology is similar to public or half-public rental housing (賃貸住宅) area supplied by UR, while it comes with a different ownership pattern. In Japanese, the buildings are known as "mansion (マンション)", and a complex is known as "分譲団地" or simply "団地".

Though there might be minor differences, such a co-ownership is common in many countries (Cagdas et al., 2018). To purchase a unit in a condominium means the acquisition of 1) individual ownership of the residential unit, 2) shared ownership of public facilities and common areas, and 3) membership in the homeowners' association (HOA) which is bound up with the management and further maintenance of the residential area. This pattern of ownership imposes more complicated rights and obligations compared to detached houses, because a homeowner is not only supposed to enjoy the exclusive residential unit and the jointly owned common space and facilities, but also has to be obliged to attend HOA meetings , comply with the by-laws of HOA, and pay management fees to keep the residential area in good condition. Thus, the condominium ownership pattern could be regarded as an instance of the property theory that considers ownership to be defined as much by the responsibilities it creates as by the rights it bestows (Van der Merwe, 1992).

(2) Dilapidated Urban Housing

According to *Provisions for the Administration of Urban Ramshackle Houses (《城市危险房屋管理规定》)*, the term "Dilapidated" infers that the building structure has been seriously damaged or the load-bearing component is in danger and may at any time lose the structural stability and load-bearing capacity, and cannot guarantee the residence and daily use.

The identification of dilapidated housing is based on *Standard of Dangerous Building Appraisal (《危险房屋鉴定标准》JGJ 125-2016)*. Following a three-step identification process covering building components, constituent parts, and whole structure, dilapidated (or dangerous) housing is categorized into four classes: Class A means the main structure is still safe for daily use; Class B means some structure components are in danger, but the whole building is still safe; Class C means a building is partly in danger, and could still be occupied after reinforcement; Class D is the most dilapidated level, indicating the main structure can no longer bear normal use and the whole building is in danger.

In China, in addition to natural disasters, the causes of dilapidated buildings include (Chen, 2014; Zheng, 2009):

1) Low design standard

   The development of building codes was far behind the pace of urbanization and construction of residential buildings. The boom of residential building construction started in the mid-1980s, reaching a peak in the early 1990s, while a complete set of regulations and codes was just established in the 2000s. For example, before the *Load Code for the Design of Building Structures (《建筑结构荷载规范》GB 50009-2001)* was carried out in 2001, wind load was calculated on basis of a return period of 30 years, which implicates that the serviceable life of a residential building is around 30 years.

2) Disordered management of architectural design market

In the 1990s, China already entered the first round of housing construction peak (Figure 1-2). There were hardly any regulations or disciplines in architectural design market at the beginning stage of housing renewal. Consequently, many projects in the 1980s and early 1990s are not designed by professional architects and engineers, some even directly use drawings of other projects of similar scale in other regions, which lead to serious flaws in the design. The third-party drawing review system (第三方审图制) was only established after 1997, when collapse accidents occurred across the country.

3) Poor construction quality

Due to the lack of regulations and supervision in construction industry before the late 1990s, many projects before that period was constructed with low quality. Large number of projects have not completed construction management procedures before construction; the construction project supervision system (工程施工质量监理制) was only gradually established from the late 1990s; some constructors won the bid at an unreasonably low price, and then subcontract the project to smaller companies; besides, a considerable number of projects did not undergo final acceptance of construction.

4) Residents' improper usage

Due to the limited structure bays in old residential buildings[11], residents' weak sense of building structure, as well as the lack of regulations and supervision on usage, some residents damage, change, or even remove load-bearing components when doing interior finish to their apartment: such as removing load-bearing walls, adding excessive number of partition walls, using decoration materials of excessive load, adding extra floors, and adding balconies. Besides, due to the carelessness of unprofessional workers, the construction process of interior finish will also damage the building structure: such as the cut of steel bars in walls and floors; and the

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[11] Most residential buildings before late 1990s were constructed with brick masonry structure. The structure bay is limited, and brick walls serve as load-bearing components. Refer to Section 2.2 for detailed explanation of design of residential buildings.

excessive vibration caused by construction machinery.

5) Construction projects in nearby sites

   The construction of new buildings in nearby sites may also damage the originally weak structure of old residential buildings. Deep excavation, construction vibration in nearby sites will damage the foundation of old buildings, and the increased ground load lead to tilt and wall cracking in old buildings.

The main cause of collapse accidents in recent years is difficult to identify. For example, according to the third-party investigation results of 2012 collapse in Jiangdong District, Ningbo, Zhejiang, and 2014 collapse in Fenghua, Zhejiang, aside from low construction standard and poor building quality, residents' change of load-bearing components could be identified in both accidents. Under such circumstances, an increasing number of dilapidated buildings are in need of renewal or reconstruction.

(3) Yangtze River Delta Area

The Yangtze River Delta Area is a triangle-shaped metropolitan region located in East China that encompasses Shanghai, southern Jiangsu province, and northern Zhejiang province. (Figure 1-10). The urban build-up in YRD is one of the largest metropolitan areas in the world. It covers an area of 210,700 km^2 and is home to over 115 million people as of 2013, among which an estimated 83 million live in urban area. Though YRD only occupy less than 2.2% of China's land, it provides more than 35.5% of the nation's imports and exports, and contributes almost a quarter of China's GDP.

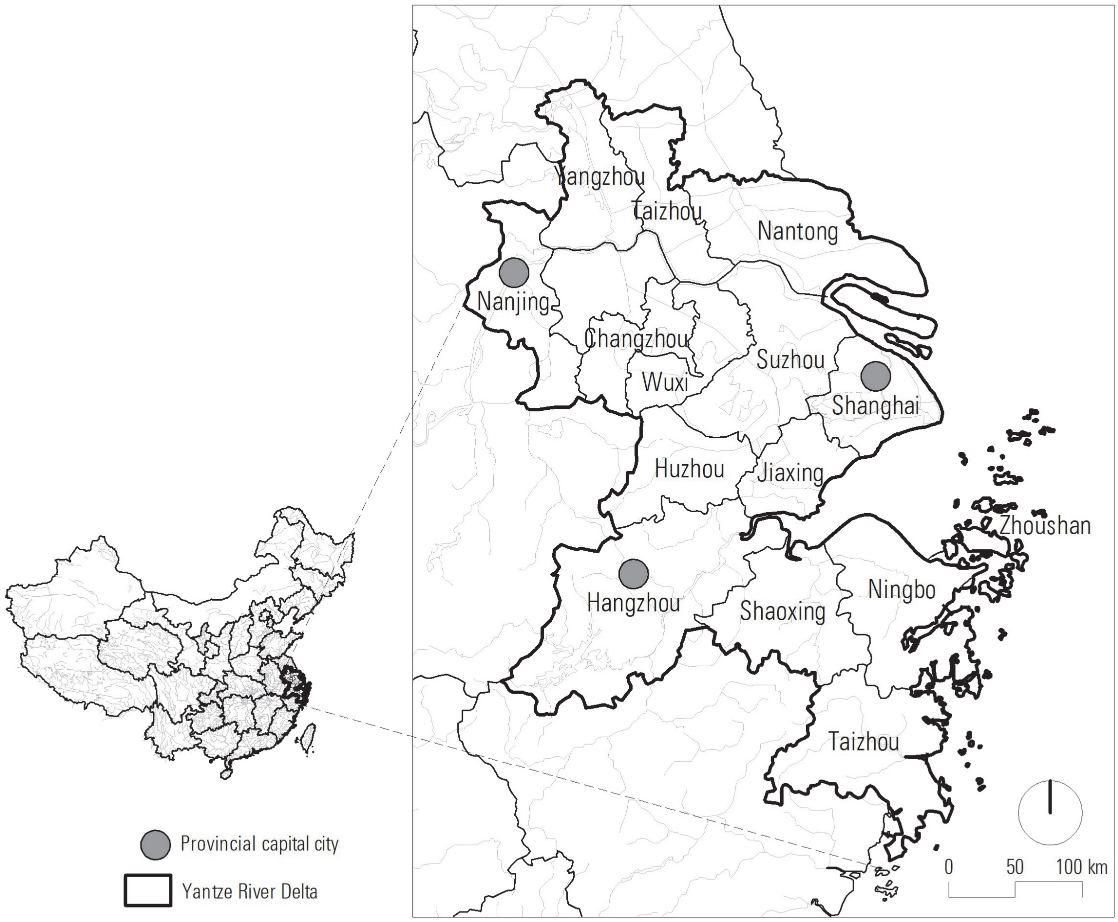

Figure 1-10 Location and boundary of Yangtze River Delta Area

1.6 Dissertation organization

This dissertation consists of eight chapters in three parts. (Figure 1-11) Chapter 1-3 constitute the preliminary part, stating the research background, raising the research questions, giving the hypothesis, finding the intellectual gaps, and developing methodological framework. Chapter 4-7 are the main body, clarifying the comparability and Chinese DUHR and Japanese CCR, identifying the exact problems in Chinese DUHR, analyzing reference cases in Japanese CCR, generating and testifying recommendations. Chapter 8 reviews and concludes the whole dissertation, summarizing main research findings, giving final recommendations for DUHR, forming an inclusionary program, and suggesting directions for further research.

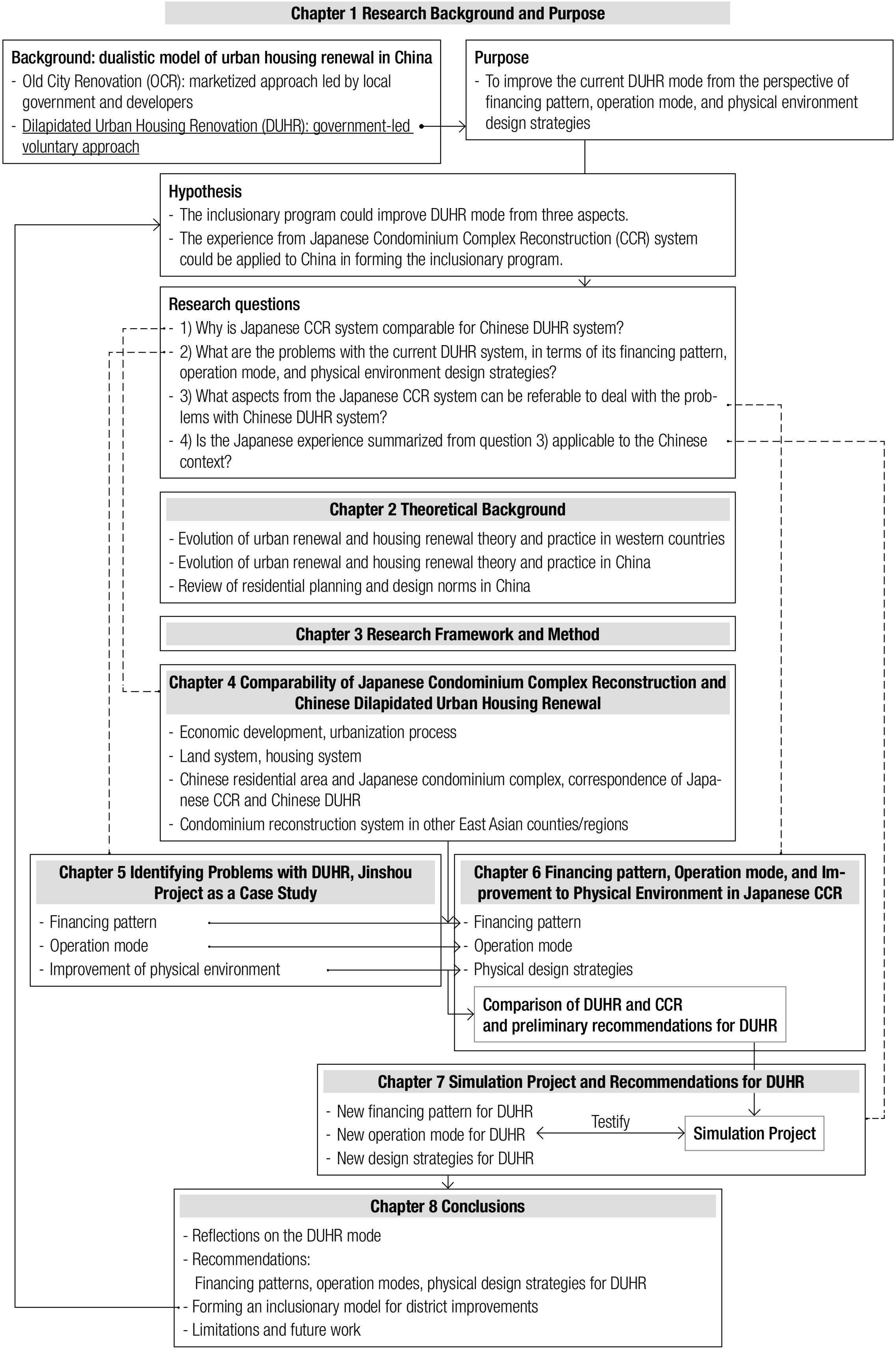

Figure 1-11 Dissertation outline

After the opening Chapter 1, Chapter 2 presents a theoretical discussion of urban renewal and housing renewal in western countries and China from an urban design perspective, and reviews residential planning and design norms in China. It provides a general context for the following researches in this dissertation.

Chapter 3 demonstrates how the research is structured to answer the research questions and test hypotheses. A three-phase research strategy is developed. The first phase is a comparative study to clarify the comparability of Japanese CCR and Chinese DUHR. The second phase uses a typical case to identify the defects of Chinese DUHR, then Japanese experience in dealing with similar problems is summarized from case study of CCR projects in Tokyo. The third phase uses a simulative reconstruction project in the Chinese context to testify the applicability of Japanese experience to China. Then the strength and weakness of five main data collecting methods in the case study—including statistics of project funding, standardized questionnaire, semi-structured interview, field observation, and documentary analysis—are discussed in detail, as well as the tactics to avoid their weaknesses for this research.

Chapter 4 clarifies the comparability of Japanese CCR and Chinese DUHR by documentary analysis. The economic development stage, urbanization process, land system, housing system, and ownership pattern and morphology of old residential areas in China and Japan are first examined to form a foundation for comparison. Then different modes of condominium construction in Japan are examined to pick out the most appropriate Japanese model for China. Afterwards, the condominium reconstruction systems in other Asian countries/regions are also discussed to strengthen the referability of Japanese OCR for Chinese DUHR.

Chapter 5 uses a representative case, the Jinshou Project, to illustrate the typical features of the nation-wide DUHR movement. Problems of three aspects, including financing pattern, operation mode, and improvement to physical environment are identified through case study.

According to the problems identified in Chapter 5, Chapter 6 uses sixteen reconstruction projects completed in Tokyo are used as a sample to summarize the experience of Japanese CCR in dealing with similar problems. Several preliminary recommendations for Chinese DUHR are generated from the Japanese case studies.

To testify the applicability of Japanese experience to Chinese DUHR, a simulative reconstruction project is carried out in Chapter 7 using the preliminary recommendations from Chapter 6. The simulation results indicate that the financing pattern, operation mode, and design strategies in Japanese CCR could be applied to Chinese DUHR.

As the final part, Chapter 8 take an overview of the whole research, giving a reflection on the current Chinese DUHR system and summarizing the experiences in Japanese CCR. Then final recommendations for DUHR are given, from the perspective of financing pattern, operation mode, and physical environment, based on which an inclusionary program for district improvements for Chinese DUHR is formed. At last, the limitations and potential direction of future work are stated.

1.7 Significance of research

Searching for improvement measures for the Chinese DUHR system, this research aims to contribute in three aspects:

1) Concentration on the overlooked DUHR mode

Most researches regarding Chinese housing renewal has concentrated on marketized OCR mode, and sometimes the government voluntary DUHR mode is even confused with the marketized OCR mode in the field of academic research in China. While this research clarifies the different origins and mechanisms of two modes, and pays close attention to the DUHR mode, which has barely been touched.

2) An inclusionary program that gives prescriptions for future practice

Skipping economic practicality and applicable operation mode, recommendations for Chinese housing renewal given by previous researches have always been solely generated either from physical environment or social life point of view, and therefore difficult to be applied as a reference in practice. While this research is firmly based on economic feasibility, with which operation mode and physical aspects are closely integrated. Therefore, the outcomes of this research are expected to provide more practicable suggestions for the future practice of private housing renewal in China.

3) In-depth case study

A more macroscopic view has always been adopted in researches on urban renewal and housing renewal in Chinese academic field, focusing on overall policy making or general physical design strategies. This research carefully compares Chinese and Japanese cases from socio-economic and physical environment aspects using concrete data, based on which recommendations are generated for the DUHR in China from multiple dimensions.

Chapter 2 Theoretical Background

This chapter aims at presenting a theoretical discussion of urban renewal and housing renewal from an urban design perspective, the literature review provides a theoretical framework for the dissertation. The evolution of urban renewal and housing renewal theory and practice in western countries and China is first reviewed, to provide a general understanding of the problems in current Chinese housing renewal practices. Then the evolution of residential planning and design norms in modern China is examined, to give a fuller view of the physical environmental features of the housing constructed during early 1980s to early 1990s, which is going to be discussed in detail in following chapters.

2.1 Evolution of urban renewal and housing renewal practice in western countries and China

2.1.1 Housing renewal practice in the western countries

The issue of housing renewal has been closely related to urban renewal at the outset. Urban renewal was initially carried out as countermeasures to improve the living conditions of industrialized cities. The poor living environment and social riots gave rise to the birth urban renewal, as well as modern urban planning. Started in Britain and France in the 19th century, legislations on town planning, housing, and public sanitation had been approved. These legislations were applied to the clearance of slums as in Haussmann's renovation of Paris. In the Netherlands, the first Housing Act in the world (enacted in 1901), besides giving legal status of social housing, clarified the obligations of house owners in housing maintenance and empowered the governments to demolish the dilapidated houses. The slum clearance in the United States was often linked to public housing developments.

Feature	Slum clearance and massive construction of social housing	Privatization	Neighborhood renaissance	Multi-partnership and social integration
period	End of WWII to late 1960s	1970s-1980s	from late 1980s	from late 1990s
Background	- urgent need for housing after WWII - lack of private investment - dominant of Keynesianism	emergence of Neoliberalism to tackle economic slump and to relieve the government's burden	- marketized development has lightened government's financial burden of housing management - polarized housing of different classes	- market alone does not solve problems in the old city fundamentally - globalized immigration and population mobility
Method	demolishment of decayed private housing, construction of social housing distributed by the state	- privatization of social housing - towards a marketized renewal mode	- emphasis on the mixture of classes in neighborhood - increasing attention to the housing availability and condition of inferior classes	- multi-agency partnership between government, developer, and community - urban renewal policies encouraging integration
Actors	state, local government, housing association	local government, developer	state, local government	state, local government
Results	- deconstruct of existing community and social structure - super-scale blocks of social housing, later became harbor of crimes	- A large number of social housing became private housing, often with compensation from the government. - aggregation of inferior classes, impoverishment of the inner city	- a better social security system of housing - To promote social integration in an area has been widely acknowledged. - Gentrification of the marketized renewal development aroused controversy.	- a certain extent of social integration in residential areas - racial segregation still being a profound issue in many aspects of social life

Table 2-1 Progress of housing renewal practice in the west since WWII

Housing renewal practice in the west is set in different political, social, and economical backgrounds, and closely related to urban renewal progress of each country. But they generally came through similar stages as summarized in Table 2-1.

Slum clearance and massive construction of social housing (end of WWII to late 1960s)

Due to the recovery of population, the increase of the family size, the shortage of housing caused by urbanization and large numbers of immigrants, and the need for military resettlement after war, massive housing renewal took place after WWII. Original dilapidated areas had to be renewed, and housing construction that had been stopped because of the war was restarted. The major implementors were governments at all levels and non-profit housing associations. In order to rapidly improve the housing provision issues and housing conditions, the scale of demolition and reconstruction at this stage was very large. Most of the demolished dwelling units were private housing in poor condition, with large amount of big-scale social housing apartment buildings being newly constructed. Housing, and new apartments are large-scale, large-scale social housing. European countries generally adopted Keynesian economics after WWII and lacked the participation of private investment. Therefore, the new social housing was mainly funded by the government for construction, management and maintenance, rented to families at a low price.

It may be asserted that, the massive urban slum clearance in Europe was mainly to deal with the decline of physical environment caused by WWII, instead of cleansing the dwellings of the poor. Housing renewal and construction of social housing became the theme of Keynesian government function and public welfare after WWII, and was protected by laws such as the 1930 Housing Act in U.K., 1947 Housing Allocation Act in the Netherlands, and 1949 Housing Act in the U.S., all of which clarified government's responsibility for decent and affordable housing for all families. This promoted the swift resolution of housing shortage after war.

The large-scale reconstruction also brought about a series of problems such as: 1) destruction of the social network of original community; and 2) oversized blocks was not suitable for low-income families and became soil for crime.

Housing privatization (1970s-1980s)

The global economic downturn in the 1970s left great impact on the economic growth of western countries, giving the government a heavy financial burden. Neoliberalism was promoted in the U.K. and U.S. as an opposition to state controlled economy. As a result, real estate-oriented urban renewal policy became an effective way to stimulate local economy growth and to get rid of government financial pressure. Besides, housing shortage was no longer the most significant issue, social housing has lost its dominance to the need for home ownership. The privatization of housing system took place in western European countries. Government policies encouraged individuals to purchase housing from the government or housing associations. The incentive polices not only targeted on families with financial ability to purchase. For those low-income families who relied on long-term rental of social housing, subsidies were also given, thereby realizing the renewal of housing ownership rights, so as to reduce the government's financial burden and allow the market to undertake more work to renew.

It should be noted that due to the different ownership types of the original housing system in different countries, the process of implementing privatization was not the same. Murie et al. (2005)

categorized the privatization of housing ownership right into three patterns represented by the United Kingdom, central and eastern Europe, and the Netherlands. The original social housing in the UK was mainly owned by the government, so it was relatively easy when implementing the privatization. In countries such as the Netherlands, Germany, and Denmark, where private housing associations are the main social housing owners, the road to privatization of housing privatization was not smooth.

However, it was also due to the right-to-buy policy that, the private housing converted from social housing has become habitats of minorities and low-income groups, leading middle class to leave the original city center (Forrest and Murie, 1991). This has also become one of the causes of the suburbanization process in Europe.

Neighborhood renaissance (from late 1980s)

After the housing privatization in the western countries, due to the decrease of public investment, the resolution of housing shortage, and the promotion of real estate development as a method of renewal, the construction of new housing boosted economic recovery, and also largely relieved the government from financial burden of housing maintenance and management. Homeowners' self-renewal and government's renewal of special areas have become the main characteristics of housing renewal, with the focus of housing renewal shifted from quantity to quality. The shift could be reflected in two aspects: 1) more attention is paid to social interaction so as to prevent isolation; 2) living condition of vulnerable groups and housing affordability earned widespread respect.

The government function has also shifted from Keynesian intervention system to a market system, with government investment turned from all-round to more specific areas, especially on vulnerable groups. Public participation was promoted in most housing renewal projects. (Boelhouwer and Heijden, 1994). Therefore, two major problems in the 1990s were: 1) to continue to provide housing for low-income families, and to improve living quality such as the average floor area of dwelling units; 2) to improve housing subsidy investment. For example, the Dutch government's subsidy for rental housing has changed from subsidies for housing associations to direct subsidies for renters, and the subsidies for housing buyers was enforced by financial institutions and banks.

The public sector has become a secondary role to create environment for private sector investment activities and economic growth, while the private sector invested landmarks and facilities to attract middle class to move back to city center area. This is used as a catalyst to stimulate the economic growth of the old city. As a result, most of the market-oriented old city redevelopment projects have achieved commercial success and are still the most widely used update model in most cities today.

Multi-partnership and social integration (from late 1990s)

Since the 1990s, in addition to continuing to encourage private investment and public-private partnership, partnerships among the public, private, and community sectors gradually emerged since it as acknowledged that market alone cannot solve problems in old city fundamentally. The meaning of urban renewal was considered to be a comprehensive renewal of multiple objectives such as economy, society and environment, rather than physical redevelopment led by developers. The multi-agency partnership is a more inclusive method based on a bottom-up mechanism. Robert (2000) summarizes the current Western urban renewal features as: "comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental condition of an area that has been subject to change."

With globalization and development of neighborhood renaissance, and the racial segregation issue which has emerged in Europe since its industrialization, mixed housing and social integration also became a main policy in the renewal of urban housing in western European countries. For example, the 1995 White Paper in U.K. directly indicates the need to promote social integration by pointing out that a sustainable community is where homeowners and tenants live next to each other. The 2001 National Strategy Action Plan emphasizes the integration of communities in both physical and social dimensions, the diversification of housing choices and the diversity of people in the housing are the primary targets for housing renewal. Social housing in Europe is no longer simply providing basic living for the poor, but it also includes the middle class, promoting mixed living by providing higher quality housing and subsidy policies for different income groups.

2.1.2 Housing renewal practice in China

In the past 30 years, China has experienced explosive growth relying on rapid and substantial investment in land. Investment and construction have rapidly shifted from industrial sector to urban construction. This section reviews the history of urban residential renewal in China.

Industry-based housing construction and property right transfer under the planned economy (1949-1978)

After the establishment of People's Republic of China in 1949, a social welfare housing system was adopted in China. According to the Constitution, land was owned by the nation, when deemed appropriate, the government could allocate the land use right for free without a time limit. The use right could not be transferred or traded.

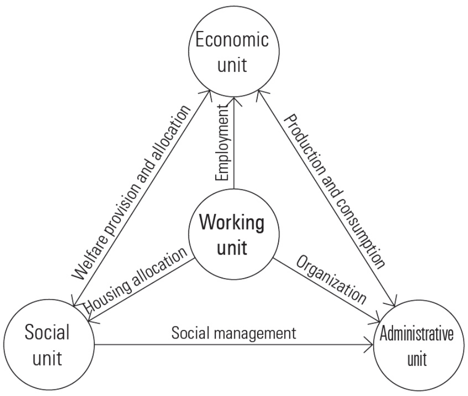

Figure 2-1 Working unit as economic unit, social unit, and administrative unit

Prior to the Economic Reform in 1978, the work unit (单位) was the system to link individuals to the central communist party. Work units[12] were nation owned enterprises, which act as the principle to implement party's policies, and to allocate resources. The life of workers was also bound to their work unit. Work units built residential areas, providing housing, clinics, schools, kindergartens, shops, post offices and cinemas for their employee. The funding for construction was provided by

[12] Even today the term of work unit is still widely used to stand for the place of employment in China, though it is more accurate to use this term for state-owned enterprises before Economic Reform.

the government as a subsidy. The location and size of an employee's apartment depended on the length of service and the size of the household. Every aspect of an employee's life was managed by the work unit, because individuals must apply for permission for travel, marriage and divorce, having a child, etc. Workers must obey rules and policies set by the government and the work unit, so that their living conditions would not be downgraded.

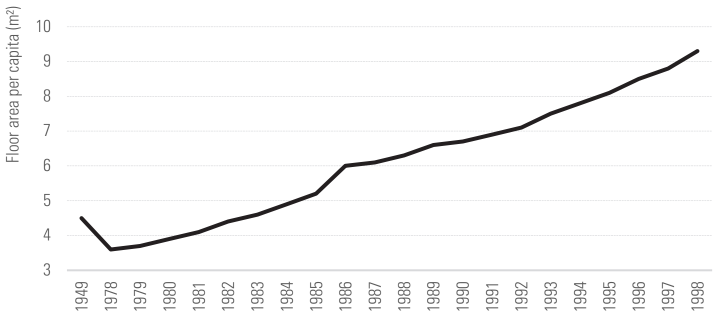

Figure 2-2 Changes of floor area per capita from 1949 to 1998 in China
(Source: China Compendium of Statistics)

Unlike the massive reconstruction in the West after WWII, the devastated country of P.R.C. needed to be rebuilt while lacked financial capacity. The lack of state capital accumulation, along with the establishment of production-oriented cities resulted in the country's construction focusing on heavy industry and city's industrial production functions. At that time, residential construction only guaranteed the most fundamental living space for citizens, the floor area per capita nationwide dropped from 4.5 m² to 3.9 m² during 1949 to 1978 (Figure 2-2). Residential renewal in large cities was only targeted on large-scale shanty towns. For example, 93% of the 11.84 million m² housing in Nanjing after the establishment of P.R.C. were brick and timber structure. Therefore, the policy of self-construction and self-sufficiency (人民住宅人民建，自己动手丰衣足食) was implemented nationwide, government gave subsidies to mobilize homeowners to repair their own houses. Newly built houses were mainly "low-cost buildings" (简易楼) and "new villages for workers" (工人新村). It was acknowledged that the country was having difficulties with financial resources, and people should solve emergency problems with a small amount of money and more effort. The life span of new residential buildings was set to only 20 years, which will be reserved for later development. But this short-term emergency-response way of construction brought tremendous pressure and obstacles for future urban renewal.

Apart from physical environment renewal, the socialist transformation of housing based on property rights renewal was also the focal point after the establishment of P.R.C. Three types of property right were approved: working unit ownership, housing management bureau ownership, and private ownership. Working units only allocated housing for their employees, and housing management bureau was mainly responsible for providing rental housing for those not employed by working units at a low price. The socialist transformation of housing only allowed private owners to keep a small number of their own house, while most of the rest became public housing. As a result, the percentage of private housing in urban areas had been declining, and the number of public housing under housing bureau and working units increased. (Figure 1-1)

Urban renewal opened to private capital (1978-1998)

After the Economic Reform, China's economic developed at full speed, however, there was big shortage of housing supply caused by the welfare housing system. In 1980, Deng Xiaoping raised the issue of housing reform, suggesting that construction and housing industry is not only a consumption area invested by the state, but also an important industry that increases revenue and increases accumulation. After that, on the one hand, the state and working units increased investment to build housing at an increasing speed; on the other hand, they have begun to remodel the welfare housing system into a market-oriented housing system.

A very important first step in 1980 was to allow foreign capital to invest factories in several "special districts", with a land use charge imposed on investors. In 1986, the State Council established a group to implement housing reform in batches in the country. In 1988, some cities were selected as pilots. In 1991, the State Council established Housing Reform Commission. *Circular of the State Council on Deepening the Urban Housing System Reform (《国务院关于深化城镇住房制度改革的决定》)* was issued in July 1994, targeting the reform on nationwide housing commercialization: (1) Full implementation of the housing provident fund system; (2) Promote rent reform, that is, increase rents, and in principle achieve 15% of the average wages of dual-employee families; (3) sell public housing to employees. With the privatization of former state-owned enterprises, the affiliations of individuals to work units under the planned economy was gradually dismantled

The Constitution was amended in 1988, allowing for land trade, which laid the foundation for privatization of former public housing in work units. Land and housing were bound together: on one hand, housing and land appreciation are the result of various urban infrastructure investments; on the other hand, the value of land determined housing price. Housing Reform and Land Reform are tied together, jointly promoting the commercialization of residential space.

At the beginning of Economic Reform, although the state had encouraged private housing construction, due to the small accumulation of private capital, the construction was still dominated by public capital. Relying on state investment, there was several problems including lack of funds, low speed of construction, and low building standards. The downtown area was usually densely populated in high building density. High cost of renewal in the old city area ended up urban construction focusing on peripheral areas. It should be mentioned that, the short-term emergency-response way of construction constrained urban renewal to a large extent.

Therefore, the 1984 Urban Planning Code for the first time clearly proposed a gradual transformation plan for old cities. The focus of renewal should be dilapidated areas, shanty towns, traffic jams, and areas with poor municipal public facilities, traffic congestion and serious environmental pollution. With the housing reform and land system, old city renewal was gradually opening to private capital in some experimental areas where the market is relatively developed. In 1992, Shanghai formulated a 3.65 million m² shanty town reconstruction plan, and land assignment (出让) system was first implemented in urban renewal (now Haihua Residential Area). The "land lease" policy implemented in Beijing in 1992 enabled developers to seize prime locations such as Chang'an Street, triggering a residential renewal of nearly 1 million m². In 1994, a series of comprehensive strategies were given, including sale of former public housing, provision of affordable housing, and rent reform.

From the perspective of management, community (社区) system was set up with the dismantle of work units. However, a strong image of work unit system, including the layout of public space and facilities, the mixed social structure, and residents' sense of group and community were generally preserved.

Capital oriented renewal (1998-2010)

The announcement of *Circular of the State Council on Further Deepening the Urban Housing System Reform and Accelerating Housing Construction (《国务院关于进一步深化城镇住房制度改革加快住房建设的通知》)* in 1998 marked the beginning of a fully market-oriented housing system in China. At that same period, the Asian financial crisis broke out and Chinese economy was also seriously affected: the growth rate of foreign trade exports fell from 20% in 1997 to 0.5%; domestic economy was suffering from industrial overcapacity and insufficient effective demand, and large numbers of workers laid-off. The country decided to ensure economic growth by expanding domestic demand. Real estate industry was considered a new growth point for the economy, and "accelerating housing construction and promoting the housing industry to become a new economic growth point"[13] was identified as the core of housing reform. On the other hand, in order to stimulate the economy and expand domestic demand, the state savings should withdraw from housing allocation as soon as possible.

The main contents of Housing Renewal at this period include:

1) Replacing housing allocation with monetary allocation;

2) Selling public housing to individuals;

3) Allowing commercial banks to issue housing loans in all cities;

4) Building a flexible housing provision system targeted on different income groups.

In this period, state-owned enterprises were regarded as the focus of reform and become the main body of practice. Specific contents include sale of public housing, establishment of housing provident fund system and commercialization of housing management. Housing was no longer state-monopolized, and property right transferred from state and working unit to individuals. Under the new housing system, housing has become a general consumer product, and people are free to choose from the market. Thus, the increasing need for housing was solved by the market. The

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[13] Circular of the State Council on Further Deepening the Urban Housing System Reform and Accelerating Housing Construction

housing investment lead to GDP growth and housing price continued to rise (Figure 2-3, Figure 2-4).

In 2004 it was announced by the central government that all land will be bid publicly, which contributed to booming of commodity housing market and the soaring home price. Despite the very low direct tax rate, the local government was able to gain capital rapidly from selling (leasing) land. The nationalized urban land during the planned economy era laid a solid foundation for this process. Thus, the local government can provide better public service and attract population. This process is a part of the land finance that drives the Chinese urbanization. Although land finance causes the waste of resource, risk of finance and growing conflicts between the rich and the poor, it is still the core institute which starts the process of rapid urbanization in China (Zhao, 2014).

Figure 2-3 Comparison of real estate and GDP growth rate in China 1998-2009

Figure 2-4 National housing price growth level in China 1998-2009

Residential renewal in Chinese cities was pushed into the forefront after housing marketization. The dilapidated residential areas built right after the founding of P.R.C., the living environment deterioration in urban villages where large numbers of migrant workers inhabited, and disfunction and chaotic land use to the old city areas caused by the emergency-response way of residential construction during 1949-1978 became basic needs for large-scale residential renewal.

Private capital, state-owned capital, and foreign capital competed to get involved in renewal, which is usually referred to as Old City Renewal (OCR，旧城改造) today. On one hand, the original buildings were completely got rid of, as well as original residents, lifestyle, and cultural traditions; on the other hand, the renewal was not just a transformation of functions and space, but also closely linked to urban consumption and industry. For example, Wanda's "a Wanda Plaza, a city center" (一座万达广场，一个城市中心) and Vanke's "unlimited life" (建筑无限生活) had brought a sign of gentrification. The original industrial relations of different working units mapped in urban space have gradually evolved into spatial differences in economic relations. This spatial differentiation is closely related to capital and land finance, and reflects local government's demand for economic development and political achievements.

Searching for balance of efficiency and justice (after 2000)

A national law clearly defined the major role of "Economic and Affordable Housing (ECH，经济适用房)" and the secondary role of "commodity housing" in 1998: ECH is sold to low and medium income families, and the price is determined by local government; commodity housing price is determined by the market.[14]

The comprehensive Housing Reform has gradually brought monetization and commercialization to urban housing in China, and established a dualistic system of commodity housing and public (and ECH) housing. However, market failure such as soaring housing price, growing speculation, and unbalanced housing provision structure, has become increasingly prominent. During 1998-2003, the proportion of ECH constructed each year was less than half as planned.

Since local government was gaining large profit from land finance and investment in real estate was increasing rapidly, the ECH did not became the major part in the housing as planned in 1998, nor are the local governments motivated to build public rental housing. In 2016, the ECH system was officially abandoned by the central government. An increasing number of commodity housing was

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[14] According to the 1998 plan, 70% population would occupy government supported ECH, 15% occupy social rental housing, and 15% occupy commercial housing.

constructed in Chinese cities, and a housing provision system dominated by commodity housing has been established in China. By 2013, the home ownership rate[15] has reached 87% (Figure 2-5).

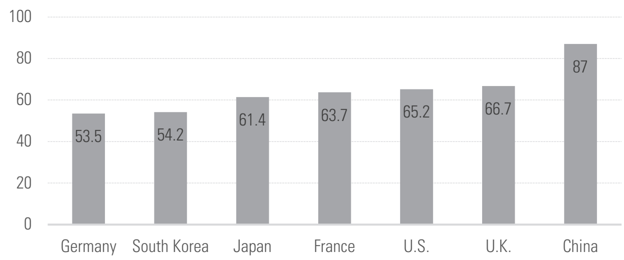


Figure 2-5 Home ownership rate in select countries (%)
(Source: Germany, France, U.K.: Eurostat (2012); U.S.: Survey of Consumer Finance (2013); Japan: Statistics Bureau of Japan (2008); South Korea: Statistics Korea (2005); China: CHFS (2013))

By 2015, there have been an over excessive number of commodity housing stock mainly in third and fourth tier cities. The central government carried out policies to destock and encourage individuals to purchase commodity housing, including using provident to ease loan, tax and down payment reduction for first and second home, as well as encourage migrant workers to purchase commodity housing in cities, and promote monetary compensation in redevelopment projects, etc.

Although it has been acknowledged that urban renewal and housing renewal should be a multi-objective process that not only renew old buildings and facilities or promote real estate development, but also pays attention to the social network and humanistic care (Zhang, 2004), in the current Chinese practice, to amplify the potential of existing land, OCR is still a major method which readjusts the structure and ownership of land. Moreover, under the guidance of market economy, renewal projects appear to pursue huge profits and turn into an economic replacement of land for developers.

Aside from the wholesale demolition and reconstruction in marketized OCR projects, for those old residential areas temporarily not included in OCR plan, or residential areas located in the old city area

[15] The "home ownership rate" published by the CHFS is the percentage of housing that are privately owned. This definition is different from that in many other countries around the world, where this term is defined as the percentage of households that own their homes.

but not with the optimal marketability, few substantial measures could be taken, except for beautification and small modifications (Table 2-2) carried out by the government. These methods mainly affect the appearance of residential areas, and bring convenience to residents to some extent, while they cannot deal with problems with building structure. It was not until mid-2015 that DUHR was carried out as a complement to OCR, to deal with the increasing number of dilapidated housing outside OCR areas. Thus, a dualistic system of private housing renewal is established in China.

Method	Contents	
"Flat to slope" roof modification	 Guihuayuan, Shanghai	Adding slope roof above existing flat roof, to improve the thermal and water-proof performance of roof
Facade beautification	 Leyejiayuan, Zhoushan	Facade repaint
"Energy Efficiency in Existing Buildings"	 Yubei Residential Area, Shanghai	- Addition of insulation on outer walls and roofs - Replacement of doors and windows
Addition of elevators	 Zhengyuan, Hangzhou	Adding elevators to old residential buildings
Comprehensive improvement of exterior environment	 Xinjing Residential Area, Shanghai	- Implementation of barrier-free design at doorways - Improvement of green space between buildings - Improvement of pavement - Additional parking space

Table 2-2 Typical examples of renewal practices on non-OCR residential areas (Photos by author, 2009 to 2016)

Socio-cultural dimension

Top-down planning and daily life of residents

The Danwei (working unit) system

A Dayuan is an area that contained the working place and residential area of employees, as well as a complete set of public facilities

They are self-sustained and relatively independent neighborhoods that facilitated needs of daily life. Some were walled to physically emphasize their independency.

People worked in one danwei, shared the same community facilities and knew each other.

"Living in dayuan" used to be an identification of social status.

Residential Area

Unified construction and integral planning of public housing areas by the municipal government

The plan followed a multi-level (e.g. district-quarter-cluster) structure.

Residential areas my be located away from the working space. Equipped with self-sustained facilities, they could be identified by the mixture of different layouts or building forms.

Rarely walled

Public house patch

Danwei-financed public housing construction without integral planning

They shared public spaces and local facilities with local communities, while they were mostly walled.

Most of the residents were still affiliated to their danwei but spatially included in the local communities.

Scope of this research

From Danwei-based to Shequ-based

Political-economic dimension

Housing distribution

Housing provision

- Pre-reform: The state allocated public rental housing to work units, then distributed to individual households by work units.
- 1978–1988: Rent increase and public housing sales experiments in pilot cities designed to promote private housing consumption and public housing sales
- + Initial deve… markets and…
- + Work unit… provision.

Property right

- Nation
- Trade forbidden

Land supply

Land ownership

- Nationalised by government
- Nation

Land transaction

- Banned, only through allocation to state units with no time limit and free of charge
- + set up of land use fees
- + administrative allocation
- + trial of land auction
- + Land use fees
- + administrative allocation
- + Land use rights have been assigned in two ways: all… (churang). Private negotiation was the dominant ways…

Trial reform (1978-1987) | Nation-wide reform (1988-1991) | Construction…

Housing reform stage — Pre-reform stage — Reform process

Feature — Social welfare housing system — Step-by-step market-oriented…

Notes

+ The state acted as both landlord and developer, responsible for housing provision, distribution and management.

+ A work unit is not just a place to work, but rather it is directly connected to housing services. Most of China's public housing is financed, built, owned and managed by work units.

+ Social status, rather than economic contribution, merit and need, serves as the determining factor in housing distribution, bringing about the inequality between the households in the various work units.

+ This system laid a huge financial burden on the government, resulting in low investment in housing and a continuous housing shortage.

+ Deng raised the issue of private sector's participation in housing.

+ Due to low affordability and the lack of a financial market, pilot reforms did not achieve their objectives in the majority of trial cities. Urban housing problems such as housing shortages and insufficient investments still existed.

+ In 1986, housing System Reform Leading Group of the State Council was founded to lead and coordinate the reform of the national housing system. Land Management Bureau was established to administer the national land and comprehensively arrange urban and rural land.

+ The nature of housing as commodity was officially identified, which laid the foundation for housing reform towards housing marketisation.

+ Call for th… distinct syst… (1) 'economi… (targeting lo… households)… housing' (tar… group at ma…

+ The reform… shift the sys… unit. Work u… purchase ne… while the sit… couraged to… rented from… subsidised p… public housi… and only ma… rights, which… privatisation…

1937 Sino-Japanese War | 1946 Chinese Civil War | 1949 Founding of P.R.C. | 1958 Great Leap Forward | 1966 Cultural Revolution | 1978 Chinese Economic Reform | 1988 | 1992 Deng's Remarks

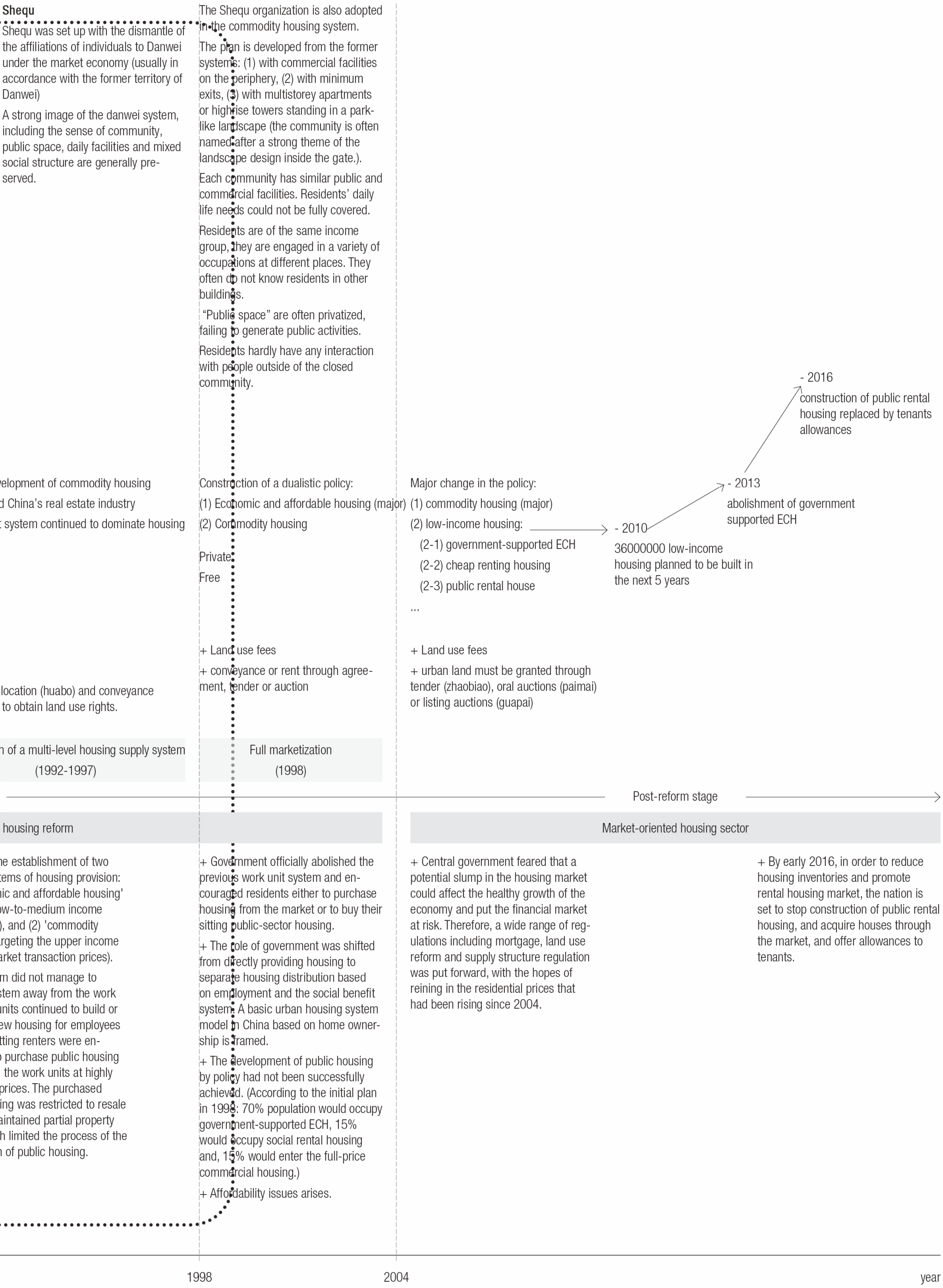


Figure 2-6 Summary of the shift from socialistic housing system to marketized housing system in China

Year	Key housing policy
Pre-reform	All land is publicly owned by law. The Constitution delivers that "no organization or individual may appropriate, buy, sell or lease land or otherwise engage in the transfer of land by unlawful means." The government can give the land use right for free without a time limit. This land use right may not be transferred.
1980	Foreign enterprises are allowed to invest in "special districts" in coastal cities. Foreign enterprises are charged for land occupancy.
1985	Enaction of "Law of Land Administration of the People's Republic of China" The first home loan is issued in Shenzhen.
1986	Initiation of urban housing reform
1987	Enaction of "Law of Land Administration of the People's Republic of China", emphasizing the land use right is independent from land ownership First auction of use right of state-owned land in Shenzhen
1988	Enaction of "Implementation Plan for a Gradual Housing System Reform in Cities and Towns", indicating a nationwide housing reform is initiated The Constitution is amended to allow transfer of land use right.
1994	Issue of "A Decision from the State Council on Deepening the Urban Housing Reform", proposing many aspects of housing reform, including privatization of former public housing, rent reform, provision of ECH, etc.
1998	Enaction of "Circular of the State Council on Further Deepening the Urban Housing System Reform and Accelerating Housing Construction", giving an overall image of a new housing provision system: low-income families' housing live in public housing provided by the government; mid to low income families purchase ECH; high-income families purchase or rent commodity housing at market price.
1999	Issue of "Guidelines for Personal Consumption Credit Operations", indicating the start of personal loans and mortgages
2000	Housing allocation ended.
2002	Enaction of urban land bidding system
2003	Issue of "Circular of the State Council on Promoting the Continuous and Healthy Development of the Real Estate Markets", emphasizing the real estate industry as a pillar industry
2004	All land will be bid publicly from 2004/08/31, which contributed to the soaring home price.
2005	Issue of "Eight Rules", "New Eight Rules", "Opinion of Such Departments as the Ministry of Construction on Effectively Stabilizing House Prices", which indicates the central government's will to stabilizing housing price
2006	"Opinions of the Ministry of Construction and Other Departments on Adjusting the Housing Supply Structure as Well as Stabilizing Housing Prices" requires local governments to control housing price, and 70% of the newly constructed housing should not exceed 90 m^2.
2007	Issue of "Certain Opinions About Solving the Housing Hardships of Urban Low-Income Households" emphasized that ECH would be a top priority policy. The down payment requirement was raised, and the monthly payment to income ratio is topped at 50%. Enaction of Property Right Law
2009	Lower mortgage rate, reduced down payment, and lower transaction taxes were announced to promote the property market. Cuts in transaction taxes for real estate sales and easier credit obtaining system was announced tor developers in December. The bottom line for sales tax exemption was raided from 2 years to 5 years ownership of their home. supply of lower-cost housing.
2010	Issue of "Notice of the State Council on Resolutely Curbing the Soaring of Housing Prices in Some Cities", announcing that the down payment rate on second home rises from 40% to 50%.
2011	The down payment rate for second mortgages was raised to 60% by "National Eight". Some cities impose new restrictions on purchase by non-residents.
2012	Policy in some cities that allow provident to ease loan was carried out. The central government requests to stop giving loans for third home purchase in regions with soaring home price.
2013	"New National Five" emphasized the importance of property-purchasing limitations, and laid out targets for local governments on construction of public housing. The ECH system was officially abandoned.
2014	Central bank carries out "930 loan policy", which relaxes the loan and property-purchasing limitations, promoting investing in real estate market.
2015	The provident to ease loan was relaxed, encouraging individuals to purchase commodity housing. The central government carried out policies to destock in commodity housing.
2016	Enaction of "the universal two-child policy" The central government emphasized that housing is for living, not for speculating. Tax and down payment rate reduction for first and second home Encouraging migrant workers to purchase commodity housing in cities Encouraging monetary compensation in redevelopment projects

Table 2-3 Key housing policies in China after Economic Reform

2.2 Review of residential planning and design norms in China

The neighborhood unit concept was first introduced to China in the 1920s by Western-educated Chinese architects. Ever since, it played a dominant role in the planning of residential areas. This concept can be clearly observed from the proposals in the 1920s to the numerous gated communities of today. Focusing on how Perry's neighborhood unit concept is interpreted in China, this section reviews the planning norms of urban residential areas, aiming to provide a new perspective to understand the shaping of Chinese residential areas and urban form, in the radical changes of social, political, and economic conditions. More importantly, in the growing need in China for renewing and reconstructing old residential areas, this section aims to provide a reference when dealing with the spatial structure of old residential areas.

Republican era

The idea of neighborhood unit, originally formed in an American context as a tool to tackle social problems such as segregation, juvenile delinquency, and lack of civic participation by enhancing the physical environmental aspects of community (Rohe, 2009), was somewhat misused in the Chinese context in urgent need of urban and housing reconstruction. According to the concept of neighborhood Unit, a unit covers an area of 65 ha accommodating 5,000 to 10,000 residents. Each unit has 1) clear boundaries determined by arterial streets and carefully designed internal roads that discourage through traffic; 2) primary school and public facilities in the center area within walking distance; 3) shops located at the edge of the unit; and 4) neighborhood parks and playgrounds to comprise about 10% of the whole area (Perry, 1929). The concept has been adopted in the construction of new housing around the world, acting as a solid principle of urban planning and housing block construction.

Perry's concept was an integrated concept combining physical planning with real estate development and sociology. This concept pays close attention to New York yet was considered to be applicable to more urban conditions—both new development and rebuilding, wealthy and poor, dense and scattered urban fabric. When imported to China by western trained planners, this concept originally formed in an American context to combine modern urban function with social interaction was somewhat misused in the Chinese context, in an urgent need of urban and housing reconstruction. Chinese planners took it as an effective method to distribute public services and organize residential buildings (Peng, 1948). This has raised debates over the effects of the neighborhood unit in the Chinese concept, among which is the view that this concept emphasizes too much on the separation of different functions, thus disabling an aesthetically harmonized urban environment (Yi, 1948).

Figure 2-7 Master plan for the satellite city of Chongqing, 1947 (Source: Planning Committee of Alternate Capital, 1947)

For example, in the 1947 Chongqing Plan (Figure 2-7), the neighborhood unit was combined with Chinese traditional norm of Baojia (保甲) (Figure 2-8), which is a community-based system of law enforcement and civil control in imperial era. Household (family) is the basic unit of Baojia system, ten households form a Jia, ten Jias form a Bao. Each level has it chief. The Chongqing Plan was an attempt to use history as a foundation of validity for modern urbanism. The city consists of nine units, each unit accommodated 361(19*19) households, 2,000 residents, with a school of 200 to 400 pupils. A commercial center is set in the middle, with railway station, middle school, stadium, and industrial district on the periphery.

Figure 2-8 Complete map of the community self-defense system of the walled city of Tianjin and its environs, 1899, by Feng Qihua (from United States Library of Congress's Geography & Map Division)

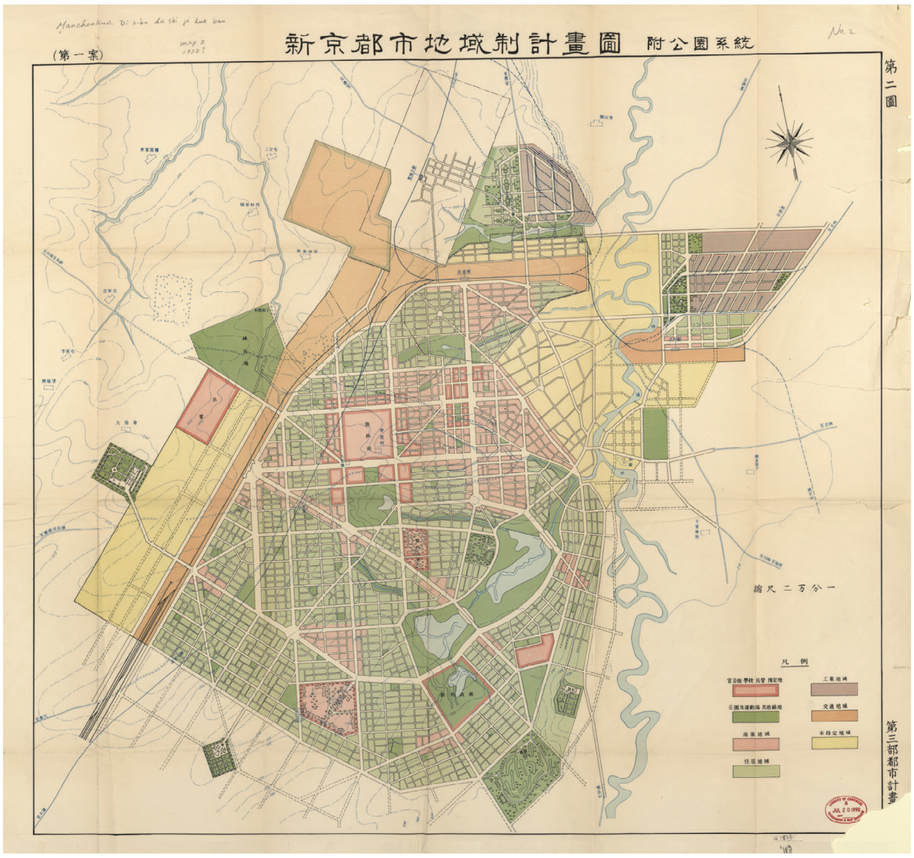


Figure 2-9 City planning map of Changchun, Capital of Manchuria, 1932 (from United States Library of Congress's Geography & Map Division)

On the other hand, the Japanese colonial planning was also heavily influenced by the neighborhood unit schema. The concept was employed to plan modern 'new Manchurian' residential districts for Japanese people in Changchun in the 1930s (Figure 2-9). Each neighborhood unit covered an area of

1.7 km², accommodating 6,000 residents in 1,500 households. Some of the most advanced ideas, including satellite city, neighborhood unit and greenbelt were employed in the 1938 Datong Plan by Uchida Yoshikazu.

Due to the internal turmoil and external threat at that time, giant proposals like the Ten-year Plan for Chongqing and The Greater Shanghai Plan were never implemented. But modern planning concepts, especially the neighborhood unit, has gradually integrated into the traditional Chinese norms. Besides, the Republican designers' early efforts laid a technical foundation for later practices.

Barrack style row house (1949–1953)

After the founding of P.R.C. in 1949, massive construction was launched, aiming to fill in the gap of housing shortage. The planning of residential area was heavily influenced by the Republican experiments, as the idea of neighborhood unit could be clearly revealed in cases including Fuxingmenwai neighborhood unit in Beijing and Caoyang New Village in Shanghai. The socialist ways of financial and human resources distribution provided an unprecedented opportunity to implement planners' ideas. The arrangement of public facilities on a manageable scale establishes a physical environment that strengthens the sense of community.

Figure 2-10 Master plan of Caoyang New Village, 1951 (Source: Wang, 1956)

The planning in this era was heavily influenced by the Republican experiments, as the idea of neighborhood unit could be clearly seen. The Caoyang New Village (Figure 2-10) plan was divided into three hierarchies: 1) neighborhood, 2) cluster, and 3) new village. Each cluster was equipped with its own nurseries, kindergartens and primary schools. The village had community facilities such as shops, post offices, cinemas and clubs at the center and shops on the periphery. The streets were laid out in a free-form pattern responding to the uneven topography of site.

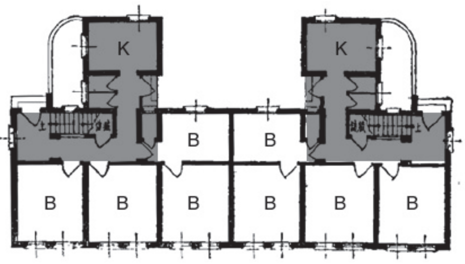


Figure 2-11 Typical floor plan in Caoyang New Village (Source: Wang, 1956)

Yet due to the shortage of fund and materials, and the poor construction techniques, numerous urban housing was built following the mode of "first build it – then improve it". The barrack style row houses are one to two stories high, built with masonry and timber. There's always only one to two bedrooms for each household, with 3-5 m² service space. Kitchens and toilets were shared by the whole floor. (Figure 2-11)

Soviet superblock (1953–1956)

Shortly thereafter, starting in 1953, the Soviet influence became predominant in urban reconstruction in China. The schema of superblock brought by the Soviet consultants often outweighed domestic scholar's voice. The schema stressed symmetrical axis and coordinated facades of four to six stories residential buildings. Each block covers an area of 1-2 km², with C-shaped and L-shaped buildings enclosing public facilities in the center.

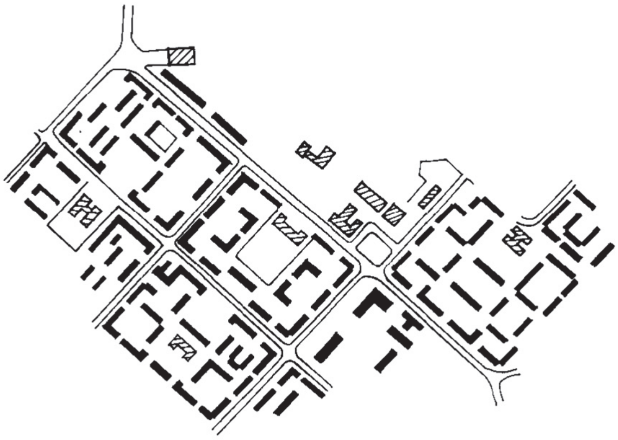


Figure 2-12 Master plan of Jiuxianqiao Neighborhood, 1953 (Source: Zhao, 1999)

Take the Jiuxianqiao Neighborhood for example, this schema was influenced by the Soviet superblock, which stressed symmetrical axis and coordinated facades of four to six stories residential buildings. The C-shaped and L-shaped buildings enclosed public facilities in the center. (Figure 2-12)

Although the superblock looks quite familiar with the neighborhood unit, Soviet scholars insisted that their scheme keeps the neighborhood an organic part of the city, which makes it different from the "bourgeois" counterpart imported from America. Interestingly, in 1956, even the chief designer of Caoyang New Village criticized himself for not adopting the latest Soviet concepts in his work. Yet the rigid layout of buildings brought many problems including lack of sunlight, westward exposure, and lack of ventilation. The layout was modified later, and was gradually abandoned with China breaking with the Soviet Union.

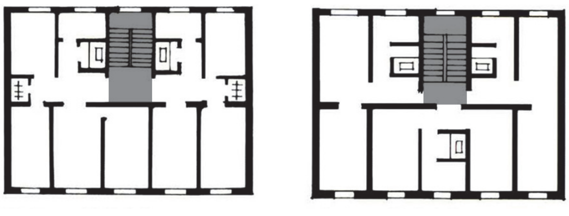


Figure 2-13 No.2 layout by BIAD, 1955 (Source: Zhao, 1999)

It was also with the Soviet assistance, a series of standard housing was developed by architects. The No.2 Housing designed by BIAD followed a five-bay layout. (Figure 2-13) Each bay runs 3.2 m strictly with a depth of 6 m, the whole floor may be shared by two or three households. The main structure is masonry and timber, with some elementary prefabricated components like stairs. The Soviet style per capita residential standard was also introduced to China.

Micro district (from 1957)

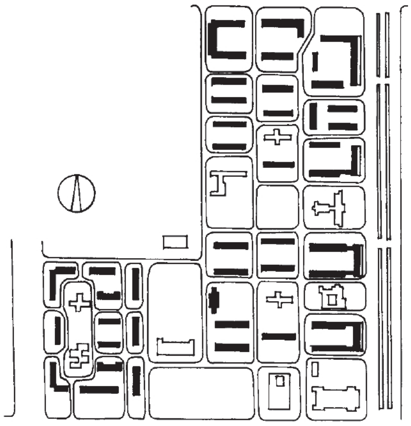


Figure 2-14 Master plan of Hepingli Micro District, 1959 (Source: Zhao, 1999)

Apart from superblock, the concept of micro district (mikrorayon in Russian, xiaoqu in Chinese) was also imported from the Soviet Union in 1957, soon after Khrushchev took over the Soviet Union. A micro district was defined as a self-contained residential area covering an area of 0.3-0.5 km², with a population of 5,000-15,000 (Sawers, 1984). The hierarchies of space and the public service distance in the micro district scheme resembles much the idea of neighborhood unit (Figure 2-14), yet a micro district was able to cover a larger area and might contain more hierarchies. A residential system could be divided into three or four levels, each level is provided with sufficient public facilities, and has respective administrative organization. The micro district has since been regarded as a reflection of communist ideology on urban structure, and adopted as a planning norm in China. Designers also developed design guidelines, including distribution of public facilities, avoidance of through traffic, service radiance, and hierarchies of space in accordance to the number of residents. A work unit based urbanism with integrated production and residence came into being throughout the whole nation. The impact of such concept is profound in most Chinese cities, and its Chinese name “xiaoqu” is still the most common Chinese word for a residential area.

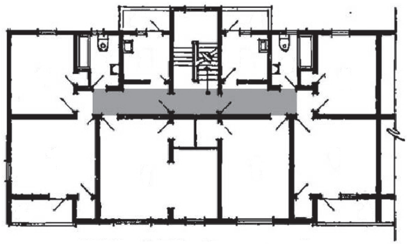


Figure 2-15 Typical floor plan in Taoyuan New Village, late 1950s (Source: Lue et al., 2001)

The former residential standard was considered to be set too high, and was lowered to 4 m² per capita. The former standard plan was modified to contain four to six households. In order to take full advantage of the left-over space in the former masterplans, lines and spots of public facilities were inserted in residential areas. The five-spans layout continued to be a common prototype and was gradually improved until the end of cultural revolution. (Figure 2-15)

A three-level planning model was developed in the mid-1970s in accordance to the larger-scale public housing development. The structure could be presented as: 1) cluster (组团), for 300-700 dwellings; 2) micro district (小区) for 2,000-3,000 dwellings; 3) residential district (居住区) for 10,000-15,000 dwellings.

Continuous development of micro district in the Economic Reform (1978–1998)

Due to the non-profitable welfare housing sector since the founding of PRC, and the turmoil of cultural revolution, the housing shortage and poor living condition remained to be severe nationwide problems by the late 1970s. It was necessary for the central government to carry out housing reform strategies to release its own pressure, and to provide better living condition for the citizens. Before reform, public service and maintenance were taken over by either nation-owned work units or local housing bureau. The heavy burden on local government, along with the need for decent service in the newly built commodity housing areas called for a new mode of urban housing production and management.

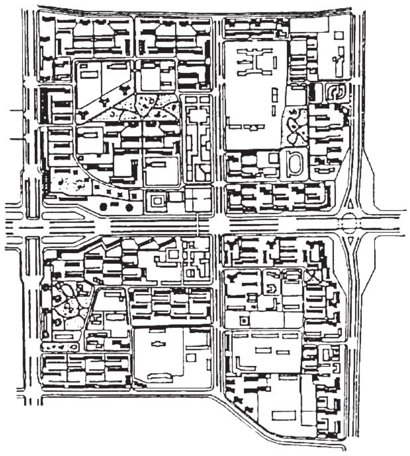


Figure 2-16 Master plan of Wuluju Micro District, 1980 (Source: Zhao, 1999)

Work unit system was also gradually abandoned, and Community (Shequ) was set up with the dismantle of the affiliations of individuals to work unit under the market economy (usually in accordance with the former territory of work unit). It must be noted that, the early reform efforts were not able to shift the system completely away from the work unit. And many work units continued to build new housing for employees. Therefore a strong image of the work unit system, including the sense of community, public space, facilities and mixed social structure are generally preserved in cases like the Wuluju Micro District (Figure 2-16). The first property management companies were also established in Shenzhen. Thus, to avoid the free-rider and to protect their property values, private residential areas soon became walled and gated. Enclosed communities gradually grow into one of the most unique sceneries of Chinese cities.

Figure 2-17 80 and 81 layout by BIAD (Source: Zhao, 1999)

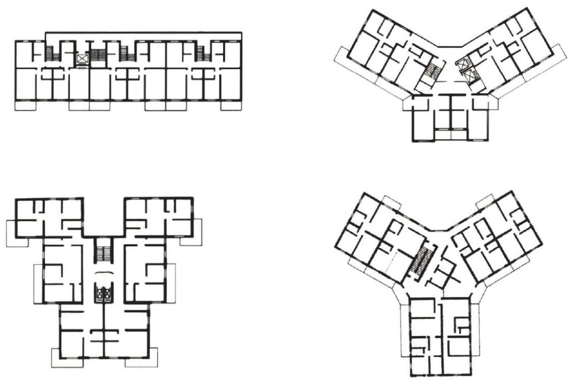


Figure 2-18 Variety of building types designed in the mid-1980s (Source: Rowe et al., 2016)

Experiments on a variety of layouts was made to replace the standardized five-bay structure, and a set of new construction standard was set. Living room became increasingly important, and received larger area and direct sunlight. Towers and slabs with more floors were developed. Although masonry remained to be the primary structure system, prefabricated concrete components was more widely applied. There was a trend for the newly developed residential areas to include a variety of different building types (Figure 2-18).

Apart from the private housing sector, an embryo of urban public housing (economic and affordable housing) targeting the low-to-medium income households was proposed after 1992. Public housing provision system is still in a revolutionary process in China, but the planning and layout generally follows the same pattern with the commercial housing, only with inferior location, higher density, lower construction quality, and poorer public facilities.

Diversity in a fully marketized environment (1998–)

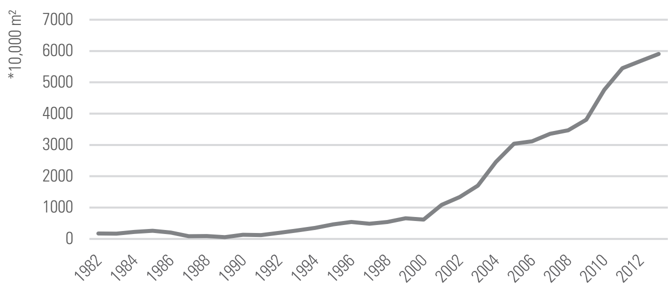


Figure 2-19 Construction area of residential buildings in Hangzhou 1978–2013
(Source: National Bureau of Statistics of the PRC)

Level		Cluster	Micro district	Residential District
Number of households		300-1,000	3,000-5,000	10,000-16,000
Number of residents		1,000-3,000	10,000-15,000	30,000-50,000
Composition	Residential	70%-80%	55%-65%	50%-60%
	Public facilities	6%-12%	12%-22%	15%-25%
	Transport	7%-15%	9%-17%	10%-18%
	Parks and open spaces	3%-6%	5%-15%	7.5%-18%

Table 2-4 Public facility index for different hierarchies in a residential district

In 1998, the central government officially abolished work unit system and encouraged citizens either to purchase new property from the housing market, or to buy out the public housing they were living in. The development of new residential areas gradually transferred from local government to property developers. In the meantime, a series of regulations and codes in line with the inherited micro district schema were established to ensure an sufficient public facilities in residential areas as shown in Table 2-4.

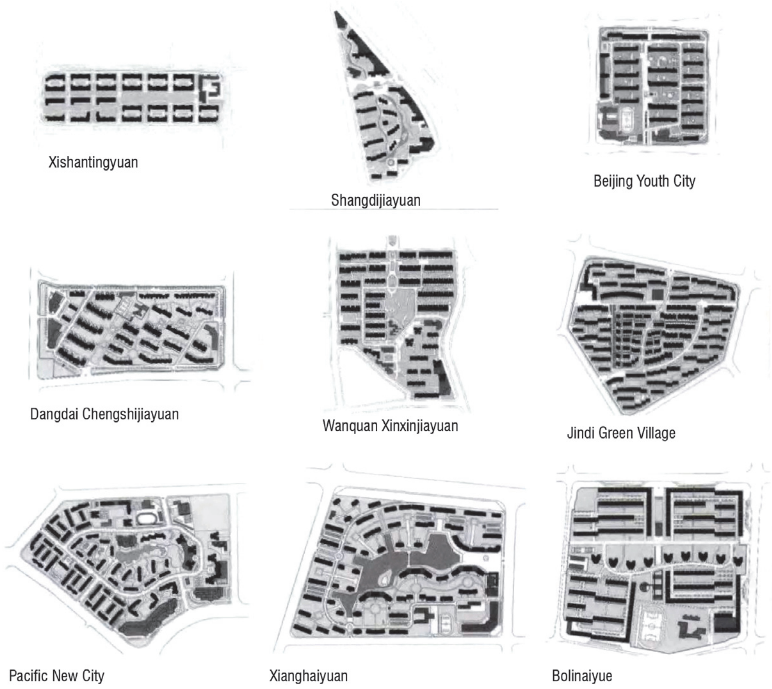


Figure 2-20 Various master plans of gated communities in Chinese housing market today
(Source: Compiled from multiple advertising brochures)

The development became driven by new consumption needs and commercial interest. Most commercial housing areas are planned with nurseries, parks, stores, and recreational facilities, within a gated plot. Gated communities today vary in enclosure size, layout of buildings, boundary elements and public facilities. They have been developed to fulfill the different needs of customers from different income classes. (Figure 2-20) Housing type may vary from high-end villas, to mid-end and low-end apartments. Design strategies have been developed to fit in not only the large plots in suburban area, but also the piecemeal development projects in the city center. A mixture of different building types is deliberately organized to make full use of the land and achieve higher density. In order to make their products competitive, developers tend to attach unique daily service (swimming pools, clubs, even schools and hospitals). To make the most of the facilities, developers would plan the gated communities as big as possible. The communities are usually named after a poetic theme, which is more or less reflected in the masterplan, facade, and landscape design. Gated community acted as an ideal development model in the wave of land finance, as it has effectively provided daily public facilities that should have been provided by the government. Therefore, while there have been a few debates since the 2000s (Wang, 2010; Xu, 2009), it has already devoured most Chinese cities in the next 15 years.

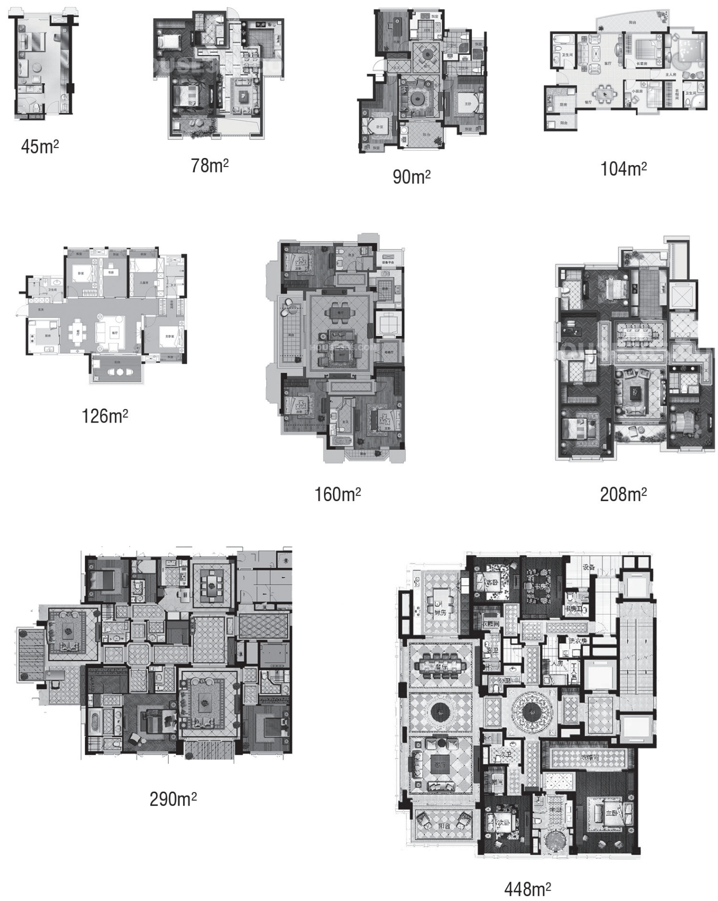


Figure 2-21 Various layouts in the Chinese housing market
(Source: Compiled from multiple advertising brochures)

Although being quite monotonous at first, the layout plan has been developed and refined constantly targeted on different walks of people, especially for core families and single people. Mature construction system of concrete framework and shear wall structure have replaced masonry system in most cases. (Figure 2-21)

Planning concepts in Republican era

1 Proposals made by western planners and western-educated Chinese planners

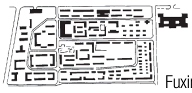
- The 1929 Nanjing residential development plan - neighborhood unit
- The 1946 Ten-year Plan for the wartime Chongqing: The structure of satellite settlements adopted the neighborhood unit concept, influenced by American consultants.
- The 1946 Greater Shanghai Plan: western-trained Chinese planners and engineers, employed modern planning ideas including zoning, the self-contained satellite city and the neighbourhood unit. The plan divided the municipal area of Shanghai into a hierarchical stratification, on the lowest level of the division was a neighbourhood unit with 4000 residents.

2 Japanese colonial planning

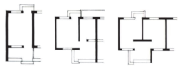
+ Japanese colonial planning in Changchun in the 1930s: the neighbourhood unit concept was employed to plan modern 'new Manchurian' residential districts for the Japanese
+ The 1938 Datong Plan: Some of the most advanced concepts, including the satellite city, the neighbourhood unit and the greenbelt were employed.

Master plan for the satellite city of Chongqing (1946)

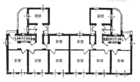
Barrack style row house (1949-1953)



Fuxingmenwai neighborhood (early 1950s)



Single storey row house (early 1950s)



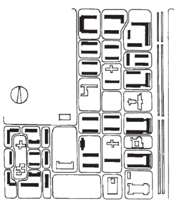
Caoyang xincun (1951)

Soviet superblock (1953-1956)

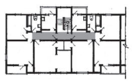
Jiuxianqiao neighborhood (1953)

No.2 layout by BIAD (1955)

Micro district (from 1957)



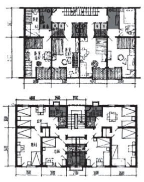
Hepingli micro district (1959)



Taoyuan layout (late 1950s)

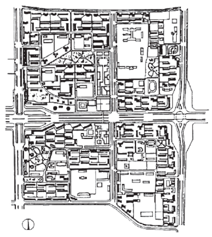
Modifications (1957-1977)

Pengpu Xincun (late 1958)



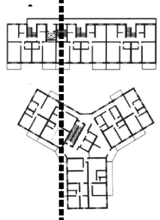
Typical layouts during the Great Leap Forward (around 1960)

Continuous development of micro district (1978–1998)



Wuluju micro district (1980)

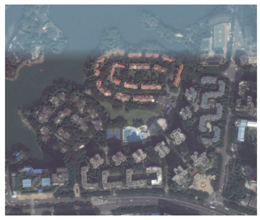
80 and 81 layout by BIAD (1980)



Typical layouts in mid 1980s

Scope of this research

Neighborhood unit transformed into gated communities



South Garden of Dragon Lake development (around 1990) was among the national pilot projects guided by neighbourhood unit concept. It was later turned into a gated community.

Communist work unit schema

1937 Sino-Japanese War
1946 Chinese Civil War
1949 **Founding of P.R.C.**
1958 Great Leap Forward
1966 Cultural Revolution
1978 **Chinese Economic Reform**
1988
1992 Deng's Remarks

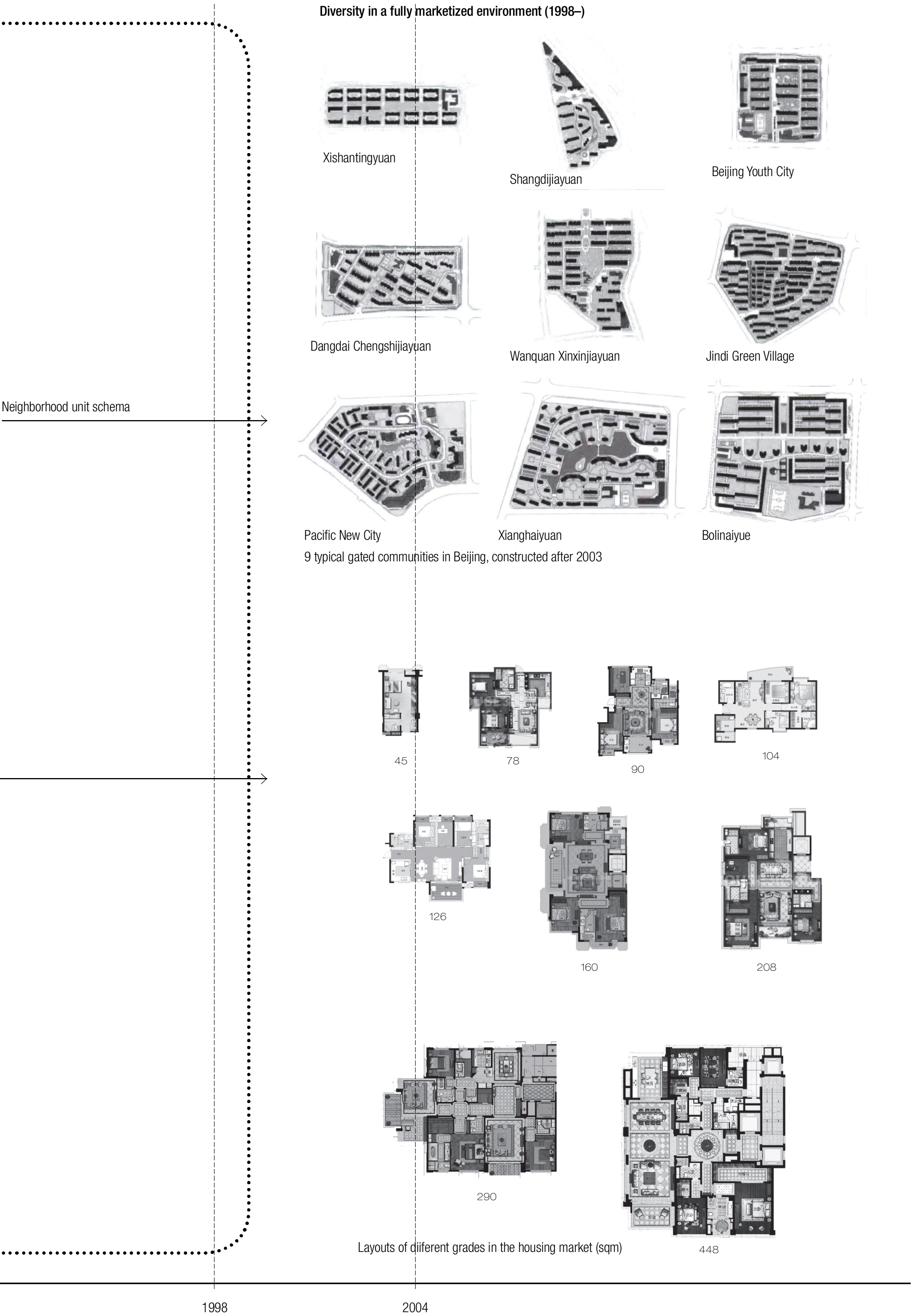


Figure 2-22 Summary of residential planning and design norms evolution in China

2.3 Summary

This chapter first presents a theoretical discussion of urban renewal and housing renewal from an urban design perspective. Starting from urban renewal and housing renewal theories in the West, it could be summarized that:

1) The renewal theory turned from physical plan to humanism plan, the physical plan focusing on form, functionality, and growth gave place to humanism plan which lays more attention on differentiation, social context, and sustainability.
2) The renewal strategy shifted from wholesale reconstruction to small-scale regeneration which takes into account social and economic issues.
3) The operation mode developed from government dominated mode to a multi-agency cooperation mode. The partnership of the government, private entrepreneurs, and neighborhood would be the future trend of urban regeneration.

On the other hand, benefiting from Economic Reform and Housing Reform, China has witnessed rapid growth and booming of housing market. Its housing renewal practice showed a different background and outcome from Western countries. (Table 2-5)

	China	Western Europe
After WWII		
Similarity	- Increase in the proportion of public housing - State being responsible for investment and construction of housing - To meet people's basic living conditions	
Difference	- Lack of state capital accumulation - State-owned firm based construction and distribution - Integration of living and working	- Rich in original capital accumulation - Government-dominated construction and distribution of large-scale public housing - Division of living and working
1980s		
Similarity	Rise of housing market and liberalism	
Difference	- Market-oriented housing reform - Severe housing shortage - Trying to solve the housing shortage problem by market - Part of the reform of the socialist market economic system	- Neoliberal policy - Housing shortage is resolved - Market as stimulation for economic development - To reduce the financial burden of the state
2000s		
Similarity	Segregation of living space caused by marketization	
Difference	- Segregation based on income differentiation - Policy changes caused by soaring housing price - In the form of housing construction and distribution	- Segregation based on race - Social integration policy due to the differentiation of social housing and private housing - In the form of policy changes such as finance and subsidies

Table 2-5 Comparison of housing renewal in China and Western Europe

With the transformation of Chinese society from a planned economy to a market economic system, urban renewal and housing renewal have shown different characteristics in different historical eras. In general, the Chinese process has been driven by economic forces to a large extent, especially after the 1990s. Compared to the western countries, local government and their political ideologies has played a more crucial guiding role. Before the Economic Reform, government was responsible for raising and allocating urban resources in urban renewal, especially during the prosperous period of political struggle, and ideology had a very serious impact on the orientation of urban renewal. Even after the Economic Reform the influence of local government policies and ideologies on urban renewal is still obvious. For example, those renewal efforts led by local government rushed to implement have actually became image projects. Property developers have been active in the urban renewal projects characterized by real estate development. Since 1998, land use right has become tradable, local government may improve a city's appearance by leasing and auctioning land use right, or by cooperation with developers in renewal projects. This is often an important means for local governments to increase local taxes. While local community has played a relatively weak role in the process of urban renewal. In many circumstances, local governments and developers are pursuing economic efficiency and urban development-oriented renewal, at the expense of the interests of local community residents.

Though the DUHR system to be discussed in this research does not belong to the marketized redevelopment nor local government's pure image project, the problems with roles of local government and community summarized above could still be a focus for this research, especially from the perspective of operation mode.

This chapter also reviewed the evolution of residential planning and design norms in China. It could be summarized that the neighborhood unit scheme was never thoughtlessly copied to China, instead, it was modified and remodeled under the shifting political, social, and economical contexts. The current Chinese residential area planning norm is a compound body of Neighborhood Unit, Soviet micro district, and needs of Chinese citizen. Some of the elements are directly inherited from neighborhood unit concept, some are influenced by the soviet micro district. And many of them have been combined with the needs of Chinese citizens.

The housing to be discussed in this research are constructed during early 1980s to early 1990s, which is the beginning stage of Housing Reform. Though Economic Reform and Housing Reform were started after 1978, residential areas constructed in this era still has a strong image of the work unit housing. Though usually located in the old city area, unlike those residential areas developed after 1998, the planning and design pursued more efficiency than comfort and diversity, with limited types of four to six story buildings arranged in a linear pattern, and minimum public space and facilities in them. These features will be examined in detail when discussing the problems and improvements in old Chinese residential areas in the following chapters.

Chapter 3 Research Framework and Method

3.1 Research design

Based on the four research questions, the main body of this dissertation consists of four chapters. Chapter 4 uses a typical case to identify the defects of Chinese DUHR from the perspective of financing pattern, operation mode, and improvement to physical environment. Then using documentary study, Chapter 5 justifies the comparability of Japanese CCR system to Chinese DUHR system by comparing the social economic background of two systems, the land system and housing system in two countries, and reviewing a wider range of condominium reconstruction systems in Asian countries and regions. Afterwards, based on the problems identified previously in Chapter 5, Chapter 6 summarizes Japanese experience in dealing with similar issues by case study of CCR projects in Tokyo, and a set of preliminary recommendations integrating financing pattern, operation mode, and improvement to physical environment are given. Adopting the preliminary recommendations, Chapter 7 uses a simulative reconstruction project in the Chinese context to testify the applicability of Japanese experience to China. (Figure 3-1)

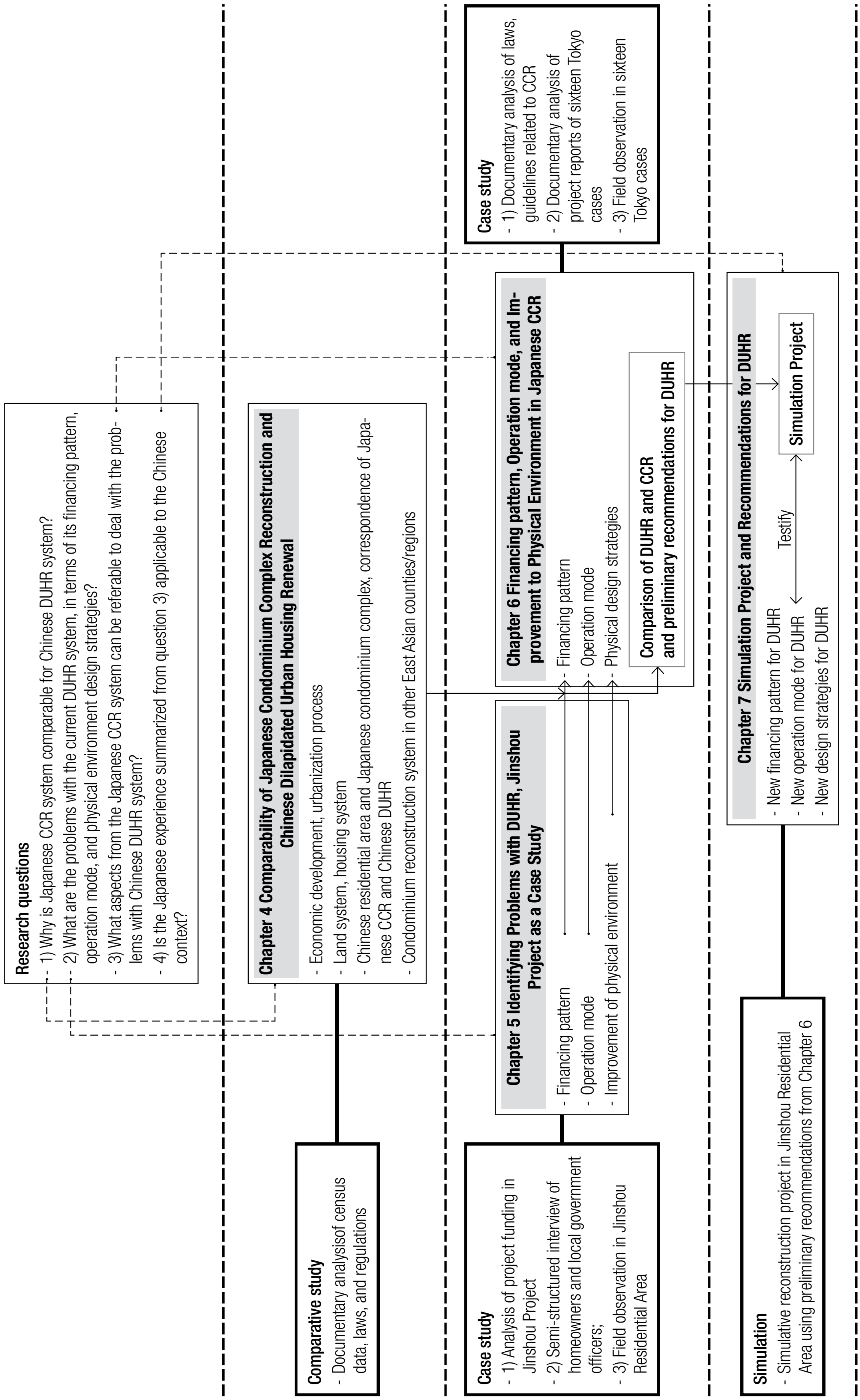


Figure 3-1 Research design

3.1.1 Comparative study

Comparative research is a research methodology that aims to make comparisons across different countries or cultures. It is an act of comparing two or more things with a view to discovering something about one or all of the things being compared. Both quantitative and qualitative techniques could be adopted in a comparative study. Such a methodology is used to clarify the referability of Japanese CCR system to Chinese DUHR system in this research for its multidisciplinary nature.

One of the weaknesses with comparative study is that it requires the coincidence of concepts across cases and cultures. To overcome this, the comparative study in this research is organized in a systematic comparative framework that starts from a higher level of overall social economic development and urbanization process, to land system and housing system in two countries, to the ownership type and morphology of Chinese residential area and Japanese condominium complex, and finally to specific systems of Chinese DUHR and Japanese OCR. Each level is based on the discussions of similarities in the higher level, so that the comparison is founded and feasible.

3.1.2 Case study

Case study is an empirical method that investigates a contemporary phenomenon in depth and within its real-world context. (Yin, 2018) Such a method is essential for this research, because in order to generate practical and useful recommendations for housing renewal practice, a detailed investigation on the performance of DUHR in its naturally occurring is required. A wide range of in-depth information collected from the case study could be helpful to understand DUHR from different perspectives, including the financing pattern, operation mode, and improvement to physical environment. While pertinent case study of the Japanese CCR system will contribute to the exploration of appropriate solutions to the problems in Chinese DUHR. Nonetheless, it may be summarized from related studies that case study has several limitations:

1) Due to the narrow focus, the case selected may have limited representatives. This methodological limitation is addressed by carefully examining the current condition and the specific strategies

adopted in the case under the DUHR system in Zhejiang Province, which will be explained in detail in section 5.1.1.

2) A case study strategy could be potentially insufficient for a scientific generalization of the findings. This limitation will not be a concern for this dissertation, since this study aims at analytical generalization instead of statistical generalization of recommendations for the improvement of Chinese DUHR.

3) There is no standardized data analysis method for case studies. This limitation is mainly about the reliability of specific data collecting and analysis methods adopted in case study. This concern will be addressed in detail in the section 3.2.

3.1.3 Simulation

Simulation is the creation of a desired set of physical and operational conditions in a controlled process or setting through a combination of graphic and mental images, technical assumptions, and direct experience. (Clipson, 2013) As an anticipatory approach, simulation allows designers to evaluate alternative futures in an artificially setting, and testify all aspects of the designed system. Simulation has the potential to provide insight into how complex systems will perform throughout their life cycle. Therefore, instead of purely relying on precedent or experience, simulation allows designers to quantify a whole host of design solutions until reaching a satisfying balance of different kinds of constraints.

Simulation could be applied in urban design mainly in two ways. The first is a numerical simulation of alternative land use regulations, building codes, transportation investments, or environmental protection policies, based on spatially distributed data of land prices, inhabitants, and traffic condition. For example, Wang et al. (2012) used a simulative financing model to testify the applicability of PPP in providing public housing for low- and mid-income groups in Nanjing, China. A more common application of simulation in the field of urban design is environmental simulation, which uses images, models, and films to simulate potential future development, to test new planning ordinances, and to communicate the plan to the public (Alexander, 1987; Bosselman and

Gilson, 1995).

Considering urban renewal and housing renewal is a process that calls for integration of disciplinary insights and stakeholders' perspectives, involving both time and space dimension, the simulation method applied in this dissertation is a combination of numerical simulation and environmental simulation. In a simulative reconstruction project, new strategies for financing pattern will be testified by numerical simulation, while recommendations for operation mode and physical environment design will be tested by environmental simulation. The simulation in this dissertation aims to propose an alternative overall strategy for the current government voluntary DUHR mode in Chinese cities, by providing project funding calculations and visually simulative physical environment.

The methodological weaknesses and difficulties of simulation are:

1) Neutrality: The simulators should not be involved in activities related to decision making of the proposed project, nor should they be associated with any party or stakeholder in the project, otherwise the validity of simulation cannot be tested. In this dissertation, the author only provides information needed for simulation, so neutrality issue will not be a major concern.

2) Accuracy: The simulation should be accurate so that it reflects improvements the proposed alternative strategies could bring. Besides, the simulation should be able to be tested accurately by any party who question the proposed project, otherwise the credibility of the project cannot be verified. In this dissertation, digital model based on map from local planning bureau and real-world measurement is first built as a basis for simulation. Grasshopper for Rhino is used to calculate floor area and generate building volume. The parameters in calculation are based on the actual housing price, construction cost, urban planning, and building codes of the site and city. Then facades, landscape, and furniture are modeled in Sketchup to give a more realistic effect to the model. The whole simulation involves subjective factor as least as possible, it may be examined and repeated if questioned.

3) Generalization: A simulation is often based on very specific conditions of one project, and perceived by a group of people of certain standpoints and preferences, it could be difficult to

generalize the findings in one simulation to other contexts. In this dissertation, the research scope is first set to Yangtze River Delta area, which is the most developed area in China, where the cities have relatively similar government policies and economic development level, people's habits and customs are also not dramatically varied. Second, the simulation is applied to a typical case whose problems are analyze from the perspective of financing pattern, operation mode, and physical environment. Therefore, the strategies tested in the simulation should also be applicable in the Yangtze River Delta area. The applicability to other areas of the country needs further examination.

3.2 Data collecting

To deal with different research questions, both qualitative and quantitative methods were used in combination for data collection and analysis. While mainly relying on qualitative methods, this research applies some simple quantitative (statistical) analysis to the data gained from surveys. In sum, five specific research methods are used.

3.2.1 Statistics of project funding

Statistics of project funding is the only reliable data to reveal the financing pattern of selected cases. In this research, various statistics forming the expenditure and revenue are collected to show the economic balance in a project. In the Chinese case study, statistics of project funding are collected from Subdistrict Office and Bureau for Housing and Urban-rural Development (BHUD). In the Japanese case study, statistics are collected from published project reports by local government and URAM (都市問題経営研究所). An analysis of these statistics demonstrates different financing patterns in the Chinese DUHR and Japanese CCR system.

3.2.2 Standardized questionnaire

Focusing on the operation mode of Chinese case, questionnaire (Appendix A) is applied to homeowners to examine their decision-making factors in the project. Questions consist of three parts: the first part collects basic information including age, sex, family structure, occupation, work place, income, start year of dwelling in Jinshou Residential Area, original use of old property, and possession of other property in the district; the second part investigates homeowners' decision making process; the third part looks into homeowners' evaluation of the living environment in Jinshou Residential Area and new relocation residential area. A short introduction about intention of the questionnaire is first made to respondents, then respondents' answers are recorded by the investigator on the questionnaire sheet, so that there is no blank answer. The respondents include homeowners choosing different strategies provided by local government. Qualitative and quantitative data collected from questionnaires is expected to provide a good opportunity to analyze decision making procedure, as well as negotiation between local government and homeowners in Chinese DUHR.

3.2.3 Semi-structured interview

Semi-structured interview is applied as a supplementary to questionnaire, to better examine the forces that shape the decision-making and the roles of different players in DUHR project. On one hand, interviews with government officers focuses on their attitudes and opinions towards DUHR operation mode; on the other hand, interviews with homeowners attempt to acquire a fuller understanding of their decision making in the project.

To ensure questions could be accurately understood by interviewees, at the beginning of interview, the purpose is briefly introduced. The interviews were initially reordered, and then transcribed literally for analysis. The interviewee list, interview time main questions are shown in Appendix B.

3.2.4 Field observation

Field observation is a qualitative data collecting method, for physical environment setting and people's naturally occurring behavior in it. In this research, field observation is used both for Chinese and Japanese case study.

In the Chinese case study, observation works as a fundamental tool to reveal the improvement of physical environment in DUHR project. The observation is concerned with two aspects:
1) Physical environment: boundaries, public facilities, traffic, building quality, floor plan;
2) Behavior: public spaces and people's activities in them.

In the Japanese case study, based on a background study of published project reports, observation examines and verifies how the physical environmental issues in Chinese DUHR system are tackled in Japanese CCR projects.

Photos, films, and annotated diagrams supplemented by text are used to record qualitative data regarding physical environment and behaviors. After each field work, the data will be reorganized and more detailed notes will be added when necessary. During the field work, informal interviews with residents and shopkeepers were frequently used to verify the observation. Through the conversation, the information given by these people who are very familiar with the residential area, ranging from the damage of building structure to the conditions of commercial facilities, is very useful in supplementing the observation by author.

3.2.5 Documentary analysis

Documentary analysis is used for secondary data in justifying the comparability of Japanese CCR and Chinese DUHR. Census data published by government is used to study the economic development and urbanization process of two countries. Laws and regulations are used to compare the land system and housing system in two countries and the ownership pattern of Chinese residential area and Japanese condominium complex, as well as the correspondence of Chinese DUHR system and Japanese CCR system.

In the Chinese case study, government administrative files of different levels are first studied, to acquire a general understanding of the DUHR mode from a policy perspective. Then, in order to examine the operation mode of DUHR, the overall procedure of case study project is first clarified using progress reports of Subdistrict Office, archival project records from the Bureau for Housing and Urban-rural Development, and reports of local media.

In the Japanese case study, secondary data of project funding and progress is the main source in examining the financing pattern and operation mode of projects completed in Japan. In terms of physical environment in Japanese cases, secondary data could provide background information, so that the field survey may better concentrate on specific issues. The main data is from project reports published by マンション再生協議会, property developers, and local government.

3.3 Summary

This chapter has explained the research framework to testify the hypothesis and respond to research questions. A three-phase research strategy is developed:

1) The first phase is a comparative study to clarify the referability of Japanese CCR to Chinese DUHR;
2) The second phase uses a typical case to identify the defects of Chinese DUHR, then Japanese experience in dealing with similar problems is summarized from a case study of CCR projects in Tokyo.
3) The third phase uses a simulative reconstruction project in the Chinese context to testify the applicability of Japanese experience to China.

Afterwards, the strength and weakness of five main data collecting methods in the case study—including statistics of project funding, standardized questionnaire, semi-structured interview, field observation, and documentary analysis—are discussed in detail, as well as the tactics to avoid the weaknesses in this research.

Chapter 4 Comparability of Japanese Condominium Complex Reconstruction and Chinese Dilapidated Urban Housing Renewal

Since Chinese and Japanese cases are situated in different political, economic, and social backgrounds, it would be necessary to justify the comparability of two systems. Responding to the first research question, this chapter seeks to find similarities in terms of economic development stage, urbanization process, land system, housing system, and ownership pattern and morphology of old residential areas in China and Japan, thus forming a background for reference. Different modes of condominium construction in Japan are examined to pick out the most appropriate Japanese model for China. Then the condominium reconstruction systems in other Asian countries/regions are also discussed to strengthen the referability of Japanese OCR for Chinese DUHR.

4.1 Comparison of economic development

Economic growth speed

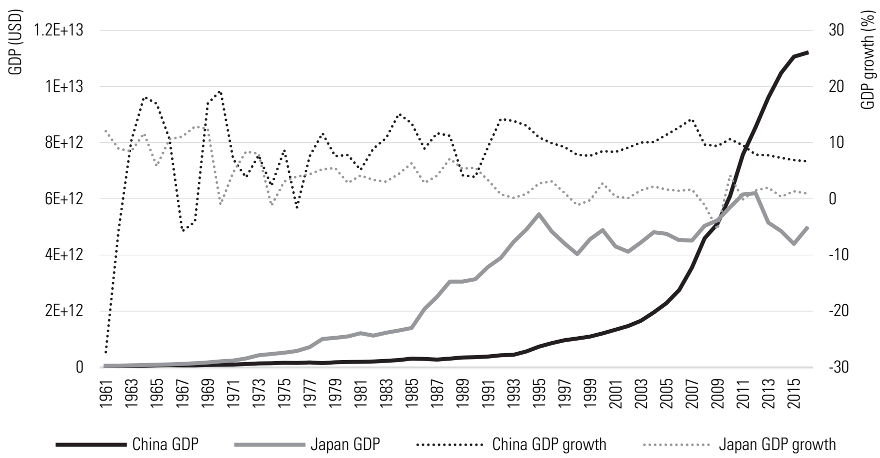


Figure 4-1 Comparison of Chinese and Japanese GDP from 1961 to 2016 (Source: World Bank)

The Japanese economy experienced a rapid growth in the 1950s and 1960s, medium-speed growth in the 1970s and 1980s, and a low-speed growth since the 1990s. The growth rate decreased from near 10% per year in the 50-60s to about 5% in the 70-80s, and then to an average of nearly 0 since the 1990s.

The Chinese economy has maintained an average annual growth rate of around 10% since the Economic Reform in 1978. Just as Japan suffered the oil crisis in the early 1970s with its economy entered a medium-speed growth period, China suffered the financial crisis in 2008, with its growth rate entered a period of around 7%. (Figure 4-1)

Economic driven force

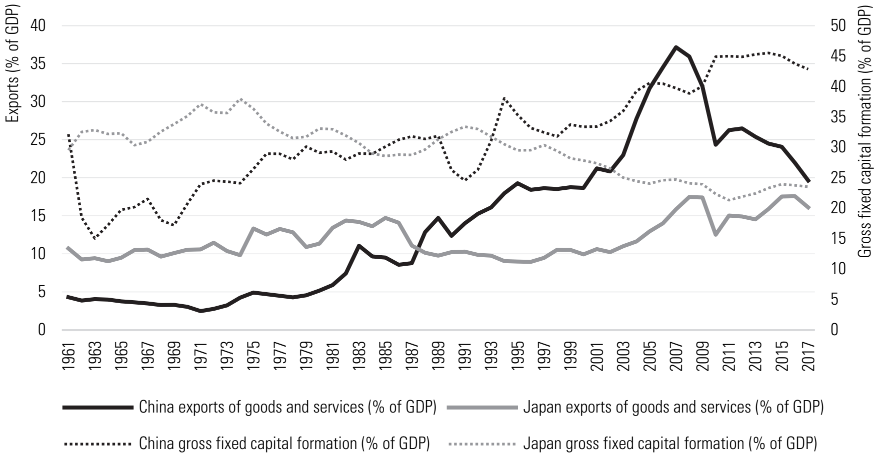


Figure 4-2 Comparison of Chinese and Japanese exports of GDP and gross fixed capital formation from 1961 to 2017 (Source: World Bank)

Investment and exports played an important role in the economic rise of China and Japan. The miracle of Japan's economic growth in the post-war era relied on growth in investment and an export-oriented economic development model. After Economic Reform, China also relied on the persistent growth of fixed-asset investment, and continued high-speed growth after entering WTO, resulting in a growth over 10% of 30 consecutive years. The rapid growth of investment and exports ensured the industry of both countries long-term development, which have become the economic pillar of both countries. Japan and China became "world factories" in different periods. The Japanese economy gradually transformed from a domestic oriented model to an export oriented model since the early 1970s due to the overcapacity. By 2005, China's exports have occupied 24% of the country's GDP, which is identical to Japan in the 1980s.

Labour force

As the two most populous countries in East Asia, both China and Japan experienced rapid population growth after World War II. The rapidly growing population has provided sufficient labour for the development of the economy, especially the development of the manufacturing industry, and has become one of the important conditions for the rapid economic growth of China and Japan.

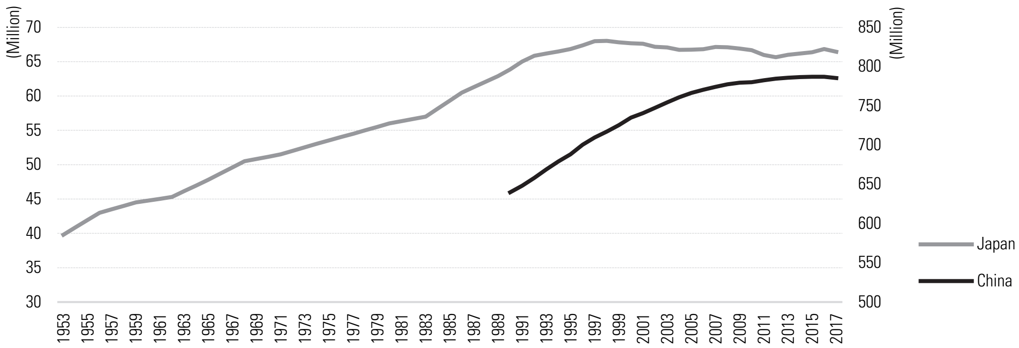


Figure 4-3 China and Japan labour force (Source: World Bank)

However, with the growth of the baby boomers after WWII, the increase of Japanese labour population gradually slowed down from the beginning of the 1990s and began to decline year after year. Since China start implementing the family planning policy after Economic Reform, the natural population growth rate has declined in a cliff-like manner. With the retirement of the population born in the 1950s and 1960s, the decreased population born in the 1980s and 1990s, China's labour force has seen a net decrease since 2010. The aging of the population has become a common problem for both countries (Figure 4-3).

Asset Bubble

Both China and Japan have experienced the accumulation and burst of asset bubbles. In the early 1990s, Japan's long-term accumulation of excess capital, quick success of financial liberalization, and mistakes in monetary policy led to the rapid accumulation and bursting of asset bubbles in stock market.

During the 2008 financial crisis, the Japanese stock market also experienced a sharp decline in stock prices. With the massive excess of capital since 2012, the Japanese stock market is experiencing a new round of bubble accumulation (Figure 4-5). On the other hand, China's securities market experienced a burst in 2007-2008. The soaring and plunging of the stock market brought about by the "leveraged bull market" in 2014-2015 was another typical case (Figure 4-4).

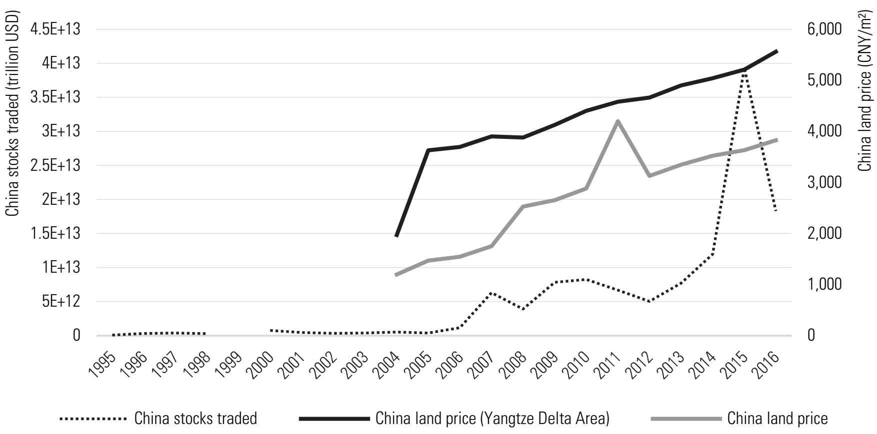


Figure 4-4 China stocks traded and land price from 1995 to 2016 (Source: World Bank, CLSPI)

The accumulation of land asset bubbles in both countries is equally alarming. Japan's average stock price rose by 2.7 times during the bubble economy from 1985 to 1989; in 1986-1990, the land price indices of six major cities increased more than three times. Land price in China has been rising rapidly since 2001. Although fluctuations exist, there has been no sign of significant cooling, and the bubble is still accumulating.

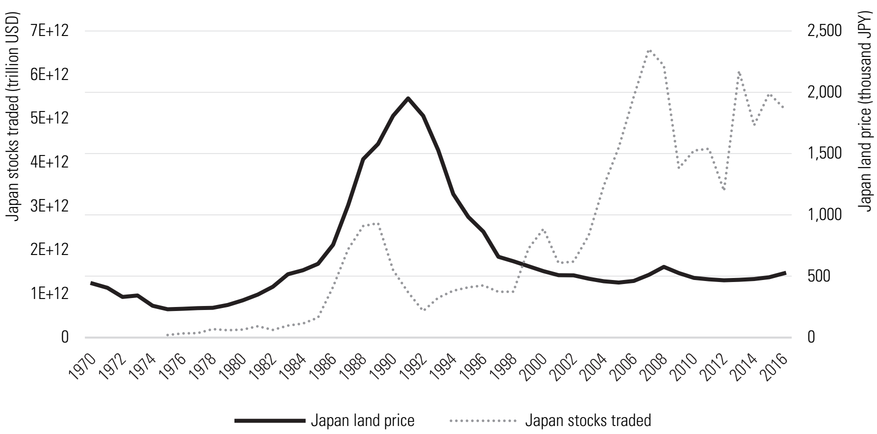


Figure 4-5 Japan stocks traded and land price from 1970 to 2016 (Source: World Bank, MLIT)

Government's role in economy transformation

The breadth and depth of government's intervention in economy is similar in both countries. During an economic transformation, both governments actively promoted economic restructuring by implementing industrial policies. After the 1982 oil crisis, Japan's industrial policy focused on supporting economic transformation, and the proportion of tertiary industries continued to rise, relying on the transition of growth mode from exports dominated to an equal of exports and domestic demand. Similarly, in response to the financial crisis, in 2008 the Chinese government introduced a series of plans to promote economic development including the ten major industry adjustment and revitalization plans, involving steel, automobiles, equipment manufacturing, textiles, and so on. Hundreds of policies and implementation details was carried out, to expand domestic consumption, stabilize the production and operation of enterprises, and accelerate industrial technological progress.

Overcapacity

During the bubble economy period, due to the rapid economic growth and the large amount of excess capital, Japanese companies' equipment investment increased rapidly. In 1990, the equipment investment amounted to 88.7 trillion JPY, with an increase of 58.6% over 1986, accounting for 19.5% of GNP. Under the influence of the false prosperity by bubble economy, Japanese companies invested large number of factories and high-end facilities. Large-scale production lines and projects have also been launched. Although the rapid increase in equipment investment has promoted the development of Heisei, it has resulted in serious equipment surplus.

China witnessed similar signs during 2003 to 2007, and most of the traditional industries including steel, cement, and chemical industries have undergone huge expansion. After the financial crisis, the excess production capacity should have been eased was further increased by the 4 trillion CNY fiscal action. This has directly led to the serious overcapacity in the traditional industries of China in recent years.

Summary

From the perspective of economic development, it could be summarized that:
1) China's high-speed economic growth turns to a medium-speed growth phase, which is similar to Japan in the 1970s;
2) China is gradually shifting from investment and export-driven to consumer-driven, from second industry to third industry driven, from labor-intensive industries to capital and technology intensive

industries, which is similar to Japan in the 1970-1980s;

3) Decrease in labour force in China around 2010 is similar to Japan in the 1990s;

4) China's asset bubble is similar to Japan in the early 1980s;

5) China's overcapacity is similar to Japan in the early 1980s.

4.2 Comparison of urbanization process

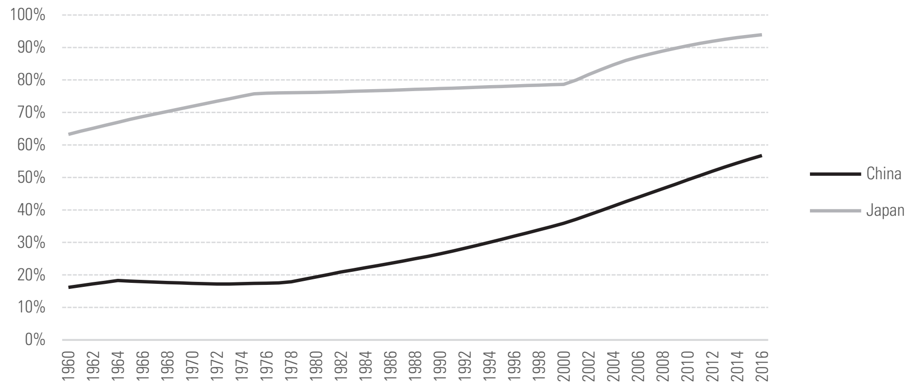


Figure 4-6 Proportion of urban population in China and Japan from 1960 to 2016 (Source: World Bank)

The Urbanization in China progressed sharply after the Economic Reform in 1978. The urbanization rate has increased from 18% in 1978 to the current 57%. It must be noted that this number is just calculated based on registered population, which means the exact number of population poured into urban areas could be larger.

After WWII, Japan experienced rapid urbanization along with its industrialization and dramatic economic growth. Especially during 1950 to 1975, the urbanization rate increased from 30% to 75%. In 2015, 68% of the population are living in DIDs[16] (densely inhabited districts). The growth rate of DID in the latest five-year is decreasing, which indicates that population has stopped concentration in urban areas and the Japanese urbanization may come to an end.

[16] http://www.stat.go.jp/english/data/chiri/did/1-1.html

		Average population size	Average size of inter-province transient population	Percentage of inter-province transient population
By region	Coastline cities	175.90	41.51	23.60%
	Inland cities	72.19	3.98	5.51%
By type	Small cities	13.98	0.69	4.94%
	Small-medium cities	34.24	1.44	4.21%
	Large cities	67.97	2.85	4.19%
	Ultra large cities	171.76	23.86	13.89%
	Super large cities	642.03	159.62	24.86%

Table 4-1 Inter-province transient population in China (compiled from 2010 census)

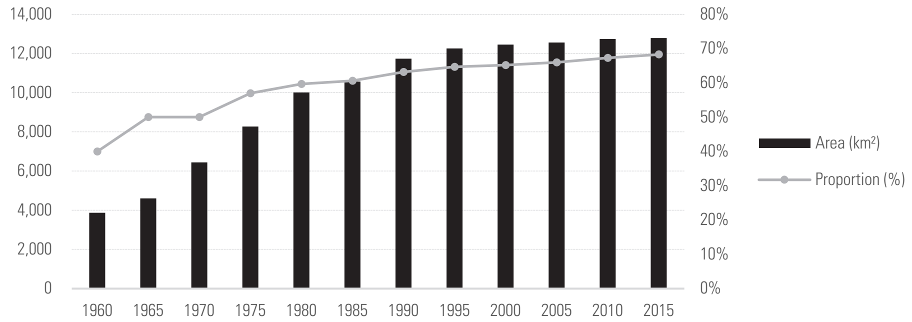


Figure 4-7 Area of DID and proportion of population in DID in Japan

In terms of the urbanization type, China and Japan both followed a relatively closed urbanization process, due to their closed geographical condition and East Asian culture. People are also less inclined to move to other countries than Europeans and Americans, and more likely to move from rural areas to urban areas, as China has experienced large population migrated to coastline cities and super large cities (Table 4-1), and Japan has witnessed a Significant growth in the area and population of DIDs (Figure 4-7).

4.3 Comparison of land system

Unlike Japan where the land is privately owned, China adopts a dual land tenure system (Table 4-2) consisting of urban land which is owned by the nation[17], and rural land rural land which is collectively owned by villagers. Therefore, it is necessary to justify the comparability of the Chinese and

[17] Article 10, 1982 Chinese Constitution

Japanese condominium reconstruction system under seemingly completely different land systems.

Land type	Urban land		Rural land	
Landowner	Nation		Collectively owed by villagers	
Usage type	Urban construction land	Unused land	Rural construction land	Agricultural land

Table 4-2 Dual land tenure system in China

Though the 1982 Chinese Constitution claims that urban land is owned by the nation, in reality, the right to use and ownership are not bound. *Several Provisions on the Determination of Land Ownership and Use Right (《确定土地所有权和使用权的若干规定》)* has guaranteed the former owners of private land still retain the use right of their land. *Land Administration Law of the People's Republic of China (《中华人民共和国土地管理法》)* and *The Urban Real Estate Administration Law of the People's Republic of China (《中华人民共和国城市房地产管理法》)* permit that state-owned land could be obtained in two ways: 1) Allocation (without paying, "划拨") and 2) Assignment (paid, "出让"). *Interim Regulations of the People's Republic of China Concerning the Assignment and Transfer of the Right to the Use of the State-owned Land in the Urban Areas (《中华人民共和国城镇国有土地使用权出让和转让暂行条例》)* allows the land use right to be transferred[18] in three ways: sale, exchange, and donation. Besides, land obtained via paid assignment could be mortgaged.

In short, the "state ownership" of urban land could be regarded as a nominal definition, and individuals or units still hold substantial land use right. Being a property right according to the Constitution, the land use right is respected and protected by the government. There is no substantial difference between use right and ownership right, in case of old residential areas.

4.4 Comparison of housing system

The issues of Chinese and Japanese condominium reconstruction belong to the domain of private housing or market housing. Section 2.1.2 has reviewed the evolution of contemporary Chinese

[18] In case of land use right obtained by allocation without paying, a certain amount of transfer fee must be paid to the government before the land could be transferred to other individual or unit.

housing provision system. This section attempts to validate the comparability of the Chinese and Japanese condominium reconstruction system, from the perspective of the role of market housing in each country's housing system.

Kemeny's framework of comparative housing system is used here to compare Chinese and Japanese housing system. Being closely related to Esping-Andersen's welfare regime system (Esping-Andersen, 1990, 1999), two types could be identified in Kemeny's framework—dualist rental system and the unitary rental market—based on the role of the state in the housing provision system (Kemeny, 1995, 2001):

1) In the dualist rental system, the government concentrates on assisting obtaining commodity housing from the housing market. Social renting housing is only organized by central or local government, and is avoided from competing with market housing. The number of social housing is very small, the housing quality is low, and the target is limited to low-income people. Besides, there is a lack of assistance for renting private housing from the market. As a result, a dualistic system consisting of a "public" command economy sector and a "private" rental market is formed. Under this model, private housing plays a dominant role in the housing system.

2) In the unitary rental market, social rental housing may receive a variety of assistance not only from public sector, but also from NPOs. The number of social rental housing is large and the target is not only low-income people but also households with relatively high income. Social rental sector is able to compete with the for-profit rental housing market. Therefore, more households are ensured tenancy and the rents are hold down. This resulted in a unitary rental market of for-profit and non-profit housing.

The Japanese housing system has been identified to fall to the dualist rental system in many researches (Sato, 2006; Hirayama, 2009), since social rental housing is supplied and managed by the government only for needy people, and social housing sector is isolated from rental housing market. Hence rental housing would not be a good choice for middle-class households looking for high-quality housing, and the home ownership rate in Japan is also very high (Figure 2-5). On the other hand, Japan has its own unique characteristics which are not included in Kemeny's typology. For example, corporate housing occupies a large proportion of the housing stock, thus acting as a sub-system in the housing system.

As for the type for China, according to the review of housing provision system in section 2.1.2, it could be observed that China has developed from a socialistic system before 1978, to a liberal system with productivist elements since the housing reform. On one hand, with the booming of real-estate industry, citizens are encouraged to purchase commodity housing; on the other hand, though the central government is trying to reshape the housing provision, local government are reluctant to build public housing, due to the dependence of local finance on land finance, and the excess number of commodity housing in the housing market, leading to a very small number of public housing which covers only a small part of needy people. Therefore, the current Chinese housing system could also be classified as a dualist system.

By using Kemeny's framework, it could be asserted that the current Chinese and Japanese housing system both follow the dualist type, where market housing plays a dominant role, and acquiring commodity housing from the market is encouraged. The emerging need for renovation or reconstruction of condominiums is an inevitable and crucial problem which dualist type countries will encounter.

4.5 Comparison of Chinese residential area and Japanese condominium complex

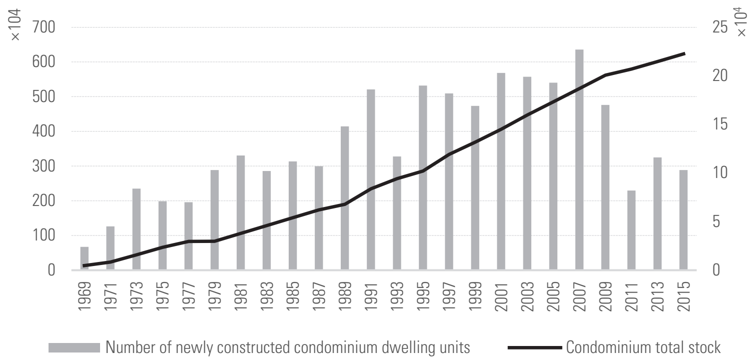


Figure 4-8 Number of newly constructed condominium dwelling units and total stock in Japan from 1969 to 2015 (Source: MLIT)

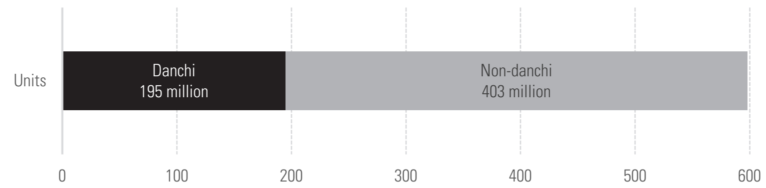


Figure 4-9 Proportion of Danchi housing (condominium complex) in total condominium stock in Japan (Source: MLIT, 2013)

In Japan, since the found of Japan Housing Corporation (日本住宅公団) in 1955, a large number of condominium complexes (分譲マンション) have been constructed by public corporations (公団) and local public entities (地方公共団体) (Figure 4-8, Figure 4-9). With the Japanese economic boom in the 1960s and 1970s, condominium complexes spread to suburban area with the development of new towns, their size and numbers also increased sharply. By 2015, the total unit number in supplied by condominiums has reached 6.2 million (Figure 4-11). Many of the condominiums are owner-occupied, accommodating around 15.3 million residents (The Building Center of Japan, 2017). Hence, condominiums make up an important part of Japan's housing stock. The Japanese condominium complex reconstruction cases to be studied in detail in Chapter 6 are all originally built during mid-1950s to early 1970s, mainly developed by Japan Housing Corporation or Tokyo Metropolitan Housing Supply Corporation (東京都住宅供給公社), which were semi-public organizations instead of real estate developers.

	China	Japan
Ownership	Property Law (物权法)	Act on Building Unit Ownership, etc. (建物の区分所有等に関する法律)
Management	Regulations on Realty Management (物业管理条例) Guidelines on owners' general assembly and owners committee (业主大会和业主委员会指导规则)	Bylaws of condominium association (マンション標準管理規約) Act on Advancement of Proper Condominium Management (マンション管理適正化法)
Reparation/ Reconstruction	住宅专项维修资金管理办法 (Regulations on residence maintenance fund)	Act on Facilitation of Reconstruction of Condominiums (マンションの建替え等の円滑化に関する法律)

Table 4-3 Laws and regulations related to residential complex in China and Japan

Figure 4-10 Haginaka Condominium Complex in Tokyo, completed in 1968, before reconstruction (left, source: マンション再生協議会) and Lantian New Village in Shanghai, completed in 1983 (right, photo by author, 2015)

From the definition of Chinese residential area and Japanese condominium complex explained in Chapter 1.5.2, it could be asserted that their ownership pattern are quite similar (Figure 1-9, Table 4-3), except for slight differences in terms of definition and calculation of individual ownership area and common area (何, 2013). In both systems, the apartments are outright owned by each homeowner, while the land and ancillary facilities are co-owned by the homeowners. The morphology of old Chinese residential areas is also similar to Japanese condominium complex, with multi-storey apartment buildings standing in a park-like territory (Figure 4-10). In addition, the early 1980s to early 1990s Chinese housing to be discussed in Chapter 5 are mainly developed by Municipal Real Estate Development & Management Corporation (市房地产开发经营总公司), which was also a semi-public firm that founded by local government that comparable to Japan Housing Corporation or Tokyo Metropolitan Housing Supply Corporation.

In a word, the similarities of ownership pattern and morphology between Chinese residential area and Japanese condominium complex make it workable to compare Chinese Dilapidated Urban Housing Renewal with Japanese Condominium Complex Renaissance.

4.6 Problems with old Japanese condominium complex

By 2000s, the earliest condominium complexes have stood for 30 years (Figure 4-12). Suffering from low building standard and physical ageing, a considerable number are left vacant (Ministry of Land, Infrastructure, Transport and Tourism (MLIT), 2010) (Figure 4-13):

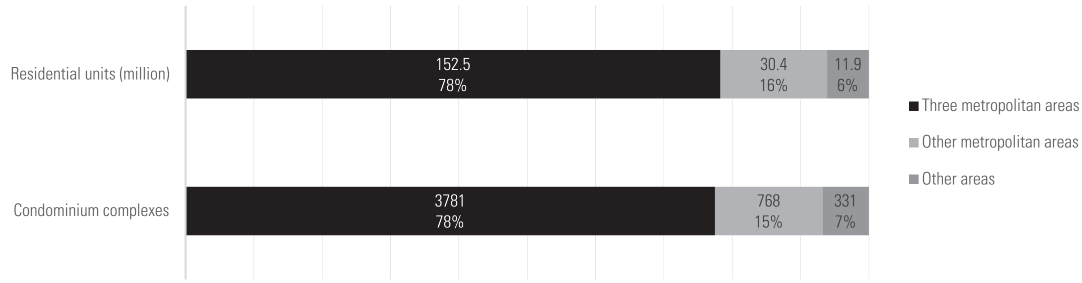


Figure 4-11 Location of condominium complexes in Japan (Source: MLIT, 2013)

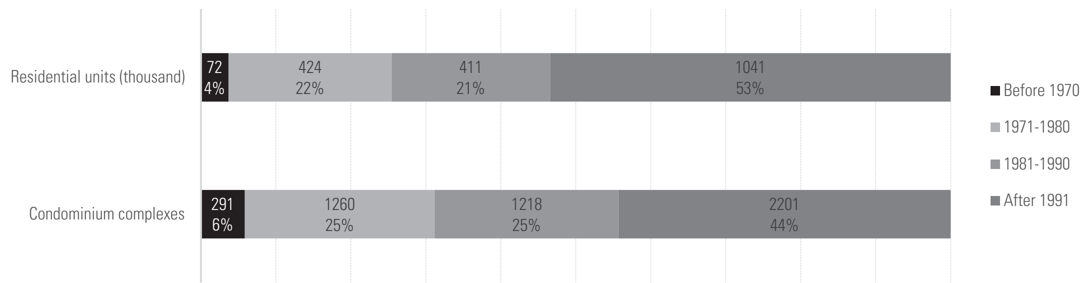


Figure 4-12 Constitution of Japanese condominium complex stock by year of construction (Source: MLIT, 2013)

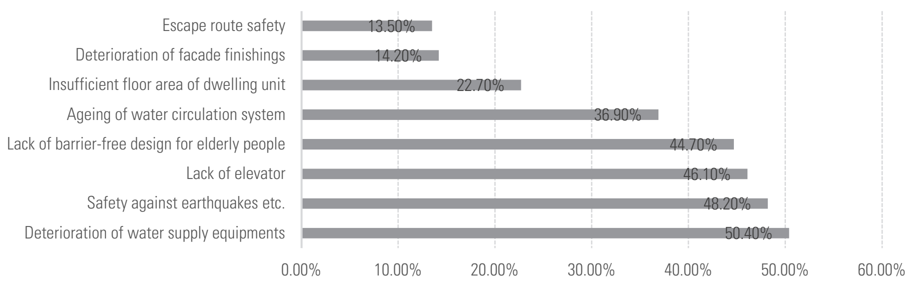


Figure 4-13 Problems in Japanese condominium complexes (Source: MLIT survey of 141 households in 2008)

1) Condominiums constructed before 1981 were under the Old Seismic Code

Approximately 1.6 million units, which is about 1/5 of the total stock of condominiums, was constructed before 1981 under the Old Seismic Code (旧耐震基準) (Figure 4-12). It is necessary to examine their seismic diagnosis, reinforce their structure, or rebuild them.

2) Lack of elevator

Most condominiums of four or five storeys constructed in the 1960s and 1970s were not equipped with elevators. With the ageing of residents, it is necessary to improve the convenience by setting up elevators. (Figure 4-14)

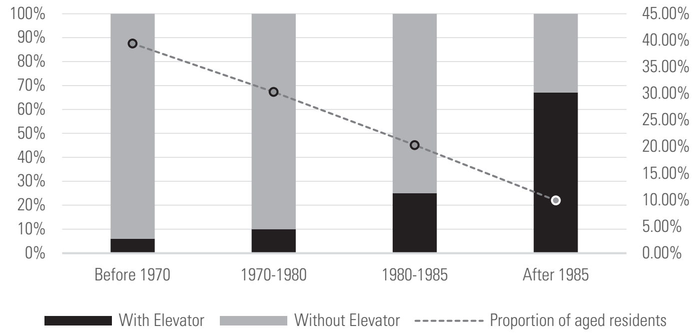


Figure 4-14 Elevator installation rate in Japanese condominiums (by number of buildings), overlapped with proportion of aged residents (Source: MLIT)

3) Ageing of facilities

Old condominiums are faced with the ageing of facilities, especially the water circulation system. These facilities, which are closely related to residents' daily life, needs to be repaired or replaced. Besides, the old design standard may be outdated for current living standard.

4) Insufficient floor area and outdated layout of dwelling units

The residential unit floor area in condominiums constructed before 1970 is around 45-50 m², many apartments do not have a dwelling unit area of less than 50 m², which is insufficient for today's standards required by current family households[19]. Besides, the unit layout may not fit today's standard. Aside from what could be read from the floor plan, the low ceiling height, and insufficient insulation (Insufficient thickness of the floor slab) are also problems hard to be tackled by renovation.

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[19] The guidance residential area given by MLIT in 2011 is: (1) General type: 1) Single person 55 m²; 2) Household of 2 or more 25 m² × family size + 25 m². (2) Urban type: 1) Single person 40 m²; 2) Household of 2 or more 20 m² × family size + 15 m².

However, due to the collective ownership, it could be a tough job to reach a consensus among owners to reconstruct. It has been concerned that the ageing of an increasing number of condominiums could cause serious problems if no effective measures are taken, including the deterioration of buildings and the decline of the living environment in the neighborhood.

4.7 Correspondence of Japanese CCR and Chinese DUHR

Reconstruction target area

Japan has been focusing on this problem since then, and formed a renovation/reconstruction system of old condominium complexes, comprising several operation modes in response to different situations that may exist in a complex.

In Japan, the reconstruction of a condominium complex could be proceeded in three ways: a) reconstruction utilizing AFRC; b) reconstruction without utilizing AFRC; c) reconstruction via urban redevelopment projects (Table 4-4). Mode c) will not be taken as a reference for China, because this mode relies on government's legislative planning, which is more similar to the Chinese Old City Renovation, and not applicable for Chinese DUHR that targets on areas excluded from government's redevelopment plan.

<table>
<tr><th></th><th colspan="2">a) Utilizing AFRC</th><th>b) Without utilizing AFRC</th><th>c) Via urban redevelopment projects</th></tr>
<tr><td>Law</td><td colspan="2">1. Act on Building Unit Ownership, etc.
(建物の区分所有等に関する法律)
2. Act on Facilitation of Reconstruction of Condominiums
(マンションの建替え等の円滑化に関する法律)</td><td>1. Act on Building Unit Ownership, etc.
(建物の区分所有等に関する法律)</td><td>1. City Planning Act
(都市計画法)
2. Urban Renewal Act
(都市再開発法)</td></tr>
<tr><td rowspan="2">Organization</td><td>a-1) Forming Reconstruction Union (組合施行)</td><td>a-2) Without Reconstruction Union (個人施行)</td><td rowspan="2">1. Resolution on reconstruction based on ABUO
2. Non-participants of reconstruction sell their properties (building and land) to participants. Then participants sell the whole property to a developer, the transfer fund could be used for the purchase of the new apartment.
3. Developer reconstructs the condominium.
4. Participants of reconstruction purchase new apartment from the developer.</td><td rowspan="2">Must be integrated with legislative (re)planning of the local government</td></tr>
<tr><td>1. Resolution on reconstruction based on ABUO
2. To establish reconstruction union (RU, 建替組合)
3. Non-participants of reconstruction sell their properties (building and land) to RU, based on AFRC.
4. Property swap based on AFRC
5. RU reconstructs the condominium.
6. Participants of reconstruction move back to a new apartment.</td><td>1. Resolution on reconstruction based on ABUO
2. All property owners agree with individual executor's plan
3. Individual executor make a plan for property swap
4. Property swap
5. Individual executor reconstructs the condominium.
6. Participants of reconstruction move back to a new apartment.</td></tr>
<tr><td>Merits</td><td>1. Property right could be transferred smoothly
2. Agreement of mortgage holder is not required
3. Mandatory measures could be taken</td><td>1. Property right could be transferred smoothly
2. Agreement of mortgage holder is not required
3. More simplified formalities than reconstruction with RU</td><td>Simplified formalities</td><td>-</td></tr>
<tr><td>Demerits</td><td>Lengthy procedures according to the law</td><td>1. Must be agreed by all property owners
2. May encounter problems in the event of opponents</td><td>1. Must be agreed by mortgage holders
2. May encounter problems in the event of opponents
3. Complicated rights transferring procedures
4. Mandatory measures cannot be taken</td><td>-</td></tr>
</table>

Table 4-4 Comparison of condominium reconstruction patterns in Japan

Reconstruction utilizing AFRC as an appropriate reference model

The Act on Facilitation of Reconstruction of Condominiums (マンションの建替え等の円滑化に関する法律) was carried out in 2002, aiming to deal with several crucial problems related to condominium reconstruction including:

1) There was no concrete procedure to follow after the resolution on reconstruction has been made;

2) After the resolution, it may be hard to make a request for those who do not cooperate in promoting the subsequent reconstruction activities to sell their property, therefore hindering the project implementation;

3) The treatment of those who agree to reconstruct while do not wish to participate in the project was not clear;

4) The project implementor was not clear;

5) The preservation of homeowner's rights was not sufficient;

6) The treatment of mortgages was not guaranteed legally.

This study takes a-1) rather than a-2) and b) because under this mode, the reconstruction project could be proceeded without a 100% universal agreement, which is particularly suitable when the physical environment is in urgent need of renewal yet multiple property owners exist. Though the approval procedures could be lengthier, the reconstruction could be proceeded more smoothly since the processes have already been determined by the law, and will not encounter problems in case of opponents appear in the middle of the process.

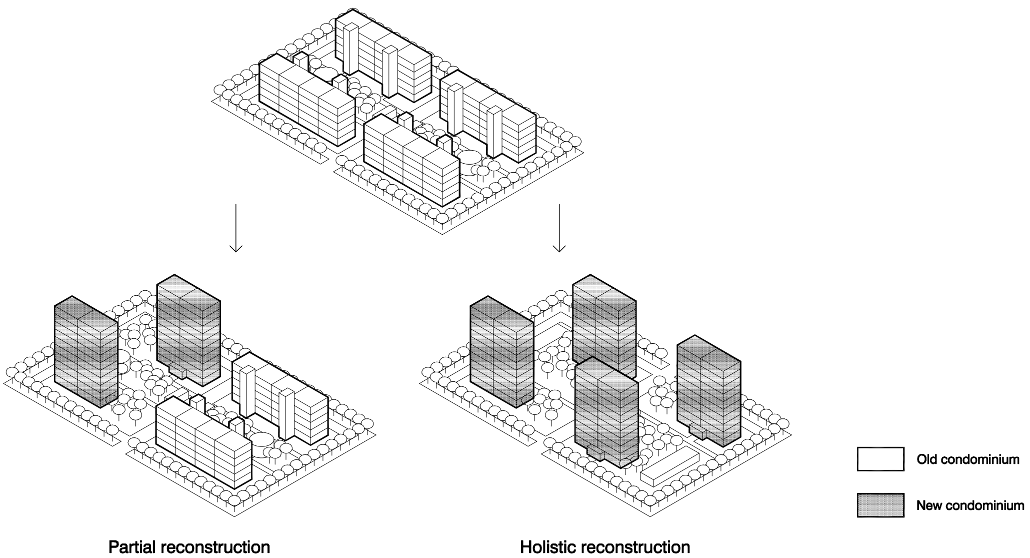

Table 4-5 Partial reconstruction and holistic reconstruction of condominium complex in Japan

Within mode a-1), the reconstruction of condominium complexes could be proceeded in two ways:
1) Partial reconstruction (棟別建替え), which is based on Act 62 and 69 of ABUO, reconstructs a certain part of the complex. 4/5 of homeowners in the reconstructed section must reach an agreement, besides, the reconstruction must be approved by 3/4 of all homeowners in the complex. This mode is suitable when: a) all or part of the apartments in the complex are outright owned by homeowners; b) the land on which the buildings to be reconstructed strands is co-owned by all homeowners in the complex.

2) Holistic reconstruction (全棟一括建替え), which is based on Act 70 of ABUO, reconstructs all the

old condominiums in a complex. 4/5 of all homeowners in the complex, or 2/3 of each building's homeowners must reach an agreement before actions are taken. This mode is suitable when: a) all apartments in the complex are outright owned by homeowners; b) the land and ancillary facilities are co-owned by all homeowners; c) the complex is collectively managed by a management association.

Applicable regions

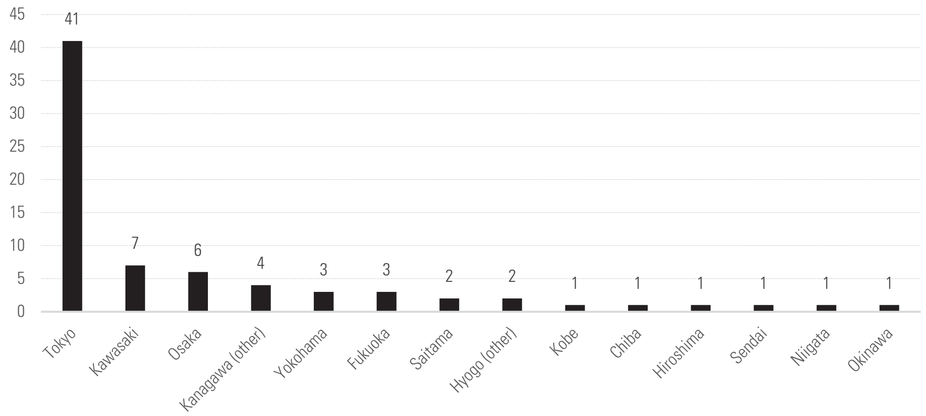

Figure 4-15 Number of completed cases utilizing AFRC in different regions of Japan

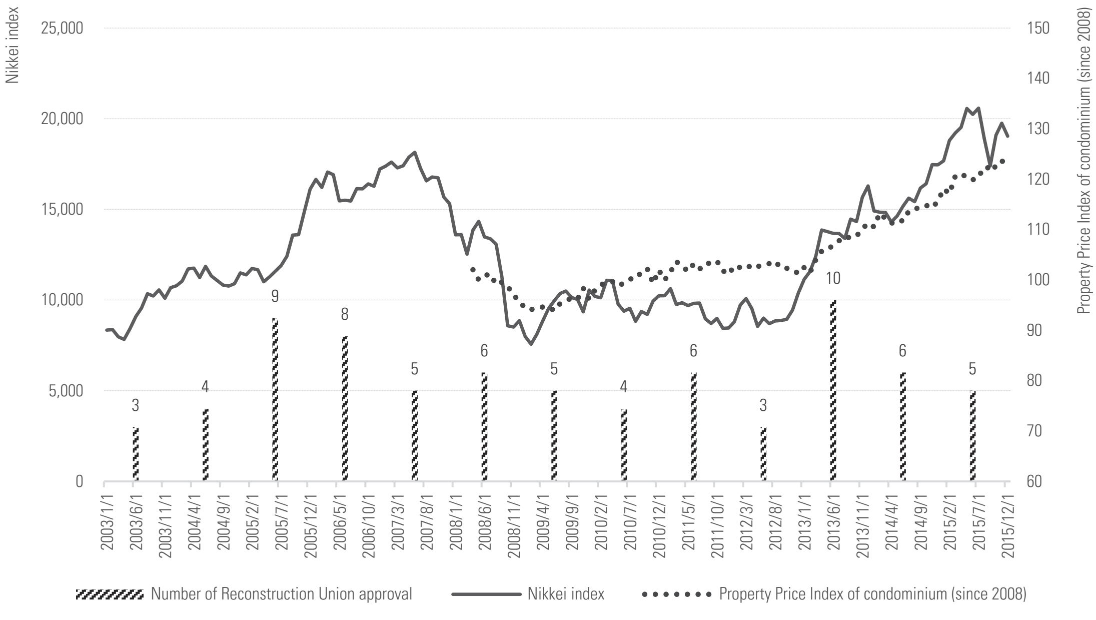

Figure 4-16 Relationship between condominium reconstruction, Japanese stock market, and real-estate market (Source: マンション再生協議会, MLIT, and Nikkei Indexes)

Most completed cases utilizing AFRC are located in major metropolitan areas in Japan, especially around Tokyo (Figure 4-15). This study takes Tokyo cases as a sample to study the Japanese reconstruction system. Besides, the number of projects approved is corelate to the market of real estate and stock. When the price of real estate and stock is rising, there were more projects approved (Figure 4-16). Accordingly, the Yangtze River Delta Area, which is one of the most developed areas in China, where new policies could always be piloted and tested, is taken as the geographic scope of this research.

4.8 Condominium reconstruction system in other Asian counties/regions

Condominium also plays a dominant role in several other Asian counties/regions' housing system such as South Korean, Hong Kong, and Singapore. The construction of condominium buildings rapidly grew with their economic development and urbanization. Correspondingly, these counties/regions have also built up a reconstruction system to deal with the increasing number of old condominium buildings. This section justifies why the Japanese system is took as a model for China mainland instead of others.

Korea also has a housing system dominated by private sector. By 2008, the total housing stock was about 13,000,000 units, among which private condominium was 6,330,000 units (49%), private row house was 210,000 units (1.6%), multi-family house was 15,000 units (0.1%), public condominium was 900,000 units (7%). Among the private condominiums, 5,680,000 was under 20 years old, 630,000 was over 20 years old.

The Korean law on condominium *Act on Ownership and Management of Condominium Buildings* is largely influenced by the Japanese ABUO law, for example both laws required 4/5 of homeowners' resolution on reconstruction.

Regarding reconstruction projects, by 2008 there has been approximately 230,000 households involved in reconstruction projects, which is nearly 23 times of the number in Japan[20]. Among the 1,440 reconstruction cases completed with a reconstruction union in Korea by 2008, the original number of 198,460 units dramatically raised to 370,459 units, and 1,072 out of 1,440 cases was in Seoul. This is because on one hand the early condominiums in Korea were mainly low-rise buildings, and it was relatively easy to increase the floor area; on the other hand there was still a shortage of housing before 2004, and the increased units in reconstruction projects has good market and increasing property value[21]. (鳴海, 2012) After 2004, the housing sufficient rate across the whole country has exceeded 100%, and the number of reconstruction projects started to decrease after 2007 due to the saturated market and the fact that not so many housing still needed to be renewed. In light of this, Korea carried out laws on reparation, renovation, and extension to prevent the degrading of old condominiums, and a remodeling project could be started with 4/5 of homeowners' agreement. Such system on remodeling is an improvement on the Japanese system it has referred to.

To summarize, the Korean condominium reconstruction system generally referred to the Japanese system. The large amount of reconstruction projects in Korea were under a different social background from Japan, with relatively higher demand for new housing in its cities. The Korean system has several improvements based on its Japanese reference, especially the remodeling system. This study will use the Japanese system—which is a more matured system that already starts to deal with issues after rapid development of real estate—as a reference for China, because the demand for new housing has decreased after years of rapid property development in most Chinese cities.

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[20] According to data revealed by MILT, there has been 11,000 households involved in reconstruction projects in Japan by 2009.10.

[21] In Seoul, 30% of the new housing supply was provided by reconstruction old condominiums.

Figure 4-17 Households by type of housing in Hong Kong (Source: Hong Kong Housing Authority and Housing Department)

Hong Kong also has a dualistic housing system, among which 70% of the housing stock is private housing (Figure 4-17). Due to the limited land available and the high population, mid-rise condominium buildings started to be built from the 1950s, today 99% people live in mid and high-rise condominiums (鳴海 et al., 2008). About 4,000 buildings are over 50 years old in the city center area and the number is still growing by 500 a year the next decade (Urban Renewal Authority, 2011). The real estate industry of Hong Kong largely influenced the rapidly growing real estate industry of China mainland.

URA (Urban Renewal Authority) was established in 2001 to work on the issue of urban decay and improve the living conditions of residents in dilapidated urban areas. And *Urban Renewal Strategy (URS)* is enacted as a government strategy, under which the urban renewal is "a comprehensive and holistic approach should be adopted to rejuvenate older urban areas by way of redevelopment, rehabilitation, revitalization and heritage preservation (the 4R business strategy)" instead of a "slash and burn" process. The URS is supposed to be jointly undertaken by URA and other stakeholders to achieve a balance among the 4R strategies.

Government plays a more important role in the Hong Kong system than in the Japanese system. According to URS, the URA will work as either "implementor" or "facilitator" in a reconstruction project. On one hand, as an implementor the URA may initiate a reconstruction project on its own, it will respond to homeowners' suggestions regarding the reconstruction of their property; on the other hand, as a facilitator URA may provide consultant help for homeowners in owner-initiated projects. The URA offers two options for homeowners affected by reconstruction project: 1) cash compensation enabling them to buy flats that are in better condition; 2) Flat-for-Flat to the domestic owner-occupiers. The strategies are comparable to the government buy-back and property swap provided in DUHR in mainland, which will be discussed in detail in Chapter 4. The establishment of URA, the role of government, as well as the options for homeowners could be worth learning for Chinese cities in dealing with the growing issue of dilapidated housing.

Figure 4-18 Private housing constructed in different eras in Hong Kong
(Upper left: tenements in Mong Kok, construction time unknown; upper right: Condominium in Mong Kok, 1960s; lower left: June Garden, 1980s; lower right: City One Shatin, 2000s; photos by author, 2011-2014)

In Hong Kong, tenements are buildings up to eight floors with two dwelling units per floor, most of them have long cantilevered balconies. The units were originally large but later illegally subdivided into small rooms and rented to poor people. Condominiums constructed in the 1960s usually have a podium on the first floor that used as shops. Low-end condominiums had central double-loaded corridor, but the most common type is the cruciform. Balconies are no longer common in condominiums as they were in tenements except for high-end developments, bay windows became common since 1980s. Then balconies came back again during 2000s, but in much smaller sizes. (Figure 4-18)

Overviewing the housing estates in Hong Kong, it could be easily observed that from a point of physical environment the Hong Kong cases may not be comparable to old residential areas in mainland except for a few cities like Shenzhen and Chongqing, due to their dramatically higher original density than old residential areas in main land China. Therefore in this research, the reconstruction of old Japanese condominium complexes (Figure 1-9, Figure 4-10), which have similar density and morphology with Chinese residential areas, will be studied.

Another Asian country whose housing system worth mentioning is Singapore, where the majority of housing are developed by the government. Around 80% of Singapore’s resident population live in HDB (Housing and Development Board) flats, the HDB is Singapore's housing authority that develops housing estates. About 90% of these residents own their home. Singapore citizens may purchase a new HDB flat at a subsidized price, the ownership of HDB flats lasts for 99 years, after which the flats must be returned to the state. Then the government redevelop the land and build new flats for future generations.

It could be observed that although the Singapore housing system is widely acknowledged successful, it may not be comparable to the Chinese housing system. Since Singapore is dominated by government subsidized HDB housing, while China is dominated by market housing. Accordingly, the housing renewal experience of Singapore is hard to be referred to for China, especially from the view of financing pattern and operation mode.

4.9 Chapter conclusion

This chapter has explained the comparability of Japanese CCR and Chinese DUHR system. To summarize, the features of Chinese economic growth and urbanization process could also be observed in Japan’s history. The land system, housing system, ownership pattern and morphology of residential areas could all be comparable to those in Japan. Then, different modes of condominium construction in Japan are examined to pick out the most appropriate Japanese model for China. Afterwards, the condominium reconstruction systems in other Asian countries/regions are also discussed to strengthen the referability of Japanese OCR for Chinese DUHR. This chapter concludes that, the Japanese condominium complex reconstruction mode utilizing AFRC forming reconstruction union could be referable for the Chinese Dilapidated Urban Housing Renovation in Yangtze River Delta Area. The applicability of Japanese experience to China will be discussed in following chapters.

Chapter 5 Identifying Problems with Chinese DUHR, Jinshou Project as a Case Study

Responding to the second research question, this chapter uses a representative case, the Jinshou Project, to illustrate the typical features of the nation-wide DUHR movement. Problems of three aspects, including financing pattern, operation mode, and improvement to physical environment are identified through case study. The analysis of financing pattern is based on statistics of project funding; for operation mode issues, semi-structured interview and documentary analysis of project report are used; field observation is adopted to examine the improvement of physical environment in old residential areas. Statistics of project funding are collected from Subdistrict Office and Bureau for Housing and Urban-rural Development (BHUD).

5.1 Introduction of Jinshou Project

5.1.1 The representativeness of Jinshou Project

The project of Building No.4 of Jinshou Residential Area (金寿新村 4 幢) in Dinghai metropolitan area, Zhoushan is selected as a typical case of DUHR in Zhejiang. The representativeness of Jinshou case lies in the fact that:

1) Current condition of the residential area: Being one of Zhoushan's first commodity housing projects, Jinshou Residential Area is a typical gated community constructed at the beginning stage of housing reform in the 1980s. Like most residential areas constructed in the same era, today it is suffering from deterioration of building structure: aside from Building No.4 which was diagnosed as Class D Dilapidated Housing, 22 other buildings in Jinshou Residential Area have been diagnosed as Class C dilapidated housing[22] (Figure 5-18).

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[22] By 2017, Building No. 2, 3, 7, 8, 9, 13, 24, 25, 40, 44, 47, 48, 51, 52, 53, 54, 57, 58, 68, 71, 75, 76 are diagnosed as Class C Dilapidated Housing.

Type	Strategy
In-situ resettlement	a) Structure reinforcement
	b) In-situ reconstruction
Relocation	c) Property swap (with local government)
	d) Government buy-back

Table 5-1 DUHR strategies provided by government

City	District	Subdistrict	Strategy adopted				Total
			a)	b)	c)	d)	
Hangzhou (2017)	Shangcheng	Nanxing	10	—	1		11
		Qingbo	2	—	—		2
		Hubin	3	1	—		4
		Ziyang	1	—	31		32
		Subtotal	16	1	32		49
	Xiacheng	Subtotal	0	5	0		5
	Jianggan	Subtotal	4	2	59		65
	Gongshu	Subtotal	1	6	0		12
	Xihu	Subtotal	2	0	0		2
Ningbo (2017)	Jiangbei	Kongpu	—	—	6		6
		Zhuangqiao	2	—	5		7
		Cicheng	1	—	2		3
		Wenjiao	—	—	2		2
		Hongtang	1	—	—		1
		Baisha	1	—	3		4
		Subtotal	5	0	18		23
Shaoxing (2017)	Yuecheng	Beihai	3	—	2		5
		Chengnan	—	—	1		1
		Tashan	1	—			1
		Fushan	10	—	1		11
		Jishan	1	—	3		4
		Subtotal	15	0	7		22
Zhoushan (2015-2017)	DInghai	Subtotal	27	0	48		75

Table 5-2 Strategies adopted in four cities in Zhejiang Province
(The locations of cities are marked on Figure 5-2)

2) Strategies adopted: Although four strategies[23] (Table 5-1) are provided by administrative files for homeowners to choose from, overviewing the practice in four cities[24] in Zhejiang Province during 2015 to 2017 (Table 5-2)[25], most projects have adopted c) and d), while b) has rarely been adopted.[26] Taking a closer look at the practice in Dinghai Metropolitan Area, strategy a) is only applied to public housing (shaded in grey in Table 5-3), which is not the focus of this research. Among the private housing projects involved (framed out in Table 5-3), only c) and d) have been adopted. The distinctiveness between private housing projects is only reflected in the proportion of homeowners who accepted c) property swap or d) government buy-back from Table 5-1. Jinshou case (No. 56 in

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[23] The four strategies are specified in administration files listed in Figure 1-5. The province level file noted that strategies including structure reinforcement, in-situ reconstruction, government buy-back, etc. could be adopted in DUHR projects. (…三、政策措施：（二）明确治理改造方式。城镇危旧住宅房屋治理改造应当优先采取以项目形式的成片改造方式，也可以采用维修加固、拆除重建或者回购处置等单独改造方式。…) The municipality level file specified that the renewal of single dilapidated building could adopt structure reinforcement, in-situ reconstruction, property swap, and government buy-back. (…四、主要任务：…（二）明确治理改造方式，分类推进改造工作：…2.单幢危房改造根据评估结果采取维修加固、拆除重建、异地置换或者回购处置方式进行改造。…) The district level file specified the same strategies with the municipality level file. (…第七章 改造方式：…第三十一条…危旧房改造可以采取维修加固和房屋征收方式。…实施房屋征收的，可采取原地重建、异地置换、货币补偿等三种主要方式。…).

[24] Hangzhou is the capital city of Zhejiang Province, with a population of 8,700,373 (2010). Ningbo is the second largest city in Zhejiang Province, with a population of 7605689 (2010). Shaoxing is a prefecture-level city in Zhejiang Province, with a population of 4912239 (2010). Zhoushan is a prefecture-level city in Zhejiang Province, with a population of 1121261 (2010).

[25] The data of Hangzhou, Ningbo, and Shaoxing listed in Table 2-2 for comparing are collected and reorganize from the Office for Dilapidated Housing Renewal of Hangzhou, and Bureau for Housing and Urban-rural Development of Ningbo and Shaoxing, extracted from database of Renewal Strategy for Urban Dilapidated Housing. The data has also been cross referred to aggregate data from Department of Housing and Urban-rural Development of Zhejiang Province. Samples of the original data are shown in the table below:

Location	Structure	Strategy	Time
…	…	…	…
方山头 26 号 1-4 幢	砖混结构	异地置换、回购处置	2017.05
卸紫桥 9 号	砖混结构	维修加固	2017.05
中学弄 14 号 3 幢	砖混结构	异地置换、回购处置	2017.05
五里塘路 73 号	砖混结构	异地置换、回购处置	2017.05
区工商所宿舍	砖混结构	维修加固	2017.05
…	…	…	…

[26] Nonetheless, there are also exceptions. In Yuecheng District of Shaoxing, the marketized OCR mode has taking a dominant role in redeveloping the old city area. Among the 22 remaining Class D dilapidated housing, 15 of them adopted a), 7 of them adopted c) and d).

Table 5-3) is first[27] one of the 75 DUHR projects to be completed in Dinghai metropolitan area in the three-year DUHR plan according to government files. 38 out of 40 homeowners accepted property swap with local government, and 2 homeowners sold their property to the government.

No.	Location	Strategy				No.	Location	Strategy				No.	Location	Strategy			
		a)	b)	c)	d)			a)	b)	c)	d)			a)	b)	c)	d)
01	Changdong No. 46			○	○	26	Furong Aly. No. 5			○	○	51	Huanchengnan Rd. No. 99			○	○
02	Dongguan No. 138			○	○	27	Furong Aly. No. 7, 9			○	○	52	Renminnan Rd. No. 69, 77			○	○
03	Dongguan No. 141			○	○	28	Zhujia Aly. No. 27	○				53	Yingjuyuan Rd. No. 54			○	○
04	Wengshan No. 6			○	○	29	Chaishui Aly. No. 4	○				54	Penglai Rd. No. 111			○	○
05	Donggang No. 19-12			○	○	30	Chaishui Aly. No. 10	○				55	Yangangxi Rd. 59			○	○
06	Xiyuan No. 29			○	○	31	Chaishui Aly. No. 13	○				56	Jinshou No. 4			○	○
07	Qingleitou Rd. No. 89-3			○	○	32	Chaishui Aly. No. 15	○				57	Changguolu No. 1 to 3			○	○
08	Aaoshan No. 14			○	○	33	Chaishui Aly. No. 22	○				58	Changguolu No. 4 to 6			○	○
09	Changguo Rd. No. 27			○		34	Chaishui Aly. No. 25	○				59	Juyuannan No. 28			○	○
10	Changguo Rd. No. 29			○		35	Chaishui Aly. No. 9	○				60	Juyuannan No. 28			○	○
11	Baihushan Rd. No. 4-6			○	○	36	Chaishui Aly. No. 17	○				61	Weihai Rd. 155			○	○
12	Xiguanmiao No. 17			○	○	37	Chaishui Aly. No. 27	○				62	Xiyuan No. 70			○	○
13	Xiguanmiao No. 3			○	○	38	Chaishui Aly. No. 29	○				63	Xiyuan No. 79			○	○
14	Xiguanmiao No. 16			○	○	39	Chaishui Aly. No. 14	○				64	Dongyuan No. 25			○	○
15	Changdong No. 1			○	○	40	Chaishui Aly. No. 35	○				65	Dongyuan No. 18			○	○
16	Haishi Rd. No. 22			○	○	41	Jiangjunqiaoxia No. 16	○				66	Shengjiatang No. 14			○	○
17	Gujiaqiao No. 11			○	○	42	Zuojiaochenggen No. 33	○				67	Xiguan No. 11			○	○
18	Haishan Rd. No. 50			○	○	43	Sangyuan Aly. No. 39	○				68	Donghai Aly. No. 31	○			
19	Xiguan No. 5			○	○	44	Sangyuan Aly. No. 10			○	○	69	Hechang Aly. No. 27-3			○	○
20	Dongdajie No. 131	○				45	Jianguo Rd. No. 44			○	○	70	Liufang Rd. No. 8	○			
21	Randian Aly. No. 16	○				46	Sangyuan Aly. No. 23			○	○	71	Dazhong Rd. No. 12 to 13	○			
22	Dongguanmiao No. 36			○	○	47	Sangyuan Aly. No. 11			○	○	72	Dazhong Rd. No. 10	○			
23	Dongdajie No. 119	○				48	Changdong No. 9			○	○	73	Shizhu Aly. No. 33	○			
24	Dongdajie No. 135, 137	○				49	Changdong Rd. No. 8			○	○	74	Shizhu Aly. No. 9-2	○			
25	Dongdajie No. 37			○		50	Dongguan No. 146-148			○	○	75	Shizhu Aly. No. 9-1	○			

Table 5-3 Strategies adopted in 75 DUHR projects in Dinghai

5.1.2 Project background

Accommodating 2315 dwelling units, the Jinshou Residential Area is located at the northeast corner

[27] The dilapidated housing issue of Jinshou No.4 building had been reported many times in local news before 2015. Therefore local government had a strong will to deal with No.4 building as soon as the DUHR movement is carried out. And this case is implemented as a pilot project to show the virtues of DUHR.

of Dinghai metropolitan area, Zhoushan. During Tang Dynasty (AD 738), Wengshan County (翁山县) was already set up with an area of 0.8 km². Since then Dinghai had become the political, economic, cultural, transportation and military center of Zhoushan. In Ming Dynasty (19th year of Hongwu), maritime trade was banned and the city was abandoned. Then imperial court of Qing Dynasty (27th year of Kangxi) redeveloped Zhoushan and the city of Dinghai was rebuilt, with local government set there. Dinghai City in the Qing Dynasty is centered on the Zhuangyuan Bridge (状元桥), which could also be read on maps from Republican era (Figure 5-1).

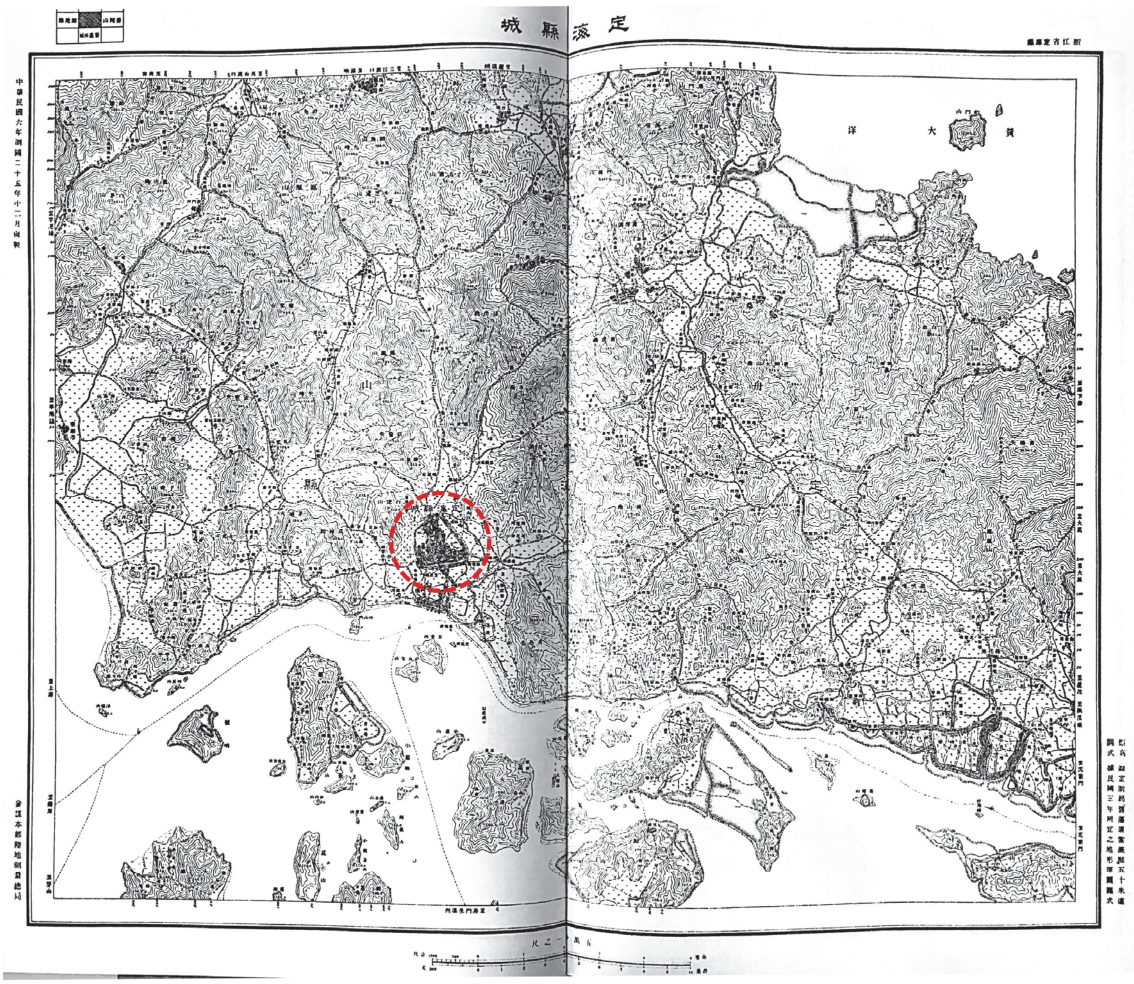


Figure 5-1 Map of Dinghai City, Republican era (Source: Qian, 2013)

The development of Dinghai was rather slow before the Economic Reform, and the built-up area was still around 1 km² before 1978. After Economic Reform, several residential area projects were started by local government and the urban area expanded rapidly. After 2000, the city sprawled on four directions based on the old city area. Today the built-up area has reached the surrounding mountains, with an area of 12 km² (Figure 5-2) and a population of 305,761 (2010). At present the population of Zhoushan is still growing due to the rapid economic growth in Yangtze Delta Region.

Census Year	Total population / growth rate		Total households / growth rate	
1990	976,132	-	302,500	-
2000	1,001,530	2.60%	360,700	19.24%
2010	1,121,261	11.95%	454,800	26.09%

Table 5-4 Population of Dinghai (1990, 2000, 2010 census)

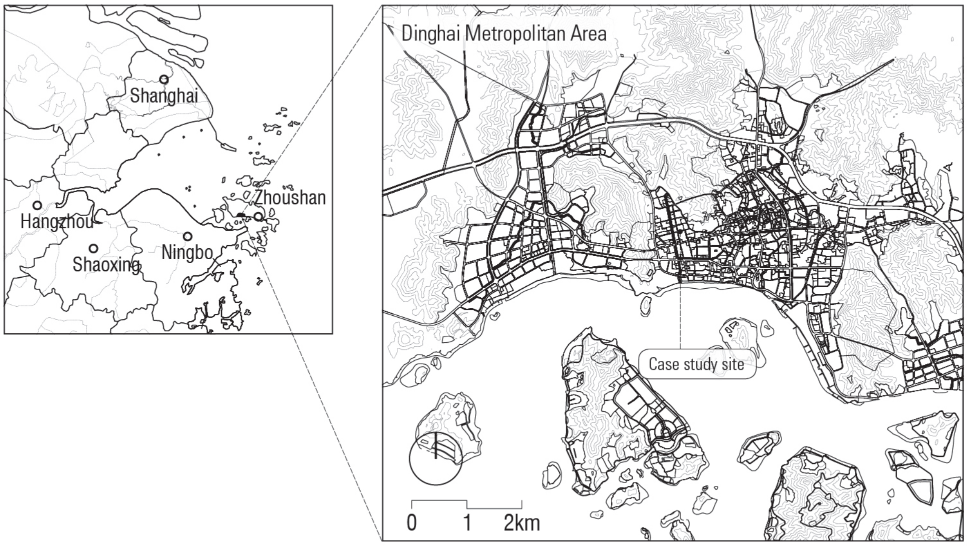
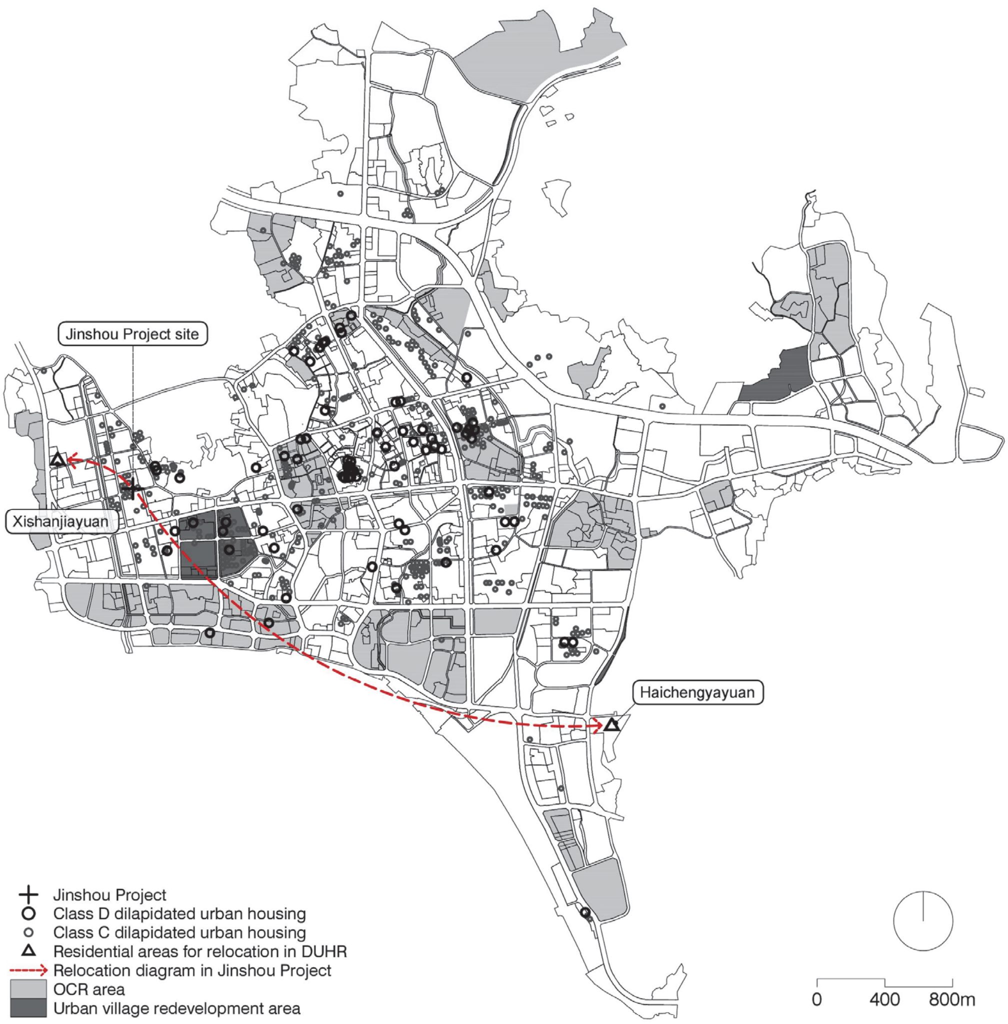


Figure 5-2 Location of Dinghai metropolitan area and case study project

The Jinshou Project site is excluded from local government's OCR scheme (Figure 5-3). Building No.4 was completed in 1987, with brick-masonry structure, 5 storeys, and a total floor area of 2,500 m² (Figure 5-4). The building partly collapsed twice in 2012, and residents were evacuated since then. Because there was no practicable mode to cope with Class D Dilapidated Housing, no substantial measures were taken before the DUHR movement carried out in 2015. In 2016, the No.4 building was finally demolished and transformed into a community parking lot (Figure 5-6).



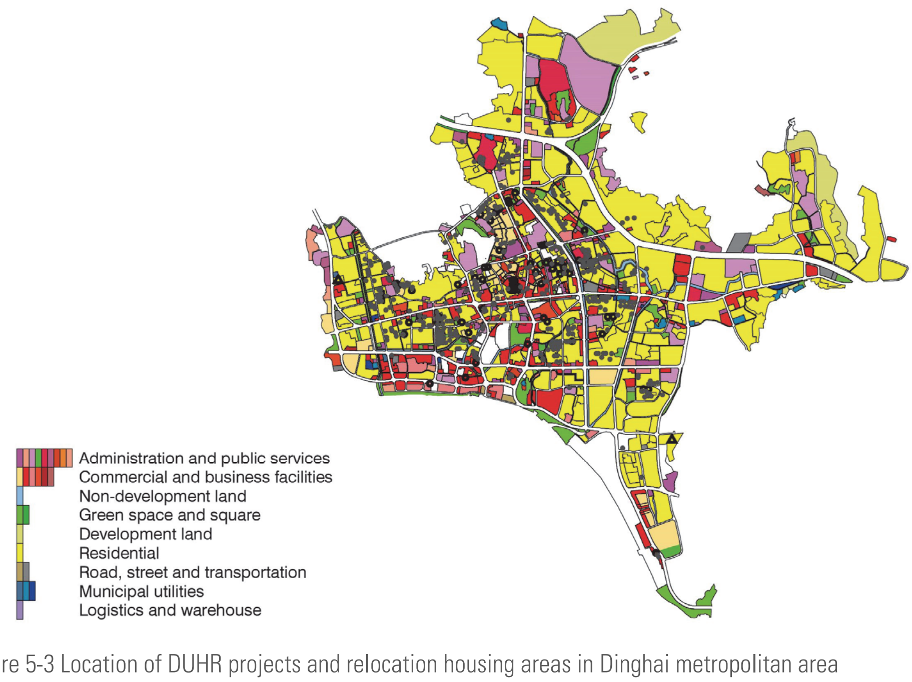


Figure 5-3 Location of DUHR projects and relocation housing areas in Dinghai metropolitan area (upper: overlapped with OCR areas; lower: overlapped with land zoning)

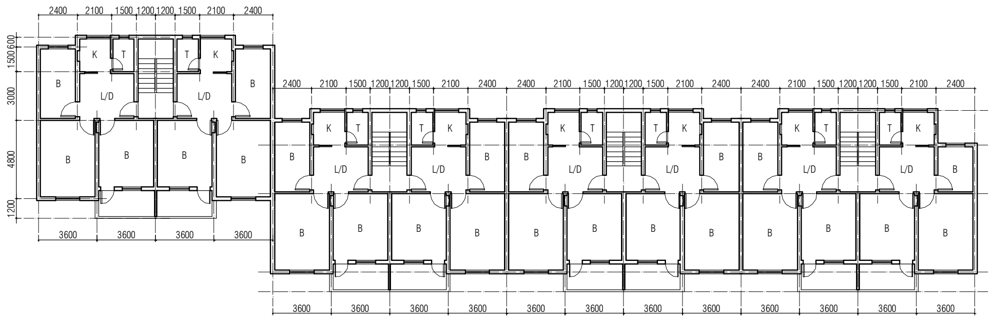


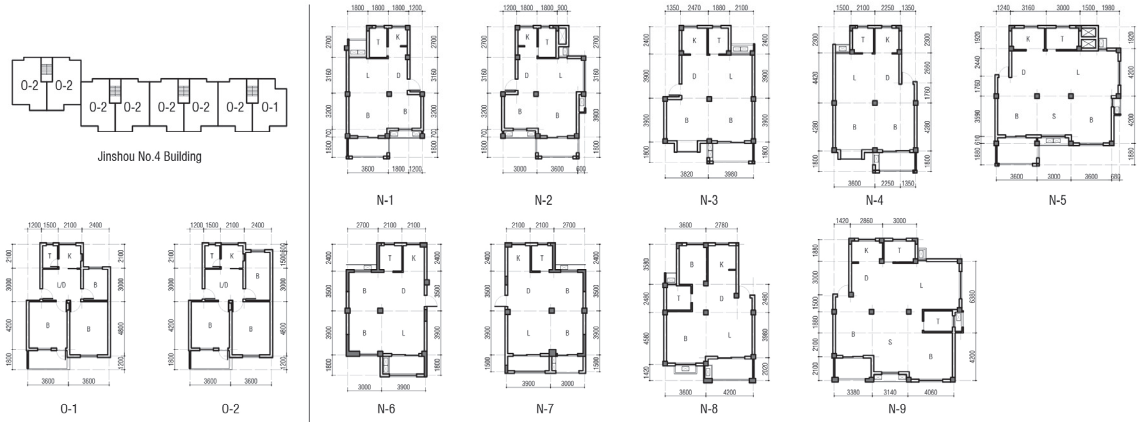
Figure 5-4 Typical floor plan of Building No.4

Figure 5-5 Typical commodity housing and public housing project involved in DUHR in Dinghai Metropolitan Area (Left: Jinshou Residential Area; right: Zuojiaochenggen Housing; photos by author, 2016)

Figure 5-6 Jinshou No. 4 Building under reconstruction (left, source: BHUD) and new parking lot replacing old Building No. 4 (right, photo by author, 2018)

5.2 Financing pattern in Jinshou case study

5.2.1 Expenses in Jinshou Project



Old apartment layouts, Masonry structure
Based on measurement of adjacent buildings

New apartment layouts, RC frame structure
Collected from Bureau for Urban Planning of Zhoushan

Unit No.	Type and floor area		a	b		c	d	e	f	a+c+d+e+f-(b1-b2)
	Old apartment (m^2)	New apartment (m^2)	Appraisal of old apartment (CNY)	Price gap paid b1 by property owner (CNY)	b2 by government (CNY)	Compensation for interior finishing and ancillary facilities of old apartment (CNY)	Reward for contract sign-up (CNY)	Compensation for temporary settlement (CNY)	Compensation for relocation (CNY)	Total government expense (CNY)
Part 1. Property swap with local government (38 households)										
A-01	O-1 (54.72)	N-1 (61.13)	578,390	158,594		54,419	21,888	9,576		506,329
A-02	O-2 (65.08)	N-2 (63.99)	687,896	5,192		75,856	26,032	11,389		796,631
A-04	O-2 (65.08)	N-2 (63.99)	691,150		6,730	41,928	26,032	11,389		777,879
A-05	O-1 (54.72)	N-3 (78.41)	583,862	385,702		66,715	21,888	9,576		296,989
A-06	O-2 (65.08)	N-4 (80.94)	694,404	232,000		45,052	26,032	11,389		545,527
A-07	O-1 (54.72)	N-5 (100.83)	575,654	623,623		41,881	21,888	9,576		26,026
A-08	O-2 (65.08)	N-5 (100.83)	684,642	518,274		91,227	26,032	11,389		295,666
A-09	O-1 (54.72)	N-2 (63.99)	567,446	138,945		40,010	21,888	9,576		500,625
A-10	O-2 (65.08)	N-1 (61.13)	674,880	56,628		53,938	26,032	11,389		710,261
B-01	O-2 (64.01)	N-2 (63.99)	676,586	19,613		49,677	25,604	11,202		744,106
B-02	O-2 (64.01)	N-1 (61.13)	676,586		32,846	65,482	25,604	11,202		812,370
B-03	O-2 (64.01)	N-3 (78.41)	679,786	229,744		40,296	25,604	11,202		527,794
B-04	O-2 (64.01)	N-4 (80.94)	679,786	249,082		67,612	25,604	11,202		535,772
B-05	O-2 (64.01)	N-3 (78.41)	682,987	219,315		93,151	25,604	11,202		594,279
B-06	O-2 (64.01)	N-5 (100.83)	682,987	483,286		86,111	25,604	11,202		323,268
B-07	O-2 (64.01)	N-4 (80.94)	673,385	250,877		54,888	25,604	11,202		514,852
B-09	O-2 (64.01)	N-3 (78.41)	663,784	240,348		63,496	25,604	11,202		524,388
B-10	O-2 (64.01)	N-1 (61.13)	663,784		8,264	43,211	25,604	11,202		752,715
C-01	O-2 (64.01)	N-2 (63.99)	676,586	6,254		51,889	25,604	11,202	650	759,677
C-02	O-2 (64.01)	N-6 (88.19)	676,586	256,868		78,121	25,604	11,202		535,295
C-03	O-2 (64.01)	N-1 (61.13)	679,786	4,786		77,848	25,604	11,202		790,304
C-04	O-2 (64.01)	N-8 (82.17)	679,786	178,730		51,379	25,604	11,202		589,891
C-05	O-2 (64.01)	N-4 (80.94)	682,987	219,976		62,188	25,604	11,202		562,655
C-06	O-2 (64.01)	N-4 (80.94)	682,987	259,594		63,050	25,604	11,202		523,899
C-07	O-2 (64.01)	N-4 (81.02)	673,385	224,121		53,790	25,604	11,202		540,510
C-08	O-2 (64.01)	N-9 (122.97)	673,385	713,254		59,011	25,604	11,202		56,598
C-09	O-2 (64.01)	N-4 (81.02)	663,784	270,823		70,360	25,604	11,202		500,777
C-10	O-2 (64.01)	N-3 (78.41)	663,784	215,776		76,896	25,604	11,202		562,360
D-01	O-2 (69.15)	N-2 (63.99)	730,916		100,171	60,518	27,660	12,101		932,016
D-02	O-2 (69.57)	N-7 (88.6)	735,355	188,597		56,224	27,828	12,175		643,635
D-03	O-2 (69.15)	N-4 (80.94)	734,373	206,502		61,413	27,660	12,101		629,695
D-04	O-2 (69.57)	N-3 (78.41)	738,833	149,945		58,943	27,828	12,175		688,484
D-05	O-2 (69.15)	N-3 (78.41)	737,831	138,270		43,316	27,660	12,101		683,288
D-06	O-2 (69.57)	N-4 (80.94)	742,312	178,525		61,758	27,828	12,175		666,198
D-07	O-2 (69.15)	N-3 (78.41)	727,458	264,528		51,956	27,660	12,101		555,297
D-08	O-2 (69.57)	N-1 (61.13)	731,876		89,763	80,403	27,828	12,175		942,695
D-09	O-2 (69.15)	N-1 (61.13)	717,086		55,158	56,388	27,660	12,101		869,043
D-10	O-2 (69.57)	N-4 (80.94)	721,441	198,461		45,097	27,828	12,175		608,730
Subtotal 1			25,888,532	7,486,233	292,932	2,295,498	981,628	429,467	24,700	22,426,524
Part 2. Government buy-back (2 households)										
A-03	O-2 (65.08)	—	691,150	—	—	41,435	26,032	—	650	759,267
B-08	O-2 (64.01)	—	673,385	—	—	57,095	25,604	—		756,734
Subtotal 2			1,364,535			98,530	51,636		1,300	1,516,001
Grand total	—	—	27,253,067	7,486,233	292,932	2,394,028	1,033,264	429,467	26,000	23,942,525

Figure 5-7 Expenses statement and layouts of apartments in Jinshou Project

In Jinshou Project, for 2 homeowners sold their property to local government, the government acquisition price is based on appraisal of old property (Figure 5-7, row A-03 and B-08 in lower table). Though the old building could not be resided anymore, government appraisal 10,620 CNY/m² was close to the second-hand house price in nearby areas, which was around 12,000 CNY/m².

For property swap, two residential areas located on the fringe of Dinghai metropolitan area were constructed by local government in advance, specially for relocation households in OCR and DUHR (△ in Figure 5-3). New apartment layouts (Figure 5-7, upper right) of four standards (60 m², 80 m², 100 m², and 120 m²) was provided for homeowners to select from. The price gap between old and new apartment was paid in the form of money (Figure 5-7, column b). Besides, homeowners received reward for prompt contract signing, as well as compensation for interior finishing and ancillary facilities, temporary settlement, and relocation (Figure 5-7, column c, d, e). An equivalent number of 24 million CNY (Fig. 5, last row "Grand total") was spent by local government, in the form of property (new apartments) and money.

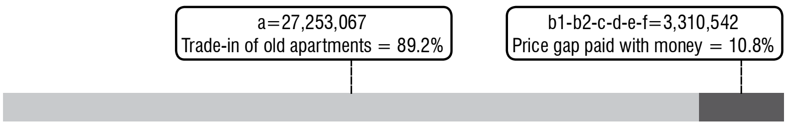


Figure 5-8 Constitution of homeowners' cost for a new apartment in Jinshou Project
(calculated based on "Grand total" row in Figure 5-7)

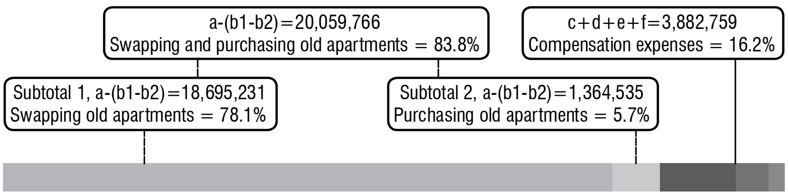


Figure 5-9 Constitution of government's cost in Jinshou Project
(calculated based on "Grand total" row in Figure 5-7)

From homeowners' perspective, 89.2% of the cost to get a new apartment was offset by their old apartment and government voluntary compensations, and only 10.8% were paid in the form of money (calculation shown in Figure 5-8). From local government's perspective, 83.8% of their cost was used to exchange or purchase the old apartments from homeowners, both in the form of new apartment trade-in or money (calculation shown in Figure 5-9).

Figure 5-10 Distance between Building No. 4 and adjacent buildings

Because the limited government funding is only enough to tackle Class D buildings, other classes could only be monitored regularly by the government at the moment. On the other hand, the distance between building No.4 and the closest building to it is 5.8m (Figure 5-10). Considering the condition of building foundation of adjacent buildings, it is technically infeasible to construct new apartment building on the site. Consequently, the old building and land that government has acquired is impossible to be redeveloped[28]. In this case the old building was transformed into a parking lot to relieve the parking pressure in Jinshou residential area.

5.2.2 Discussions on financing pattern of DUHR

Through clarifying the financing pattern in Jinshou case study, it could be concluded that government appropriation is the key in current DUHR projects. And economic foundation is also believed to be the key point in the success of current DUHR mode by local government:

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[28] Such close distance between buildings and bad condition of building foundation could be observed in many residential areas of the 1980s.

'*In the past, although we could diagnose the damage level of dilapidated housing and classify them into four classes, we were not able to get rid of them due to the lack of fund. All we could do is to evacuate residents in severely damaged buildings, or spend some money reinforcing them. Now with fund given by the government, not only can we reinforce or reconstruct, we can also carry out property swap and government buy-back. The fund is enough to tackle with all the diagnosed Class D buildings in Dinghai Metropolitan Area.*' (Director, Bureau for Housing and Urban-rural Development of Zhoushan)

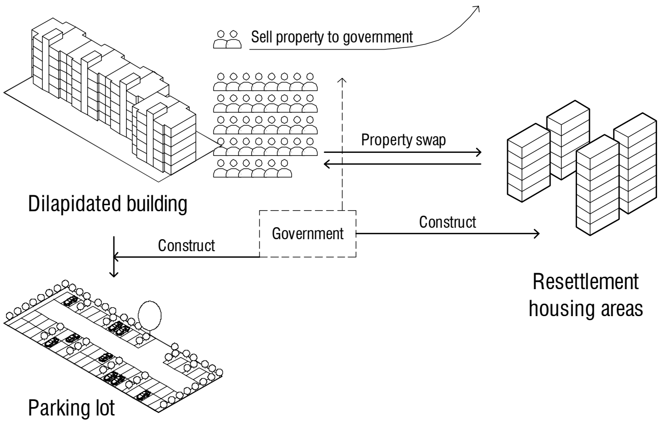

Figure 5-11 Summary of financing pattern in Jinshou Project

This mode is isolated from the market and completely relies on government funding. The major part of government expense is used to purchase or exchange the dilapidated properties from homeowners, with a minor part used as subsidy and incitation. Since the DUHR funding comes from upper-level administrative appropriation, local government finance, and bank loans, such financing pattern would lay a heavy burden on different levels of government. With limited fund, only a small part of dilapidated urban housing, i.e. Class D, could be involved, while no essential measure could be taken for other classes. And local government also take limited fund as the biggest issue in DUHR:

'*The biggest issue we have now is also fund related. Since the fund is limited, sometimes we have to proceed the projects one by one, and let homeowners wait in line. Besides, the fund could mainly be used on Class D buildings, while for other dilapidated buildings which are also in danger, we cannot do so much.*' (Vice director, Bureau for Housing and Urban-rural Development of Dinghai District)

Local government could not retrieve their investment, because the single dilapidated buildings and land they acquired from homeowners could hardly be sold or redeveloped. (Figure 5-11) The amount of appropriation is hard to be kept at a steady level in China, so DUHR's capability to meet the increasing need for renewal is in question. Commenting on the sustainability of DUHR's financing pattern, the officer in charge of the DUHR in Dinghai District also acknowledged his concern: '*PSL*[29] *covers the majority of fund resource, local government is able to lend more money from the bank to support urban renewal related projects. We cannot guarantee the DUHR mode will continue to proceed smoothly like now, because the damage level of dilapidated housing is unpredictable, and there is indeed uncertainty in the fund source. The fund source issue is out of our concern at our position, what we do is to involve as many dilapidated housing as possible, not only private housing, but also public housing managed by the city, while the fund is still sufficient.*' (Vice director, Bureau for Housing and Urban-rural Development of Dinghai District)

Considering the similarities in terms of strategies adopted in DUHR movement in different areas in Zhejiang Province (as stated in Section 5.1.1), many cities—e.g. Shangcheng District, Jianggan District of Hangzhou, Jiangbei District of Ningbo—will encounter the same problem as in Dinghai District of Zhoushan. Besides, the whole country is following the same administration files, while such financing pattern problems will bring severer consequences in regions that are economically less developed than Zhejiang Province. Since the currently diagnosed class D buildings are just a small part of potential buildings that needs to be renewed or reconstructed[30], more sustainable financing pattern—with which the government's cost could be retrieved—needs to be explored in further studies.

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[29] The PSL (Pledged Supplementary Lending) is a monetary policy carried out by the People's Bank of China to stimulate the economy by boost bank lending. Its mechanism is a lending facility, under which banks are given loans by the central bank for relending. Compared with conventional policies like lowering of interest rate, the PSL is more targeted for providing loans in urban renewal projects.

[30] Take Dinghai Metropolitan Area for example, by 2017, aside from 75 diagnosed Class D Dilapidated Buildings, 465 buildings are diagnosed as Class C Dilapidated Building (Figure 5-3), which are also in urgent need of renewal. Besides, the emerging of newly diagnosed dilapidated building is unpredictable.

Local government should not take full responsibility for the problems identified, since the problems to a larger extent originated from the DUHR mechanism, which has led to the dominance of property swap and government buy-back. From the perspective of financing pattern, one of the solutions could be to include surrounding land and buildings in a project, so that the land that local government has acquired could be redeveloped to balance costs. And this solution should be studied together with the marketability of project location, since DUHR projects does not have the best location as in OCR projects. However, current DUHR mechanism does not allow for such solution, so the mechanism needs to be carefully remodeled.

5.3 Operation mode in Jinshou Project

In order to examine the operation mode of DUHR, the overall procedures of Jinshou Project is first clarified using progress reports of Changguo Subdistrict office, archival project records from the Bureau for Housing and Urban-rural Development in Dinghai District, and reports of local media.

No.	Content
2.1	Original intention at the beginning of the project, reasons
2.2	Main reasons of choosing property swap as a final decision
2.3	Opinion on the fixed menu given by government
2.4	Opinion on the duration of decision-making process
2.5	Necessity of holding general meetings to discuss the selection of strategy
2.6	Whether or not tried to negotiate with local government, after the consultation meeting, before contract signing
2.7	Necessity of third-party professional guidance, reasons
3	Connection with the urban environment, Access control system, Public security, Parking space, Management of illegal building, Public space, Floor area and layout of old property, Neighborhood harmony

Table 5-5 Main questions in second and third part of the questionnaire

<table>
<tr><th colspan="3">Total household in Building No.4</th></tr>
<tr><td colspan="3">40</td></tr>
<tr><th colspan="2">Household selected property swap</th><th>Household selected government buy-back</th></tr>
<tr><td colspan="2">38</td><td rowspan="3">2</td></tr>
<tr><th>Relocated to Xishanjiayuan</th><th>Relocated to Haichengyayuan</th></tr>
<tr><td>36</td><td>2</td></tr>
<tr><th colspan="3">Household investigated by questionnaire</th></tr>
<tr><td>19</td><td>2</td><td>-</td></tr>
</table>

Table 5-6 Questionnaire sampling

<table>
<tr><td rowspan="2">Gender</td><td colspan="4">Male</td><td colspan="4">Female</td></tr>
<tr><td colspan="4">12 (57.1%)</td><td colspan="4">9 (42.9%)</td></tr>
<tr><td rowspan="2">Age</td><td colspan="2">30-40</td><td colspan="2">40-55</td><td colspan="2">55-65</td><td colspan="2">Above 65</td></tr>
<tr><td colspan="2">3 (14.3%)</td><td colspan="2">9 (42.9%)</td><td colspan="2">7 (33.3%)</td><td colspan="2">2 (9.5%)</td></tr>
<tr><td rowspan="2">Occupation</td><td>Worker</td><td>Service industry</td><td>Employee</td><td>Professional and technical</td><td>Businessman</td><td>Farming, forestry, animal husbandry, and fishery</td><td>Retired</td><td rowspan="2">-</td></tr>
<tr><td>3 (14.3%)</td><td>3 (14.3%)</td><td>2 (9.5%)</td><td>2 (9.5%)</td><td>2 (9.5%)</td><td>1 (4.8%)</td><td>8 (38.1%)</td></tr>
<tr><td rowspan="2">Personal monthly income (CNY)</td><td>500-1,500</td><td>1,500-3,000</td><td>3,000-5,000</td><td>5,000-10,000</td><td>Above 10,000</td><td colspan="3" rowspan="2">-</td></tr>
<tr><td>1 (4.8%)</td><td>4 (19.0%)</td><td>5 (23.8%)</td><td>9 (42.9%)</td><td>2 (9.5%)</td></tr>
<tr><td rowspan="2">Move-in year</td><td colspan="2">Before 1990</td><td colspan="2">1990-1994</td><td colspan="2">1995-2009</td><td colspan="2">2000-2005</td></tr>
<tr><td colspan="2">6 (28.6%)</td><td colspan="2">8 (38.1%)</td><td colspan="2">3 (14.3%)</td><td colspan="2">4 (19.0%)</td></tr>
<tr><td rowspan="2">Usage</td><td colspan="2">Self-occupied</td><td colspan="2">Rent</td><td colspan="2">Vacant</td><td colspan="2" rowspan="2">-</td></tr>
<tr><td colspan="2">17 (81.0%)</td><td colspan="2">3 (14.3%)</td><td colspan="2">1 (4.8%)</td></tr>
<tr><td rowspan="2">Other property in Zhoushan</td><td colspan="4">Yes</td><td colspan="4">No</td></tr>
<tr><td colspan="4">5 (23.8%)</td><td colspan="4">17 (76.2%)</td></tr>
</table>

Table 5-7 Socioeconomic condition of respondents

Next, questionnaire is applied to homeowners to examine their decision-making factors in the project. Questions consist of three parts: the first part collects basic information including age, sex, family structure, occupation, work place, income, start year of dwelling in Jinshou Residential Area, original use of old property, and possession of other property in the district; the second part investigates homeowners' decision making process; the third part looks into homeowners' evaluation of the living environment in Jinshou Residential Area and new relocation residential area (Table 5-5).[31] A short introduction about intention of the questionnaire is first made to respondents, then respondents' answers are recorded by the investigator on the questionnaire sheet, so that there is no blank answer. The sampling of investigation is shown in Table 5-6, with respondents' socioeconomic condition shown in Table 5-7.

Then semi-structured interview is applied as a supplementary to questionnaire, to better examine the forces that shape the decision-making and the roles of different players in the project. On one hand, interviews with government officers focuses on their attitudes and opinions towards DUHR operation mode; on the other hand, interviews with homeowners attempt to acquire a fuller understanding of their decision making in the project.[32]

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31 The original questionnaire is attached in Appendix.

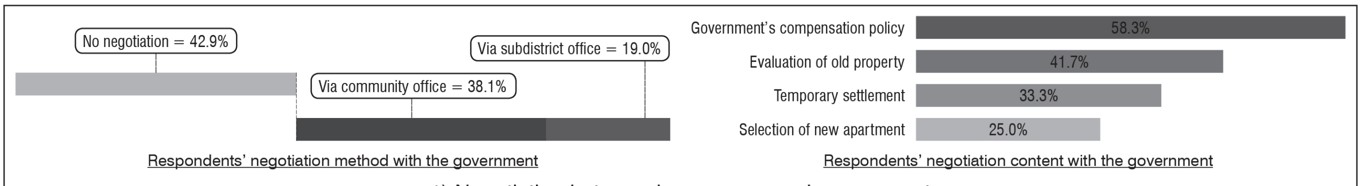
32 Interviewee list and main questions is attached in Appendix.

5.3.1 Processes of Jinshou Project

In 2012.09, having lived with the structural damage of the building (cracks due to inclination) for some time, the homeowners of Building No. 4 applied for appraisal of dilapidated building to the Building Appraisal Committee (舟山市房屋鉴定委员会), at an expense of approximately 10,000 CNY. By November, they have received appraisal report on structure safety, which says the buildings was suffering from many and wide settlement cracks in the longitudinal external wall of the building, exposed and rusted iron bar in the concrete column on the corner of the building and in the beams at eaves and stairs, crack and deformation of cantilevered stair, and displacement of prefabricated floor. The building was inclined to the east direction, at a maximum inclination rate of 17.2‰, which exceeds the limit in *Standard of Dangerous Building Appraisal (《危险房屋鉴定标准》)*, according to which the building was diagnosed as a Class D Dilapidated Building. Hence it was recommended to evacuate and demolish immediately.

However, the original developer of the residential area has been cancelled, and there was no mature way of reconstruction approved by the government, residents could only choose to stay or move to other places on their own. The Jinshou community office reported this situation to Changguo Subdistrict, then the subdistrict funded a reparation work including structural reinforcement of the stairs, and adding perimeter guardrail to prevent other residents getting hurt by bricks falling from the building. Building No. 4 partly collapsed twice on 19 December 2012, and residents were forced to evacuated since then. Because there was no reliable mode to cope with Class D Dilapidated Housing, no substantial measures were taken before the DUHR Movement carried out in 2015.

After the nation level file *Guiding Opinions of the General Office of the State Council on Redevelopment of Shanty Areas and Dilapidated Buildings and Improving Supporting Facilities (《国务院关于进一步做好城镇棚户区和城乡危房改造及配套基础设施建设有关工作的意见》)* was carried out in June 2015, and the district level file *Implementation Measures of Dinghai District on Renovating Urban Dilapidated Housing (《定海区城镇危旧住宅改造工作实施办法》)* was accordingly carried out in November 2015 (Figure 1-5), substantive measures could finally be taken to dilapidated buildings. The whole project process could be divided into four stages (Figure 5-12):



1) Negotiation between homeowner and government

2) Schedule of Jinshou Project

H Homeowner | C Community office | S Subdistrict office | B Bureau for Housing and Urban-rural Development

2012.09 H
Evaluation of building's dilapidated degree

2012.12 S B H
Vacation of residents (due to partial collapse)

Building No.4 before demolition (residents already evacuated)

2016.01
DUHR guidelines for Dinghai District carried out

2016.03.08 - 03.09 H S B C
Opinion consultation meeting, resolution on renewal strategy

Consultation meeting on 9 March 2016 (Source: community office)

2016.05.11 - 05.29 H S B C
Contract signing

Contract signing at community office (Source: community office)

2016.05.19 H S B C
Lots drawing for priority to select desired new apartment

2016.06 - H
Moving out and resettlement

Lots drawing at community office (Source: community office)

Interior finish work in one of the new apartments in Xishanjiayuan

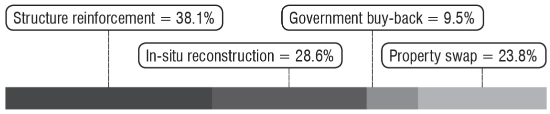
2016.06.20 - 07.20 S B
Demolition of old building

2016.09.10 - 11.04 S B
Construction of parking lot

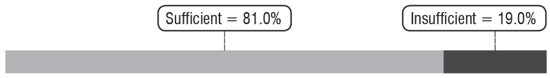
Building No.4 under demolition (upper) and new parking lot completed (lower)

3) Summary of two consultation meetings

Date & Time	Agenda	Content
2016.03.08 09:30- 12:30	1) Have the homeowners understand the new DUHR policy could be adopted to Building No. 4, and the difference between government voluntary DUHR and marketized OCR	Officers from BHUD first conveyed the DUHR renewal policies to the homeowners, emphasized that unlike the OCR from which original homeowners may usually get very high compensation, the DUHR mode is a government voluntary mode from which no profit would be made. The officers stated that Jinshou Residential Area is not included in the OCR areas according to the current urban planning approved by municipality, and Building No. 4 would luckily be one of the first DUHR projects in Zhoushan if the homeowners agree to participate. Then the officers explained four strategies provided for homeowners to choose from: a) Structure reinforcement, b) In-situ reconstruction, c) Property swap (with local government), and d) Government buy-back.*5)
		After explaining renewal policies provided by government, the officers also made an analysis of the current situation of Building No. 4 for homeowners. It was suggested by the officers that homeowners may select strategy c) or d), because considering the small distance between No. 4 and surrounding buildings, and the fact that Building No. 4 does not have pile foundation, reinforcement or reconstruction would be uneconomical and may do damage to surrounding dilapidated buildings (especially No. 3 and No. 9).*
		Then the officers introduced the two residential areas constructed by the government specially for property swap in DUHR and other kinds resettlement related to urban renewal. Dwelling units of four standards (60 m^2, 80 m^2, 100 m^2, and 120 m^2) was provided for homeowners to select from (Fig. 5). The price gap between old and new apartment would be paid in the form of money.
	2) Answer the homeowners' questions regarding the newly carried out DUHR mode	Homeowners' questions focused on three issues: 1) Why the OCR mode could not be adopted to their property? 2) What would be the evaluation price of their property? 3) Will the government provide temporary settlement or other kinds of subsidies (before they move into Xishanjiayuan or Haichengyayuan, or before they purchase a new property from the housing market)?
2016.03.09 09:30- 12:00	1) Answer homeowners' further questions on DUHR policies	Homeowners' questions mainly focused on three issues related to property swap: 1) What's the amount of new property area which they may offset with their old property? 2) Will the property swap influence their children's' entrance to middle school if they move to another school district? 3) What if there are individuals who are unwilling to move and take the opportunity to ask for price?
	2) Let homeowners make a preliminary resolution on which strategy should be taken	All 35 agreed to adopt relocation: 34 selected c) Property swap (with local government), 1 selected d) Government buy-back.
		For the other 5 homeowners who were absent, the community office contacted them by telephone, explaining the policies and the results of resolution in the consultation meeting. All the 5 homeowners also accepted relocation.

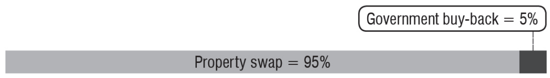


4) Respondents' initial selection at the beginning of project

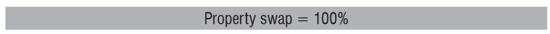


5) Respondents' opinion on the diversity of options

6) Respondents' expectation for decision-making period



7) All homeowners' final selection



8) 21 Respondents' final selection

Figure 5-12 Processes of Jinshou Building No.4 Project (photos by author, 2016-2018)

Consultation meeting

On 8 and 9 March 2016, two consultation meetings were held in the community office, to let homeowners understand the renewal policies provided by the government, and make a resolution on which renewal strategy (Table 5-1) would be taken. (Figure 5-12-3) The attendees of the meeting were officers from Bureau for Housing and Urban-rural Development (BHUD) of Dinghai District, officers from Changguo Subdistrict, staff in Jinshou community office, and homeowners of Building No. 4. 35 out of 40 homeowners attended the consultation meeting, the 5 other homeowners not living in Dinghai were absent.

On 8 March, the meeting started from 09:30, ended at 12:30. The agenda items were: 1) have the homeowners understand the new policy of DUHR could be adopted to tackle with the dilapidated Building No. 4, and the difference between government voluntary DUHR and marketized OCR; 2) to answer the homeowners' questions regarding the DUHR mode.

Officers from BHUD first conveyed the DUHR renewal policies to the homeowners, emphasized that unlike the OCR from which original homeowners may usually get very high compensation[33], the DUHR mode is a government voluntary mode from which no profit would be made. The officers stated that Jinshou Residential Area is not included in the OCR areas according to the current urban planning approved by municipality, and Building No. 4 would luckily be one of the first DUHR projects in Zhoushan if the homeowners agree to participate. Then the officers explained four strategies (Table 5-1) provided for homeowners to choose from: a) Structure reinforcement, b) In-situ reconstruction, c) Property swap (with local government), and d) Government buy-back.

According to *Implementation Measures of Dinghai District on Renovating Urban Dilapidated Housing*, which is set under the direction of higher-level administration files (Figure 1-5), in the case of strategy a) is taken, the resettlement shall be done according to the original floor and unit number. Homeowners may be rewarded prompt contract sign-up fee of 100 CNY/m², besides another

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[33] The mechanism of OCR has been introduced in Chapter 1.1.2.

subsidy of 100 CNY/m² will be given if they would like to install burglary-resisting window. If the indoor area reduced more than 3% of the original area due to reinforcement, the reduced part will be compensated by the district government at double of the market price. If the reinforcement seriously affects the daily use of a unit, this single unit may adopt c) Property swap (with local government) or d) Government buy-back.

b) In-situ reconstruction is applicable when a dilapidated building is in a good location, and surrounding buildings are in good condition. If b) is adopted, neither c) nor d) could be used any more in the project. In principle, homeowners should cover no less than 70% of the reconstruction cost. When a reconstruction is implemented, the total floor area of new building should not exceed the old building, and the height of new building should not break the building code regarding sunlight distance. The resettlement will be done according to the original floor and unit number.

c) property swap and d) government buy-back are applicable when the damage level or surrounding context of a building technically does not allow for reinforcement or reconstruction. In the case of c) or d) is adopted, the old property would be expropriated by local government at evaluation price. If a homeowner chooses d) and will purchase a new property in Dinghai metropolitan area within six months from the day of contract signing, a subsidy of 6% of the old property's evaluation price will be given, when the new property's price is higher than the old property. Besides, when b), c), or d) is adopted, a 400 CNY/m² will be rewarded for prompt moving out. The compensation for interior finishing will be given based on evaluation.

After explaining renewal policies provided by government, the officers also made an analysis of the current situation of Building No. 4 for homeowners. It was suggested by the officers that homeowners may select strategy c) or d), because considering the small distance[34] between No. 4 and surrounding buildings (Figure 5-10), and the fact that Building No. 4 does not have pile foundation (which is necessary in this location according to current building codes), reinforcement or

[34] It could be read from Figure 5-10 that, Building No. 4 is adjacent to other class C dilapidated buildings: Building No. 3 5.8m to the east, and Building No. 9 10.9m to the north.

reconstruction would be uneconomical and may do damage to surrounding dilapidated buildings (especially No. 3 and No. 9).

Figure 5-13 Resettlement Housing Areas in Dinghai metropolitan area (left: Xishanjiayuan; right: Haichengyayuan; photos by author, 2017)

Then the officers introduced the two residential areas (Figure 5-3, Figure 5-13) constructed by the government specially for property swap in DUHR and other kinds resettlement related to urban renewal: Xishanjiayuan on the west border of Dinghai metropolitan area and Haichengyayuan on the east border of Dinghai metropolitan area. Dwelling units of four standards (60 m², 80 m², 100 m², and 120 m²) was provided for homeowners to select from. The price gap between old and new apartment would be paid in the form of money.

After explanation of renewal policies, homeowners were given time to consult the officers. Their questions focused on three issues: 1) Why the OCR mode could not be adopted to their property? 2) What would be the evaluation price of their property? 3) Will the government provide temporary settlement or other kinds of subsidies when they move out (before they move into Xishanjiayuan or Haichengyayuan, or before they purchase a new property from the housing market)?

In response to homeowners' questions, the officers explained that:

1) The planning of OCR areas is made by Zhoushan Housing security and Management Bureau (舟山市住房保障和房产管理局) and Zhoushan Urban Planning & Architectural Design and Research Institute (舟山市规划建筑设计研究院), and approved by municipal government. The determination of these areas is based on the overall urban planning and the marketability of different areas. According

to the plan, Jinshou Residential Area is not included in OCR areas. In the past, dilapidated housing outside OCR areas were a tricky issue, since these housing are not marketable, and there was no method to reconstruct them. Now that the DUHR mode is carried out, it is a good chance to tackle with the dilapidated housing, and it is suggested to make a decision as soon as possible, then make sign a contract with the local government.

2) The evaluation price of class D dilapidated housing should be assessed by a real estate appraisal institution entrusted by the municipality, according to real estate market price on the date of the announcement of the acquisition plan. The local government will provide no less than three appraisal institutions for homeowners to vote. The assessment involved in the acquisition should be reported to the district government for filing.

3) Local government will not provide housing for temporary resettlement, instead a resettlement subsidy will be given. In the case of structure reinforcement is adopted, the amount of subsidy should be calculated according to the period of move-away. In the case of in-situ reconstruction is adopted, the amount of subsidy will be calculated as 24 months when the new building is below 27m, 36 months when the new building is above 27m, besides a 6 months' subsidy for interior finishing will be given. The subsidy value is no higher than 25 CNY/m². In the case of government buy-back is adopted, the subsidy will be no more than 6 months, the subsidy value will be determined by the evaluation agency based on factors such as the location. In the case of property swap, the subsidy will be calculated according to the condition of new housing selected.
Besides, a moving subsidy of 650 CNY each time will be given. For in-situ reconstruction, it will be calculated as twice; for government buy-back, it will be calculated as once; for structure reinforcement and property swap, the calculation will be based on the condition of each case.

On 9 March, the meeting started from 09:30, ended at 12:00. The agenda items were: 1) answer homeowners' further questions; 2) let homeowners make a preliminary resolution on which strategy should be taken.

Homeowners' questions mainly focused on three issues related to property swap: 1) What's the amount of new property area which they may offset with their old property? 2) Will the property swap influence their children's' entrance to middle school if they move to another school district? 3) What if there are individuals who are unwilling to move and take the opportunity to ask for price? In response to these two questions, the officers explained that:

1) The property swap must be based on the evaluation of old property. In similar cases in Dinghai District, a 70m² old property could swap a new property of approximately 60m².

2) Children of resettled households may choose to study in a school in their original school district, during the nine-year compulsory education period.

3) For individuals who are unwilling to cooperate with the work of DUHR and take the opportunity to ask for price, relevant government departments will also have corresponding policies. In the early stage, they have convened the Court and the Legislative Affairs Office to have a meeting. In the process of DUHR project, for individuals who do not cooperate, they will carry out forced relocation according to *Emergency Response Law of the People's Republic of China (中华人民共和国突发事件应对法)*, and try to ensure the interests of most homeowners.

Then the homeowners were asked to make a preliminary resolution on which strategy should be taken. The result was all 35 agreed to adopt relocation: 34 selected c) Property swap (with local government), 1 selected d) Government buy-back. For the other 5 homeowners who were absent, the community office contacted them by telephone, explaining the policies and the results of resolution in the consultation meeting. All the 5 homeowners also accepted relocation.

Contract signing

The contract sign-up period started from 11 May 2016. Homeowners were very prompt to have the contract signed, 22 of them signed within one day. By 29 May 2016 all homeowners have signed contract with subdistrict office for relocation. Among 40 homeowners, 38 signed for property swap, 2 signed for government buy-back. Among 38 property swap homeowners, 13 selected a new apartment of 60 m², 21 selected 80 m², 3 selected 100 m², 1 selected 120 m²; 36 selected Xishanjiayuan, 2 selected Haichengyayuan. The contract stated the compensation method, amount, and payment period, relocation fee, temporary resettlement fee, loss of production and business suspension, relocation period and so on.

Lots drawing

By 19 May, all 38 homeowners preliminarily selected property swap had already signed contract. In order to advance the project as soon as possible, local government started the lots drawing before the other 2 homeowners who preliminarily selected government buy-back signed their contract. The lots drawing meeting for priority to select new apartment is held by the subdistrict government in the community office. The meeting was held by officers from BHUD of Dinghai District, officers from Changguo Subdistrict, and staff in Jinshou community office. Except the single homeowner who selected 120 m², all the others attended the meeting.

At the selection meeting, the masterplan and dwelling unit floor plan were posted on the board for the homeowners. (Figure 5-12) The homeowners picked lottery order number according to the order of sign-in, then selected the room number, and filled in the selection confirmation form. The whole process is supervised by notary. After the lots drawing, another contract regarding location and area for property swap is signed between homeowners and subdistrict government.

Resettlement and demolition

After selecting their new apartment, the property-swap homeowners paid (or received) the price gap between old and new property, then began interior finish work of their new apartment and prepared to move in. Government buy-back homeowners received money from local government, and a maximum of 6% of the old property appraisal price will be given if they buy a new apartment in Dinghai District within six months after the execution of contract.

The demolition of Building No.4 started on 20 June 2016 and lasted for one month. Scaffolding was installed on east, west, and north side of the building surrounded by bamboo rafts, to minimize the impact of demolition work. The building was demolished carefully with the five-hole slabs removed by a steam hoist.

From 10 September to 4 November 2016, a parking lot of 50 parking spots was constructed on the site of Building No.4. The parking lot is rented to residents in Jinshou Residential Area, managed by the community office.

5.3.2 Analysis on decision making process

Local government's attitude

From the process of Jinshou Project, it could be observed that administrative files and appropriation from central government played a decisive role in DUHR, giving local government the motivation and fund to accomplish this nationwide movement. Officers in local government expressed their gratification because substantial measures could finally be taken to the large amount of Class D dilapidated housing outside OCR areas:

'*… In the past, because there is no policy, no fund, and no mature method to deal with the Class D dilapidated housing, we could only spend small money to those severely damaged housing, and they have indeed been a threaten to citizen's life safety. Now with DUHR administrative files and fund, we have a clear path and economic base, with which we could finally get rid of these dilapidated buildings.*
Although we only apply reinforcement, reconstruction or relocation to Class D buildings, we have also built a monitoring system for Class C buildings. Through the daily observation of building senior, the regular inspections by the community office and subdistrict staff, obvious changes of the dilapidated buildings and illegal remodeling will be discovered in an early stage, so that measures could be taken in time.
Dinghai district government purchases services from specialized inspection institutions to conduct professional housing safety monitoring. Through the inspection of settlement, inclination, and cracks of the house, the changes of dilapidated buildings will be quantitatively grasped. The inspection will be conducted at least once a week to Class D buildings, once a month to Class C buildings, to ensure the safety of residents.' (Vice director, Bureau for Housing and Urban-rural Development of Dinghai District)

The BHUD is responsible for setting and conveying detailed policies based on administration files form higher level; the subdistrict office works on the front line, being responsible for informing and negotiating with homeowners; the community office assists the whole project. With a working group established on district level, the government acts as organizer and implementer. The local government believe that homeowners may initiate a project easily, and the DUHR mode has provided sufficient options for the residents:

'*The homeowners can apply for the appraisal of dilapidated building on their own. As long as their building is diagnosed as Class D, they may make an application to the community office, who will then report to the subdistrict office. Then subdistrict office will implement the DUHR procedures according to related administrative files. There is no forced relocation in DUHR projects, we have provided four strategies for the homeowners in Class D dilapidated buildings, and they may choose the most appropriate strategy based on their own condition*.' (Vice director, Bureau for Housing and Urban-rural Development of Dinghai District)

Regarding the four DUHR strategies, the officers from BHUD of Zhoushan hold their own attitude about which strategies they prefer towards private housing projects like Jinshou Residential Area. Considering the efficiency and the clearance of excessive market housing, they are more prone to property swap or government buy-back, which could finish a project in approximately six months. Accordingly, the acquisition price and subsidy policies are also more incentive for property swap or government buy-back.

'*For the four to six floor apartment buildings, we are encouraging homeowners to adopt property swap or government buy-back. Because with these two strategies, the project cycle could usually be controlled within about half a year, while structural reinforcement or reconstruction for this kind of building is unpredictable. This is very helpful for us to accomplish the overall target set by higher levels. Besides, those homeowners who sell their property may take the money to buy a new or second-hand apartment, which will help to clear the stock in Zhoushan's housing market. The price we are offering for government buy-back is a little higher than market price, besides, the homeowners are generously subsidized for resettlement and purchasing new property.*' (Director, Bureau for Housing and Urban-rural Development of Zhoushan)

Local government's preference could also be reflected in the accuracy of information they provided for homeowners. For property swap and government buy-back, related data are relatively accurate: the evaluation price would be based on second-hand housing in nearby area; the reward for prompt contract signing is 400 CNY/m²; the compensation for temporary settlement is 175 CNY/m²; the compensation for relocation is 650 CNY per household. While for reinforcement and in-situ reconstruction, the information is not equally clear. Since there is no professional of engineering in local government's working group, nor is there precedent case to refer to, an estimated reinforcement/reconstruction cost cannot be given at the consultation meeting[35]. What can be determined is that, 70% of the cost should be covered by homeowners, and no extra floor area will be allowed.

Changes in respondents' selection of strategy

The homeowners had a complicated attitude towards DUHR, on one hand, they feel sorry their property cannot be included in the OCR area, which leads to higher compensation; on the other hand, they are happy their property could be involved in DUHR because it is diagnosed as Class D dilapidated housing:

'*I really don't understand why Jinshou Residential Area is not planned as part of OCR areas by the government, the buildings are so old and there are so many dilapidated buildings in our residential area. Those homeowners included in OCR can get highly compensated. Every year we wait for the new OCR areas to be announced, but ours is never included.*

They carried out the DUHR mode last year, for me it is also acceptable because our apartment was not livable for years and forbidden to be traded by the government. It is just like abandoned there and became a junkyard in the residential area. Now that there was a way to get rid of the old apartment, I participated the DUHR as prompt as possible. I'm happy with the new apartment, and I feel sorry for those living in Class C dilapidated buildings. They have to

[35] The reinforcement/reconstruction cost could only be calculated by professionals according to the situation of each case, on the condition that homeowners reach a preliminary consensus for reinforcement or reconstruction.

stay there just because their property is not dilapidated enough.' (Property swap homeowner A)

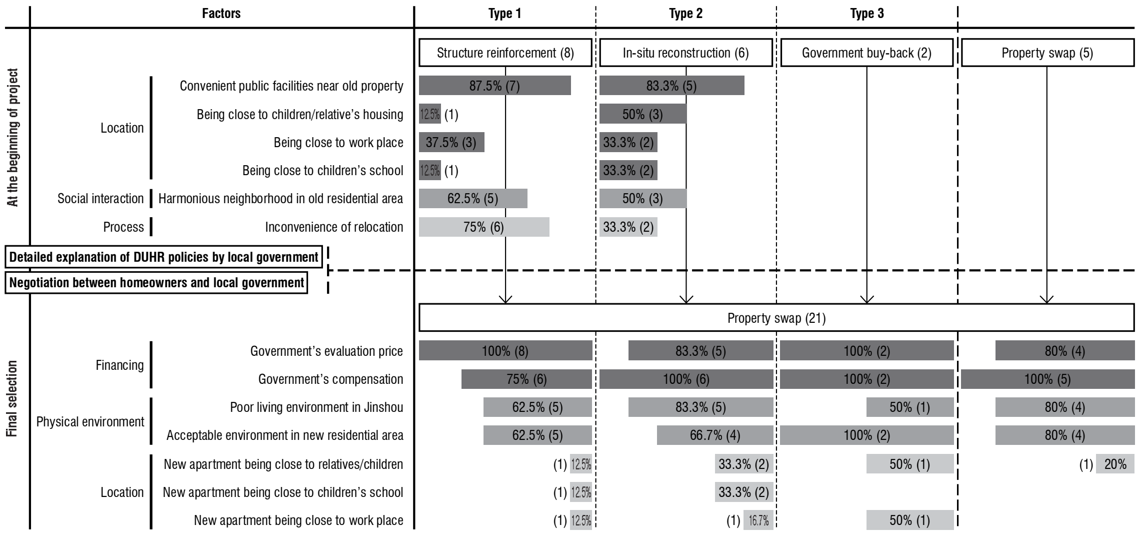

Figure 5-14 Patterns of selection change among respondents (The percentages are followed by exact number of respondents in brackets.)

At the beginning of project, respondents expressed their willingness to stay, since only 33.3% took property swap or government buy-back as first choice (Figure 5-12-4). Contrastingly, all respondents switched to property-swap as final decision (Figure 5-12-7, Figure 5-12-8). Among the 21 respondents, aside from 5 originally selected property swap, three patterns of change in selection could be observed. (Figure 5-14). For 14 respondents who originally intended to stay at Jinshou (type 1 and 2), the location advantage of old residential area was the prime factor, as public facilities near old residential areas are relatively more convenient. The Harmonious neighborhood in old residential area and inconvenience of relocation were also their major consideration, because 2/3 of respondents had moved to Jinshou before 1995 (Figure 5-7). Another concern is the inconvenient process of relocation, especially among aged residents over 55.

After BHUD officers explained DUHR policies in detail, and homeowners had a fuller understanding, financing issues have been the most influential factor in respondents' final decision making, even with the unequally detailed information towards different strategies provided by local government (Figure 5-14). On one hand, before the DUHR policies have been carried out, Class D dilapidated housing was suspended from trading by local government to avoid disputes between buyers and sellers, which means the old property was not monetizable. After DUHR was started, the total amount of government's evaluation price and all compensations for relocation is higher than second-hand housing price in nearby areas[36], which was very incentive for homeowners. On the other hand, the expense to reinforce or reconstruct is higher than homeowners' expectation[37]. Even 30% of the cost could be covered by local government, reinforcement and reconstruction are still economically inferior to relocation.

Scale	Qualities	Rating (left: old property; right: new property)									
		5		4		3		2		1	
Urban	Connection with urban framework	0.0%	0.0%	4.8%	0.0%	57.1%	4.8%	23.8%	66.7%	14.3%	28.6%
Residential area	Access control	0.0%	14.3%	0.0%	66.7%	9.5%	19.0%	76.2%	0.0%	14.3%	0.0%
	Public security	0.0%	28.6%	4.8%	61.9%	71.4%	9.5%	23.8%	0.0%	0.0%	0.0%
	Parking space	0.0%	61.9%	0.0%	38.1%	0.0%	0.0%	23.8%	0.0%	76.2%	0.0%
	Management of illegal building	0.0%	66.7%	0.0%	33.3%	52.4%	0.0%	47.6%	0.0%	0.0%	0.0%
	Public space (for elderly people)	4.8%	0.0%	71.4%	0.0%	23.8%	9.5%	0.0%	33.3%	0.0%	57.1%
	Public space (for children)	0.0%	0.0%	4.8%	0.0%	38.1%	14.3%	47.6%	38.1%	9.5%	47.6%
	Public space (for mid-aged)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.4%	38.1%	47.6%	61.9%
Building	Social interaction	38.1%	0.0%	61.9%	0.0%	0.0%	9.5%	0.0%	71.4%	0.0%	19.0%
	Layout of dwelling unit	0.0%	23.8%	0.0%	52.4%	9.5%	23.8%	61.9%	0.0%	28.6%	0.0%

* 5 = very good, 1 = very poor

Table 5-8 Respondents' evaluation of living environment in old and new residential area

Aside from financing issues, a second factor has been physical environment. As shown in Table 5-8, though Jinshou Residential Area has relatively good neighborhood harmony and public space for elderly people, respondents are not satisfied with the access control, parking condition, public space for children and mid-aged, and the floor area/layout of their old property. (Figure 5-18, Figure 5-24) However, current DUHR only deal with one single Class D building, while hardly improve the overall living environment of Jinshou Residential Area. Moreover, even when structure reinforcement or in-situ reconstruction could be adopted regardless of financing issues, the floor area is prohibited from being raised under current policies, which also leaves little room to rearrange the floor plan layout. It could be observed that, although there is a decline in social interaction and public space in the relocation residential area than in Jinshou as evaluated in Table 5-8, the access control, parking space, floor area and layout of dwelling unit could be dramatically improved in the relocation residential area. All these improvements cannot be achieved under the current in-situ resettlement

[36] The final evaluation price for each household is shown in Figure 5-7.

[37] The technical infeasibility of reinforcement or reconstruction has been explained in Section 5.2.

strategies provided in DUHR.

In this way, homeowners' selection was actually limited to property swap or government buy-back:

'*On knowing our building could be involved in DUHR, my first reaction is to select a) structure reinforcement, since we don't want to move to another place. We have lived in here for decades, and we have a lot of friends here. But they told us that we must pay 70% of the reconstruction cost, and the reconstruction could be costly considering the actual condition of our building and surrounding buildings. Besides, there are so many Class C dilapidated buildings in our residential area, which makes it very unpleasant for me to continue living here. As my wife and I are quite old and don't have the energy to look for another apartment in the housing market, we finally chose property swap with the government. We may get a new apartment of 60 m² nearly for free, which is enough for my wife and I to live in. I have already visited Xishanjiayuan, it is not very far away from here, the construction quality and overall environment is nearly equivalent to mid-low class new commercial housing area. The house is provided by the government, I think it would be safe to live in.*' (Property swap homeowner B)

'*At first we thought about reconstruction, because Jinshou Residential Area is not far away from our work place, and the surrounding public facilities are quite convenient. However, they told us the floor area may not be raised if reconstruction is implemented. The current floor area is a little small for us, and the layout is not very comfortable, I don't think these issues could be solved in a reconstruction. The parking in our residential area is also a big problem, it is very hard to find a parking spot where we get back home from work, and if we may only reconstruct within a small plot, it would be very hard to build an underground parking space. Besides, although we can accept to pay 70% of the reconstruction cost, we don't have confidence that the majority of other homeowners would be happy to pay. That's why we eventually chose to sell our property to government. Including all the subsidies, we may totally receive about 700,000 CNY, if we spend another 100,000 to 200,000 CNY, we can buy a lovely second-hand apartment in Dinghai District.*' (Government buy-back homeowner A)

Analysis on project procedure and period

Figure 5-15 Respondents' opinion on the necessity of holding general meeting to discuss the selection of strategy

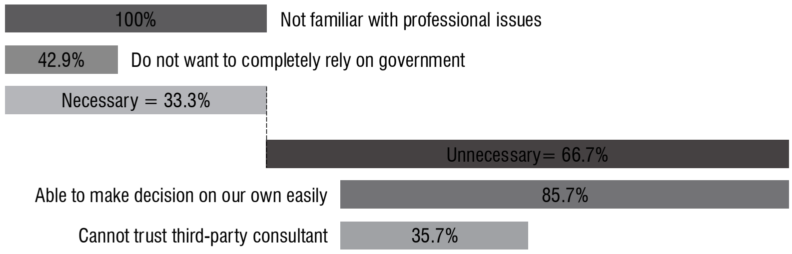

Figure 5-16 Respondents' opinion on the necessity of involving third-party expert/consultant in project

The opinion consultation meeting held on 8 and 9 March 2016 required homeowners to make a quick decision on which strategy to adopt, while 90.4% respondents expected a longer decision-making period of 1-3 months (Figure 5-12-6), and 76.2% affirmed the necessity of holding general meeting to discuss the appropriate strategy before making a vote (Figure 5-15). In terms of the diversity of options, 81% respondents think government has provided sufficient choices for them (Figure 5-12-5).

The decision-making process did not have third-party professional guidance, 66.7% respondents also does not see the necessity of having a consultant (Figure 5-16), because they believed that due to the policies given, along with the actual condition of their building, the decision is very clear to them even local government could not provide equally detailed information for four strategies, and third-party experts could hardly provide help. Their selection could be made by themselves mainly based on an economic consideration. Only when structural reinforcement or reconstruction are no longer economically inferior to relocation, do they need to consult third-party experts for more detailed analysis and advices.

'*The community office had informed us that there will be some kind of policy carried out to our building about one month before the official consultation meeting was held. Then on the meeting the officers informed us the policies given by government, and told us that a preliminary resolution will be made on the next day. Our thinking time was a little tight, but*

basically my selection would be either property swap or government buy back, since it is not cheap to reinforce or reconstruct our building. I would rather relocate to another residential area because the DUHR will not improve the environment of our residential area.
Besides, it was only an unformal resolution, and they told us it is fine if I change my idea and would like to select other strategy at the formal contract sign-up. Either property swap or government buy back will end up in relocation, which makes no difference for the government. Expert's opinion will not be so useful under the current DUHR framework, because property swap or relocation are much more incentive for us. Unless reinforcement or reconstruction is practical, we will need to hear expert's or professional's suggestions.' (Property swap homeowner A)

Communication between homeowner and government

As shown in Figure 5-12-3, during the consultation meeting, local government spent much effort on explaining policies to homeowners. Local government also made a preliminary analysis for homeowners, and recommended the feasibility and economic superiority of c) Property swap and d) Government buy-back. After local government's explanation and analysis, homeowners' questions also centered on issues related to relocation.

After the consultation meeting, a total number of 57.1% respondents attempted to negotiate with local government. There was no concrete form of homeowner's organization to let homeowners negotiate with the local government effectively, 38.1% was via community office and 19% was via subdistrict office.[38] (Figure 5-12-1) During the whole project, community office works as the informer to convey local government's policies to homeowners, as well as the coordinator between homeowners and local government:

'*The subdistrict office will inform us as soon as new policies have been determined, then we will call or visit homeowners of Building No.4 to let them know. We are also responsible for*

[38] In other DUHR projects in Dinghai, homeowners also consult or negotiate with Bureau for Housing and Urban-rural Development individually, when they are not satisfied with subdistrict office's explanation.

organizing homeowners to participate in each official procedure including consultation meetings, contract sign-up, lots drawing and so on. If the homeowners have any questions we can consult the subdistrict office for them. Sometimes they will also go to the subdistrict office or Bureau for Housing and Urban-rural Development by themselves when they would like to have a better understanding of the policies or negotiate. We try our best to help the homeowners to deal with their dilapidated housing.' (Director of Jinshou Community Office, secretary of Jinshou Community Party Committee)

Most of the negotiation subject between homeowners and government focused on government's compensation policy (58.3%) and evaluation of old property (41.7%), which are financing related issues. 33.3% negotiation was on temporary resettlement and 25% was on the selection of new apartment, which are procedure related. (Figure 5-12-1) There is not much room for negotiation, since government's policy and working procedures have already been set up, which are not subject to change. Local government could only explain the policy to homeowners in detail, so that they have a better understanding of the policies.

5.3.3 Summary on operation mode of DUHR

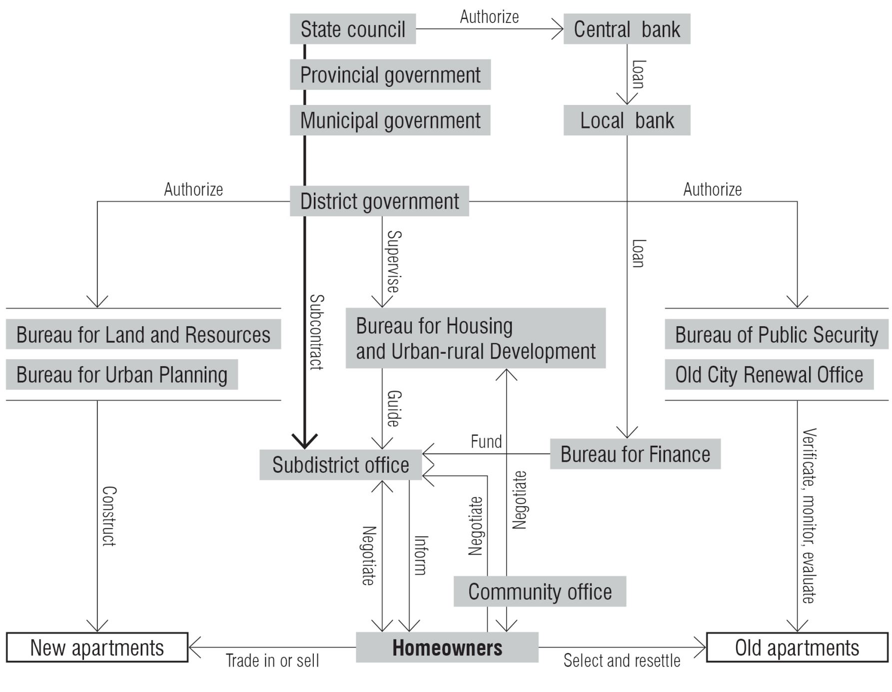

Figure 5-17 Roles of stakeholders in Jinshou Project

Being able to relieve citizens from Class D dilapidated buildings, the DUHR is a top-down system between government and homeowners following administrative files. There has been no big opposition or conflicts between homeowner and local government as revealed in the case study, or in the other 74 projects in Dinghai metropolitan area[39]. Nonetheless, from the case study of Jinshou Project, a series of problems related to decision making could be observed.

Players' responsibilities and rights in DUHR are not well defined, as local government controls most sections without supervisions or restrictions, leaving homeowners merely the right to select from a fixed menu (Figure 5-17). Although there is no forced relocation in DUHR, and homeowners may choose from four strategies provided by the government, homeowners' selection is in fact largely constrained in property swap or government buy-back. On one hand, homeowners are influenced by local government's preference towards relocation. While local government's strategies are made from a different angle centering on efficiency, striving to finish one project within half a year, regardless of homeowners' original will. On the other hand, reinforcement or reconstruction is technically difficult and uneconomic under the current renewal mode which only work on single building plot. Even though homeowners can afford the reinforcement and reconstruction cost, DUHR's poor performance in improving the physical environment in old residential areas still puts an end to their idea of in-situ relocation. Therefore, the administrative policies for DUHR need to be remodeled, so that strategies like structural reinforcement and in-situ reconstruction will not be technically or economically infeasible in most cases, in order to make it possible for homeowners to move back at their own will.

The decision-making procedure is insufficient both time-wise and organization-wise, since the decision-making period is too short for homeowners, and general meetings are missing. There is only one consensus making procedure, which is the preliminary resolution on renewal strategy selection at the consultation meeting. Considering the actual selection will be either property swap or government buy-back, which is mainly generated from a short-term economic point of view,

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[39] By the end of 2017, all 75 projects included in the three-year (2015-2017) DUHR plan of Dinghai Metropolitan Area have been completed.

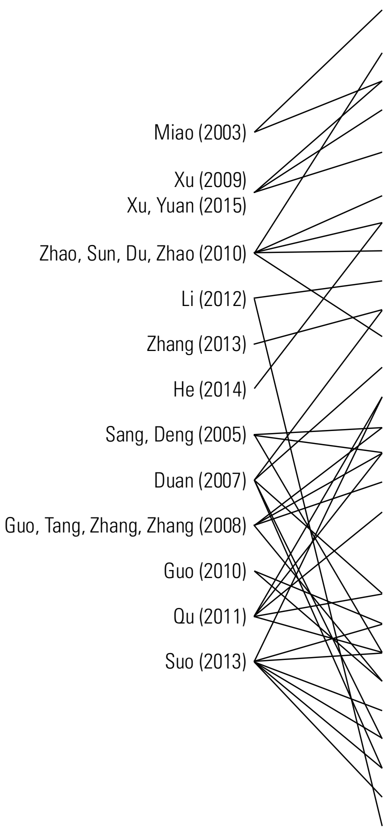
homeowners does not need professional consultation under the current DUHR policies. Accordingly, the project procedures also need to be remodeled, so that homeowners may have enough time and discussion before making a final decision. Besides, third-party consultants' involvement could be explored in future studies, in order to assist decision making from a professional view.

Moreover, the currently limited negotiation ends up with one-way information transfer from government to homeowners, while there is not much room to compromise. Homeowners are loosely organized in DUHR projects, there is no concrete organization to negotiate with local government effectively. So appropriate organization of homeowners in DUHR projects needs to be studied in future works, in order to bring more effective communication between homeowners and local government.

Aside from the factors discussed in this research, homeowner's decision making could be affected by a variety of other aspects, especially information from public media and the Internet, since DUHR related issues are both reported in public media and discussed in online forums in China. On one hand, in local TV news, newspapers and smartphone news apps, due to the government control over news media in China, most reports are positive towards DUHR as a government effort to renovate old residential buildings for citizens. The information revealed includes introduction and overall plan of DUHR, the working progress, achievements, and typical successful projects in an area, all aiming to show the advantage of DUHR, and to encourage citizens to take part in DUHR projects actively. In the case of Jinshou Project, as the first DUHR project in the area, it has been reported several times about its strategies, progress, and final result. On the other hand, related issues and citizen's concern have a chance to be discussed in online forums among citizens. The discussions cover the overall policy, the strategies provided for selection, and the evaluation price of old property in different projects. Therefore, public media and online forum could have different influences on homeowners: public media may stimulate homeowners to participate actively and reach an agreement more swiftly; while discussions in online forums could lead homeowners take further considerations before making a final decision. Furthermore, the information in public media and online forum tends to have different audience groups based on age and education level, and the complicated impacts of public media and Internet deserve to be further examined in future researches.

5.4 Improvement of physical environment in Jinshou Project

In the 1980s, at the beginning of Chinese housing reform, large number of residential areas were constructed, using the same planning norm which derived from Micro District, with similar building material and technique, under similar building code across the nation. After thirty years, these residential areas are having similar problems today.



Problem	Location/part	Scale
Internal streets isolated from the urban street system	Connection	Urban
Not enough entrances and exits		
Oversized enclosure	Size	
Visually and functionally monotonous boundary	Boundary	
Internalized and segregated public facilities and public space	Public facilities and public space	
Insufficient parking space	Transportation facility	Residential area
Lack of community open space	Community open space	
Lack of access control system	Security system	
Lack of age-friendly facilities	Public facility	
Inconvenient public facilities		
Lack of commercial buildings		
Self-built extensions	Unauthorized building	
Damage of building main structure	Main structure	Building
Insufficient unit floor area	Apartment layout	
Outdated layout for today's lifestyle		
Poor lighting and ventilation		
Inflexibility (due to masonry structure system)		
Inconvenient level difference inside residential unit		
Lack of elevator	Common facility	
Leakage	Exterior wall	
Poor thermal insulation		
Poor sound insulation	Partition wall	
Damaged stair	Building component	
Aging of door and window		
Damage of air conditioner external unit holder		
Aging of wire and cable	Electricity and plumbing	
Lack of age-friendly design	Age-friendly design	

Table 5-9 Three scales of physical environmental problems identified in former researches

The 1980 and 1990s old residential areas have been discussed in a variety of researches, through a comprehensive documentary study of previous researches, it could be summarized that a series of problems have been discussed, ranging from the connection with urban environment, to the aging of building components. The problems could be categorized into three scales as shown in Table 5-9:

1) Urban scale, which is reflected in the relationship between the residential area and its urban surrounding;
2) Residential area scale, which is mainly reflected in the public space and facilities in the residential area;
3) Building scale, which is reflected in the outdated apartment layout, ageing or damage of building structure and components, poor sound and thermal insulation, or lack of common facilities.

Based on such a framework, field observation is then used to reveal the improvement of physical environment in DUHR project, focusing on physical environmental setting and residents' behaviors in it.

5.4.1 Physical environment problems in Jinshou Residential Area

Urban scale

Located in the west corner of Dinghai Metropolitan Area, Jinshou Residential Area is bounded by four city roads: 24m to the south, 12m to the north, 10m to the east, and 8m to the west. This block is surrounded by residential blocks on four sides: on the north, west, and south are also typical linear-arrayed row housing blocks developed in the 1980 and early 1990s; on the east is a residential block of two to three-storey brick building constructed in the 1950 and 1960s. A river runs on the west boundary between the city road and the residential area.

Jinshou Residential Area does not cover the whole block, the majority of east part of the block is occupied by several office buildings and some company housing. Approximately 680m long and 200m wide, this irregular shaped residential area could be well accessed by 10 entrances, and the longest distance between two entrances is 250m, which is appropriate even under today's *Standard for Urban Residential Area Planning and Design (城市居住区规划设计标准)*. The residents are basically satisfied with the connection with urban environment, since 57.1% respondents rated 3 and 4.8% respondents rated 4 (Table 5-8). However, as shown in Figure 5-18, not all the entrances could be accessed by cars, which means the residential area could be an obstacle for urban traffic.

Figure 5-18 Physical environmental condition in Jinshou Residential Area (Photos by author, 2017-2018)

Figure 5-19 West, north, and east boundary of Jinshou Residential Area (Photos by author, 2017)

Considering the relatively early development period, the boundaries of residential area was not the focus of design. The west boundary is set by the river, the north boundary is directly set by residential buildings, and the north boundary is formed by gable wall and bush. (Figure 5-19)

Residential area scale

Being a typical residential area developed in the 1980s, Jinshou is also semi-gated, with no fences to completely separate it from the urban surrounding. Except for the main entrance on the south and two entrances on the west, the other entrances are not equipped with guard room. There is also no access control system for each building. (Figure 5-20) Although burglary is very rare, residents' non-motor vehicles are frequently stolen. This situation could be reflected in resident’s different evaluation of public security and access control. (Table 5-8)

Figure 5-20 Entrances to residential area and buildings (Upper: guarded entrances to residential area; lower left: unguarded entrance to residential area; lower right: entrance to building without access control; photos by author, 2017)

Figure 5-21 Illegal parking in Jinshou Residential Area
(Upper: central main road; lower left: branch road; lower right: space between buildings; photos by author, 2017-2018)

Parking has been one of the most prominent problems in old residential areas in China, and Jinshou is no exception. This residential area was planned in the bicycle era, and planners did not expect the booming of car industry in China. Originally, no parking lot was planned in Jinshou. With the growing number of private cars, a total number of 152 parking lots was gradually arranged along the central main road and in the space between buildings by the community office, but that is still far from enough for a residential area with over 2,000 dwelling units. Another approximately 150 unauthorized car parking could be observed in the area as mapped in Figure 5-18, these cars have taken up the central main road the space between buildings (Figure 5-21), which could bring safety hazard in case of emergency and degrade the quality of outdoor space for residents. Traffic accidents frequently occur in this residential area during peak hours. As evaluated by residents, 76.2% rated 1 and 23.8% rated 2. (Table 5-8)

Unauthorized self construction is another problem in Jinshou Residential Area as 52.4% respondents rated 3 and 47.6% respondents rated 2. (Table 5-8) Originally a certain number of storage rooms are constructed for resident's bicycles and sundries, while due to lack of management, in the 1990s and 2000s residents (especially those of first floor) have added extensions and fences without authorization to expand their floor area. Such construction has further reduced outdoor space for residents and laid safety hazard in case of fire emergency.

Figure 5-22 Public space in Jinshou Residential Area (Upper: central park; lower: self-organized public space; photos by author, 2017-2018)

Originally there is only one park planned in the center as a public space for the residential area. During daytime the park is used by children as playground and by elderly people for fitness. In the evening the park is occupied by elderly people as for “square dance (广场舞)”. Over the years, a series of self-organized public space has been developed by residents spontaneously. Elderly people tend to gather under the balcony or in the sunlight space between buildings. (Figure 5-22) Regarding the public space for different age groups, respondents have given different evaluation: 71.4% rated 4 for public space for elderly people; 47.6% rated 2 and 38.1% rated 3 for public space for children; 52.4% rated 2 and 47.6% rated 1 for public space for mid-aged. (Table 5-8) Therefore Jinshou Residential Area lacks public space for children and mid-aged group.

Building scale problems

Damage of building structure is the most serious issue on building scale. As mapped in Figure 5-18, there is 1 Class D and 22 Class C dilapidated building, some of them form small blocks, some are standalone. These buildings not only threaten life safety of residents in them, but also degrade the living environment in the whole residential area.

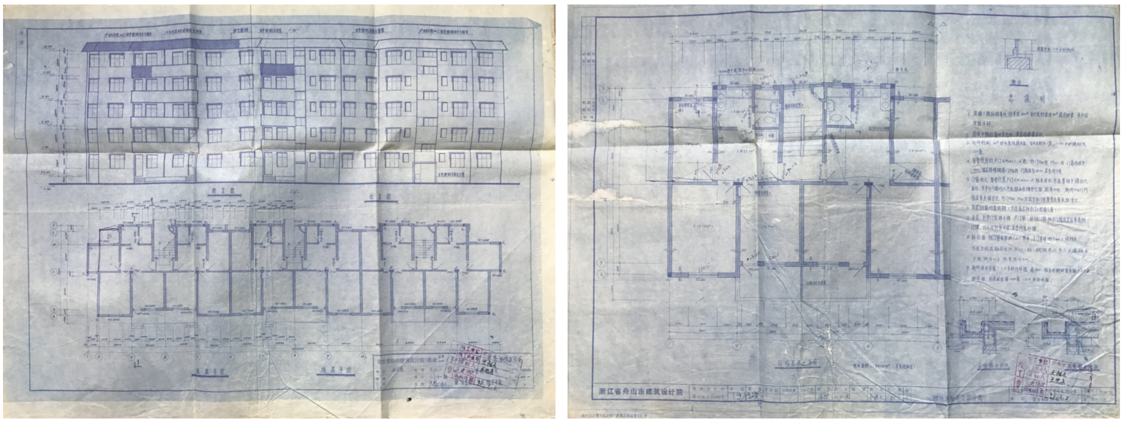
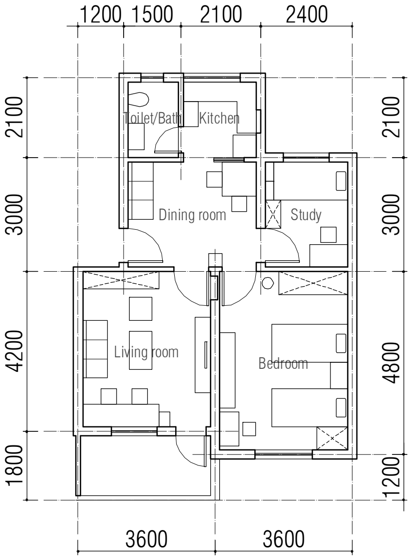
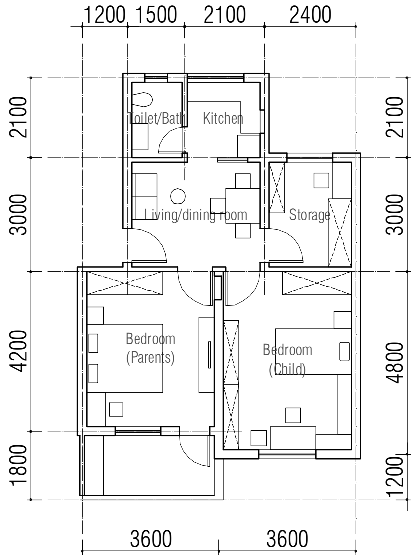


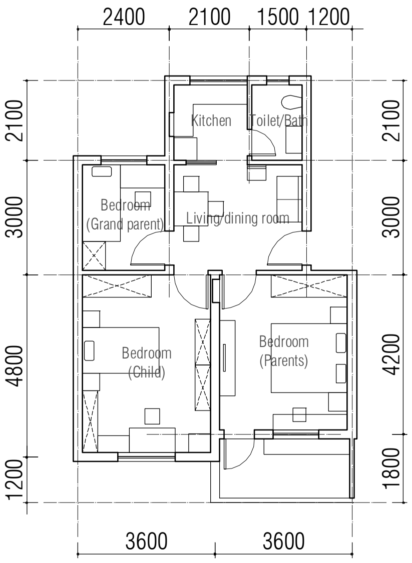
Figure 5-23 Technical drawings for standardized buildings in Jinshou Residential Area.



Husband: 62 Wife: 60



Husband: 40 Wife: 41
Child: 13



Grandmother: 70
Husband: 48 Wife: 43
Child: 17

Figure 5-24 Three main family types in Jinshou Residential Area

Apart from building structure issue, the small and outdated layout is another major concern. The buildings in Jinshou Residential Area were constructed using uniform layout (Figure 5-23) under the building standard of 1980s, so that the development could be more efficient at its time. However, the unified floor plan layout may not suit the lifestyle of different family types today (Figure 5-24), as a result, 61.9% respondents rated 2 and 28.6% respondents rated 1 for the layout of dwelling unit.

(Table 5-8) This issue could also be reflected in the selection of new apartment by homeowners in Building No. 4, as among 38 property swap homeowners, 13 selected a new apartment of 60 m², 21 selected 80 m², 3 selected 100 m², 1 selected 120 m².

In addition, several other common issues in old residential areas could also be observed in Jinshou, including lack of elevator, damaged staircase, and leaking roof, external wall, and floor slab.

5.4.2 Improvements in Project Building No. 4

Scale	Problems	Improvements
Urban	Oversized enclosed territory	-
	Boundaries not well designed as an urban interface	-
Residential area	Lack of access system	-
	Insufficient parking space	50 parking spots added
	Unauthorized self construction	-
	Insufficient public space for children and mid-aged	-
Building	Damage of building structure	Problems in building N0. 4 could be solved with the demolition of the building and relocation of residents, while problems in other buildings cannot be tackled with.
	Small and outdated layout of dwelling unit	
	Lack of elevator	
	Damaged staircase	
	Leaking roof, external wall, and floor slab	

Table 5-10 Summary of improvement of physical environment in Project Building No. 4

For the urban, residential area, and building scale problems identified in Jinshou Residential Area (Table 5-10), only building scale problem of one single building could be solved in Jinshou Building No. 4 Project with the demolition of old building and relocation of residents. Besides, 50 parking spots are added to relieve the parking pressure, but the parking space is still far from enough for a residential area with over 2,000 dwelling units. The other urban and residential area scale problems, along with building scale problem in the other buildings remain unsolved in the project.

5.5 Chapter conclusion

Using an average case of DUHR in Zhejiang Province—the Jinshou Project—this chapter has identified the problems in Chinese DUHR, from the perspective of financing pattern, operation mode, and physical environment.

Through analyzing the statistics of project funding, it could be concluded that the current DUHR mode is isolated from housing market and completely relying on government funding. Since there is no extra FAR allowed, local government cannot retrieve their investment in DUHR, this financing pattern will lay heavy burden on different levels of government, and the unpredictable government appropriation may not cover renewal demand in the future. Local government should not take full responsibility for the problems identified, since the problems originate from the overall DUHR mechanism, which has led to the dominance of property swap and government buy-back.

From the perspective of operation mode, by studying the project process using documentary analysis of project report and semi-structured interview, it is concluded that the DUHR is a top-down system from government to homeowners. Players' responsibilities and rights in DUHR are not well defined, as local government controls most sections without supervisions or restrictions, leaving homeowners merely the right to select from a fixed menu. Although there is no forced relocation in DUHR, homeowners' selection is largely influenced by the preference of local government and eventually results in property swap or government buy-back. The decision-making procedure is time-wise and organization-wise insufficient for homeowners, and homeowners does not have third-party professional guidance under the current DUHR mode. The currently limited negotiation ends up with one-way information transfer from government to homeowners.

Regarding improvement to physical environment, through field observation and questionnaire, it is argued that the current DUHR mode only tackle safety issues within single building plot, while hardly affect the physical environment on residential area and urban scale.

The three aspects are not isolated but interrelated to each other. For example, the financing pattern has restricted the improvement to physical environment, while the money issues and expected limited improvement to living environment have influenced homeowners' decision making. Therefore, new strategies for DUHR must integrate these three aspects so that the research findings may really enlighten practical field.

Chapter 6 Financing Pattern, Operation Mode, and Improvement to Physical Environment in Japanese Condominium Complex Reconstruction

After identifying the problems with Chinese DUHR through an in-depth case study, this chapter responds to the third research question by taking a look at the Japanese CCR mode, attempting to summarize its experience in dealing with similar problems in the Chinese DUHR mode. Then a series of preliminary recommendations for Chinese DUHR are given based on the comparison of Chinese DUHR and Japanese CCR.

16 projects completed in Tokyo are used as a sample to summarize the experience of Japanese CCR. This study only uses Tokyo cases because among the74 reconstruction cases utilizing AFRC in Japan by 2017 (Appendix C), 41 of them are located in Tokyo (Figure 4-15), which means Tokyo is the most widely used area of AFRC law in Japan.

In accordance with the problems identified in last chapter, this chapter will also be focusing on three perspectives of reconstruction projects: 1) the financing pattern; 2) the operation mode; and 3) improvement to physical environment, especially on residential area and urban scale. The reports used in this chapter are mainly from マンション再生協議会, property developers, and local government.

6.1 Overview of sixteen Tokyo cases

6.1.1 Location of Tokyo cases

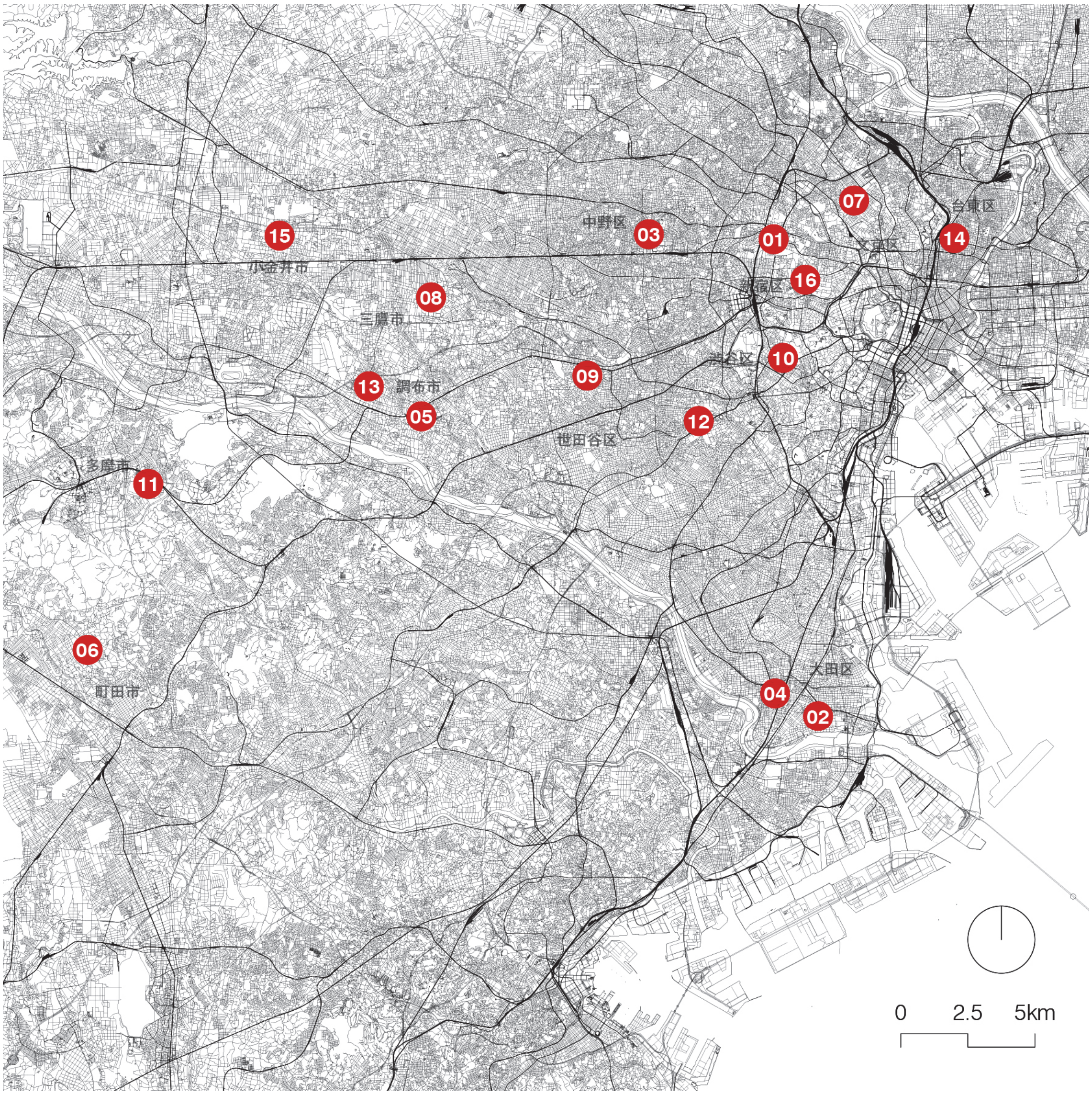


Figure 6-1 Location of sixteen Tokyo cases

Among the 41 completed reconstruction cases utilizing AFRC in Tokyo, sixteen of them are condominium complex[40] type. These projects cover a large variety of geographical conditions,

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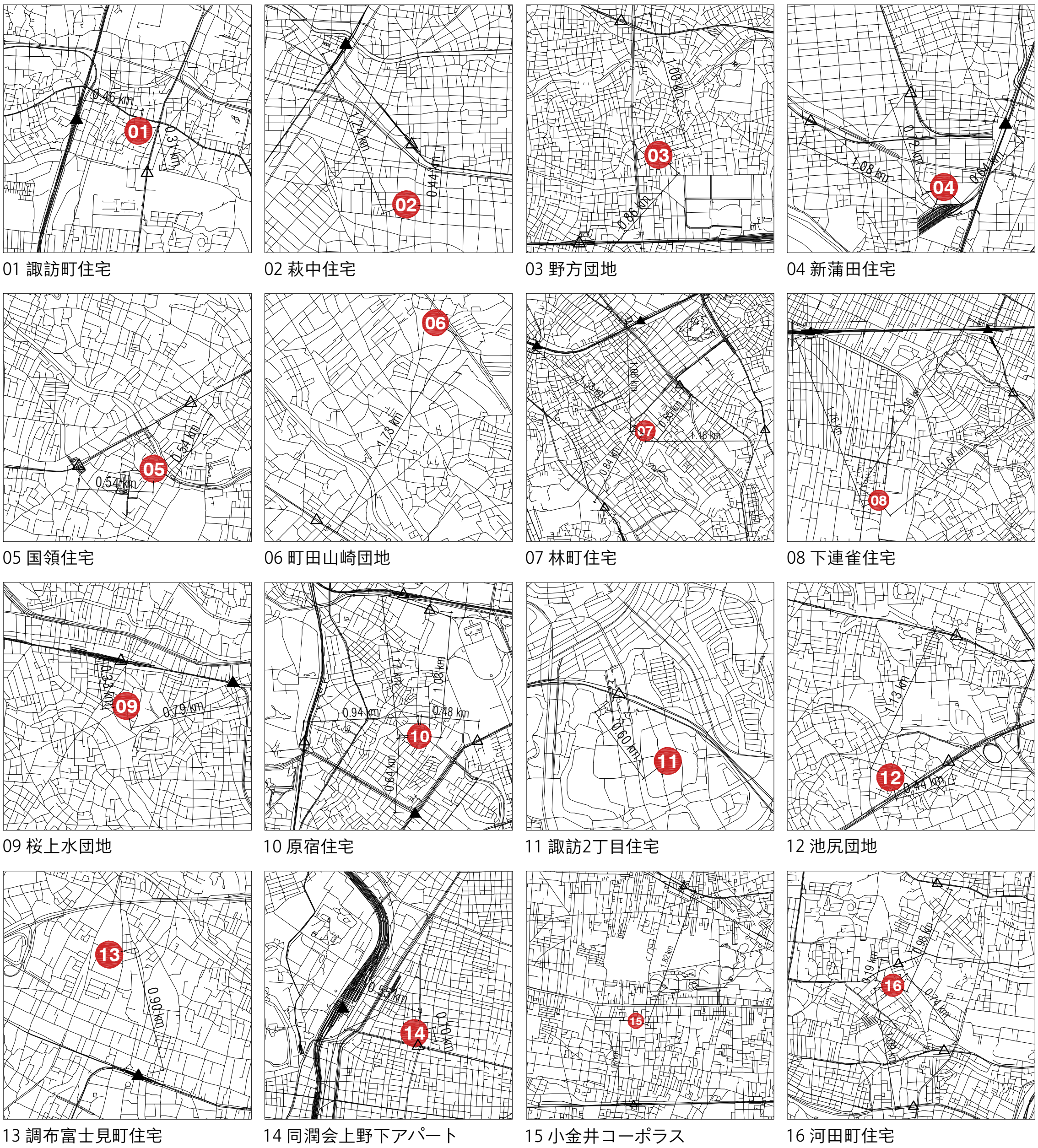
[40] Condominium complex infers that there are two or more buildings involved in the reconstruction project. Those single building projects will not be discussed in this dissertation.

ranging from city center to satellite town (Figure 6-1). Except for No. 06 and No. 08, all the other cases are within 1 km distance from metro/railway station (Figure 6-2).



△ Metro / railway station (normal) ▲ Metro / railway station (transfer)

Figure 6-2 Distance between Tokyo cases and nearby stations

6.1.2 Incentive policies in Tokyo cases

The Japanese reconstruction model not only relies on ABUO and AFRC laws, but is also aided by a variety of secondary policies and subsidies. These laws, policies, and subsidies could also be categorized into economic, operational, and physical environmental fields. (Figure 6-3) The main incentive policies and laws will largely determine the economic pattern, operational process, or the physical environment of new condominium complex; the secondary policies and subsidies are those give relatively small-scale economic support or convenience for the residents to find temporary housing during the reconstruction period.

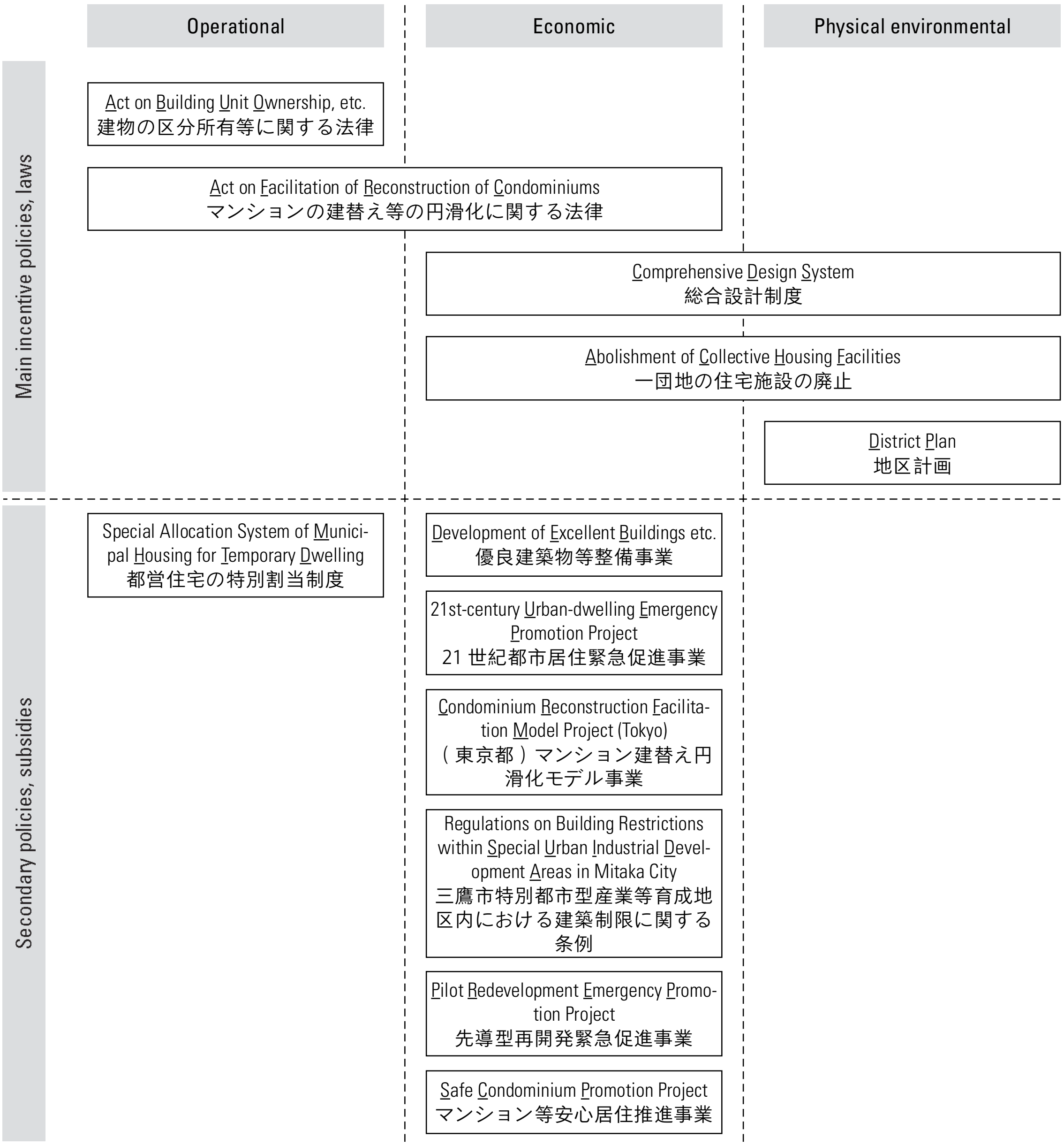


Figure 6-3 Policies, laws, and subsidies related to condominium reconstruction in Tokyo cases

The main policies include:

Comprehensive Design System

The Comprehensive Design System (CDS, 総合設計制度) is a policy listed in the Building Standards Law (建築基準法 59-2), in order to prevent overcrowding and to promote more efficient land use. A certain amount of extra FAR will be rewarded, and the Slant Plane restriction could be eased, if a project provides public open space to the urban space (Figure 6-4).

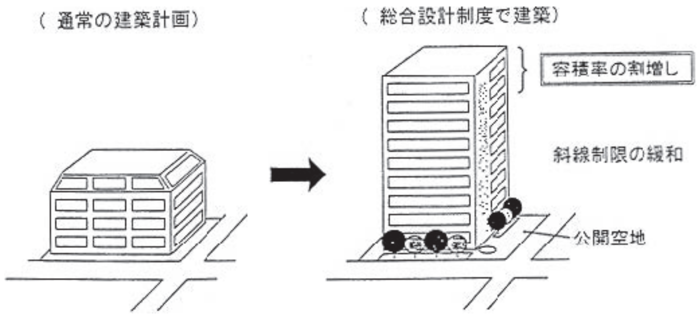


Figure 6-4 Image of Comprehensive Design System (Source: MLIT)

Abolishment of Collective Housing Facilities ("Ichi-Danchi")

Collective Housing Facility (一団地, "Ichi-Danchi") (Article 11, City Planning Act) is a national policy in Japan during the rapid growth era of 1950s. For the purpose of providing mass supply of housing, and promoting population inflow into cities, condominium complexes are stated as a kind of urban facility, which is in parallel with rivers, roads, and parks. Approximately 150 collective housing facilities (175,000 residential units) was constructed in Tokyo, most of which are in need of renewal.

The most difficult economic problem with collective housing facilities reconstruction is the BCR (building coverage ratio) and FAR (floor area ratio) limited by City Planning Act. According to Article 11, the BCR of a collective housing facility should be 20%-30%, with a FAR of 60%-80%. Because in the 1940s and 1950s, large amount of housing supply was necessary, and the surrounding urban areas was not mature. A FAR of 60%-80% was regarded as a way to prevent too much pressure on the public facilities, and ensure an adequate distance between buildings, in order to give enough sunlight to the four to five storeys residential buildings.

However, it has been over 50 years since the enact of Collective Housing Facility, and most urban areas surrounding those old condominium complexes have developed into mid/high-rise oriented residential zones, with a FAR of 150%-200%, while the reconstruction of old collective housing facility still has to obey a FAR of 60%-80%. This situation has made it hard to reconstruct collective housing facilities from an economic point of view, since there is not enough extra floor area to balance the cost of reconstruction. Therefore, there is an urgent need to abolish the Collective Housing Facility system in case of a reconstruction, and raise the FAR of these old residential areas.

Recognizing that the historical role of Collective Housing Facility has finished, the Japan MLIT decided to abolish the Collective Housing Facility system in 2001, for the purpose of securing a good living environment by utilizing the district plan[41]. In response to this, the Tokyo Metropolitan Government also launched a policy to abolish the Collective Housing Facility and adopt District Plan.

The District Plan (地区計画) is a planning system that is set up in 1980, referring to the German Bebauungsplan (B-Plan). It is based on the issues and characteristics of the district, with the cooperation between residents and municipality. The District Plan sets up the future image of the district and uses Machizukuri as a technique to realize it. A District Plan will define
1) location of public facilities (local roads, small park, open spaces, footpaths, etc.);
2) building control regulations (land-use, FAR, BCR, scale of building lot, set back of buildings, design, hedge, etc.);
3) preservation of green areas.

With the abolishment of Collective Housing Facilities and integration of District Plan, the FAR of a former collective housing facility could usually be relaxed to 1.5 or higher[42].

The secondary policies and subsidies include:

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[41] 地区計画の活用等により引き続き良好な居住環境を確保した上で、一団地の住宅施設に関する都市計画を廃止する事が望ましい。

[42] The new limit after abolishment of Collective Housing Facilities is defined floor-area ratio and building coverage ratio regulations in land use zones

Development of Excellent Buildings etc.

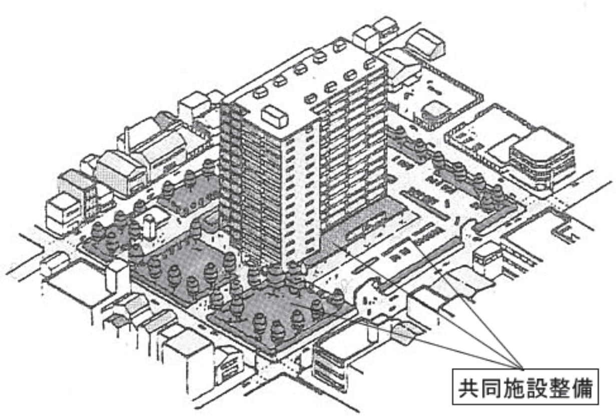


Figure 6-5 Image of Development of Excellent Buildings etc. (Source: MLIT)

The Development of Excellent Buildings etc. (DEB, 優良建築物等整備事業) is a policy to improve urban environment and promote the provision of high-quality urban housing. It is a system based on national guidelines, not dependent on statutory procedures. Public aid will be given in a project, when a certain amount of open space, or sharing and improvement of land utilization is provided. There are four types in this system: 1) High-quality redevelopment type (優良再開発型); 2) Urban residential supply type (市街地住宅供給型); 3) Effective use of stock type (既存ストック活用型); and 4) Aseismic type (耐震型).

Requirements for subsidy: built-up area in three major metropolitan areas, city of prefectural government, city center

Subsidy content:

Category	Content	Amount
Design fee	Project plan, ground survey, architecture design	Nation 1/3, local government 1/3
Land preparation fee	Building demolition, compensation cost	
Common facilities fee	Open space, supply and disposal services	

21st-century Urban-dwelling Emergency Promotion Project

The 21st-century Urban-dwelling Emergency Promotion Project (21UEP, 21 世紀都市居住緊急促進事業) aims to create comfortable living space suitable for the 21st century. It is a policy that deals with a wide range of urban and housing problems such as environment and resources, aged society, inadequate development of dangerous urban areas due to disaster prevention, and promote the development of apartment houses that can be utilized as high quality stocks throughout the 21st century.

Requirements for subsidy:

1) Location requirements

Built-up area and suburban consolidation zone in three major metropolitan areas, priority supply areas set by Act on Special Measures concerning Promotion of Supply of Houses and Housing Lands in Urban Districts (大都市地域における住宅及び住宅地の供給の促進に関する特別措置法), city center, city of prefectural government, DID in communing area with a population of 250,000 or more, urban redevelopment emergency area according to Act on Special Measures concerning Urban Reconstruction (Act on Special Measures concerning Urban Reconstruction), planned development area

2) Housing requirements

Responding to environmental and resource problems, responding to aging society, contributing to disaster management and safety measures, provision of urban green space

Subsidy amount:

3% of the construction cost if 2 of the housing requirements are met, 5% if 3 are met, 7% if 4 are met

Pilot Redevelopment Emergency Promotion Project

The Pilot Redevelopment Emergency Promotion Project (PREP, 先導型再開発緊急促進事業) is a policy to promote reduction of burden on the environment, provision of well-being facilities, formation of safe urban area, provision of green space, and other facilities that comply with related laws and regulations. As a reward, part of the project expenses will be subsidized by the government.

Subsidy content:

Category	Content	Amount
Environment friendly	Equipment etc. are installed to reduce burden on environment	3% of the construction fee if 2 categories adopted, 5% if 3 categories adopted, 7% if 4 categories adopted
Well-being facilities	Barrier-free facilities	
Promotion of safe urban area,	Expenses to enhance disaster prevention, provision of open space that could be evacuation sites in the event of a disaster	
Promotion of urban greening	Green space in the site	

Regulations on Building Restrictions within Special Urban Industrial Development Areas

The Regulations on Building Restrictions within Special Urban Industrial Development Areas in Mitaka City (SUIDA, 三鷹市特別都市型産業等育成地区内における建築制限に関する条例) is a policy to promote the development of urban industry in built-up areas like Mitaka City. When part of the floor area is used as school, public facilities etc., the FAR restriction of the project could be relaxed.

Condominium Reconstruction Facilitation Model Project (Tokyo)

The Condominium Reconstruction Facilitation Model Project in Tokyo (CEFM, 東京都マンション共同化建替えモデル事業) is a policy to promote old condominium reconstruction in Tokyo. This policy facilitates condominium reconstruction with neighboring parcel in a case where the FAR is limited, and give aid to the initial examination expenses at the beginning of a reconstruction project.

Subsidy target: condominiums constructed under the old seismic code (before 1981), located in priority areas set by Tokyo Municipal Housing Master Plan

Subsidy content:

Content	Amount
Formulation of reconstruction plan	1/3 of the project cost (within 3,330,000 JPY) by municipal government
Preparation of materials for negotiations with landowners in adjacent land	
Preparation of materials for briefing sessions conducted by the management association to the property owners	
Preparation of materials for promotion of resolutions	
Consultation with experts	
Preparation of project reports	

Safe Condominium Promotion Project

The Safe Condominium Promotion Project (SCP, マンション等安心居住推進事業) is a policy to promote high-quality condominium stock. Homeowners association will be aided when managing, renovating, and reconstructing a condominium.

Subsidy target: condominium plan to optimize its management, condominium managed by a third party, aged condominium, condominium complex

Subsidy amount

1) Condominiums with high economic burden: flat-rate subsidy up to 3 million JPY, 1/2 subsidy for expenses exceeding 3 million JPY

2) Condominiums other than 1): 1/2 subsidy

3) 5 million JPY per condominium per year

Special Allocation System of Municipal Housing for Temporary Dwelling

The Special Allocation System of Municipal Housing for Temporary Dwelling (都営住宅の特別割当制度) is a subsidy policy that facilitates the residents' temporary housing by allocating municipal public housing as temporary residence during the reconstruction process.

Types of cases according to policies adopted

Other than ABUO and AFRC law. based the main policies that are adopted in the reconstruction project (Figure 6-6), three types could be observed:

1) No. 02, 10 is completed with the utilization of Comprehensive Design System;

2) No. 05, 06, 09, 11, 12, 13 are under the Abolishment of Collective Housing, with the introduction of new District Plan;

3) No. 01, 03, 04, 07, 08, 14, 15, 16 are completed mainly relying on ABUO and AFRC law, among which no secondary subsidies were given to 03, 07, 16.

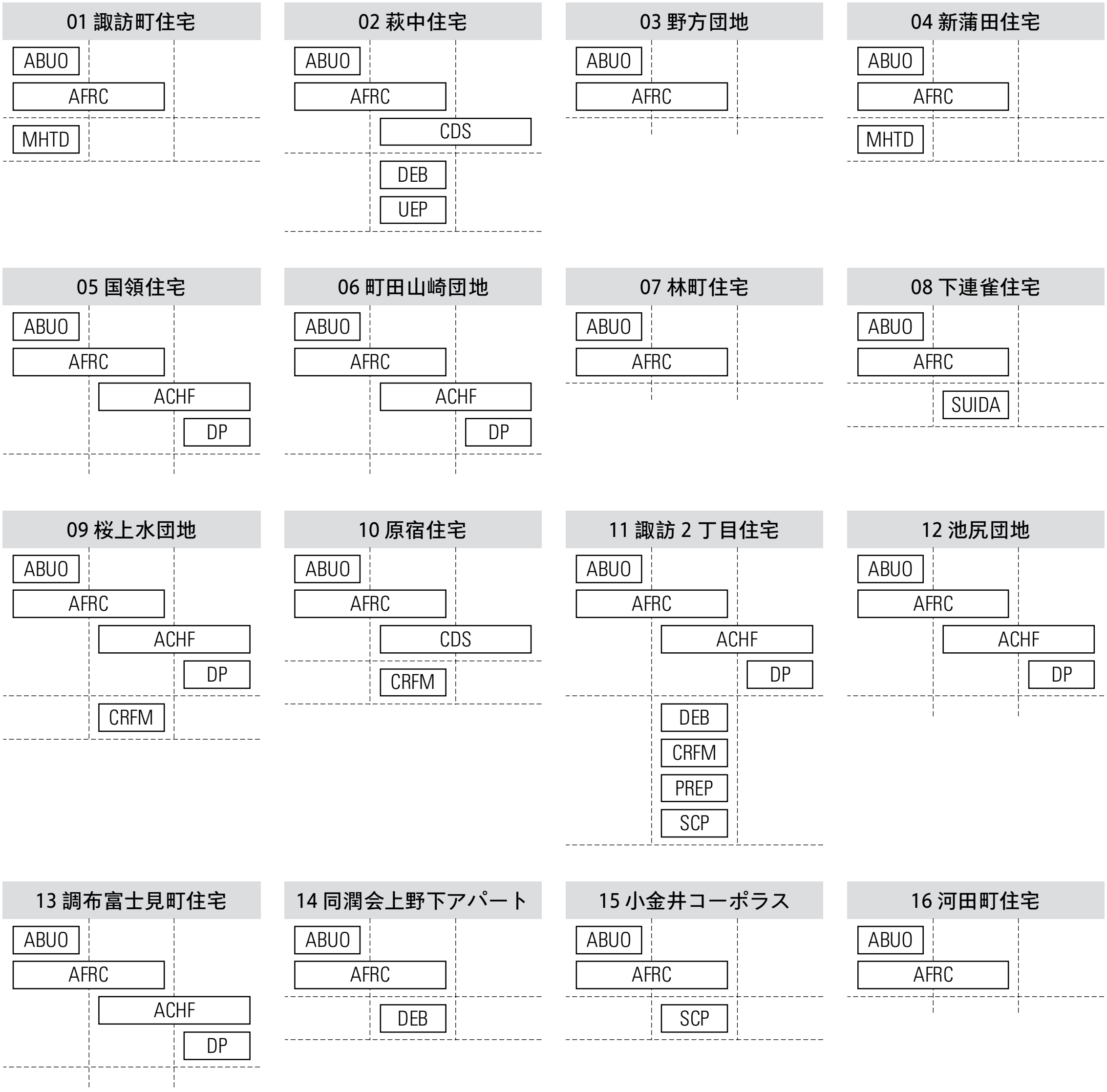


Figure 6-6 Policies, laws, and subsidies adopted in Tokyo cases

6.2 Financing pattern in Japanese CCR

The financing pattern of Japanese CCR mode is examined through a case study of No. 11 No. 11, Suwa 2-chome Housing (諏訪 2 丁目住宅). The data of project funding is collected from report published by URAM (都市問題経営研究所).

6.2.1 Suwa 2-chome Housing as a typical case

Representativeness of Suwa 2-chome Project

Under the a-1) reconstruction mode, the expenditures of a reconstruction project are:

1) Survey cost: survey, ground survey, environmental impact investigation

2) Design fee: architecture design fee, supervision fee, approval procedure costs

3) Planning fee: business plan fee, property swap plan fee

4) Land preparation fee: demolition of existing buildings, land leveling

5) Construction fee: building construction cost, auxiliary facilities construction cost, infrastructure contribution fee

6) Administrative fee: administrative expense, taxes, legal affairs related fee

7) Others: purchase of adjacent sites, purchase of properties of those who choose to move out

The revenues are:

1) Previous homeowners' payment for extra floor area of their new housing

2) Sale of extra dwelling units and land

3) Government subsidies

This dissertation takes case No. 11, Suwa 2-chome Housing, which has the most complicated subsidy system (Figure 6-6) among Tokyo cases, as a typical case to clarity the financing pattern of the Japanese reconstruction system.

Introduction of Suwa 2-chome Housing

Figure 6-7 Location of Suwa 2-chome housing and nearby station and housing complexes
(Photos by author, 2017)

The Suwa 2-chome Housing was constructed as part of the Tama New Town which started from 1965 in order to solve the severe residential difficulties in the city center in the high growth period. Located 0.6 km from the Keio-nagayama and Odakyu-nagayama station which arrives in Shinjuku in 30 minutes, the complex is seven minutes' walk from the station through a path surrounded by green. This complex was occupied since 1971, it is surrounded by several similar complexes (both public and private exist) constructed in the same era (Figure 6-7).

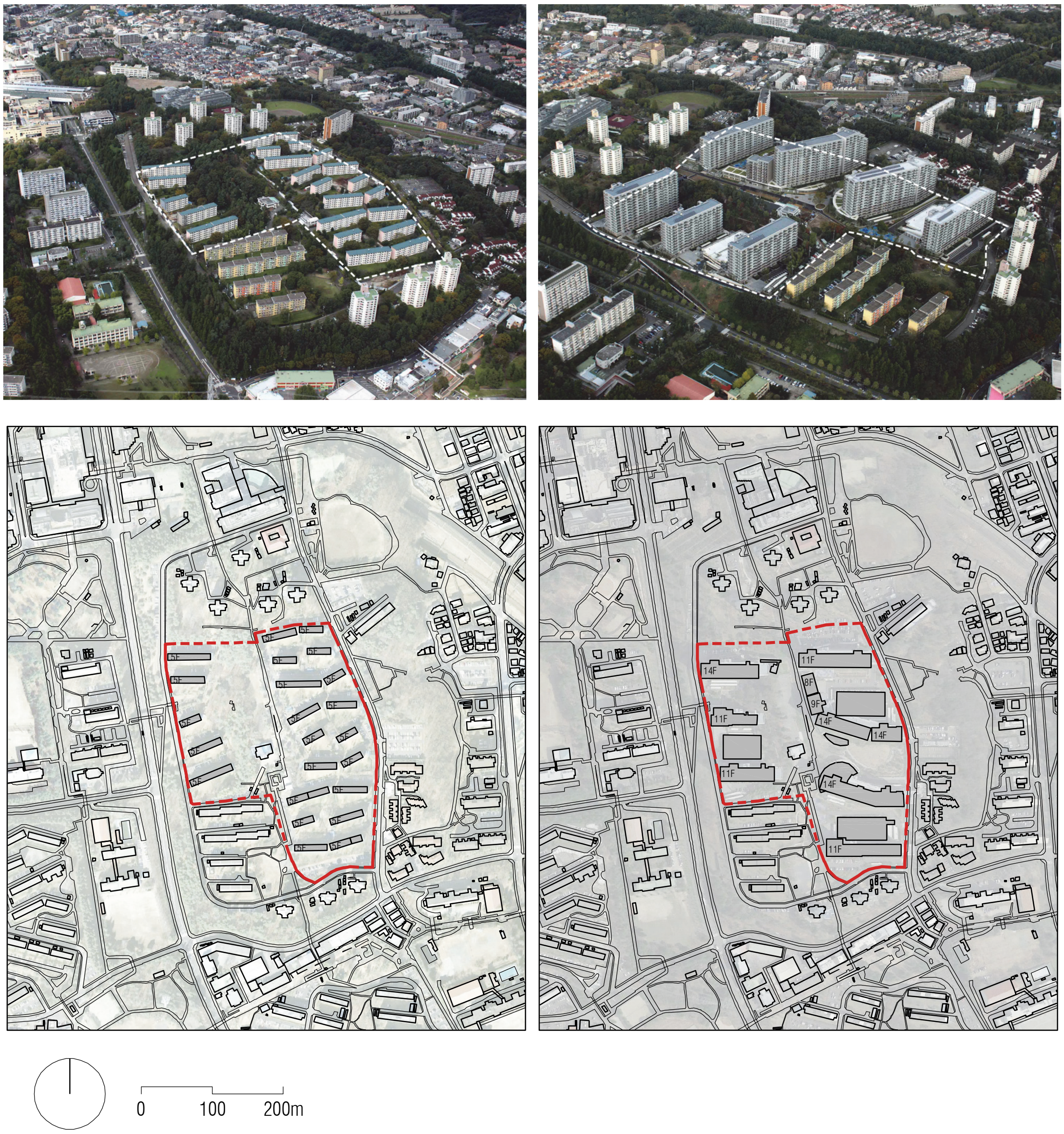


Figure 6-8 Suwa 2-chome Housing before and after reconstruction
(Image source: Source: Matsuda Hirata Sekkei)

		Before	After
Year of construction		1971	2013
Site area		64,400 m²	
Maximum FAR allowed		0.5	2.0
Total floor area		34,037 m²	124,871 m²
Building condition	Number of floors and buildings	5F × 23	11, 14F × 7
	Structure type	RC	RC
Dwelling unit	Number of households	640	1,249
	Layout	3DK	2DK - 4LDK
	Unit floor area	48.85 m²	43 m² - 101 m²
Others		Part of Collective Housing Facility	Part of Suwa District Plan

Table 6-1 Overview of Suwa 2-chome Housing before and after reconstruction

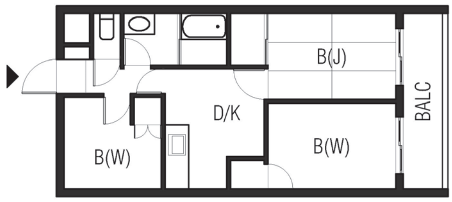


Figure 6-9 Unit layout in Suwa 2-chome Housing before reconstruction, 1:200

The Suwa 2-chome Housing is one of the earliest and biggest condominium complexes in Tokyo Metropolitan Area. The site area is 64,400 m², with a total floor area of 34,037 m². The buildings were 5 storeys RC structure, with 640 3DK units layout of 48.85 m² (Figure 6-9). Most of the tenants were in their 30s and 40s when they purchased their property. By 2009, there were 605 property owners, 418 self-occupied households, 179 tenants, and 43 unoccupied units. The average number of people per household was 2.0 (lower than the Tama City average number of 2.2), and 164 residents were over 70 years old.[43]

The main reasons for reconstruction of this complex were that[44]:

1) Insufficient unit floor area,

2) Ageing of building and plumbing system,

3) Anxiety about earthquake resistance,

4) Lack of barrier-free facilities,

5) Limit of cost and effect in repair/renovation.

The reconstruction of Suwa 2-chome Housing finished in 2013, the old complex was reconstructed into a new one with a total floor area of 34,037 m². The new buildings are 11 and 14 storeys RC structure with 1,249 dwelling units, ranging from 43 m² to 101 m², varying from 2DK to 4LDK.

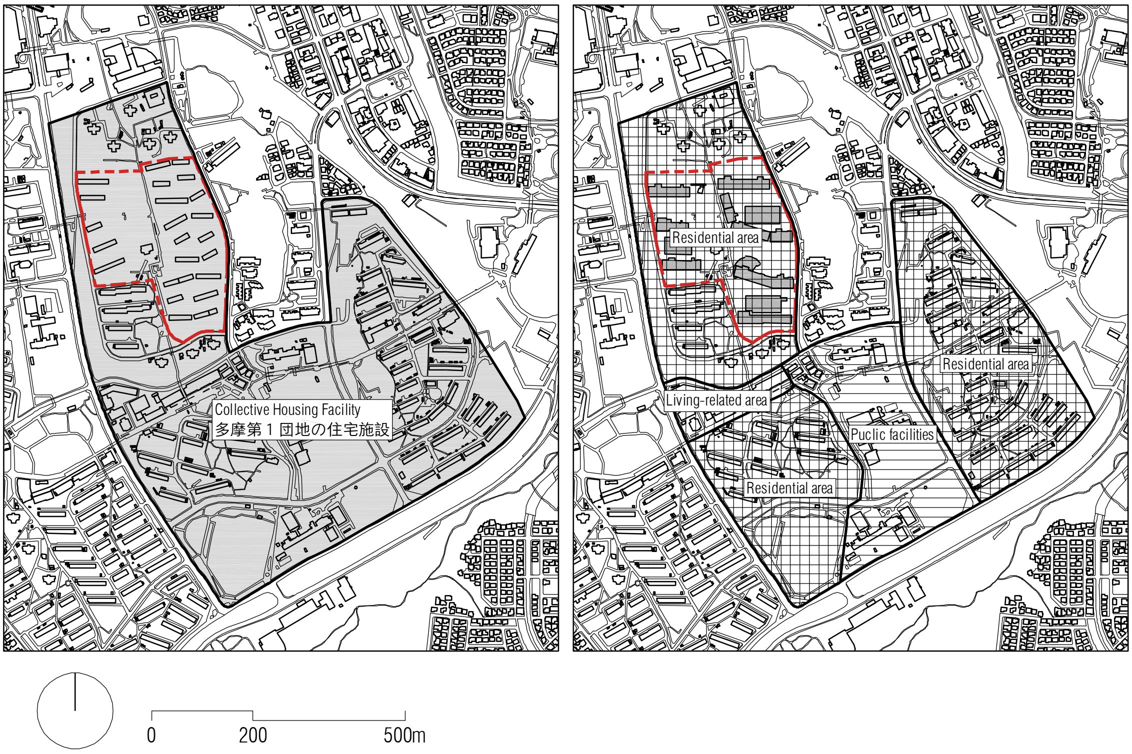
[43] Demographic data from City Planning Division of Tama City

[44] From report by マンション再生協議会

6.2.2 Incentive policies in Suwa 2-chome Housing Project

The Abolishment of Collective Housing Facilities in Suwa 2-chome Project

Like many large-scale old condominium complexes that were planned and constructed under the Collective Housing Facilities system, from the perspective of financing, the biggest obstacle in reconstruction was the insufficient FAR allowed by the City Planning Acts. The FAR of Suwa 2-chome Housing was limited to 0.5 due to the Collective Housing Facility. The low FAR limit cannot allow enough extra dwelling unit or floor area to balance the reconstruction cost, therefore making it economically difficult to reconstruct the complex. It was with the approval of Abolishment of Collective Housing Facilities in 2006, that the FAR limit was raised to 1.5. (Figure 6-10)



	Collective Housing Facility 多摩第１団地の住宅施設	Suwa District Plan 諏訪地区計画
Area	48.3 ha	48.3 ha
Period	Occupied since 1971	Approved in 2006
Content	FAR: 0.3-1.5 BCR: 10%-60% Total household number: 2,930	FAR: 1.5 Minimum site area: 170-3,000 m² Maximum building height: 15-35 m

Figure 6-10 The abolishment of Collective Housing Facilities and integration with district planning in Suwa 2-chome Project

Secondary subsidies in Suwa 2-chome Project

The Suwa 2-chome Housing Project adopted four secondary subsidies aside from the abolishment of Collective Housing Facilities:

1) DEB (優良建築物等整備事業),

2) CRFM (東京都マンション共同化建替えモデル事業),

3) PREP (先導型再開発緊急促進事業),

4) SCP (マンション等安心居住推進事業).

6.2.3 Economic balance in Suwa 2-chome Housing Project

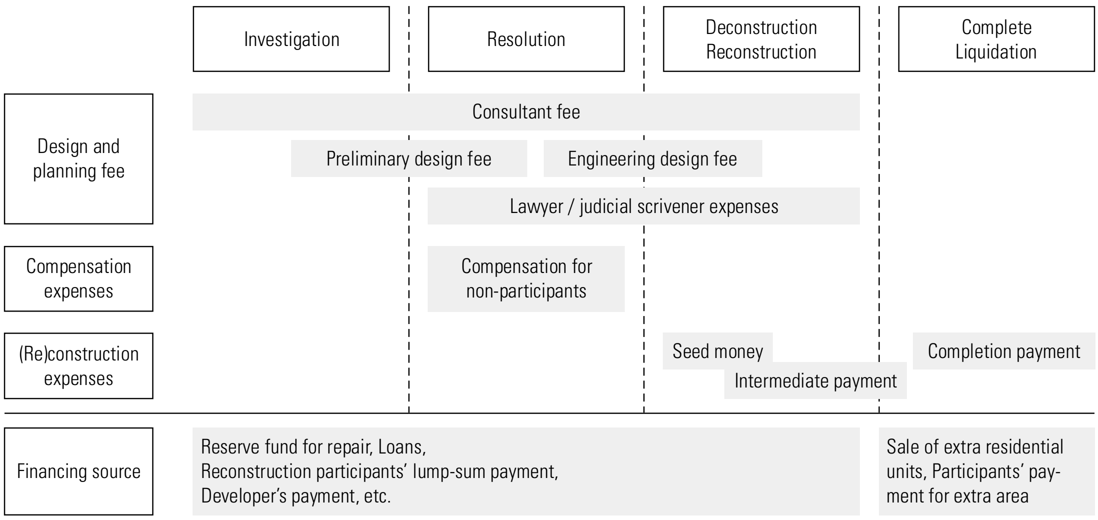


Figure 6-11 Payment and financing source in different stages

The project financing is handled by reconstruction union, which is the operator formed by reconstruction participating homeowners and property developer, approved by municipality. As an independent legal entity, the reconstruction union is able to sign construction contracts and borrow funds. The payment and financing source in different stages are shown in Figure 6-11.

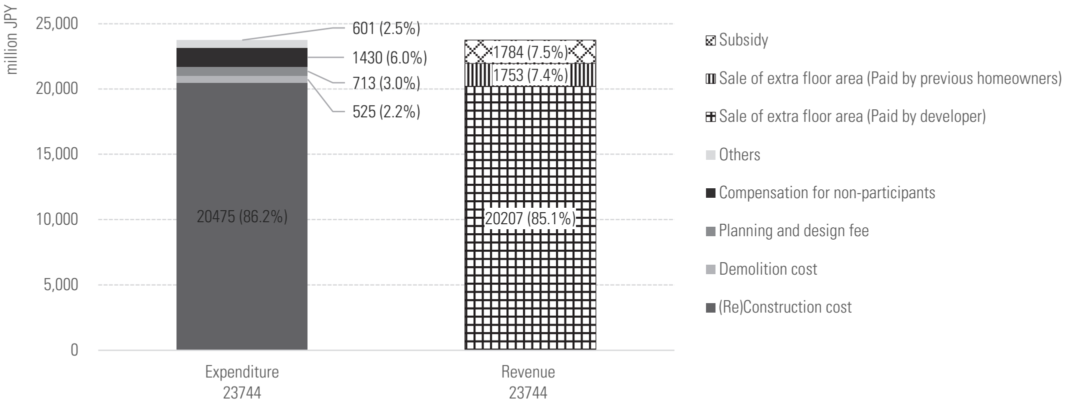


Figure 6-12 Balance of project expenditure and revenue in Suwa 2-chome project (Source: URAM)

From Figure 6-12 it could be observed that, the construction cost of new building and environment takes up 86.2% of the whole expenditure, the rest of expenditure is used as compensation for non-participants (6.0%), planning and design fee (3.0%), demolition cost (2.2%), and others (2.5%). For revenue, 85.1% is from the sale of extra residential units, 7.4% is from the sale of extra floor area to former homeowners, 7.5% is from government subsidy.

6.2.4 Discussion on financing pattern in Japanese CCR

In Suwa 2-chome Housing Project, the total expenditure of 23744 million JPY is basically balanced within the project. From the expenditure side, the majority of money is spent on the reconstruction of new built environment. From the revenue side, the extra FAR allowed by the abolishment of Collective Housing Facility and integration of District Plan is the key in balancing the expenditures. Though exact numbers may vary, a similar pattern of financing could exist in other projects that adopted the abolishment of Collective Housing Facilities, including project No. 05, 06, 09, 11, 12, and 13. In other projects where the ACHF is not applicable, the FAR limit could be relaxed by adopting the Comprehensive Design System (as in No. 02, 10), or by approaching the FAR limit set by District Plan (as in No. 01, 03, 04, 07, 08, 14, 15, 16).

Due to the abundant extra FAR in Suwa 2-chome Housing Project, the former homeowners could obtain a floor area of 49 m^2 in the new complex for free, which means the restore rate[45] in this project reached 100%. The restore rate of each case depends on its extra floor area margin and land price trend, so not every case could have a 100% restore rate, for instance, the number is 116% for No. 13 and 83% for No. 02. When reconstructing a small condominium that does not have much extra floor area margin, the restore rate theoretically could be 0. But even in such a case, it is possible to increase the restore rate and reduce homeowners' financial burden by carrying out projects including surrounding land and buildings with the same intention for reconstruction.

Unlike the Chinese DUHR in which Chinese government spent large amount of money in purchasing the old and dilapidated properties, in Japanese CCR the Japanese government only give small subsidies to promote reconstruction projects. As revealed in the Suwa 2-chome Project, subsidy only covers 7.5% of the revenue.

6.3 Operation mode in Japanese CCR

In order to obtain a general understanding of the process and roles of different players in Japanese CCR project, reconstruction manuals published by authorities and associations are first studied. Then the actual process of Tokyo cases is examined, to verify homeowners' role in the project decision making, and to what extent AFRC law has helped reconstruction projects to proceed smoothly. The study of project process is based on reports published by developers, associations, and local authorities.

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[45] The term of restore area (還元面積) refers to the amount of new floor area a homeowner could get for free in a reconstruction area. Restore rate (還元率) is the ratio of restore area to a homeowner's original floor area. These two indexes are the most important factors for homeowners to make decisions in reconstruction projects in Japan.

6.3.1 Project phases suggested in official reconstruction manuals

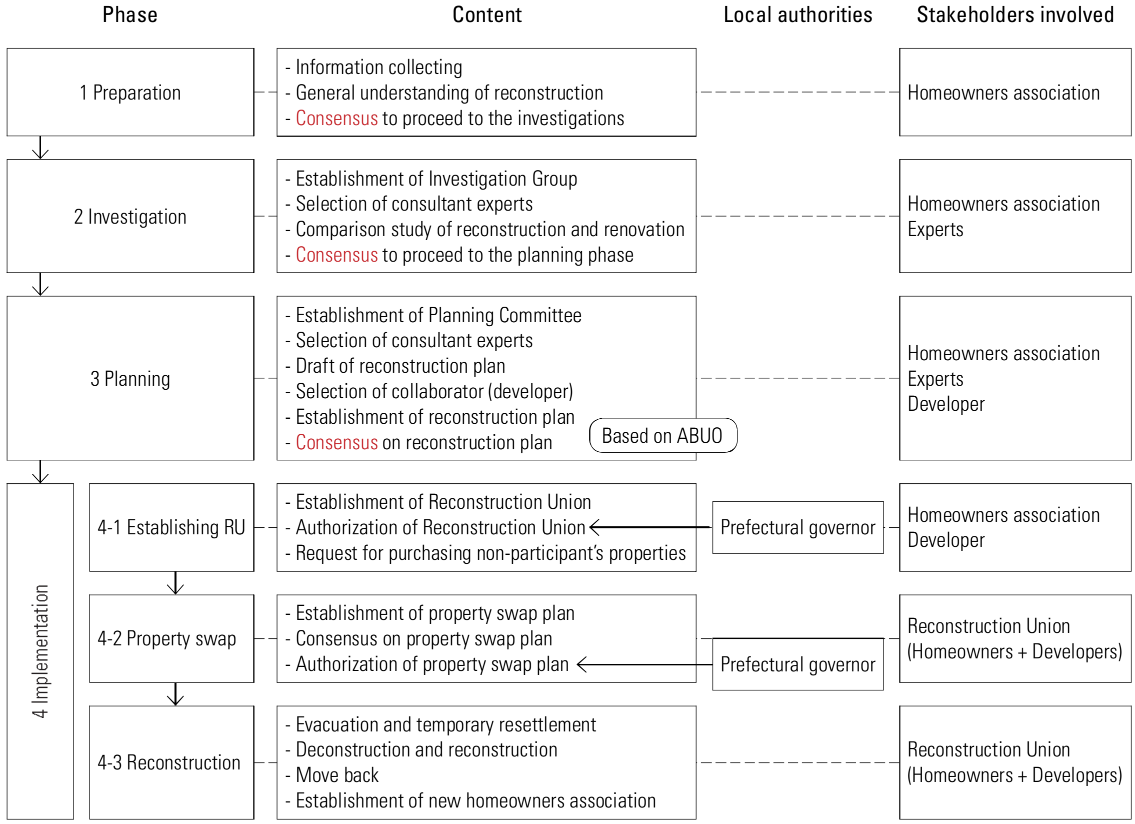


Figure 6-13 Project phases in reconstruction manuals

Based on ABUO and AFRC laws, a variety of project phases along which a reconstruction project could be conducted have been suggested in manuals published by authorities and associations (Chiba City, 2011; Ministry of Land, Infrastructure, Transport and Tourism (MLIT), 2010; ンション再生協会, 2009). Here the process could be generally summarized into four steps based on these manuals (Figure 6-13):

1) Preparation

The purpose of the preparation phase is to reach an agreement as a homeowners' association to officially investigate and examine the refurbishment or reconstruction of the condominium complex. In this preparatory stage, it is common that some property owners already have a will for regenerating. They will encourage other property owners join and form a study group. The study group will collect basic information including current condition of the complex, procedures to regenerate, legal issues, regeneration methods, and successful cases for reference. The utilization and introduction of experts and related expense will also be discussed in this stage. However, since the study group does not have the right to make a proposal, it is necessary to bring up their study results to the homeowners' association, and develop it to a resolution on continuing the regeneration/reconstruction efforts or not.

2) Investigation

a) Regeneration mode	b) Implementing method
a-1) Reconstruction	b-1) Same mode for all buildings at once
a-2) Repair/refurbishment	b-2) Varied mode for different buildings

Table 6-2 Combinations of regeneration mode and implementing method

The purpose of the investigation phase is to make a comparison study on which regeneration mode and implementing method (Table 6-2) is the most appropriate for the complex, and to make resolution on the mode that is chosen.

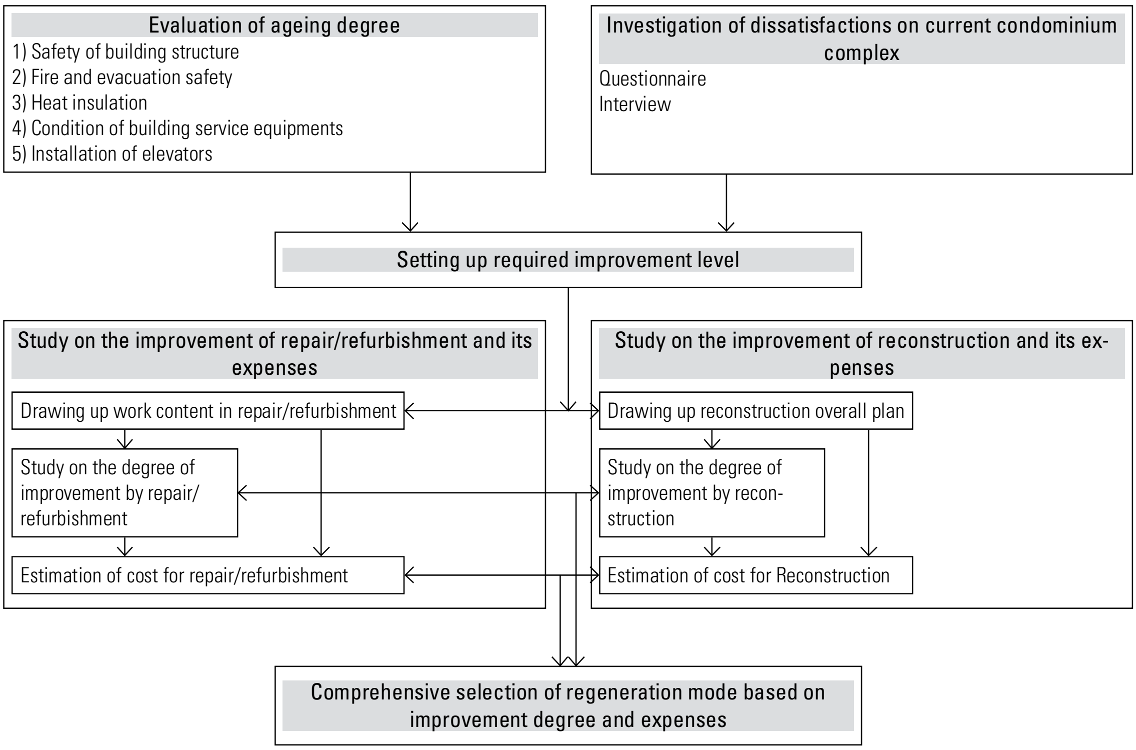


Figure 6-14 Workflow of comparative study and selection of regeneration mode

First, it is necessary to understand the ageing degree of the buildings. The investigation group may hire experts to do a professional evaluation of ageing degree. It is also necessary to investigate homeowners' dissatisfaction points about the current condominium complex, including the buildings and the overall physical environment.

Based on the results of ageing degree and homeowners' dissatisfaction, the required improvement level in the regeneration could be set up. The results are also lay a foundation for comparative examination of different regeneration modes.

In the comparative study of reconstruction and repair/refurbishment, the work contents of both modes will be drawn up. Then the improvement degree and the expenses will be compared, based on which the investigation group could select an appropriate mode.

Based on the results of investigation, homeowners association will make a resolution on whether the project will proceed to the planning stage, for the implementation of the project.

3) Planning

The planning phase is the start point to realize the mode selected in phase 2), the purpose of the planning phase is to make a formal reconstruction scheme and a resolution of all homeowners on the scheme. The study group during phase 2) will be reorganized to implement the reconstruction plan. New experts need to be hired at this stage, for consultation of reconstruction scheme making, consensus making, selection of collaborating developer, legal and tax issues.

Based on the selection of regeneration mode selected in phase 2), a draft reconstruction scheme will be drawn up at this stage, including a) land use plan for the new condominium complex, b) outline of the design of buildings in the new complex, c) implementing method of reconstruction, d) calculation and coverage plan of the reconstruction cost, e) project schedule. The reconstruction cost coverage plan will also be used in the selection of collaborating developer.

A collaborating developer will be recruited after the draft scheme is made, because it is necessary to have the developer construct the new complex, and sell extra floor area for balancing the reconstruction cost. The prospectus of the marketability and predetermined price needs to be discussed at this stage.

Afterwards, the draft reconstruction scheme will be developed into a formal scheme under the help of collaborating developer. The formal scheme includes a) overall concept of the plan; b) plan of the whole condominium complex; c) design of buildings; d) design of the outdoor environment; e) plan of public facilities; and f) schedule, financing pattern, rule for selection of new apartment for current homeowners, schedule for temporary relocation etc.

The formal plan will be adjusted to reflect the needs of the homeowners. It is also necessary to negotiate with local authorities so that the reconstruction could be integrated with the urban plan of the area, and with nearby residents so that the plan will not be opposed for issues such as sunlight and view influence brought by the probable high buildings.

After obtaining the consent of related stakeholders, the project proceed to the resolution procedure. In case of reconstruct whole complex at once, the resolution is based on Article 70 of ABUO, which calls for at least 4/5 of all homeowners and 2/3 of homeowners in each building to agree; in case of reconstruct part of the buildings, the resolution is based on Article 62 and 69 of ABUO, which call for at least 4/5 of homeowners in reconstructed part and 3/4 of all homeowners in the complex to agree.

4) Implementation

4-1) Establishing Reconstruction Union

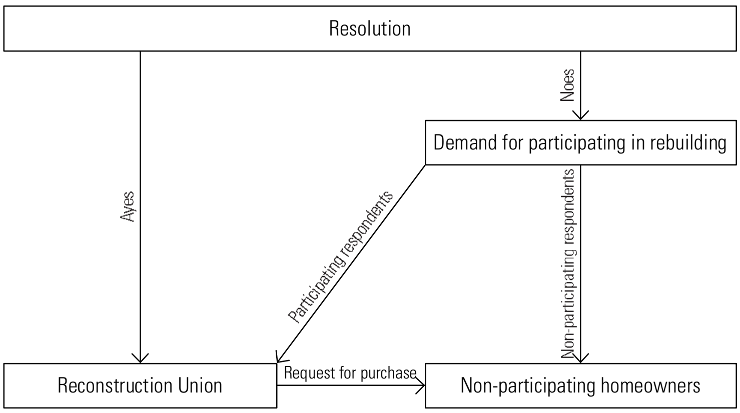


Figure 6-15 Workflow for purchase request of non-participants' property

After the resolution is passed, a reconstruction union will be formed by the homeowners and collaborating developer. The reconstruction union should be established with the consent of 3/4 of homeowners who agree to reconstruct, and be approved by prefectural government. After the union is established, all homeowners who participates in reconstruction will become members of the union. The union acts as the main body to implement the reconstruction project.

The reconstruction union may make a request for purchasing the property and land ownership of those homeowners who does not participate in the reconstruction project at a market price.

4-2) Property swap

After the reconstruction union has gain ownership of the whole part of complex that is to be reconstructed, the project comes into property swap stage (権利変換). Property swap is a procedure for transferring the ownership rights of the former property and land ownership, as well as related mortgage right, to the new condominium complex after reconstruction.
A property swap plan will be made and resolved by the reconstruction union, specifying detailed contents of property swap such as selection of new apartment's location and making up of the difference of old and new property. By having the property swap plan approved by the prefectural government, the rights in the old complex could be legally transferred to the new complex, without having to sell the property first then purchase back.
After the property swap plan is approved, on the day of swap, the related right in the old complex, including land ownership, apartment ownership, and mortgage rights, will be transferred to the homeowners specified in the plan. The compensation for those who lose certain right in the reconstruction will also be paid by the date of swap.

4-3) Reconstruction

After the property swap, the project comes to its implementation phase. Residents will move out, old condominium complex will be demolished, and new complex will be constructed. After the reconstruction work is completed, the new complex will be registered and the whole project will be liquidated. A new homeowners association will also be established in the new complex.

6.3.2 Preparation, investigation, and planning stage in Tokyo cases

Project No.	Initiation	Selection of collaborator	Consensus on reconstruction plan	Establishment of Reconstruction Union	Authorization of property swap plan	Completion
01	1990	2002.05	2003.05	2003.09	2004.01	2005.07
02	1994	-	2003.06	2003.11	2004.02	2006.03
03	1989	-	2004.06	2004.12	2005.08	2007.04
04	2003.06	2004.09	2005.07	2005.11	2006.01	2007.12
05	1987	2000	2005.07	2005.11	2006.03	2008.03
06	1990.05	-	2006.05	2006.12	2007.07	2009.09
07	2005.05	2007.11	2007.04	2007.09	2008.03	2010.03
08	2004.09	2006.02	2007.11	2008.04	2008.08	2010.03
09	1989.06	2002.05	2009.09	2010.07	2011.07	2015.08
10	-	-	2010.02	2010.08	2011.03	2013.07
11	1988	2007.05	2010.03	2010.12	2011.11	2013.10
12	-	2009.10	2010.12	2011.08	2012.03	2014.03
13	2006	2008.08	2011.12	2012.05	2013.04	2015.05
14	2009.10	-	2012.04	2012.10	2013.05	2015.08
15	2009.01	2012.04	2013.01	2013.06	2014.10	2016.04
16	2011.05	2012.03	2013.03	2013.09	2014.04	2015.12

Table 6-3 Progress of sixteen Tokyo cases (Source: マンション再生協議会)

Overviewing the project phases suggested in official reconstruction manuals, it could be observed that AFRC law is most effective in the implementation stage. Before that, homeowners need to initiate the project, investigate the strategies, and reach a consensus on reconstruction plan (Table 6-3). This section will first study the preparation, investigation, and planning stage, focusing on homeowners' role in the process of reconstruction plan making.

Case No. 05 Kokuryo Housing project is selected for an in-depth study of the planning stage. This case is selected because during its planning stage, homeowners not only worked closely together with developer to make reconstruction plan, but also negotiated with local government for district development plan making. The Kokuryo Housing is located in Chofu City, six minutes' walk from Keio line Kokuryo train station (Figure 6-16). It was developed by Japan Housing Corporation (日本住宅公団) in 1964. The land area is 13,213 m², before reconstruction there was seven buildings were arranged in a linear pattern, accommodating 144 households with two types of dwelling units (96 units of 43 m², 48 units of 48 m²). (Figure 6-18)

The most important factor in finishing the reconstruction project was the abolishment of Collective Housing Facilities and integration with District Plan, with which the FAR limit could be raised from

0.7 to 2.0, and BCR limit from 20% to 60%.[46] This guaranteed economic balance of the project, as well as possibility to increase the floor area of dwelling units.

Figure 6-16 Location of Kokuryo Housing and nearby stations

Figure 6-17 Condition of Kokuryo Housing before reconstruction (Source: Asahi Kasei)

The first efforts to reconstruct Kokuryo Housing dates to late-1980s, when Japan Housing Corporation was still in operation. However, after 10 years' study and design, Japan Housing Corporation withdrew from private housing, and due to the collapse of bubble economy, property developers were also withdrawing from many projects.

[46] The land zoning of this site is Category I mid/high-rise oriented residential zone (第一種中高層住居専用地域).

Figure 6-18 Master plan and two dwelling unit types in Kokuryo Housing before reconstruction (Source: Hirakawa et al., 2008)

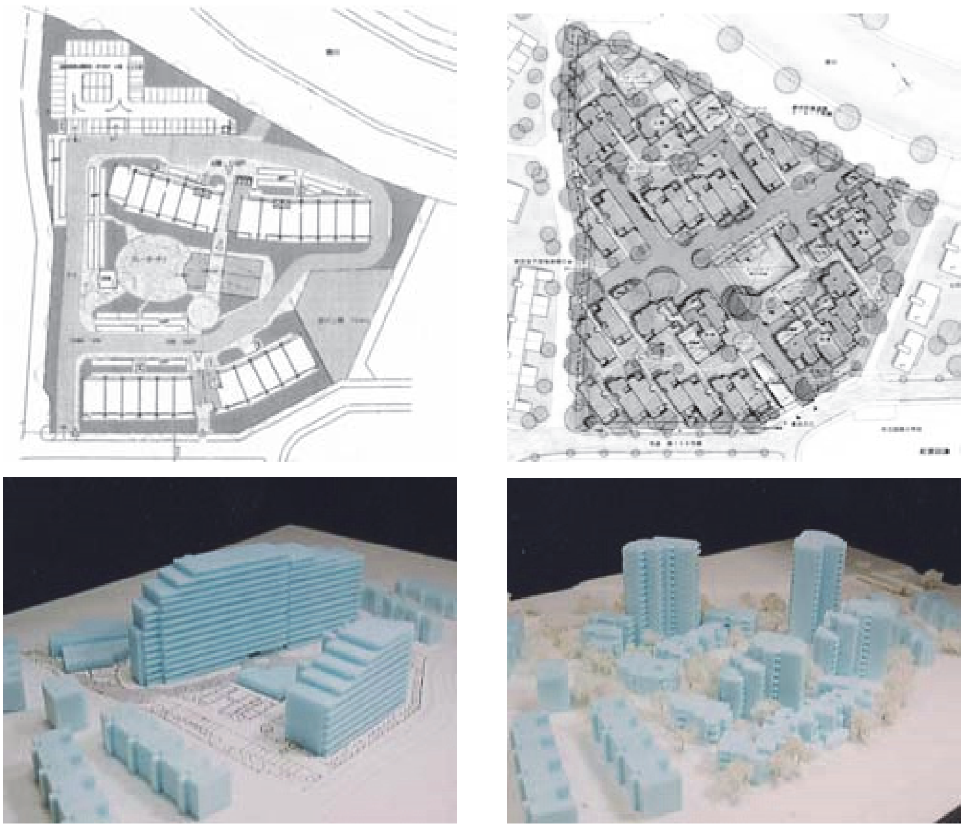


Figure 6-19 Master plan and model of two proposals at competition (Source: Next Architect & Associates)

	Figure 6-19, left	Figure 6-19, right
Site area	13,213 m^2	
Total floor area	35,704 m^2	31,087 m^2
FAR	1.99	1.85
Total dwelling units	318	290
Number of buildings	15F*2	3-15F*8

Table 6-4 Statistics of two proposals at competition

Homeowners' participation in reconstruction plan making

The homeowners finally chose two developers out of nine for a final resolution, these two companies provided two contrasting directions of proposal. Both achieving a FAR of approximately 2.0, whereas one company proposed high-rise slabs that emphasize the economic factor (Figure 6-19, left), the other proposal combined low-rise and high-rise buildings (Figure 6-19, right), attempting to highlight the regional context and cityscape by paying special attention to the skyline viewed from across the river, and human-scale streets and squares for residents. (平川 et al., 2008).

The high-rise slab proposal was very similar to the reconstruction plans in the Japan Housing Corporation era, which basically take advantage of the FAR as much as possible. As a matter of fact, homeowners' primary concern had already been identified as the area of dwelling units; their second concern was regional context and cityscape.

Homeowners in favor of the first proposal agreed its simplicity, sunlight conditions, convenience in management, and large green space. While for homeowners voting for the second proposal, the FAR is just a little less than that of the first (Table 6-4), while it has better consideration for regional context and cityscape. Finally, the second proposal won by a small margin.

Figure 6-20 Master plans for reconstruction during planning stage in Kokuryo Housing Project (Source: Hirakawa et al., 2008)

In order to share the reconstruction plan with homeowners, three briefing sessions was held with all 134 homeowners by the developer. In addition, homeowners' opinions were collected by questionnaire, interviews, and several meetings with homeowner representatives during 2000 to 2002. The main modifications to reconstruction plan include:

1) Urban design

   1-1) Using underground parking to separated pedestrian and vehicles;

   1-2) Walkability of inner streets;

   1-3) Enriching common space;

   1-4) Increased setbacks to create green way using existing trees on the peripheries of the site

2) Barrier-free design

   Elevators for low-rise buildings

3) Dwelling unit floor plan

   3-1) Redesign of dwelling unit according to opinions collected from questionnaire;

   3-2) About 60 types (ultimately 80 types) of floor plan ranging from 60 m² to 100 m² designed, to meet different life styles, and promote a mixed community; (Figure 6-5)[47]

3-3) More low-rise units to meet homeowners' will as much as possible

4) Project	Before		After	
	Units	Types	Units	Types
01 諏訪町住宅	60	1	96	31
04 新蒲田住宅	134	2	202	32
05 国領住宅	144	2	320	80
08 下連雀住宅	79	1	108	36
12 池尻団地	125	2	205	26
13 調布富士見町住宅	176	1	331	75
16 河田町住宅	34	2	41	30

Table 6-5 Increase of dwelling unit types in seven Tokyo cases

On top of these, after modifications from the viewpoint of construction cost (adopting mechanical parking facility), and the viewpoint of condominium complex type housing market (dwelling unit composition), a reconstruction plan reflecting homeowners' opinions is created. (Figure 6-20, left)

Later the estimated cost of 6.9 billion JPY was higher than the initial budget of 5.4 billion JPY, and the sale price of extra floor area was not optimistic due to the stagnant market, so the restore area would be 15%-20% lower than 75 m² as initially planned. Since such a result may essentially wipe out all the efforts so far from homeowner's point of view, the SRC structure of high-rise buildings was changed to RC structure. Besides, common facilities were moved to underground to increase net floor area of each dwelling unit. To further reduce reconstruction cost (by approximately 500 million JPY), low-rise buildings were canceled, and a master plan consisting of high-rise and mid-rise building were made. (Figure 6-20, right)

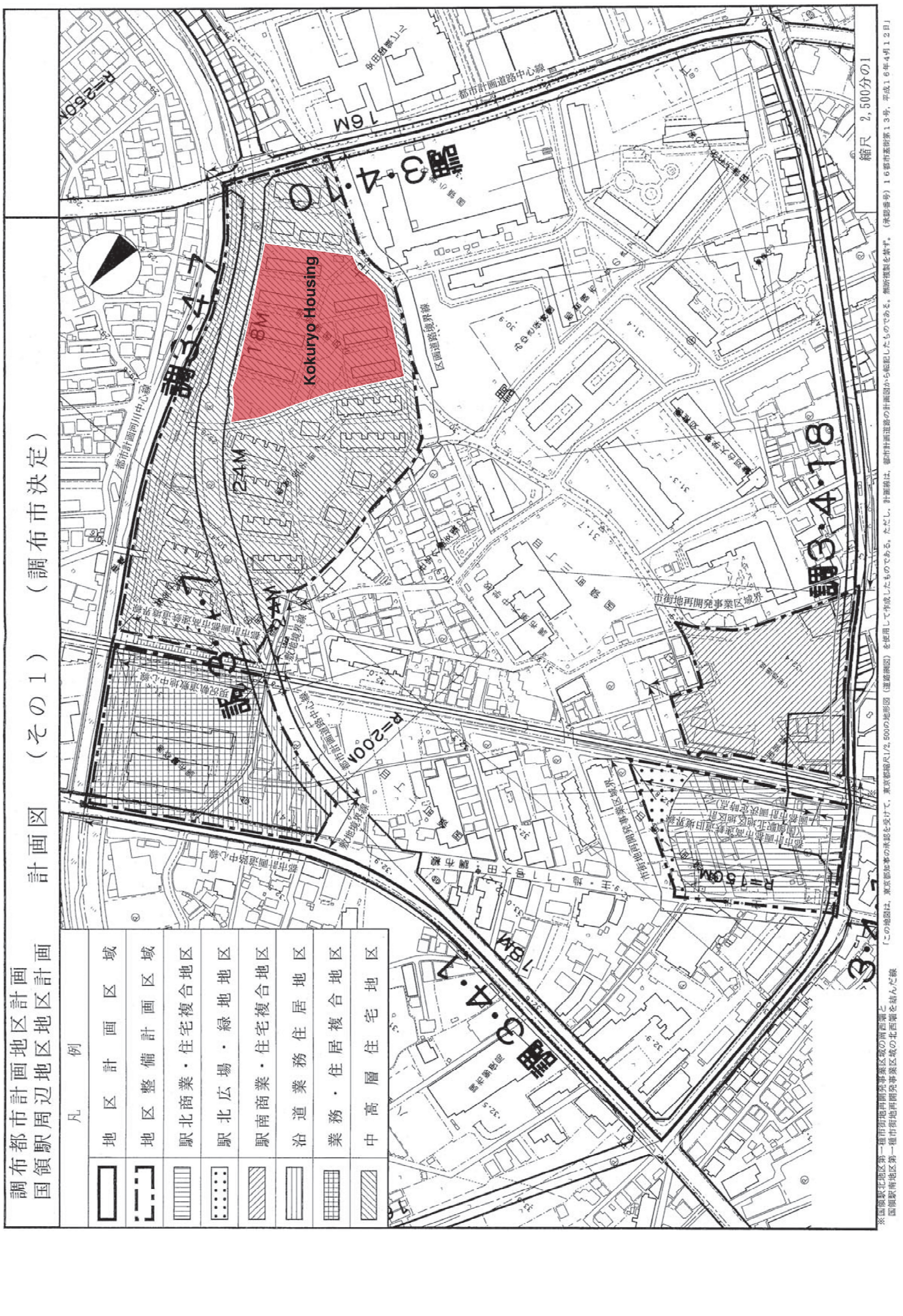
However, the larger building volumes weakened the cityscape and the scale of pedestrians and patios, therefore this plan was not convincible for homeowners. So the reconstruction cost was then set to 6.3 billion JPY, based on which the restore area was 66 m². Such a solution was approved by homeowners.

[47] An dramatic increase of dwelling unit types is quite common among reconstruction projects completed in Tokyo, as shown in Table 6-5.

In this way, the homeowners actively participated in the modification of the reconstruction plan which won by a small margin at the bidding. During the whole process, floor area, which is usually the most important factor in reconstruction projects, gives way to urban and neighborhood scale physical environmental qualities to a certain extent according to homeowners' wills.

Homeowner participation in district development plan making

From 2000, the local government had been discussing changes to district development plan, however, there was not much progress after one year or more. In March 2012, 127 out of 134 (95%) residents signed and submitted a request to local government for promotion of district plan remaking, in which the residents listed their daily troubles living in the old complex. (including aged pipes, lack of elevator, poor sound insulation, insufficient floor area, etc.) Afterwards, substantial consultation of district plan took place in response to homeowners' request in August 2002. It took much effort to reach an agreement on the district development plan for the Chofu City and homeowners in Kokuryo Housing.



調布都市計画地区計画
国領駅周辺地区地区計画
計画図　（その１）　（調布市決定）
凡例
地区計画区域
地区整備計画区域
駅北商業・住宅複合地区
駅北広場・緑地地区
駅南商業・住宅複合地区
沿道業務住居地区
業務・住居複合地区
中高層住宅地区
Kokuryo Housing
18M
24M
16M
R=200M
R=150M
R=250M
調3・4・7
調3・4・18
調3・4・10
市街地再開発事業区域界
都市計画道路中心線
縮尺　2,500分の1

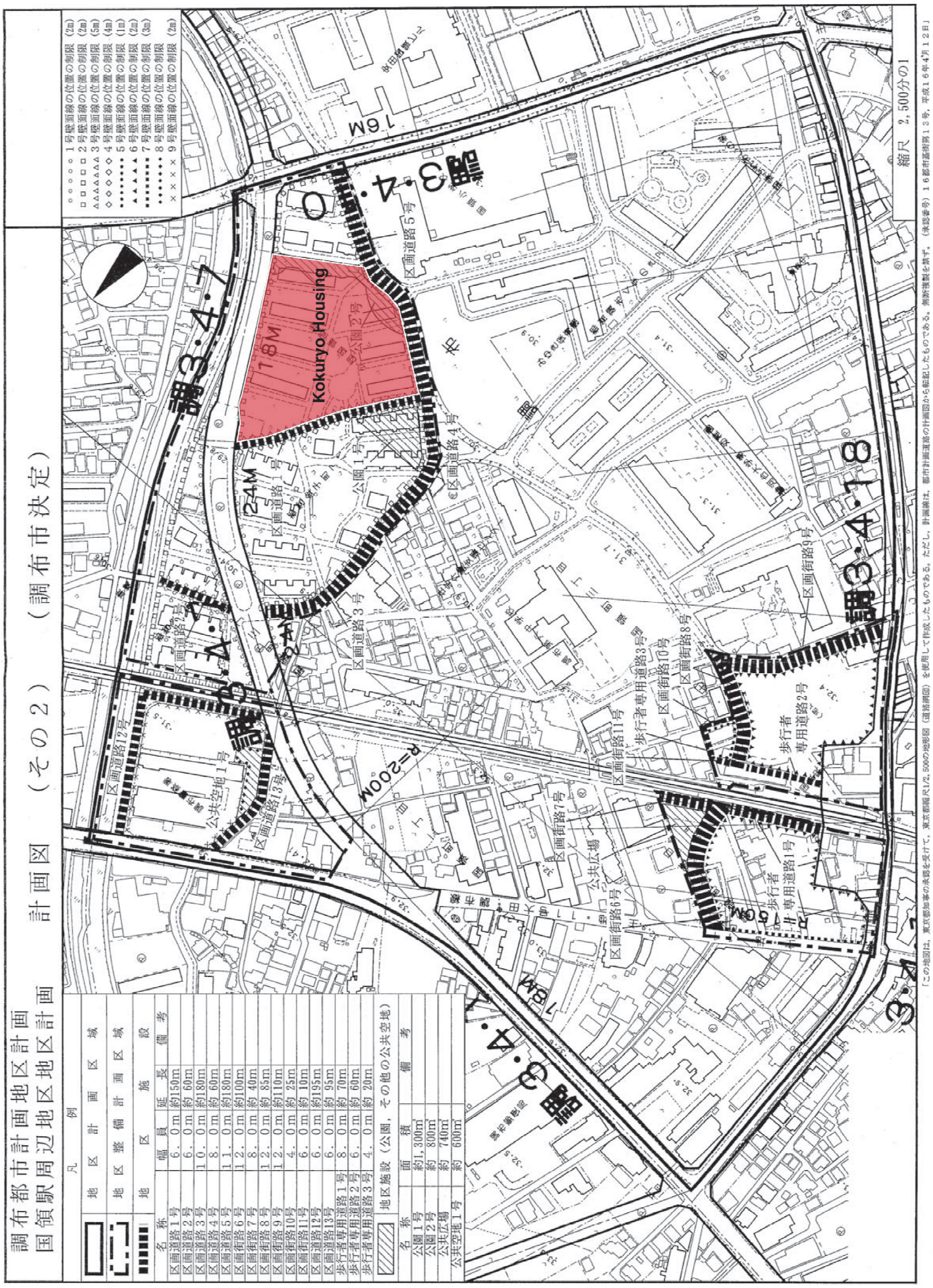


Figure 6-21 District plan for Kokuryo Station and nearby areas (Source: Chofu City)

Scope of district development plan

Homeowners initially applied for a change of district development plan only within the scope of

Kokuryo Housing. But this scope was considered too small for a district development plan by Chofu City, and hard to be integrated with surrounding blocks. Therefore the new district development plan will also include the adjacent UR staff housing. Furthermore, the scope is integrated with higher level district plan made by the city, and the abolishment of Collective Housing Facilities will be adopted in the project. (Figure 6-21)

Contents of district development plan

Regarding the contents of district development plan, the Chofu city's initially intended to stick with the existing "new town" concept. In the name of "to ensure a good living environment", they wanted to control the FAR and building height, and keep the large parks. So there was a big gap between the city's concern and homeowners' intention. The city's first district development draft plan was made in February 2003:

1) The FAR was set to 1.5, which is lower than nearby areas' 2.0;
2) The height limit was set to 30 meters, which is not based on sunlight distance regulation in Building Standards Act.;
3) Parks should occupy 13% (about 1,700 m²) of the site, which could be a rigorous condition for condominium complex reconstruction project.

With respect to the first draft plan, the homeowners fundamentally questioned "to ensure a good living environment". Besides, they raised the issue that if the FAR and building height were to be strictly controlled lower than nearby areas as in the draft, the consensus up to then among homeowners would be in vain.

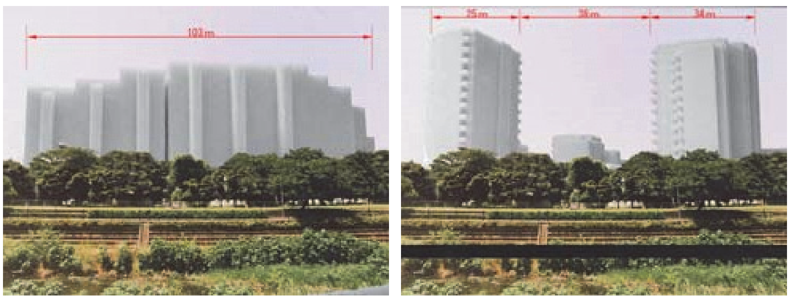


Figure 6-22 Study of building volumes in Kokuryo Housing Project (Source: Hirakawa et al., 2008)

Responding to homeowners' question, it was made clear by the city that, "to ensure a good living environment" does not simply means lower FAR and building height, nor larger parks, it will also take into consideration the cityscape and how it is perceived by citizens.

Hence, special attention was paid to the layout of building volumes. The total floor area is divided into seven buildings including high-rise and low-rise buildings, which would make the volumes look smaller and thinner. Based on this, the building height limit is relaxed. Low-rise buildings will be arranged along the street, and high-rise buildings will be arranged in the center to minimize the pressure to pedestrians. Models and perspective drawings were used for consultation with the city. (Figure 6-22)

According to this consultation, the second district development draft plan was made in July 2003 by the city. The FAR limit was raised to 2.0, the building height limit was also set according to Building Standards Act. without any further restrictions. However, with regard to parks, it was proposed that parks should be arranged on the southwest side along streets, and occupy 17% (about 2,200 m²) of the site, which was higher than the first draft.

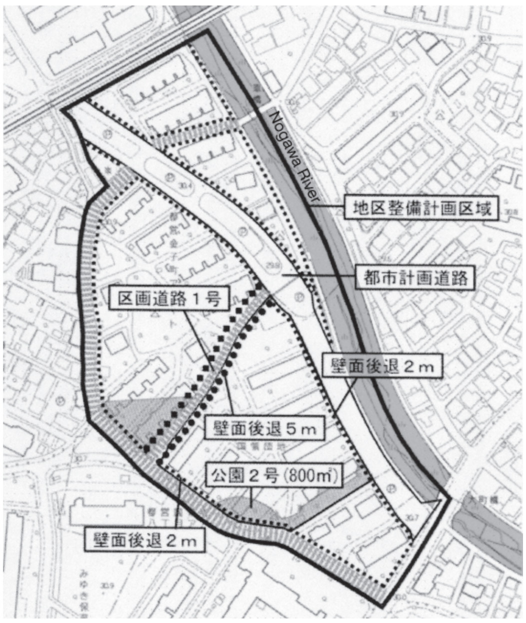


Figure 6-23 Arrangement of new park in Kokuryo Housing Project

Figure 6-24 Park in front of the elementary school after reconstruction (Photo by author, 2017)

Responding to this, the homeowners questioned the necessity of 17% park area, which was nearly three times of the usual number of 6% in projects aiming to "ensure a good living environment". It was also argued that, rather than limiting the area and shape of the park, it would be better to think about what kind of park is needed for this area and how to integrate the park with the built environment and the nurtured trees. So the homeowners' proposal set the park in front of the elementary school to improve the accessibility with Nogawa River. (Figure 6-23)

Setbacks

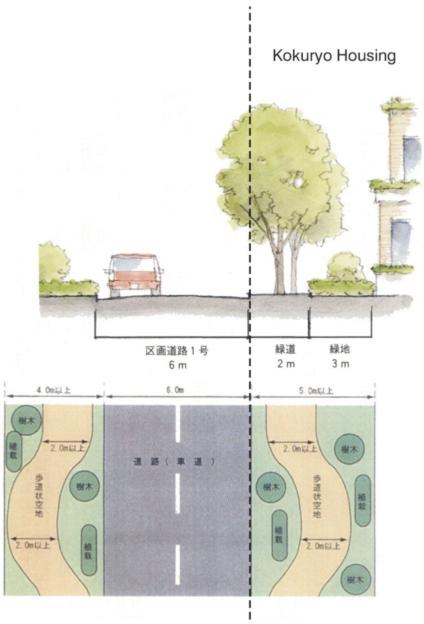


Figure 6-25 Setbacks on the west side in Kokuryo Housing Project (Source: Hirakawa et al., 2008)

Figure 6-26 Road on the west side, before and after reconstruction (Photos by author, 2017)

Originally there was no restrictions on the setbacks in the first district development draft plan. However, the plan for road on the west between Kokuryo Housing and municipal housing needed to be discussed. From the city's perspective, they wanted the road to be 10 meters wide, with Kokuryo Housing and municipal housing taking care of 5 meters each. However, the existing trees could not be saved if the road had to be 10 meters wide. Besides, a 10-meters road would increase passing traffic and degrade the living environment.

Responding to this, the homeowners proposed to keep the existing 6-meters road on the municipal housing's side, and add a 5-meters setback on the Kokuryo Housing side, so as to form a green passage using existing trees, and improve the accessibility to Nogawa River. From the perspective of increasing accessibility and contribute to urban space, consultations were done on a 5-meters setback on the Kokuryo Housing side. (Figure 6-25, Figure 6-26)

It could be summarized that, extra floor area gained from abolishment of Collective Housing Facilities is the key in the complete of Kokuryo Housing Project. Nonetheless, examining the planning stage of Kokuryo Housing Project, the reconstruction plan was not simply maximizing the economic benefits. Based on a certain amount of extra floor area, homeowners, developer, and local government worked closely together to enhance the cityscape, walkability, accessibility, as well as design streets and parks suitable for the existing urban context.

Reconstruction plan making

Developer

Homeo

The first proposal used high-rise slabs that maximize the FAR;
the second proposal combined low-rise and high-rise buildings, attempting to highlight the regional context and cityscape by paying special attention to the skyline viewed from across the river, and human-scale streets and squares for residents.

The second proposal won by a small margin.

The proposal was modified according to homeowners' opinions:
1) Urban design
1-1) Using underground parking to separated pedestrian and vehicles;
1-2) Walkability of inner streets;
1-3) Enriching common space;
1-4) Increased setbacks to create green way using existing trees on the peripheries of the site
2) Barrier-free design
Elevators for low-rise buildings
3) Dwelling unit floor plan
3-1) Redesign of dwelling unit according to opinions collected from questionnaire;
3-2) About 60 types (ultimately 80 types) of floor plan ranging from 60 m² to 100 m² designed, to meet different life styles, and promote a mixed community;
3-3) More low-rise units to meet homeowners' will as much as possible

Facing the stagnant market, in order to reduce cost, the restore area would be 15%-20% lower than 75 m² as initially planned, the SRC structure of high-rise buildings was changed to RC structure, common facilities were moved to underground to increase net floor area of each dwelling unit. Besides, low-rise buildings were canceled, and a master plan consisting of high-rise and mid-rise building were made.

The larger building volumes weakened the cityscape and the scale of pedestrians and patios, therefore this plan was not convincible for homeowners.

Reconstruction cost was then set to 6.3 billion JPY, based on which the restore area was 66 m².

District development plan making

owner	Chofu City

Chofu City started to discuss changes to district development plan, while there was no substantial results.

127 out of 134 (95%) homeowners signed and submitted a request to local government for promotion of district plan remaking, in which the homeowners listed their daily troubles living in the old complex.

Substantial consultation of district plan took place in response to homeowners' request.

Homeowners initially applied for a change of district development plan only within the scope of Kokuryo Housing.

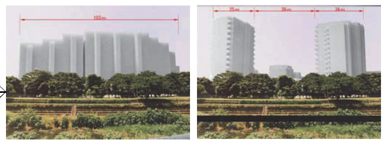
The new district development plan will also include the adjacent UR staff housing. Furthermore, the scope is integrated with higher level district plan made by the city, and the abolishment of Collective Housing Facilities will be adopted in the project.

Regarding the contents of district development plan, the Chofu city's initially intended to stick with the existing "new town" concept. In the name of "to ensure a good living environment", they wanted to control the FAR and building height, and keep the large parks.
1) The FAR was set to 1.5, which is lower than nearby areas' 2.0;
2) The height limit was set to 30 meters, which is not based on sunlight distance regulation in Building Standards Act.;
3) Parks should occupy 13% (about 1700 m²) of the site, which could be a rigorous condition for condominium complex reconstruction project.

Homeowners questioned "what is district development plan". Besides, if the FAR and building height were to be strictly controlled lower than nearby areas as in the draft, the consensus up to then among homeowners would be in vain.

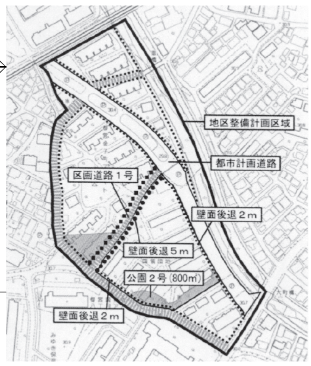
"To ensure a good living environment" does not simply means lower FAR and building height, nor larger parks, it will also take into consideration the cityscape and how it is perceived by citizens.

Special attention was paid to the layout of building volumes. The total floor area is divided into seven buildings including high-rise and low-rise buildings, which would make the volumes look smaller and thinner. Based on this, the building height limit is relaxed. Low-rise buildings will be arranged along the street, and high-rise buildings will be arranged in the center to minimize the pressure to pedestrians.



The second district development draft plan:
The FAR limit was raised to 2.0, the building height limit was also set according to Building Standards Act. without any further restrictions.
Parks should be arranged on the southwest side along streets, and occupy 17% (about 2200 m²) of the site, which was higher than the first draft.

Homeowners questioned the necessity of 17% park area, which was nearly three times of the usual number of 6% in projects aiming to "ensure a good living environment".
It was also argued that, rather than limiting the area and shape of the park, it would be better to think about what kind of park is needed for this area and how to integrate the park with the built environment and the nurtured trees. So the homeowners' proposal set the park in front of the elementary school to improve the accessibility with Nogawa River.



The city wanted the road to be 10 meters wide, with Kokuryo Housing and municipal housing taking care of 5 meters each.

The existing trees could not be saved if the road had to be 10 meters wide. Besides, a 10-meters road would increase passing traffic and degrade the living environment.
Responding to this, the homeowners proposed to keep the existing 6-meters road on the municipal housing's side, and add a 5-meters setback on the Kokuryo Housing side, so as to form a green passage using existing trees, and improve the accessibility to Nogawa River.

From the perspective of increasing accessibility and contribute to urban space, consultations was done on a 5-meters setback on the Kokuryo Housing side.

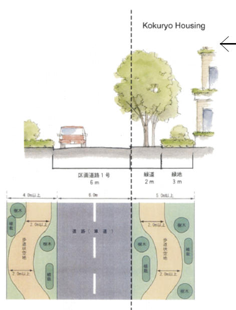


Figure 6-27 Homeowners' participation in reconstruction plan making and district development plan making in Kokuryo Project

By forming a reconstruction union with the developer, homeowners had played an active role in making the reconstruction plan and district development plan (Figure 6-27). On hand, through discussions with the developer, the arrangement of building volumes, and the design of dwelling unit layout, streets, squares, and parks reflected homeowners' thoughts on their own living environment. On the other hand, homeowners and developer consulted with the local government to make a district development plan suitable for Kokuryo Housing. The new FAR limit, building height limit, relocation of city road, building setbacks, and integration of park with the urban environment are the result of repeated meetings between homeowners, developer, and local government.

6.3.3 Implementation stage in Tokyo cases

After a reconstruction plan is made and resolution on reconstruction is passed, the project proceeds into implementation stage and AFRC law starts to function. The project will go through establishment of reconstruction union, property swap, purchase of non-participants' property, reconstruction and resettlement. Under the protection of AFRC law, these phases took two to four years in the Tokyo cases (Table 6-6).

Year	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
1987					I											
1988											I					
1989			I			I			I							
1990	I															
1991	RC										RC					
1992																
1993		I			RC											
1994		RC														
1995																
1996																
1997		SC														
1998																
1999																
2000				I	SC											
2001									RC				I			
2002	Enactment of AFRC															
	SC	RF							SC							
2003	R RU	R RU		RC		RC						I				
2004	PS C	PS C	R RU	SC	CD			I								
2005			PS C	R RU	R RU		I RC		CD							
2006				PS C	PS C	CD R RU	SC	RC SC	RF		RC CD	RC				
2007						PS	R RU	R	RF		SC					
2008						C	PS C	RU PS C					RC SC			
2009									R			CD SC		RC	I RC	
2010									RU	R	R RU	R				I RC
2011									PS	PS C	PS C	RU	CD R	SC		
2012												PS C	RU	R RU	SC	SC
2013									C				PS C	PS C	R RU	R RU
2014															PS C	PS C

I: Investigation started RC: establishment of Reconstruction Committee SC: Selection of Collaborators
R: Resolution on reconstruction RU: establishment of Reconstruction Union PS: approval of Property Swap schema
RF: Resolution on reconstruction (Failed) C: Construction started CD: Abolishment of CHF and Integration of DP
: Implementation stage

Table 6-6 Implantation of Tokyo cases

6.3.4 Discussion on operation mode in Japanese CCR

By studying the official reconstruction manuals and actual process of Tokyo cases, it could be summarized that the Japanese CCR is a bottom-up system with top-down support and supervision. On one hand, a project could be initiated and decided by homeowners; on the other hand, the government sets up a legal framework and is responsible to approve projects. Homeowners' decision making is not guided by local government's preference as in the Chinese DUHR. Through working closely with developer and local government, homeowners could take part in the reconstruction plan making and district development plan making when necessary.

During the investigation and planning stage, homeowners could form Investigation Group and Planning Committee to discuss and make reconstruction plan. After a consensus is made on reconstruction plan, according to AFRC law, a reconstruction union is established between homeowners and developer as an implementor to procced the project. Third-party consultants could be hired during the investigation and planning stage to help homeowners make better choices.

No.	Project	Original households	Original households stayed after reconstruction	Percentage of households stayed after reconstruction
01	諏訪町住宅	54	45	83%
02	萩中住宅	350	298	85%
03	野方団地	44	32	73%
04	新蒲田住宅	129	113	88%
05	国領住宅	134	126	94%
06	町田山崎団地	321	286	89%
07	林町住宅	56	47	84%
08	下連雀住宅	79	64	81%
09	桜上水団地	404	362	90%
10	原宿住宅	112	70	63%
11	諏訪 2 丁目住宅	640	599	94%
12	池尻団地	125	83	66%
13	調布富士見町住宅	176	104	59%
14	同潤会上野下アパート	71	52	73%
15	小金井コーポラス	80	53	66%
16	河田町住宅	34	22	65%

Table 6-7 Percentage of households stayed in reconstruction in Tokyo cases[48]

It should also be mentioned that, as a result of the operation mode in Japanese CCR, a large proportion of homeowners could continue to live in the same condominium complex. The average percentage of households stayed in reconstruction in Tokyo cases was 84%, the number in each project varied from 59% to 94% (Table 6-7). A higher percentage of original households might

[48] The percentage is calculated based on the contract signing of each project. There could be more complicated situations in each project, for example joint ownership of a property, or homeowners may sell their property soon after the project completion.

contribute to the preservation of social structure and lifestyle in the area.

6.4 Improvement of physical environment in Japanese CCR

Previously in Chapter 4, the problems in improvement of physical environment haven been identified as that, the DUHR mode only focuses on single dilapidated buildings, while does not respond to residential area scale and urban scale problems. This section will take a look at the improvement of physical environment in Japanese CCR projects, mainly from urban scale and residential area scale.

6.4.1 Urban scale - integration with urban context

Considering the varied development background and different types of locations of old condominium complexes, the urban scale study will examine three cases located at three different types of location: new town, commuter town, and city center, to see the integration of reconstruction projects with urban space in different context.

New town - Case No.11 Suwa 2-chome Housing

The Suwa 2-chome Housing project, which is located in Tama New Town, is used again in this section to reveal the improvement to physical environment. As introduced in section 6.2, abolishment of Collective Housing Facilities is adopted, and the project is integrated with district plan (Figure 6-28) so that a higher FAR limit could be allowed.

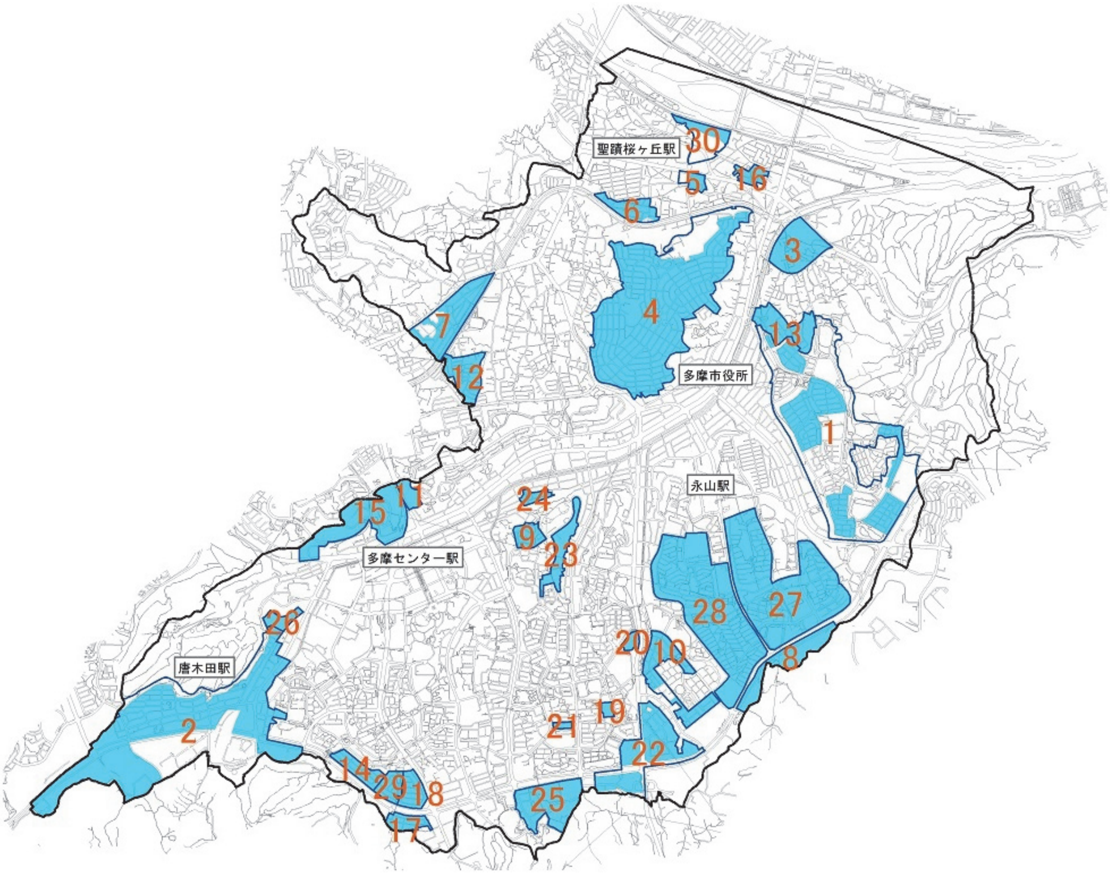


Figure 6-28 District plan areas in Tama City (Suwa 2-chome Housing in plot 27, Source: Tama City Planning Division)

According to the Comprehensive Improvement Plan for Residential Area in Suwa and Nagayama of Tama New Town (多摩ニュータウン諏訪・永山地区住宅市街地総合整備事業), the reconstruction of Suwa 2-chome Housing is part of a larger plan (Figure 6-29, Figure 6-30) to improve the living environment in the area, which lasts from 2010 to 2015 including housing, parks, roads, and other facilities (Figure 6-31).

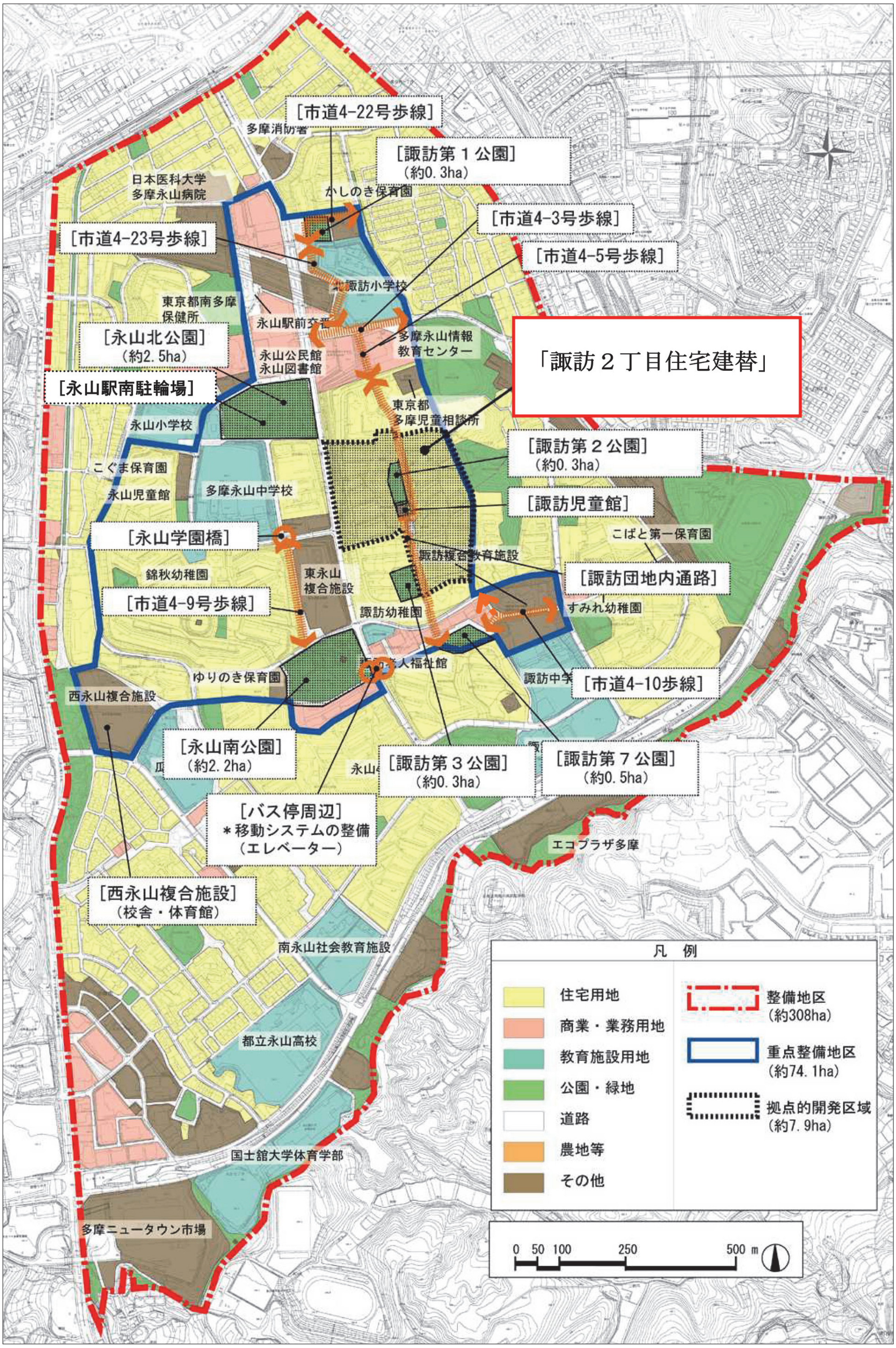


Figure 6-29 Overview of Comprehensive Improvement Plan in Suwa and Nagayama area (Source: Tama City Planning Division)

Figure 6-30 Schedule of projects in Suwa and Nagayama area District Development Plan
(Source: Tama City Planning Division)

Aside from new condominium buildings, the central road running north-south through the plot is widened and redesigned with brighter vision, and streetlamps are renewed for improved safety for pedestrian. Small level difference is eliminated, and steep slopes are relaxed for better walkability. The Suwa No. 2 park is also renewed with new benches, streetlamps, and reorganized plants. Several new squares and children's playground are arranged along the central road, and new stairway linking different levels is added. (Figure 6-32) In this way, the project is integrated with the pedestrian corridors of the whole area, which links parks and green spaces. (Figure 6-34)

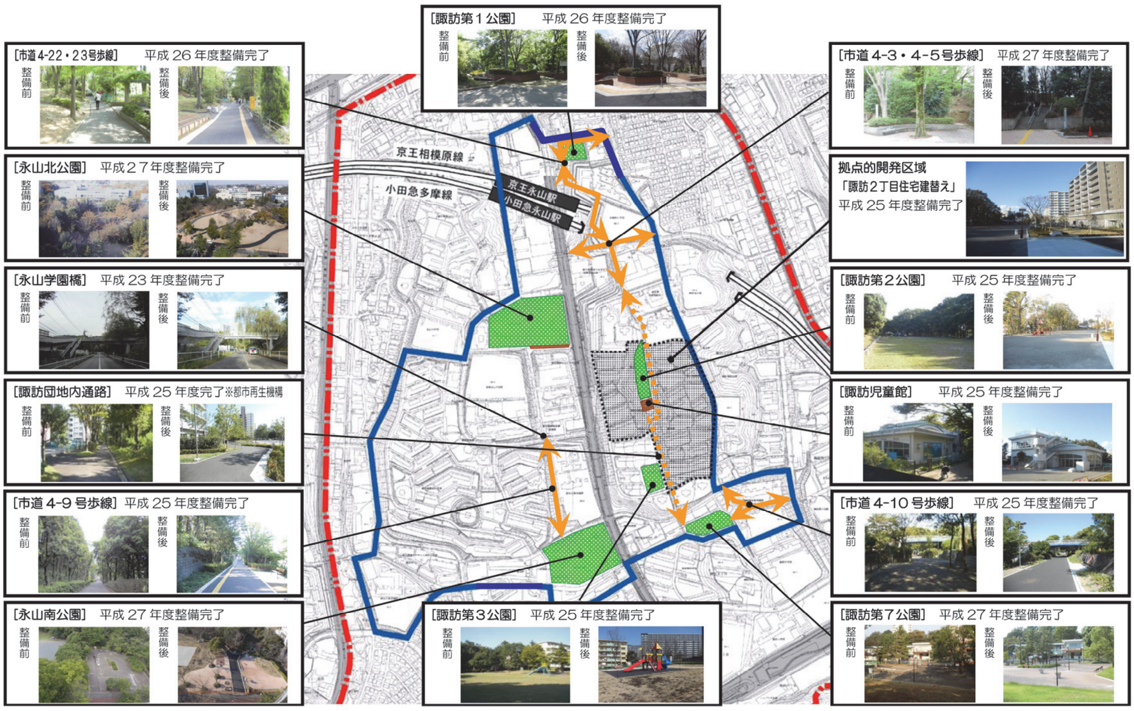


Figure 6-31 Main projects in Comprehensive Improvement Plan (Source: Tama City Planning Division)

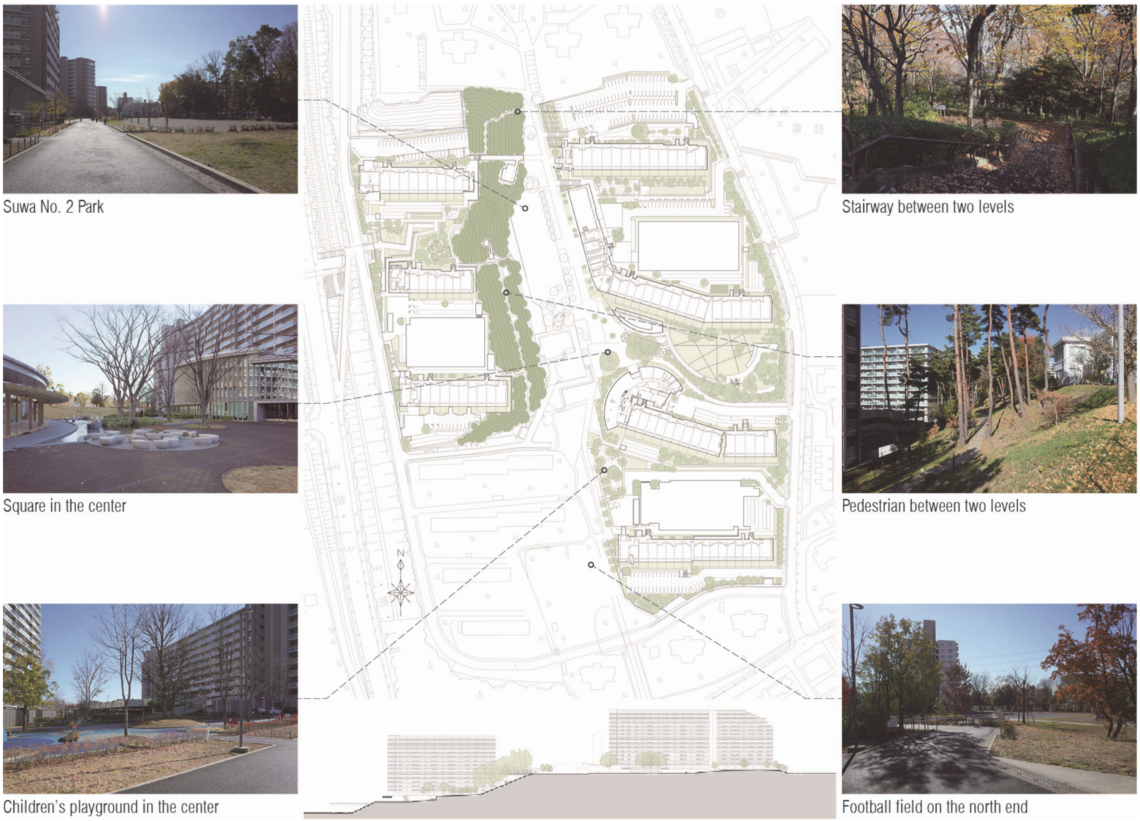


Figure 6-32 New streets, parks and open public spaces in Suwa 2-chome Housing (Photos by author, 2017)

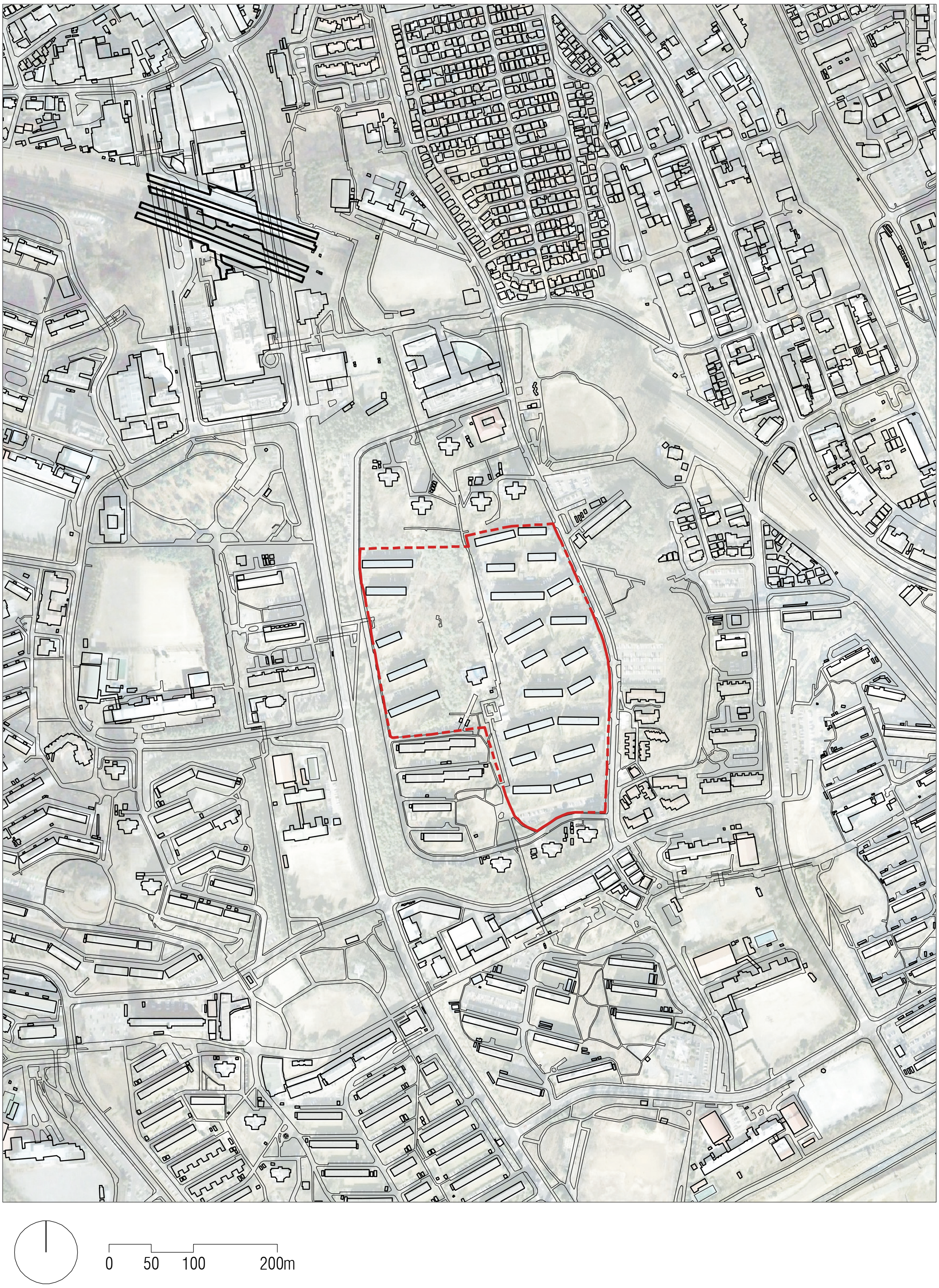


Figure 6-33 Site plan of Suwa 2-chome Housing before reconstruction

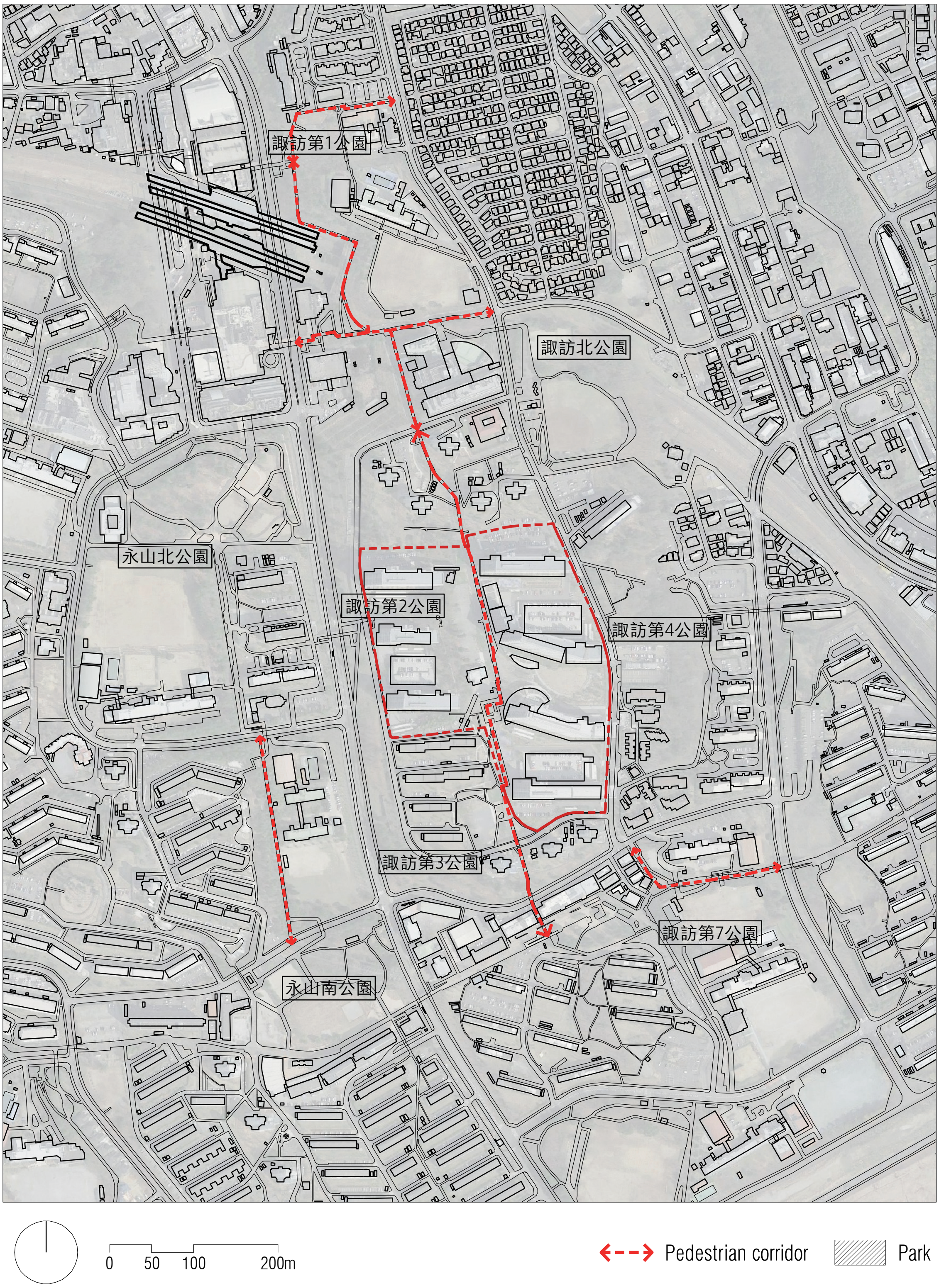


Figure 6-34 Site plan of Suwa 2-chome Housing after reconstruction

The boundaries and connections with surrounding urban environment are also improved. Greenery is arranged along the east and west boundaries along city road, and the site could be accessed by automobile at eight entrances with better vision. Since city roads on the west are at a different elevation from the site, stairway is added to enhance the connection. At the center of the site, an elevator connecting two levels in the sight is added for convenience of residents and citizens. (Figure 6-35)

Figure 6-35 Boundaries and connections with urban context in Suwa 2-chome Housing (Right middle image source: Matsuda & Hirata Design; other photos by author, 2017)

The Suwa 2-chome Housing project is an example of integrating condominium complex reconstruction project with the improvement of urban environment in a new town area. Instead of being an isolated project, this reconstruction has been included in a larger scale plan of improving the living environment in the Suwa and Nagayama area of Tama New Town. With an overall plan from the city, and redesigned walkway, park and open spaces in the Suwa 2-chome Housing project, the overall walkability of Suwa and Nagayama area has been improved. The boundaries and connections with urban context in this condominium complex have also been redesigned, forming a more friendly interface and enriched streetscape for the city.

Commuter town - No.13 Chofu Fujimi Housing

Case No.13 Chofu Fujimi Housing is located in Chofu City, a commuter town in the south center of Tokyo Metropolis, approximately 20 kilometers from downtown Tokyo. (Figure 6-1) The site is 15 minutes on foot from Chofu Station (Keio Line) and 20 minutes on foot from Nishichofu Station (Keio Line). (Figure 6-2) Completed in 1971, this condominium complex was developed by Tokyo Metropolitan Housing Supply Corporation. The site area is 12,507 m², with a total floor area of 10470 m² arranged in two rows of five-storey buildings. The dwelling units were 3DK with an average area of 50.83 m². 40 years after completion, the complex was suffering from poor earthquake resistance ability, lack of elevators, residents aging, and high rate of vacancy. Although the investigation of reconstruction had been initiated by a group of homeowners back in 2001, the investigation was ceased due to the limitation (FAR: 80%; BCR: 20%) of Collective Housing Facilities, under which this complex was planned and constructed. When the discussion of reconstruction started again around 2008, it was possible to abolish the Collective Housing Facilities system and integrate the project with district plan.

One of the most challenging issues in Chofu Fujimi Housing project was that the plot was ran through by a city road (市道北 183 号線), one the south side of the road stood five buildings, while an enclave is created on the north side accommodating a parking lot, pump house, and garbage disposal area. The road was also not cleanly connected to adjacent roads, forming a Z-shaped intersection on the west side on the plot. (Figure 6-36) Not only is the current situation of the city road inconvenient and insecure, it will also affect the economic benefit of reconstruction project, because the 10 meters wide enclave is hard to be redeveloped (Figure 6-37), which will lower the land utilization rate.

		Before	After
Year of construction		1971	2015
Site area		12,507 m²	12,446.42 m²
Maximum FAR allowed		80%	200%
Total floor area		10,470 m²	35,060 m²
Building condition	Number of floors and buildings	5F above ground × 5	6F, 8F above ground 1F underground × 2

	Structure type	RC	RC
Dwelling unit	Number of households	176	331
	Layout	3DK	2LDK - 3LDK
	Unit floor area	50.83 m²	56.14 m² - 94.64 m²

Table 6-8 Overview of Chofu Fujimi Housing before and after reconstruction

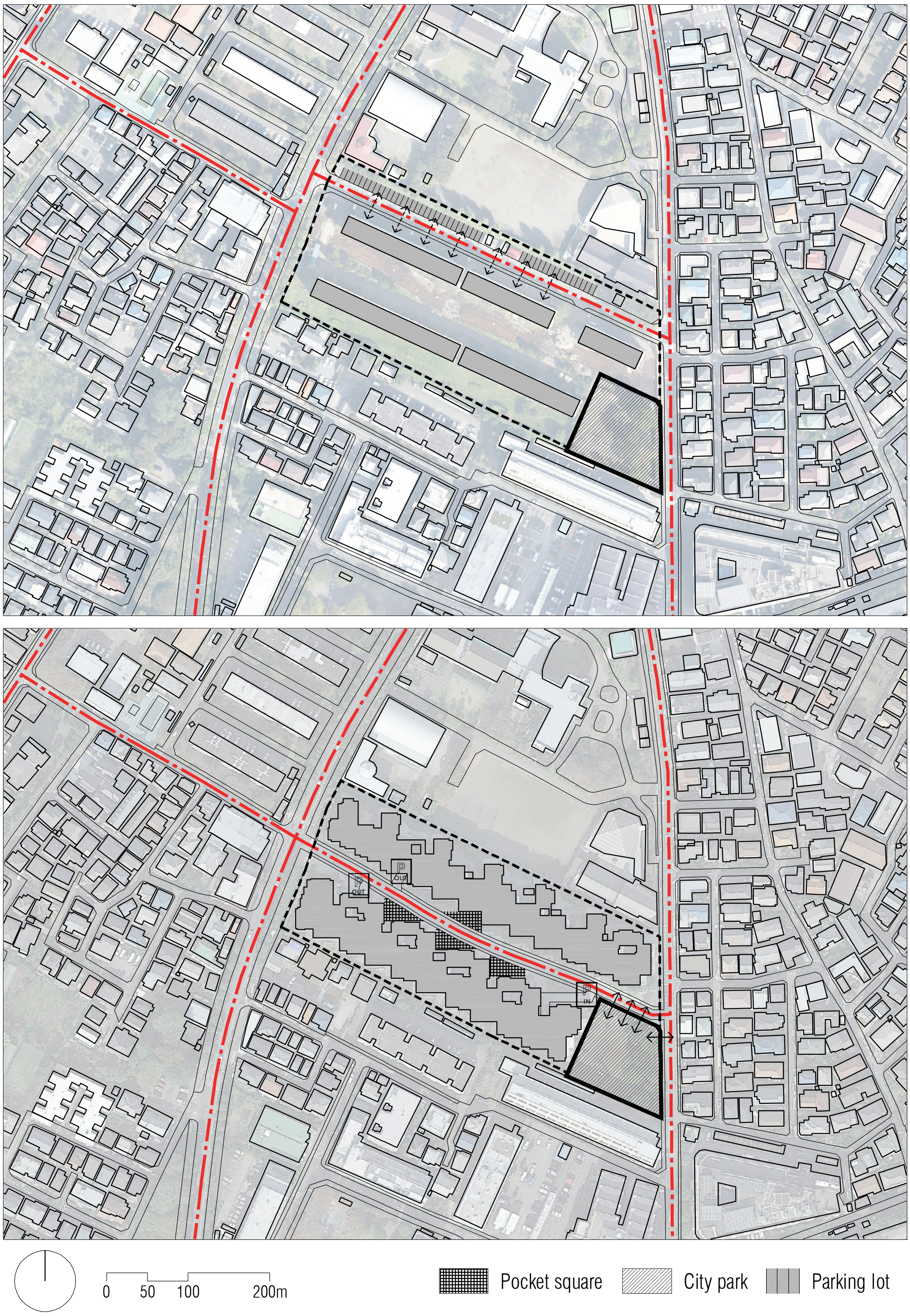


Figure 6-36 Site plan of Chofu Fujimi Housing (Upper: before; lower: after)

Figure 6-37 Chofu Fujimi Housing before reconstruction
(Left: street to the north and parking with dimensions; Right: pedestrian in the middle of the plot; Source: Asahi Kasei)

Therefore, it is necessary to relocate this city road in the project. Normally the solution would be to relocate the road to the north end of plot, but this will result in a square-shaped enclosure of buildings, where many parts do not have enough ventilation and sunlight. The final solution adopted here is to reposition the road to the center of site, forming a front yard for the two rows of buildings. (Figure 6-36) In this way the buildings become more open, and all dwelling units may enjoy abundant sunlight and ventilation. The irregularly shaped intersection on the west could also be solved with this master plan (Figure 6-40), and the city park became accessed from two sides (Figure 6-45). After negotiation with the city, the relocation of city road was finally approved. (Figure 6-38)

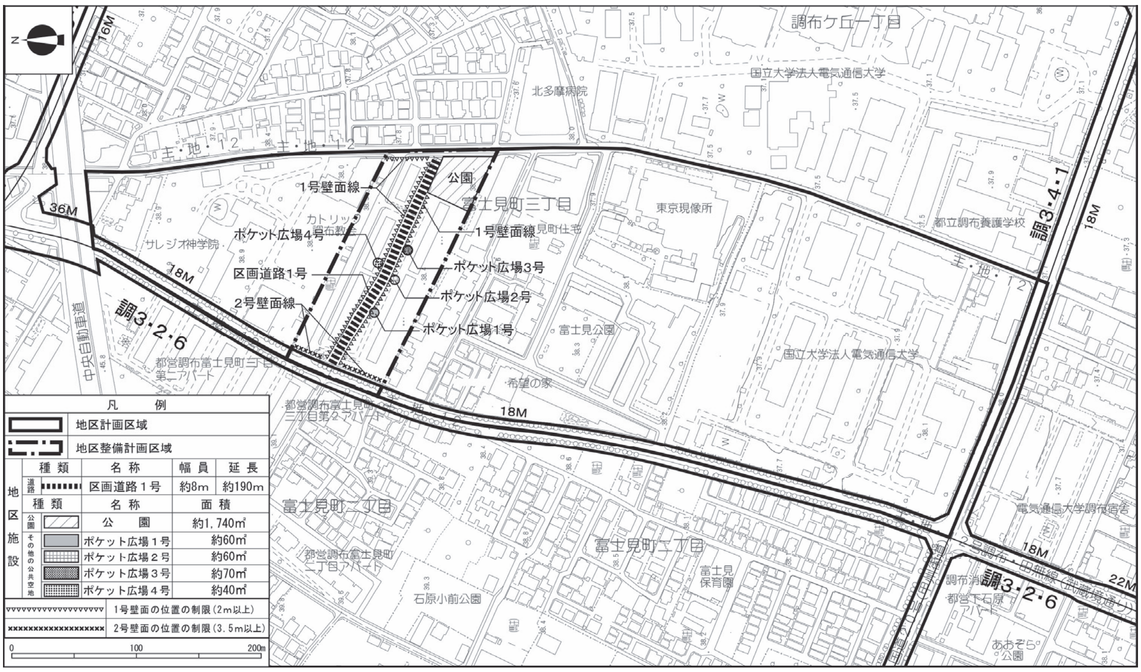


Figure 6-38 2011 District Plan for Fujimicho 3 chome (Source: Chofu City)

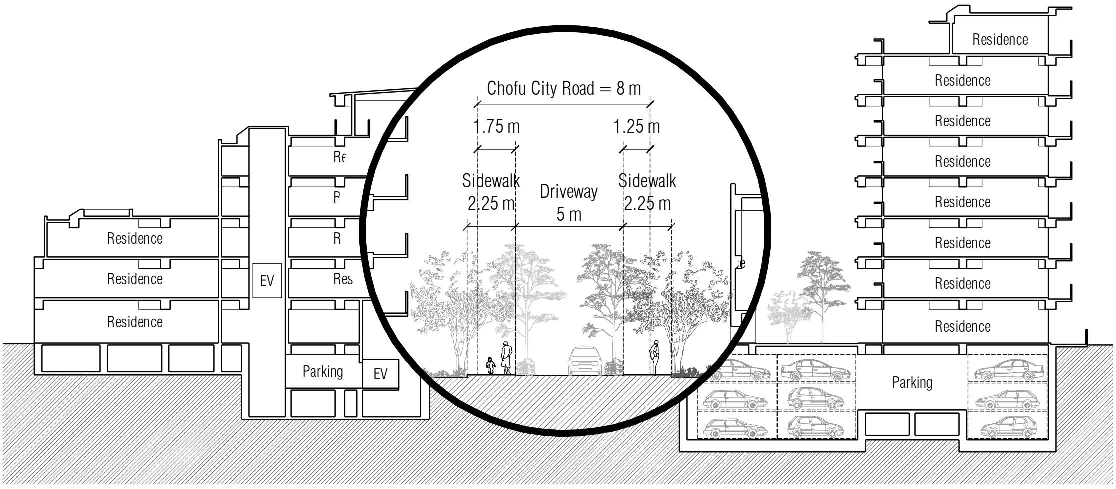


Figure 6-39 Cross section of Chofu Fujimi Project after reconstruction

Figure 6-40 New street running through the condominium complex in coordinate with the surrounding urban street (Left: view from west intersection; right: view from east intersection; photos by author, 2017)

Figure 6-41 New city road across the plot (Right image source: Shinkenchiku; other photo by author, 2017)

Figure 6-42 Improved accessibility to city park (Photos by author, 2017)

To deal with the potential traffic danger brought by the road running through center of site and create a community street centered on pedestrian, the road is gently bent for traffic speed reduction and landscape. (Figure 6-41) The width of roadway is set to 5 meters with planting to further limit traffic speed, and the sidewalk is set to 2.25 meters with planting integrated with it (Figure 6-39). In addition, landscape elements such as pavement is carefully designed to promote interaction between the south building and north building. (Figure 6-41)

Figure 6-43 Typical floor plan of Chofu Fujimi Housing after reconstruction


Figure 6-44 View connection between walkway and courtyard (Photos by author, 2017)

Instead of being parallel to the road, the two buildings are arranged in a zigzag shape (Figure 6-43) with all dwelling units facing south, to achieve higher FAR, enhance ventilation and sunlight for dwelling units, and enrich streetscape at the same time. Full-height glass curtain wall is used on the first floor so that it is possible to enjoy a view of the courtyard from walkway. (Figure 6-44) Underground parking lot is used to ensure ground space, three entrances/exits for underground parking lot are set along the central road, one for entrance on the east, two for exit on the west. (Figure 6-45)


Figure 6-45 Entrance and exit of new underground parking (Photos by author, 2017)

By abolishing Collective Housing Facilities system, the FAR of Chofu Fujimi Housing was raised so that reconstruction project is economically practical. Based on that, this project is an example of integrating a reconstruction project with the modification of city road structure and improvement of cityscape in a commute town area.

City center - Case No.10 Harajuku Housing

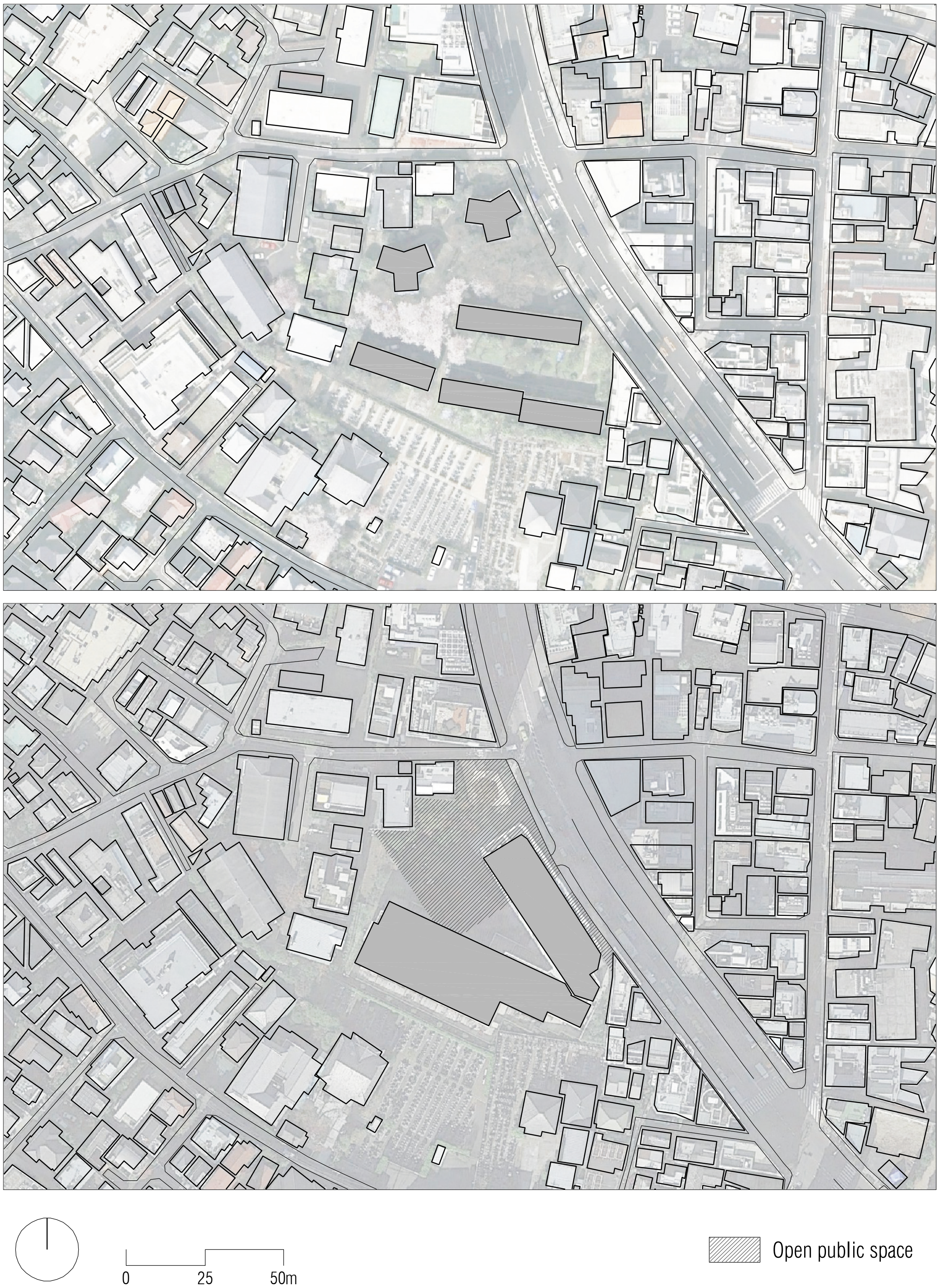


Figure 6-46 Planning of open public space in Harajuku Housing Project (Upper: before; lower: after)

Figure 6-47 Harajuku Housing before reconstruction (Source: Studio Pooh & Catty)

Case No.10 Harajuku Housing is located in Shibuya District, the city center area of Tokyo (Figure 6-1). The site is seven minutes on foot from Gaienmae Station (Ginza Line), 9 minutes on foot from Omotesando Station (Ginza Line, Hanzomon Line, Chiyoda Line). (Figure 6-2) Completed in 1957, this condominium complex was developed by Japan Housing Corporation. The site area is 5,341 m², with a total floor area of 4,523 m² arranged in two types of buildings: two five-storey star-shaped and four slab buildings (Figure 6-46). The dwelling units were 2DK with an average area of 35.38 m². This property had been popular as one of the landmarks in that region because of its modern design language and green space. (Figure 6-47)

		Before	After
Year of construction		1957	2013
Site area		5,341.40 m²	5,176.40 m²
Maximum FAR allowed		200%	347.16%
Maximum building height		40 m	60 m
Total floor area		4,523.35 m²	26,517.49 m²
Building condition	Number of floors and buildings	5F above ground × 4 4F above ground × 2	18F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit	Number of households	112	220
	Layout	2DK	1LDK - 3LDK
	Unit floor area	35.38 m²	50.03 m² - 122.86 m² (avg. 77.84 m²)

Table 6-9 Overview of Harajuku Housing before and after reconstruction

Figure 6-48 Harajuku Housing after reconstruction (Photos by author, 2017)

More than 50 years since its completion, the aged condominium complex was reconstructed from 2010 to 2013. Comprehensive Design System was adopted in this project, the Maximum FAR allowed was raised from 200% to 347.16%, and building height from 40m to 60m. The six buildings accommodating 112 dwelling units was replaced by one high-rise building accommodating 220 units (70 original homeowners). The new building consists of two wings: a 18F tower and a 9F tower (Figure 6-48) In order to be rewarded the extra floor area and building height, 55% of the plot is left for open public space or greenery. A park extents from Gaiennishidori Street to the triangle formed by the two building wings. Two by two span of the tower wing's first three floors is designed as a piloti, in order to increase the accessibility of the open public space and reduce the heaviness brought by large building volume. Green plants are arranged in the open public space, with some landscape furnitures available for pedestrians to take a rest. (Figure 6-49)

Figure 6-49 Open public space in Harajuku Housing reconstruction project (Photos by author, 2017)

Figure 6-50 Sign board for Comprehensive Design System in Harajuku Housing project
(Photo by author, 2017)

The Harajuku Housing project is an example of integrating condominium complex reconstruction project with the improvement of urban environment in the city center area. Through adopting

Comprehensive Design System, on one hand, the FAR limit in the project could be dramatically raised, which makes the reconstruction economically feasible; on the other hand, in order to get extra FAR, the reconstruction union devoted a part of the land as open public space to the city as a contribution to improve the crowded urban space in the city center area.

6.4.2 Residential area scale - architecture volume and facilities

After studying the relationship between the reconstructed environment with its urban context, this section zooms in from urban scale to a residential area scale, focusing on how building volumes, open spaces, and facilities are rearranged within the site.

The morphology of old condominium complexes in Japan are generally four to five-storey slab buildings standing in a park-like territory. In order to achieve a balance between increased floor area (building volume) and living environment, four types of rearrangement of building volumes could be observed in sixteen Tokyo reconstruction cases (Figure 6-51). These types correspond to the size, density, and surroundings, which is also related to the subsidy policies that could be adopted.

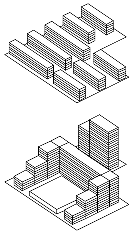
Type 1 – linear to "C" is the most common type, it is adopted in case No. 02, 03, 04, 07, 08, 10, 15, 16. A center slab volume and two wings enclose a vacancy in the center, the center is usually occupied by parking lot and other common facilities.

In type 2 – linear to block, the building volumes form a closed shape, leaving little vacancy in the center for sunlight and ventilation as in case No. 01 and 12. The space enclosed in the center could hardly be used for other purpose.

In type 3 – linear to linear, the old volumes are replaced by larger and higher building volumes, with bigger distance between buildings, as seen in case No. 06, 11, 13, 14. The space between buildings could be used for facilities like parking lot, roads and walkways, or open space for outdoor activities.

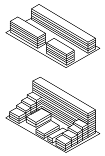
Type 4 is a variation of type 3, which comes with a more complicated layout of building volumes. Both slab and tower volumes are arranged in the site. As a result, the space enclosed by buildings have more diversified shapes.

Type 1 - Linear to “C”



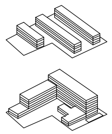
18511 m²
15935 m²

02 萩中住宅



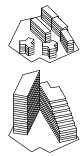
8736 m²
5467 m²

04 新蒲田住宅



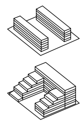
4915 m²
5356 m²

15 小金井コーポラス



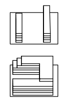
4523 m²
5341 m²

10 原宿住宅



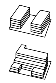
3907 m²
3994 m²

08 下連雀住宅



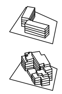
2915 m²
3563 m²

07 林町住宅



1600 m²
2800 m²

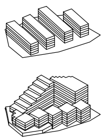
03 野方団地



1776 m²
1952 m²

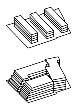
16 河田町住宅

Type 2 - Linear to block



11286 m²
6019 m²

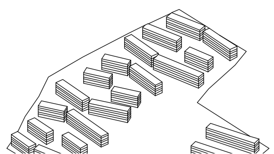
12 池尻団地



3100 m²
3960 m²

01 諏訪町住宅

Type 3 - Linear to linear



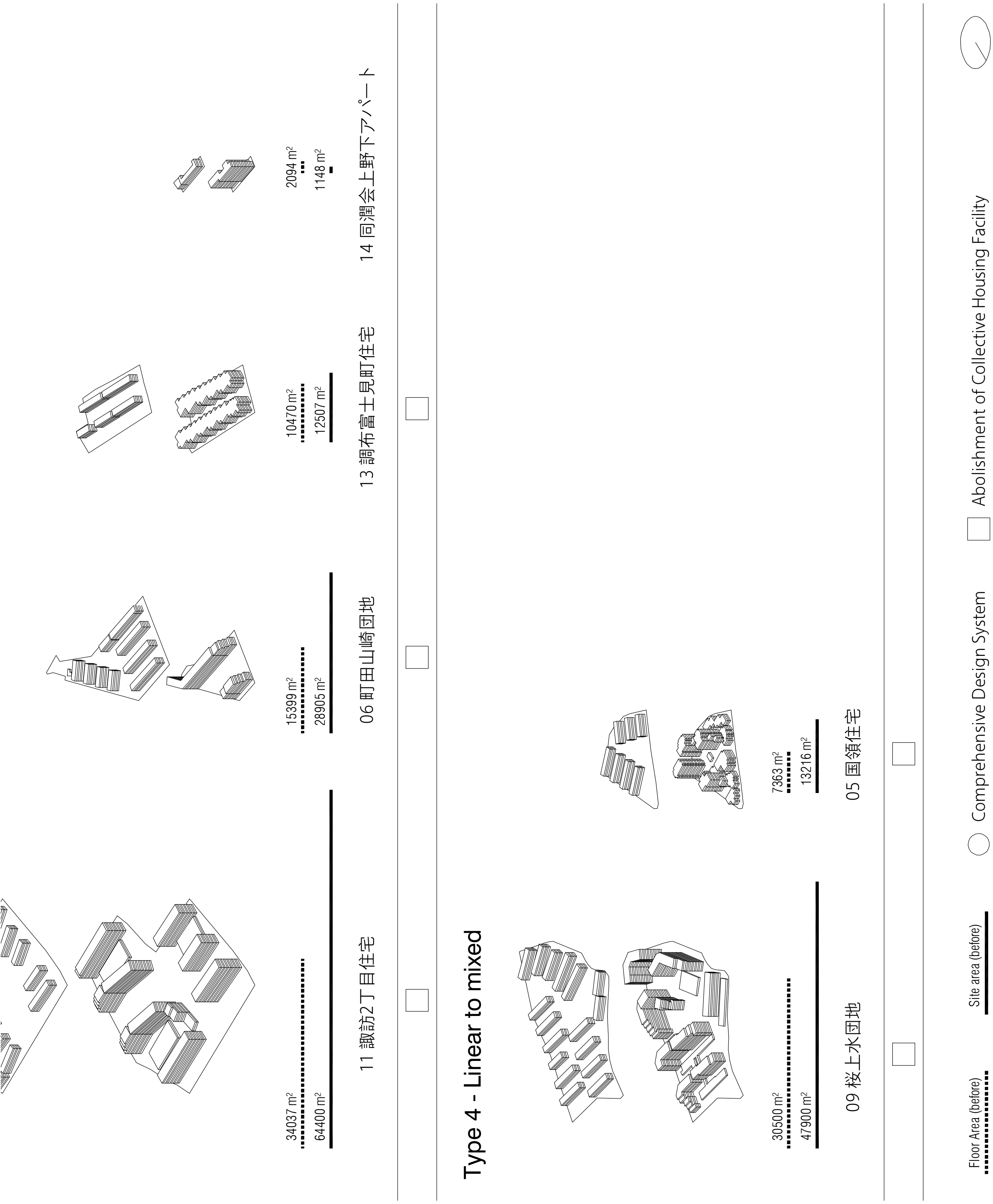


Figure 6-51 Four types of architecture volume transformation in Tokyo cases

Figure 6-52 Building setback in case No, 01, 03, 07, 08 (Photos by author, 2017)

Figure 6-53 Pocket parks in case No. 04, 15 (Photos by author, 2017)

Figure 6-54 Space enclosed by building volumes in case No. 03, 04 (Photos by author, 2017)

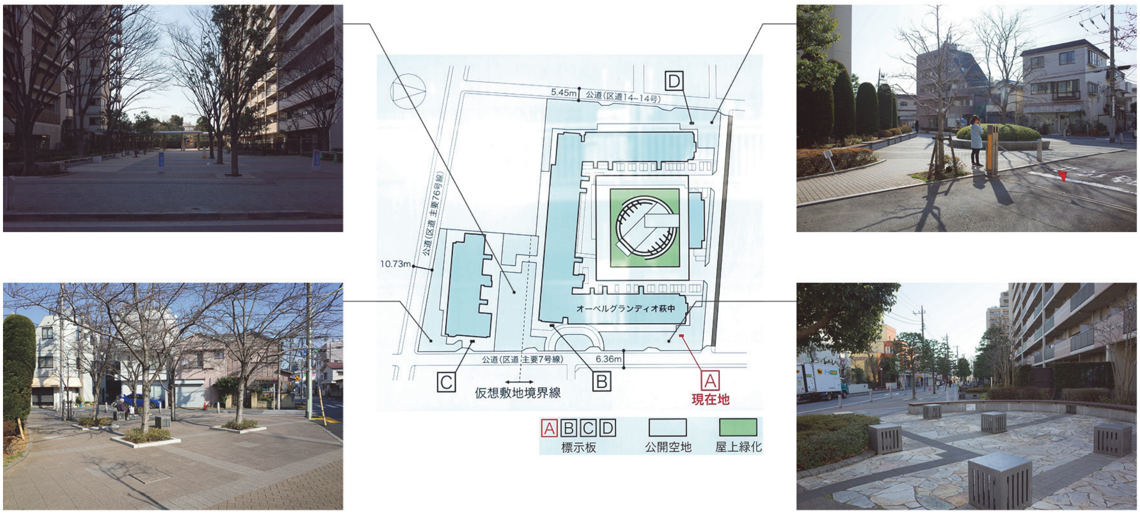


Figure 6-55 Open public space in case No. 02 (Photos by author, 2018)

Type 1 and type 2 are mainly adopted in smaller scale complexes, among which the largest is No.02 Haginaka Housing Project with a site area of 15,935 m² and floor area of 18,511 m² (before reconstruction). Due to the limit of site area, the building setbacks from street are usually minimum (Figure 6-52), in very few cases the setback design take into consideration of pedestrian's usage (Figure 6-53). The patio enclosed by C-shaped or square-shaped building volume is occupied by common facilities such as parking lot or library, which make them not suitable for residents' outdoor activities, as in case No. 01, 03, 04, 07, 08, 12, 15, 16 (Figure 6-54). Case No. 02 and 10 are two exceptions, in which Comprehensive is adopted. In these two cases, except for rearranged buildings and common facilities, a variety of open public space is provided, freely accessed by pedestrian and available for residents' outdoor activities (Figure 6-55).

Figure 6-56 Building volume in case No. 05, 13 (Photos by author, 2017)

Figure 6-57 New facilities and open spaces in case No. 11 (Photos by author, 2017)

Figure 6-58 Walkway system in case No. 05 (Photos by author, 2017)

Figure 6-59 Open space in case No. 09 (Photos by author, 2017)

Type 3 and type 4 are mainly adopted in larger scale projects except for No. 14, a case that could also be classified as type 2-linear to block. These two types are closely bound to abolishment of Collective Housing Facilities. With the permission to raise FAR limit, and relatively larger site area, there is more freedom regarding the layout of building volumes (Figure 6-56). The space enclosed by buildings are no longer closed and fully taken over by parking lot, instead, variety of common facilities and open spaces well integrated with landscape of the site are arranged. As in the largest case—No. 11—Nursery center, shops, pocket farm, children's playground, café and square on the hill are added to the complex (Figure 6-57); and in case No. 05 a walkway system is designed for residents (Figure 6-58). Although in most projects the open spaces are not supposed to be shared with citizen outside the complex, they could at least provide a place for residents' outdoor activities (Figure 6-59).

6.4.3 Discussion on improvement of physical environment in Japanese CCR

On an urban scale, three cases in different kinds of locations in Tokyo have shown how the reconstructed condominium complex could be better integrated with its urban context in a variety of ways. The new town case redeveloped its walkway and open space so that the project fits in a larger plan to improve the overall living environment of the area. With its boundaries and connections redesigned, the large complex has also provided a more friendly interface to the city. The commuter town case is a combination of upgrading of city road structure, more efficient land use, and improvement of cityscape. While the city center case has provided precious open public space in a dense built-up area. A series of policies are provided by the government, linking higher FAR limit with improvement of physical environment on urban scale. For example, Abolishment of Collective Housing Facilities is adopted in larger projects as in the new town and commuter town case, Comprehensive Design System is adopted in dense built-up area as in the city center case.

On a residential area scale, the building volumes are rearranged in a more efficient way to accommodate higher FAR and provide more open space for residents. Besides, a wide range of facilities is added to improve residents' living environment. Larger scale projects have relatively better flexibility to rearrange its building volumes, to provide more abundant open public space, and to host a wider range of facilities for residents.

Policies such as Abolishment of Collective Housing Facilities and Comprehensive Design System laid a foundation for improvement of physical environment both urban scale and residential area scale, but not all the projects are eligible for such policies. Nonetheless efforts to achieve a better relationship between the complex and its urban context could be observed, in cases such as No. 04 Shinkamata Housing Project and No. 15 Koganei Housing Project. (Figure 6-53)

6.5 Chapter conclusion

6.5.1 Experience from Japanese CCR for Chinese DUHR

	Problems in Chinese DUHR	Experience of Japanese CCR
Financing pattern	Isolated from housing market	Part of housing market
	No extra FAR allowed in any form	A variety of policies linking extra FAR with improvement of urban environment
	Complete relies on government appropriation	Using extra floor area to balance reconstruction cost, small government subsidy as incentive
Operation mode	Top-down system, local government controls most sections	Bottom-up system with top-down support and supervision
	Homeowners' selection largely influenced by local government, which ultimately leads to relocation; Time-wise and organization-wise insufficient decision making process for homeowners	Depends on homeowners' own investigation and consensus making
	One-way information transfer from government to homeowners, little room to compromise	Through working closely with developer and local government, homeowners could take part in the reconstruction plan making and district development plan making when necessary.
	No third-party consultants involved	Third-party consultants could be hired during the investigation and planning stage
Improvement of physical environment	Only affecting single building site, while residential area and urban scale problems cannot be solved.	Clear focus on district improvements: On a residential area scale, building volumes are rearranged in a more efficient way, modern common facilities are added. On an urban scale, the connection, boundary, and open space are redesigned to form a better relationship with urban context.

Table 6-10 Summary of Japanese CCR experience

According to the problems identified in Chinese DUHR, through documentary study and field observation, this chapter has studied the experience from Japanese CCR in dealing with similar issues. (Table 6-10)

From the perspective of financing pattern, the Japanese CCR system is not isolated from housing market as the Chinese DUHR, instead, property developer is involved, and a variety of policies is provided by the government linking extra FAR with improvement of urban environment. So a CCR project does not have to rely on government funding, by using extra floor area the reconstruction cost could be balanced within the project. Small government subsidy only works as incentive. The restore rate of a project depends on its extra floor area margin and land price trend.

From the perspective of operation mode, the Japanese CCR is a bottom-up system with top-down support and supervision. Homeowners could initiate a project and make final decisions depending on their own investigation and consensus making, government act as law maker and supervisor of reconstruction projects. During the investigation and planning stage, homeowners could form Investigation Group and Planning Committee to discuss and make reconstruction plan. Through working closely with developer and local government, homeowners could take part in the reconstruction plan making and district development plan making when necessary. Third-party consultants could be hired during the investigation and planning stage to help homeowners make better choices.

Regarding the improvement to physical environment, the Japanese CCR system does not simply reconstruct single buildings, but has a clear focus on district improvements that deal with residential area and urban scale problems. Building volumes are rearranged in a more efficient way to achieve a balance between higher FAR and qualities such as sunlight and ventilation, as well as to provide open space for residents. Up-to-date common facilities are added for convenience of resident's life. With recognized streets, redesigned open public space, walkway system, and boundaries, the reconstructed condominium complex could be better integrated with its urban context in a variety of ways as analyzed in the new town, commuter town, and city center case.

Just like the problems identified in Chinese DUHR, the experience of financing pattern, operation mode, and physical environment are also corelated to each other. The extra floor area enables reconstruction projects to happen from the perspective of financing pattern, while reward of extra floor area is usually bound with improvement of physical environment on an urban scale as set in the policy of Abolishment of Collective Housing Facilities and Comprehensive Design System. By forming a reconstruction union with the developer, homeowners may take part in the decision making of project. Homeowners' decision-making process is a repeated consideration of the balance between economic benefit (building volume and floor area) and living environment (open space, sunlight, ventilation, and common facilities).

6.5.2 Preliminary recommendations for DUHR

Based on the comparison of Chinese DUHR and Japanese CCR, a series of preliminary recommendations are given for the improvement of DUHR. The applicability of such recommendations to the Chinese context will be examined in the next chapter.

Preliminary recommendations for financing pattern

1) Introduce housing market in reconstruction of private housing areas in regions with good marketability.

2) Allow increase of floor area in reconstruction projects, and use the increased floor area to balance the reconstruction cost. Give FAR bonus for providing open public space in dense built-up area.

3) Use public money as incitation to promote reconstruction projects, instead of building a government voluntary system totally relying on government funding.

Preliminary recommendations for operation mode

1) Construct a legal framework on reconstruction like the AFRC law in Japan which ensures the project to be proceeded smoothly.

2) Make official reconstruction manuals that present a clear process for homeowners to follow. Break down a project into four stages including initiation, preliminary investigation, formal reconstruction plan making, and implementation. Each phase should be based on homeowners' resolution from last phase, so that the project does not start over constantly.

3) Give homeowners the right to initiate a project. Let homeowners take part in the investigation and decision-making process.[49]

4) Encourage homeowners to form groups to study reconstruction strategies, and involve third-party consultants to help homeowners' decision making.

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[49] Since there has been rare Chinese housing development cases in which homeowners could take part in the planning and design, the applicability of Japanese homeowners' participation in planning and design to China may need further investigation.

Preliminary recommendations for environment on ground level

Shift the focus from single buildings to district improvements that:

1) Include multiple buildings instead of single buildings in a project, so that it is possible to rearrange building volumes and open space, as well as provide new facilities.

2) Integrate residential area reconstruction projects with larger scale redevelopment plan, reconsider the connection of the residential area and its urban surrounding, and improve the boundaries of gated territories.

6.5.3 Problems with Japanese CCR

Despite there is a lot of experience in Japanese CCR that is worth learning for China, the Japanese CCR is not yet a perfect system by itself. Japanese scholars have been studying the termination of sectional-ownership as implemented in the U.S. (村辻, 2012) Because up until now, the completed projects in Japan are mainly those constructed in the 1960s which have sufficient extra FAR space, or located in highly marketable locations. However, the amount of aged condominiums is growing rapidly, and it is predictable that one after another condominiums with little extra FAR space or located in less profitable locations will exceed the limit of maintenance and in need of reconstruction. While Japan's Act on Building Unit Ownership only permits projects that passed consensus making, otherwise the FAR or building codes cannot be relaxed, in this case the condominium will continue to deteriorate until becoming a slum. Such a situation not only harm homeowner's individual interest, but also hinders an effective land usage for the city. Since it is usually not an easy job to reach a consensus in a diversified modern society, it is argued that a termination system of sectional-ownership needs to be formed as a supplement to the condominium reconstruction system based on consensus making, so that essential measures could be taken on those old condominium in less marketable areas.

Besides, the requirement for consensus making could be too strict in certain conditions. For example, it is required to have the agreement from 4/5 of all homeowners in a complex and 2/3 of homeowners of each building so that a complex could be reconstructed at once (団地一括建替). But in a large complex with multiple buildings, with such strict requirement on consensus making, it is possible that even over 90% of all homeowners have agreed to reconstruct, the reconstruction could be canceled due to the disagreement of one single building.

Another problem has to do with its impact on living environment of adjacent area. Since extra floor area usually leads to higher building height and larger building volume, which may not be agreed by surrounding residents. Take Tokyo case No.10 Harajuku Housing for example, although for the project itself, comprehensive design system could be adopted, bringing higher FAR to balance reconstruction cost and creating precious open public space in the crowded city center area, the large building volume and sunlight issues had been opposed by the surrounding residents, who strongly criticized the pressure of the gigantic building volume, the big shadows from high-rise building, the damage of townscape in the area, and the efficiency of irregularly shaped open public space[50]. This conflict originated from homeowners' demand for better economic benefit (higher restoration rate) and surrounding residents' claim for better living environment for the whole region could be a common issue in reconstruction projects, especially in dense built up areas. Therefore, it is an essential but trick issue how to achieve a better balance between economic effect and improvement of physical environment (especially on urban scale), between homeowners and surrounding residents. Laws and regulations regarding such conflict need to be constructed, and an operation mode enabling better communication between homeowners and surrounding residents could be developed.

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[50] Surrounding homeowners' criticism is summarized from a blog hosted by them: https://ameblo.jp/everyheart-daichi/theme-10011242119.html

Chapter 7 Simulation Project and Recommendations for DUHR

Based on the preliminary recommendations generated in Chapter 6, this chapter uses a simulative reconstruction project to testify the applicability of Japanese CCR to Chinese DUHR, which responds to the fourth research question. The simulation is done in Jinshou residential area, under current Chinese building codes in China. The hypothetical condition of the simulation is that there are increasing dilapidated buildings in this area. The rules for simulation are first stated, then the simulation process is demonstrated.

7.1 Rules for simulation

7.1.1 Overriding rule

Based on the preliminary recommendations given (Figure 7-1), the overriding rule for simulative reconstruction is that, the project should be a process that reconstructs the residential area

1) Without relying on government funding (financing pattern);

2) According to homeowners' will and consensus making (operation mode);

3) Not only reconstruct buildings, but also tackle residential area and urban scale problems (physical environment).

These overriding rules could also be taken as goals for the simulation, based on which a series of more detailed rules will be set to achieve them.

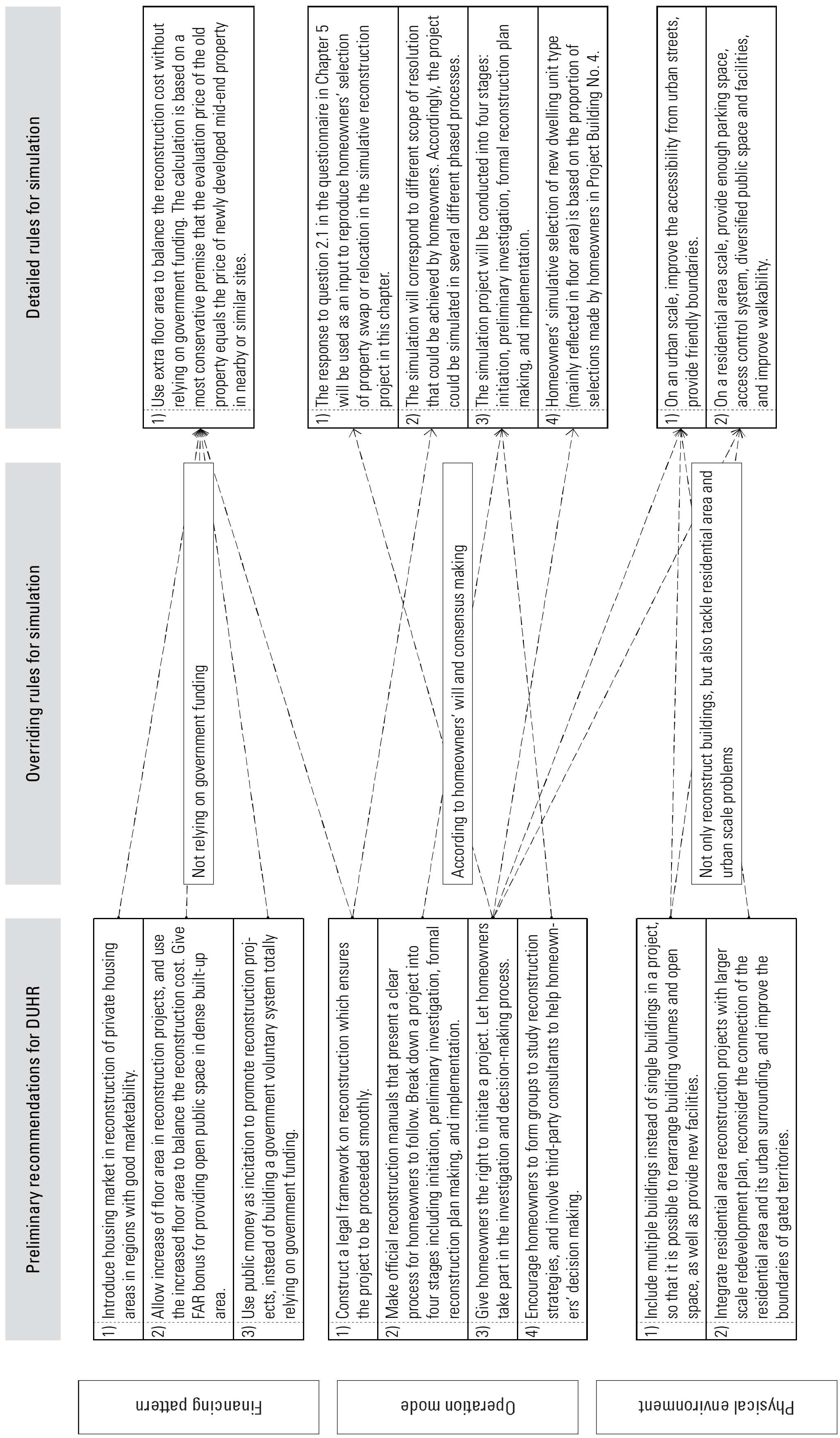

Figure 7-1 Relationship between rules for simulation and preliminary recommendations

7.1.2 Detailed rules

In order to execute the overriding rule in a workable way in a specific Chinese context, several detailed rules are set:

For financing pattern

1) Use extra floor area to balance the reconstruction cost without relying on government funding. The project should be based on actual design fee rate, (re)construction cost, home price, building codes, and FAR limit set by Regulatory Detailed Urban Plan. The economic feasibility of project depends on the sale of extra floor area. Here in the simulation, the calculation is based on a most conservative premise that the evaluation price of the old property equals the price of newly developed mid-end property in nearby or similar sites.

For operation mode

1) Since it is hard to simulate homeowner's consensus making process, the response to question 2.1[51] in the questionnaire in Chapter 5 will be used as an input to reproduce homeowners' selection of property swap or relocation in the simulative reconstruction project in this chapter. Selection a) and b) will be calculated as property swap, while c) and d) will be counted as relocation in the simulation, which means 66.7% homeowners will select property swap and 33.3% homeowners will select relocation.

2) The simulation will correspond to different scope of resolution that could be achieved by homeowners. Accordingly, the project could be simulated in several different phased processes.

3) The simulation project will be conducted into four stages: initiation, initiation, preliminary investigation, formal reconstruction plan making, and implementation. Considering a Chinese residential area usually comes much larger in its overall dimension than a Japanese condominium

[51] In Question 2.1 (Appendix A), respondents' original selection of strategy a) Structure reinforcement, b) In-situ reconstruction, c) Property swap (with local government), and d) Government buy-back is investigated.

complex, a consensus by all homeowners of the residential area as in the Japanese system will not be required in this simulation. Instead, only a consensus among homeowners of the part to be reconstructed will be needed. The minimum proportion is set to 2/3 of homeowners, which is stipulated in the *Measures for the Administration of Special Fund for House Repair* *（《住宅专项维修资金管理办法》）*.

4) Homeowners' simulative selection of new dwelling unit type (mainly reflected in floor area) is based on the proportion of selections made by homeowners in Project Building No. 4.

For physical environment on ground level

1) The design will try to improve those qualities with lower ratings by respondents in Table 5-8, which means on an urban scale, it will improve the accessibility from urban streets, provide friendly boundaries

2) On a residential area scale, it will provide enough parking space, better access control system, diversified public space and facilities for residents (especially for children and the mid-aged group), and improve the walkability of the area.

In addition to community inputs, design strategies in Japanese cases studied in Section 6.4, as well as trends in Chinese housing market will also be used as inputs when simulating the new physical environment.

7.2 Simulative reconstruction project in Jinshou Residential Area

7.2.1 Stages and phases

Following the rules set in last section, a simulative reconstruction project is conducted in Jinshou Residential Area which has been studied in Chapter 5, to testify the applicability of Japanese experience to China.

The reconstruction project is break down into four stages: initiation, preliminary investigation, formal plan making, and implementation. (Figure 7-2) In the initiation stage, homeowners of in certain buildings or plots may initiate a project and encourage other homeowners to participate. The community office may provide assistance in the initiation stage. At the end of this stage, a resolution among homeowners (2/3) in these plots is needed, to proceed to the preliminary investigation stage.

During the preliminary investigation stage, with the help of third-party experts, homeowners may compare different reconstruction possibilities, with special attention paid to the estimation of economic feasibility of the project. The scope of sub-projects needs to be determined at this stage, and a resolution of homeowners involved (2/3) is needed, to proceed to a formal study of the reconstruction plan. It should be noted that this scope may differ from the initiation stage.

In the formal planning stage, developer is introduced to make a formal reconstruction plan according to the scope decided in Phase 2. Homeowner and developer may discuss the financial effect and physical environment through a series of meetings. When changes to urban plan restrictions are considered, meetings between homeowner, developer, and local government is necessary. The final reconstruction plan needs to be agreed by 2/3 of the homeowners in these buildings, and approved by local government. An overall agreement from all homeowners in the residential area as in Japanese CCR projects will not be required here, since a Chinese residential area is usually much bigger than a Japanese condominium complex[52], and an overall agreement will be impractical.

In the implementation stage, homeowners and developers form a Reconstruction Union, which act as the main body to implement reconstruction plan. The union needs to be officially approved by local government. The union may make a request for purchasing the property and land ownership of those homeowners who does not participate in the reconstruction project at a market price. Then the reconstruction union makes a property swap plan. After the property swap plan is approved by local government, it will be executed, with land ownership and residential unit ownership transferred to homeowners in the new residential area. Afterwards, homeowners move out to temporary

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[52] The Jinshou Residential Area accommodates around 2,300 units, while the biggest project in Tokyo, the Suwa 2-chome Housing accommodates around 640 units.

resettlement, and the old residential area will be reconstructed.

Corresponding to the different scope of possible resolution among homeowners, the whole residential area could be reconstructed in less but bigger sub projects, or more but smaller sub projects. Each subproject forms a gated territory to provide better access control, and each subproject will provide enough parking space for its residents. In each subproject there will be outdoor space for different aged groups, for elderly people there will be walkway for stroll and space to sit down and chat; for the mid-aged there will be facilities like swimming and courts to take an exercise; for children there will be playgrounds. Besides, facilities like pocket farms which all age groups could enjoy will be added when they could fit in the limited space in a gated territory. Here the simulation is conducted in three hypothetical processes to provide a comparison between different possibilities (Figure 7-3).

In the large-scale process, the whole residential area will be reconstructed with fewer sub projects, and each sub project will cover a larger area. A consensus needs to be made among the homeowners in each sub project. In the small-scale process, the whole residential area will be reconstructed with more sub projects, and each sub project will cover a smaller area. The upper limit of a sub project in large-scale process is a whole block bounded by urban roads. The lower limit of a sub project in the small-scale process is at least 2×2 buildings, which is defined by: 1) minimum sunlight distance, so that the construction of new building does not violate the sunlight hours of the building to its north and 2) possibility to provide enough parking space according to today's residential planning standard. And there is an intermediate scale process in between these two limits depending on the scale of its sub projects. In each process, the whole residential area will be reconstructed in three phases. Each phase includes several sub projects. With first sub projects carried out on plots with most dilapidated buildings, the sequence of sub projects is arranged in a random pattern in the simulation.

The actual condition in a real-world reconstruction project will be probably more complicated than the processes conducted in the simulation. For example, it may take more than three phases to reconstruct a residential area, and a real project could be a synthesis of different scales of sub projects. Nonetheless, by setting up three hypothetical processes consisting of three hypothetical phases in each, it is possible to theoretically testify the recommendations with the simulation in a more comparable and justifiable way.

In all three processes, the reconstruction cost is to be balanced by the sale of extra floor area. They not only reconstruct buildings, but also involved urban scale improvements such as modification of the street and redesign of boundaries, as well as residential area scale improvements such as provision of sufficient parking space (using underground parking), provision of outdoor space for different age groups, and adding access control system.

In this way, the financing pattern, operation mode, and physical environment design recommendations are all synthesized into the reconstruction project.

7.2.2 Detailed simulation

In order to make a more comprehensive comparison and better examine the effectiveness of recommendations, a detailed simulation is conducted on the block containing Building No. 4. The large scale process could reconstruct the whole plot in one step (Figure 7-4), the small scale process could reconstruct the plot in three phases (Figure 7-7, Figure 7-8, Figure 7-9), and the intermediate scale process could finish in two phases (Figure 7-5, Figure 7-6).

The transformation of physical environment is presented with isometric drawings and masterplans, next to which the economic and technical indexes, estimation of economic balance, urban planning restrictions and building codes & standards, and sunlight hours simulation are attached.

Then a human eye's view of the possible impact on physical environment from different processes is also conducted to have an intuitive perception of different processes. A comparison of central main street is shown in Figure 7-10, a comparison of entrances to gated territories along central main road is shown in Figure 7-11, and a comparison of open space between buildings is shown in Figure 7-12.

1 Initiation
Homeowners

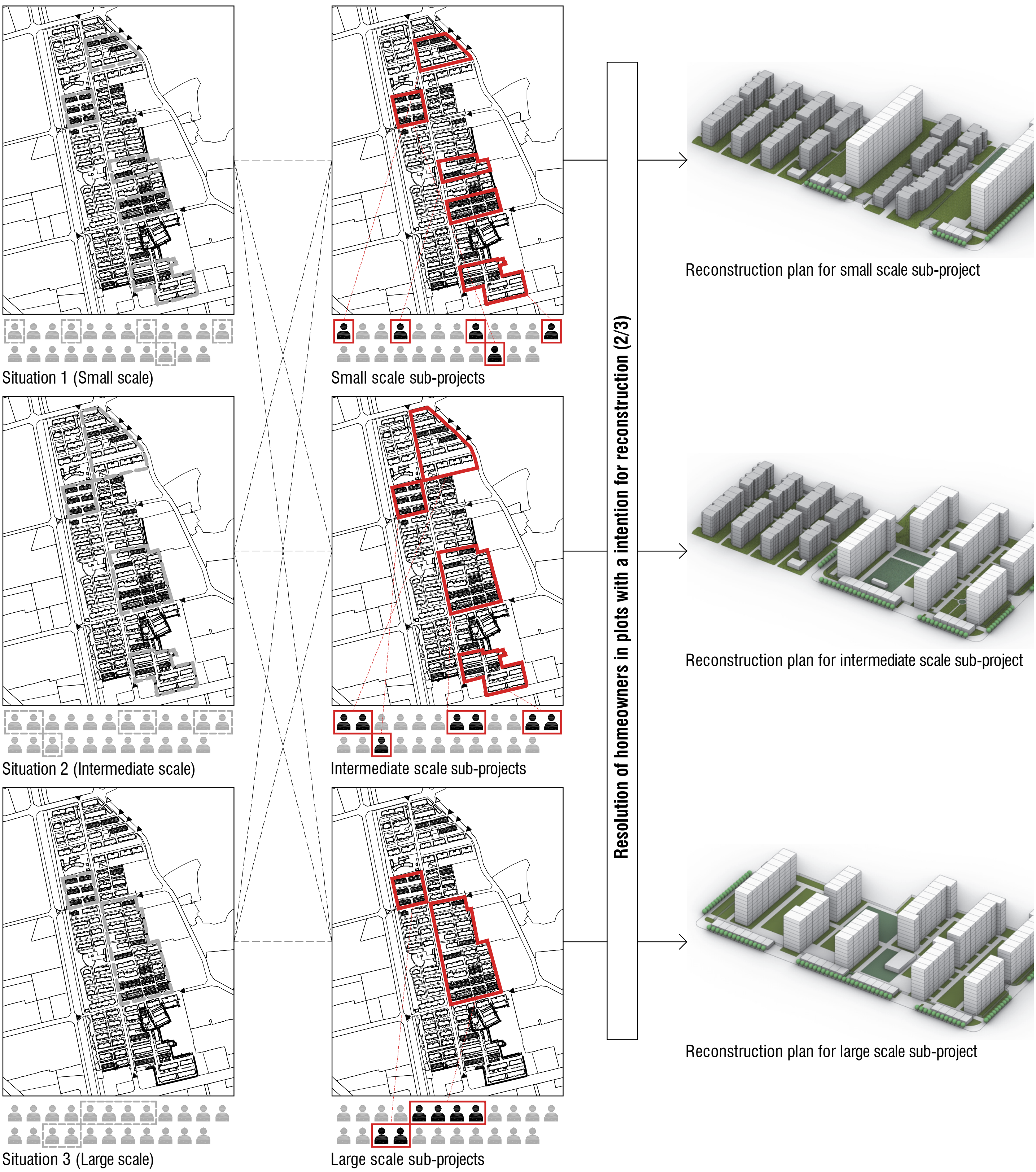
- Homeowners of in certain buildings or plots may initiate a project and encourage other homeowners to participate. The community office may provide assistance in the initiation stage.
- At the end of this stage, a resolution among homeowners (2/3) in these plots is needed, to proceed to the preliminary investigation stage.

2 Preliminary investigation
Homeowners, third-party experts

- With the help of third-party experts, homeowners may compare different reconstruction possibilities, with special attention paid to the estimation of economic feasibility of the project.
- The scope of sub-projects needs to be determined, and a resolution of homeowners involved (2/3) is needed, to proceed to a formal study of the reconstruction plan.

3 Formal planning
Homeowners, developer, local government

- Developer is introduced in this formal planning phase, to make a formal reconstruction plan according to the scope decided in Phase 2. Homeowner and developer may discuss the financial effect and physical environment through a series of meetings.



- When changes to urban plan restrictions are considered, meetings between homeowner, developer, and local government is necessary.
- The final reconstruction plan needs to be agreed by 2/3 of the homeowners in these buildings, and approved by local government.

4 Implementation

Homeowners, developer, local government

- Homeowners and developers form a Reconstruction Union, which act as the main body to implement reconstruction plan. The union needs to be officially approved by local government.
- The union may make a request for purchasing the property and land ownership of those homeowners who does not participate in the reconstruction project at a market price.
- The union makes a property swap plan. After the property swap plan is approved by local government, it will be executed, with land ownership and residential unit ownership transferred to homeowners in the new residential area.
- Homeowners move out to temporary resettlement, and the old residential area will be reconstructed.

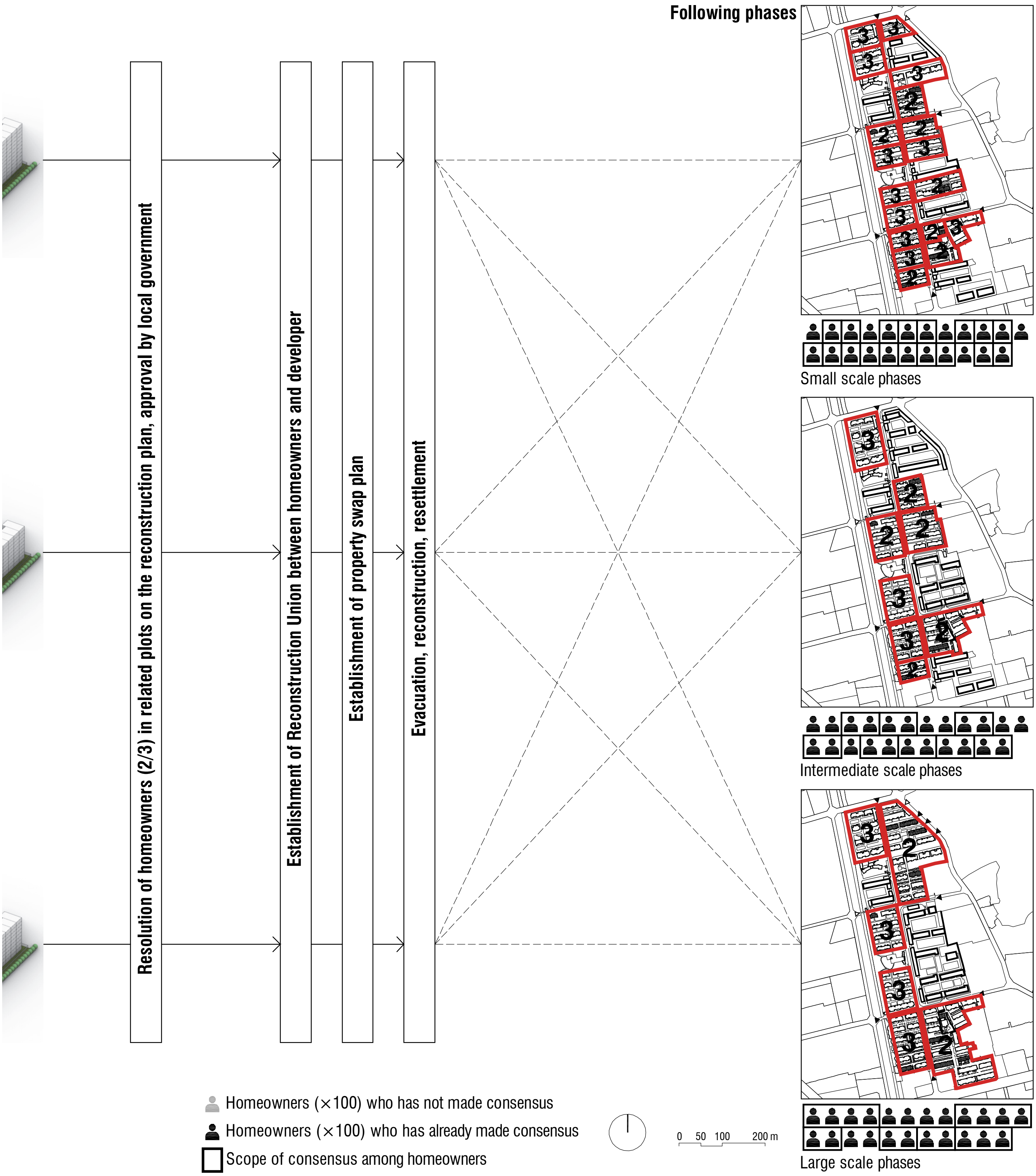
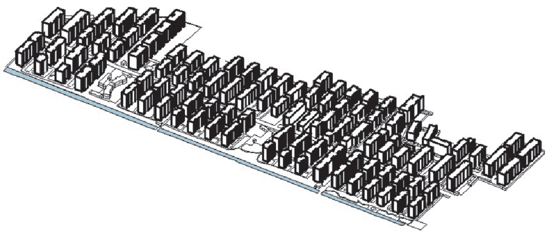


Figure 7-2 Hypothetical stages in reconstruction project



Homeowners (×100) who has not made consensus

Homeowners (×100) who has already made consensus

Scope of consensus among homeowners

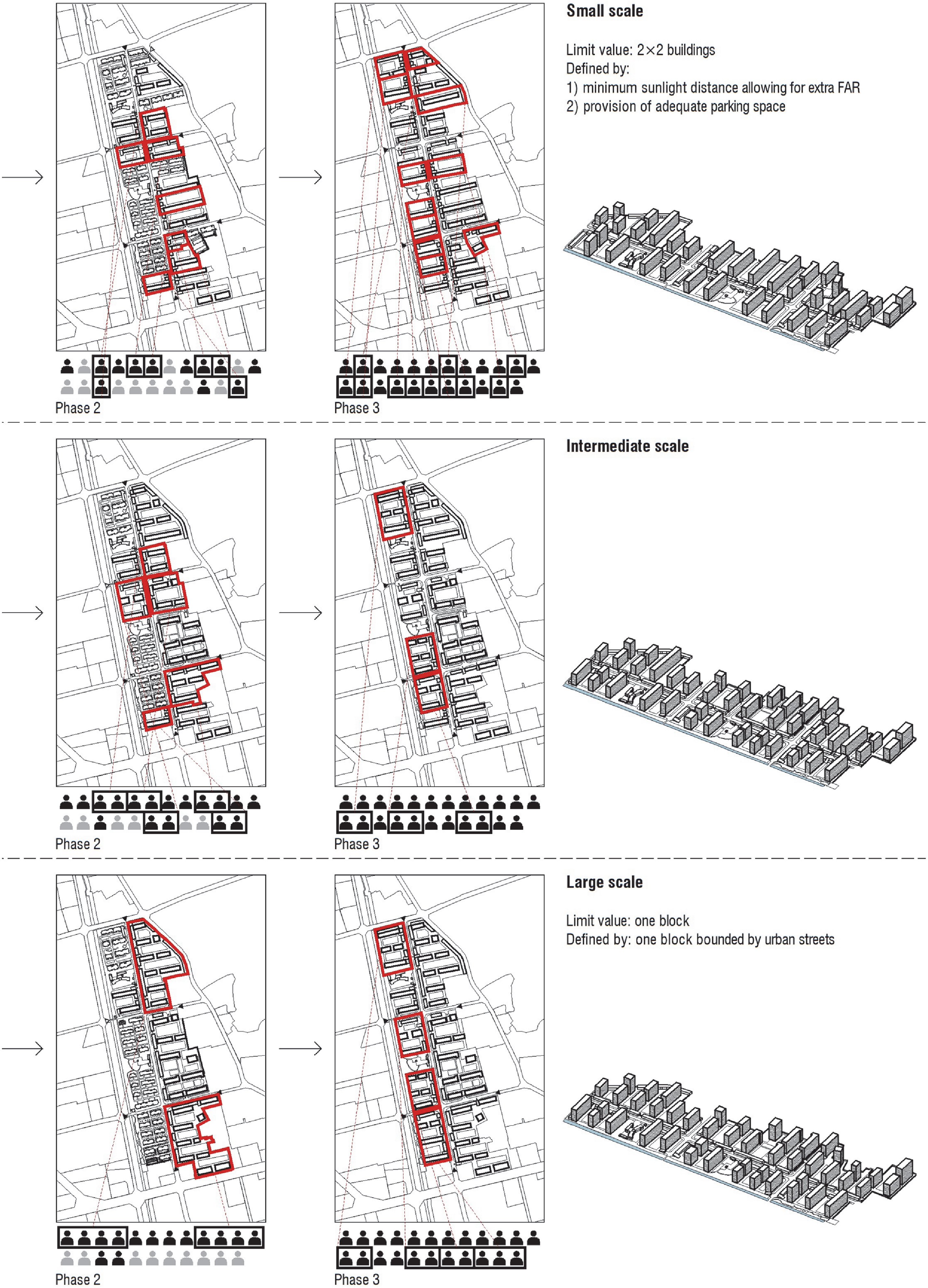
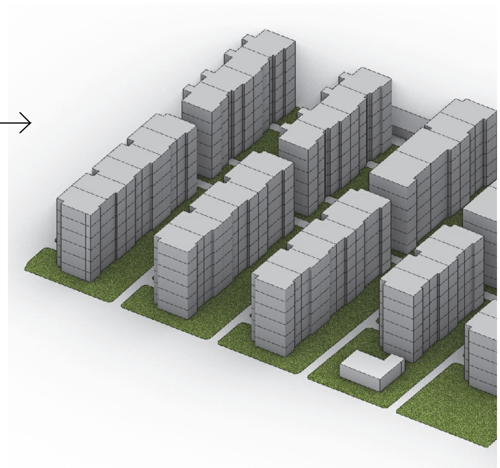
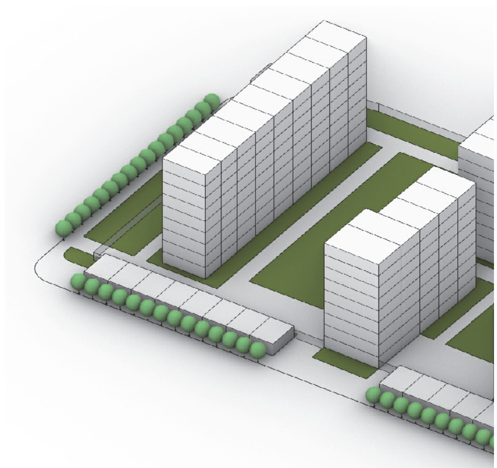


Figure 7-3 Phases of three scales of simulative reconstruction



Economic and technical indexes before and after

	Before	After
Site area (m^2)	24713	
Building coverage area (m^2)	7579	5906
Floor area above ground (m^2)	33184	49400
Floor area underground (m^2)	-	20500
FAR	1.3	2.0
BCR	30.7%	23.9%
Households	515	760
Max building height (m)	18	27
Green coverage ratio	25.3%	41.8%
Parking spot	23+44 (unauthorized)	770
Parking spot per household	0.13	1.01



Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m^2)	200
Design fee (CNY/m^2)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m^2)	3250
Price of mid-grade housing in similar location in Zhoushan (CNY/m^2)	16000

Claculation

Let

X = Minimum extra floor area to balance reconstruction cost

since

Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area

so

Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)

= Housing price per m^2 × X

so

$200\times33184+(3250+20)\times(33184+X) = 16000\times X$

hence

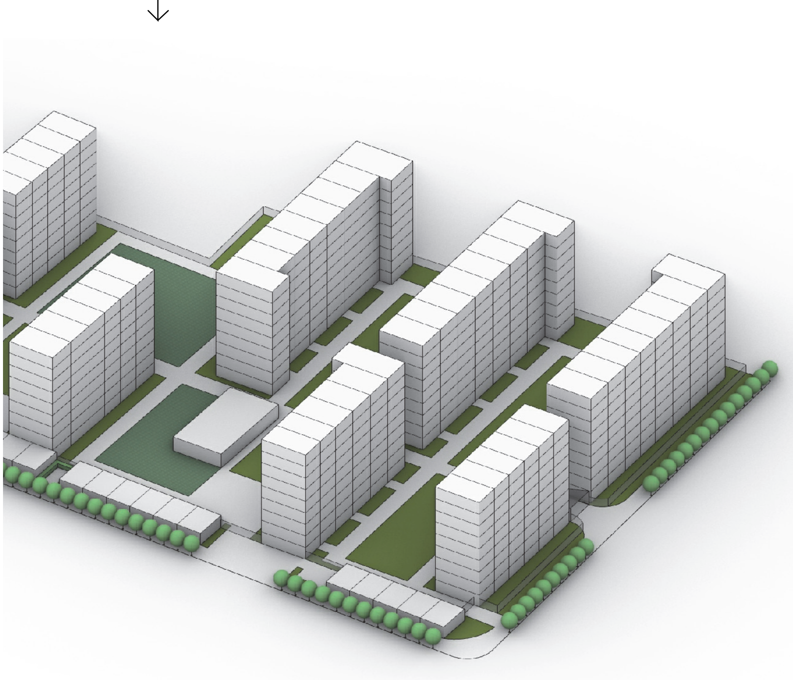
Minimum extra floor area to balance reconstruction cost = 9045m^2

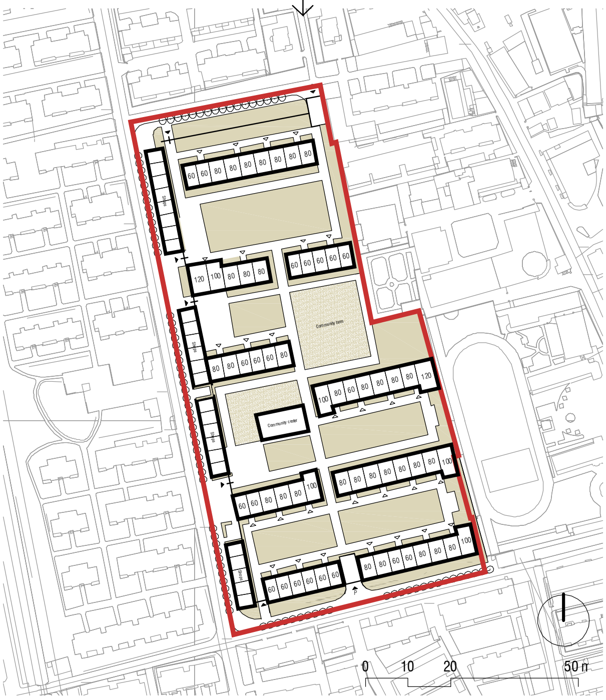
So developer's maximum profit = $(24713\times2-33184-9045)\times16000$ = 115152000 CNY

Distribution of layout types

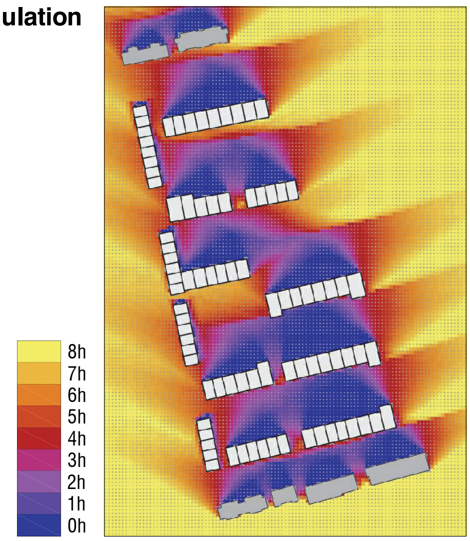
The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m^2	80m^2	100m^2	120m^2
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 515 households				
Number (total)	176	285	41	13
Number (per floor)	20	32	5	2
In simulation project - extra apartments, 245 households				
Number (total)	84	136	19	6
In simulation project - commercial and others, 27 units				
$48m^2\times27=1296m^2$				





Sunlight hours simulation



Urban planning restrictions and building codes & standrds

Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when 90m^2<unit floor area<140m^2 0.8, when 60m^2<unit floor area<90m^2
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-4 Detailed reconstruction process - large scale

Economic and technical indexes before and after

	Before	After
Site area (m^2)	16240	
Building coverage area (m^2)	5313	3830
Floor area above ground (m^2)	24120	32650
Floor area underground (m^2)	-	15500
FAR	1.5	2.0
BCR	32.5%	23.6%
Households	363	425
Max building height (m)	18	27
Green coverage ratio	21.9%	21%
Parking spot	11+43 (unauthorized)	440
Parking spot per household	0.15	1.04

Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m^2)	200
Design fee (CNY/m^2)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m^2)	3300
Price of mid-grade housing in similar location in Zhoushan (CNY/m^2)	16000

Claculation

Let

X = Minimum extra floor area to balance reconstruction cost

since

Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area

so

Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)

= Housing price per m^2 × X

so

$200 \times 24120 + (3300+20) \times (24120+X) = 16000 \times X$

hence

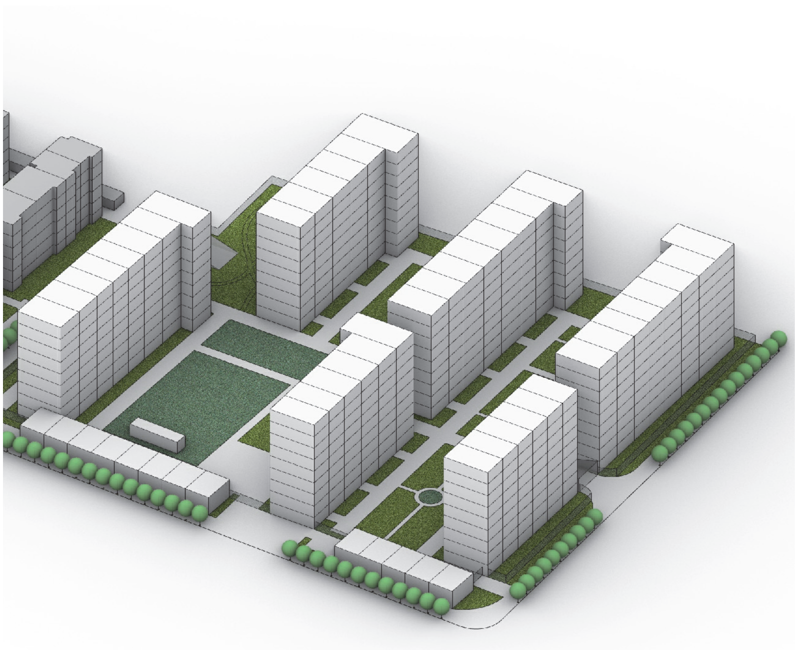
Minimum extra floor area to balance reconstruction cost = 6695m^2

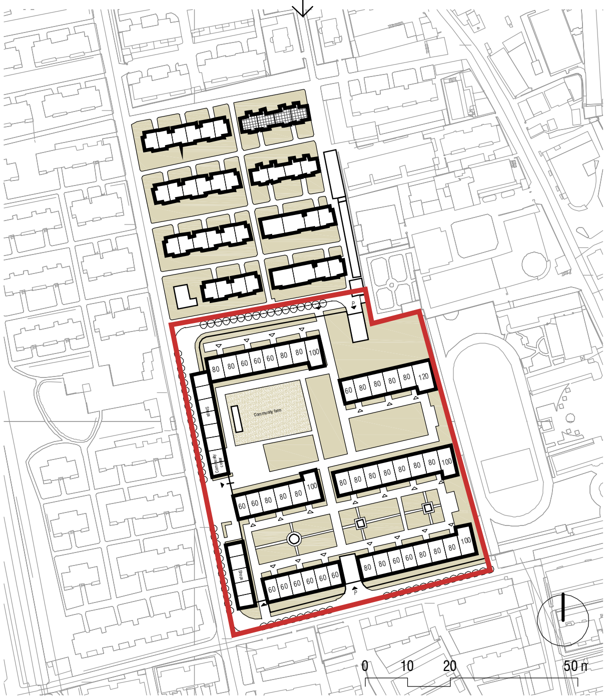
So developer's maximum profit = $(16240 \times 2-24120-6695) \times 16000$ = 26640000 CNY

Distribution of layout types

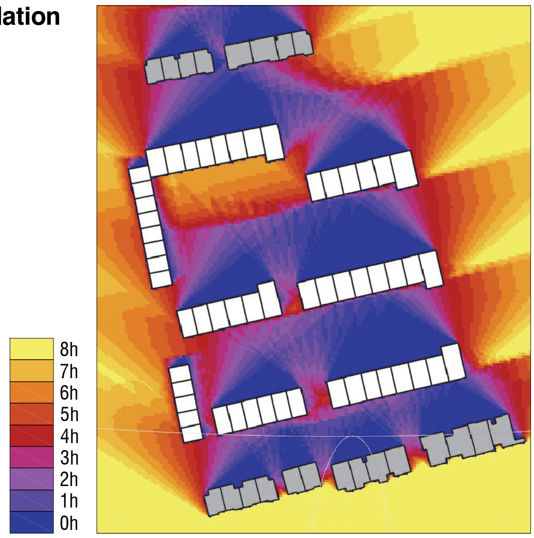
The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m^2	80m^2	100m^2	120m^2
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 363 households				
Number (total)	124	201	29	10
Number (per floor)	13	21	3	1
In simulation project - extra apartments, 62 households				
Number (total)	43	19	0	0
In simulation project - commercial and others, 13 units				
$48m^2 \times 13 = 672m^2$				





Sunlight hours simulation



Urban planning restrictions and building codes & standrds

Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

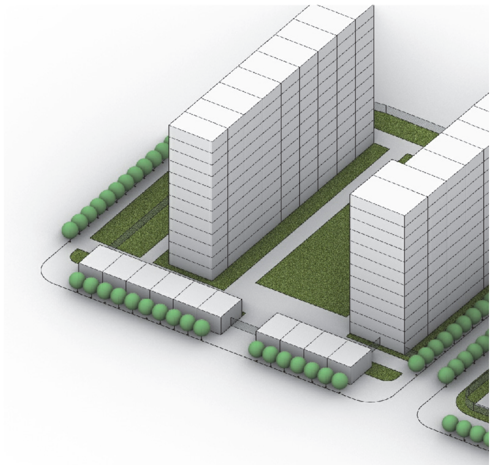
Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when 90m²<unit floor area<140m² 0.8, when 60m²<unit floor area<90m²
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-5 Detailed reconstruction process - intermediate scale - phase 1/2

Economic and technical indexes before and after

	Before	After
Site area (m^2)	8373	
Building coverage area (m^2)	2266	1852
Floor area above ground (m^2)	9064	16700
Floor area underground (m^2)	-	8000
FAR	1.08	2.0
BCR	27%	22.1%
Households	152	214
Max building height (m)	18	36
Green coverage ratio	51.4%	21%
Parking spot	13+1 (unauthorized)	216
Parking spot per household	0.09	0.59



Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m^2)	200
Design fee (CNY/m^2)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m^2)	3300
Price of mid-grade housing in similar location in Zhoushan (CNY/m^2)	16000

Claculation

Let

X = Minimum extra floor area to balance reconstruction cost

since

Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area

so

Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)

= Housing price per m^2 × X

so

$200 \times 9064 + (3300 + 20) \times (9064 + X) = 16000 \times X$

hence

Minimum extra floor area to balance reconstruction cost = 2516m^2

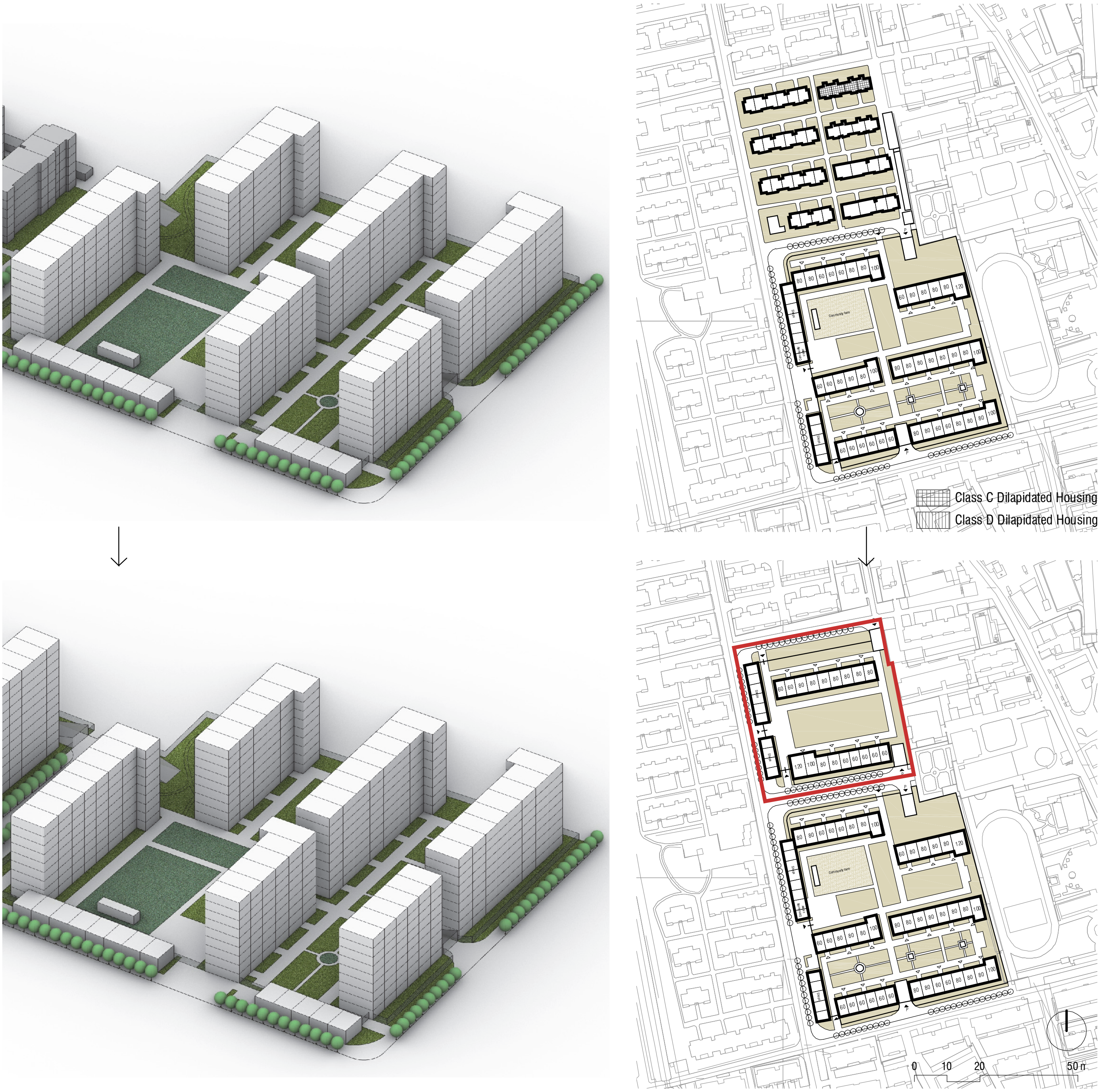
So developer's maximum profit = $(8373 \times 2 - 9064 - 2516) \times 16000 = 82656000$ CNY

Total profit of two phases = $26640000 + 82656000 = 109296000$ CNY

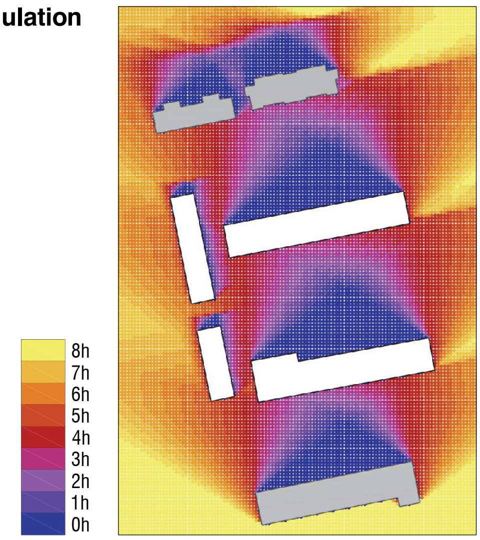
Distribution of layout types

The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m^2	80m^2	100m^2	120m^2
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 152 households				
Number (total)	52	84	12	4
Number (per floor)	4	7	1	1
In simulation project - extra apartments, 62 households				
Number (total)	33	28	1	0
In simulation project - commercial and others, 10 units				
$48m^2 \times 10 = 480m^2$				



Sunlight hours simulation



Urban planning restrictions and building codes & standrds

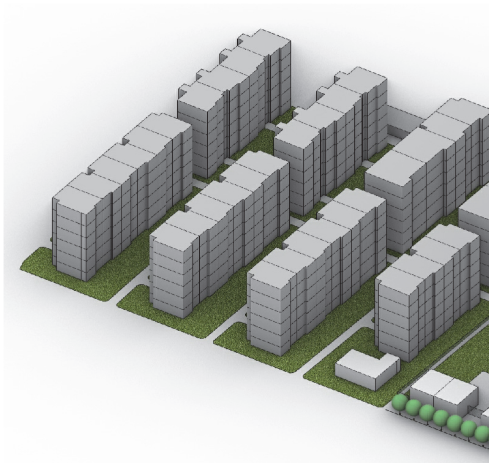
Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when 90m²<unit floor area<140m² 0.8, when 60m²<unit floor area<90m²
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-6 Detailed reconstruction process - intermediate scale - phase 2/2



Economic and technical indexes before and after

	Before	After
Site area (m^2)	10878	
Building coverage area (m^2)	3440	2119
Floor area above ground (m^2)	16280	21900
Floor area underground (m^2)	-	10000
FAR	1.50	2.0
BCR	31.6%	19.5%
Households	251	293
Max building height (m)	17.4	36
Green coverage ratio	17%	57%
Parking spot	5+34 (unauthorized)	285
Parking spot per household	0.16	0.97

Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m^2)	200
Design fee (CNY/m^2)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m^2)	3350
Price of mid-grade housing in similar location in Zhoushan (CNY/m^2)	16000

Calculation

Let

X = Minimum extra floor area to balance reconstruction cost

since

Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area

so

Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)

= Housing price per m^2 × X

so

$200\times16280+(3350+20)\times(16280+X) = 16000\times X$

hence

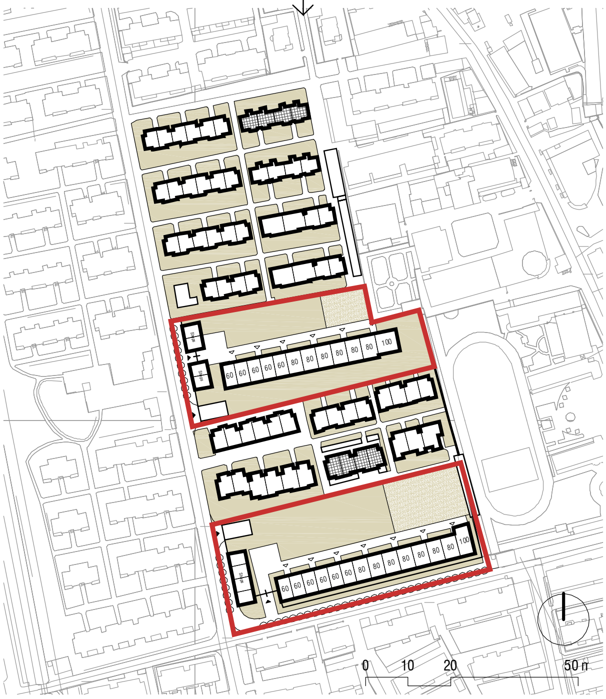
Minimum extra floor area to balance reconstruction cost = 4602m^2

So developer's maximum profit = $(10878\times2\text{-}16280\text{-}4602)\times16000$ = 13984000 CNY

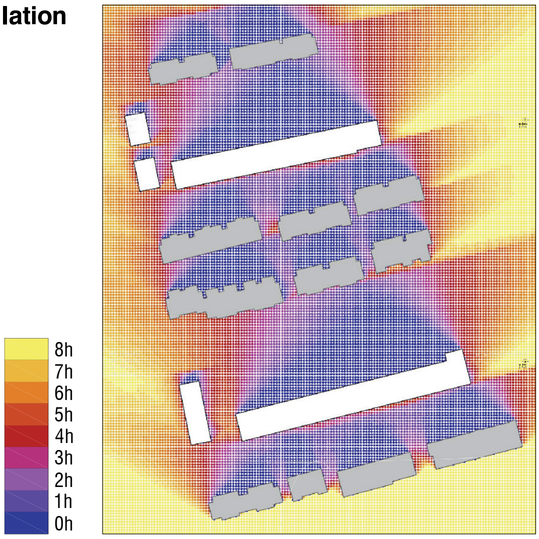
Distribution of layout types

The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m^2	80m^2	100m^2	120m^2
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 251 households				
Number (total)	86	139	20	7
Number (per floor)	7	12	2	1
In simulation project - extra apartments, 42 households				
Number (total)	29	13	0	0
In simulation project - commercial and others, 8 units				
$48m^2\times8=384m^2$				



Sunlight hours simulation



Urban planning restrictions and building codes & standrds

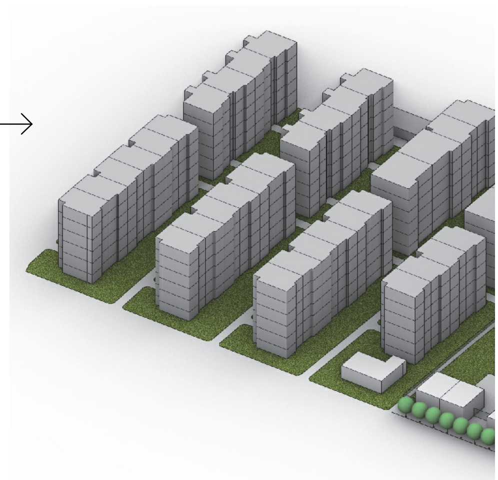
Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when 90m²<unit floor area<140m² 0.8, when 60m²<unit floor area<90m²
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-7 Detailed reconstruction process - small scale - phase 1/3



Economic and technical indexes before and after

	Before	After
Site area (m^2)	9591	
Building coverage area (m^2)	3003	1699
Floor area above ground (m^2)	12360	19000
Floor area underground (m^2)	-	9200
FAR	1.3	2.0
BCR	31.3%	17.7%
Households	192	257
Max building height (m)	17.4	36
Green coverage ratio	40.7%	60.1%
Parking spot	12+9 (unauthorized)	262
Parking spot per household	0.11	1.02

Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m^2)	200
Design fee (CNY/m^2)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m^2)	3350
Price of mid-grade housing in similar location in Zhoushan (CNY/m^2)	16000

Calculation

Let

X = Minimum extra floor area to balance reconstruction cost

since

Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area

so

Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)

= Housing price per m^2 × X

so

$200 \times 12360 + (3350 + 20) \times (12360 + X) = 16000 \times X$

hence

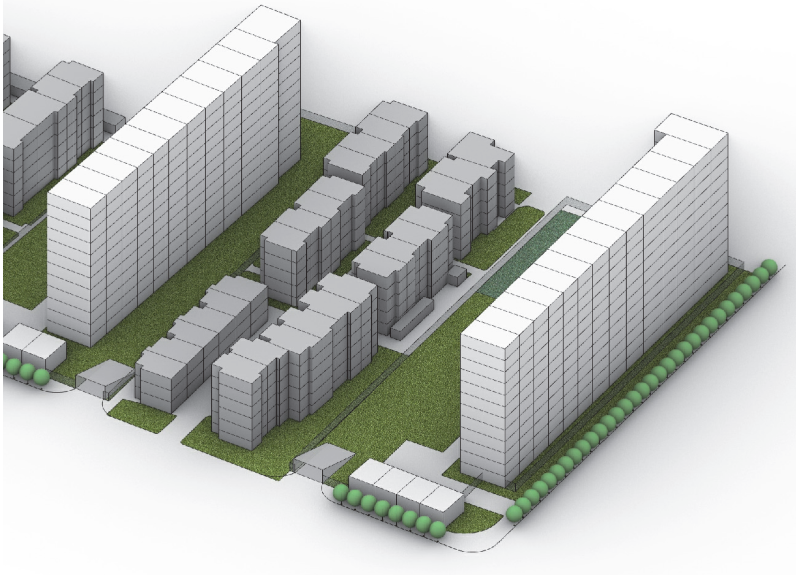
Minimum extra floor area to balance reconstruction cost = 3494m^2

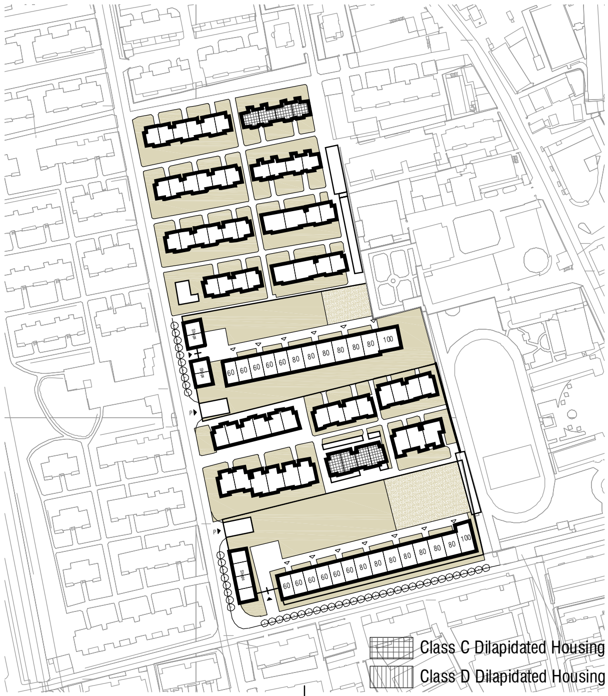
So developer's maximum profit = $(9591 \times 2 - 12360 - 3494) \times 16000$ = 53248000 CNY

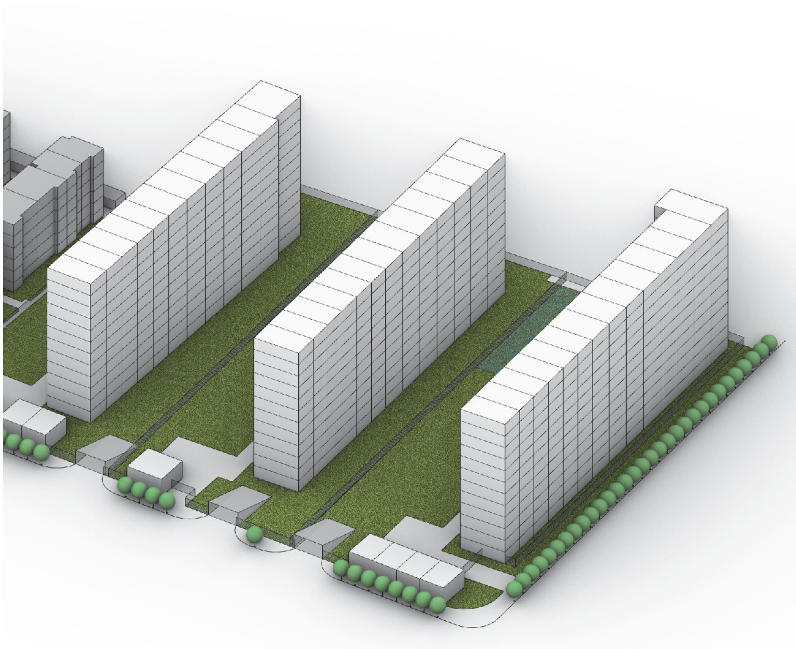
Distribution of layout types

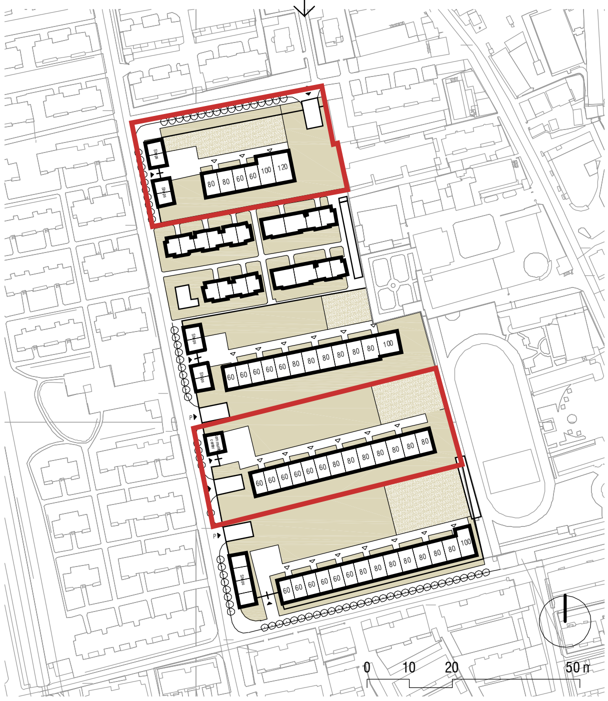
The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m^2	80m^2	100m^2	120m^2
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 192 households				
Number (total)	66	106	15	5
Number (per floor)	5	9	1	0
In simulation project - extra apartments, 65 households				
Number (total)	36	27	1	1
In simulation project - commercial and others, 5 units				
$48m^2 \times 5 = 240m^2$				

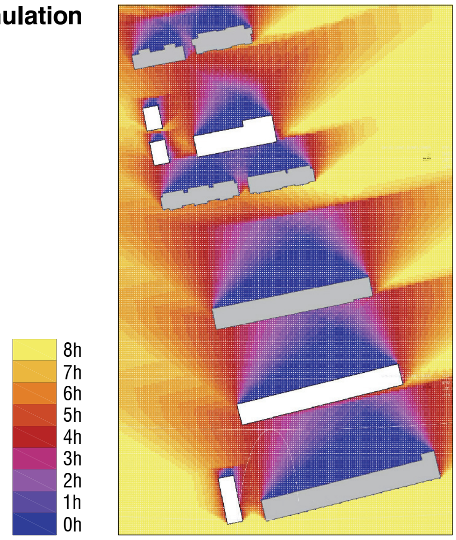








Sunlight hours simulation



Urban planning restrictions and building codes & standrds

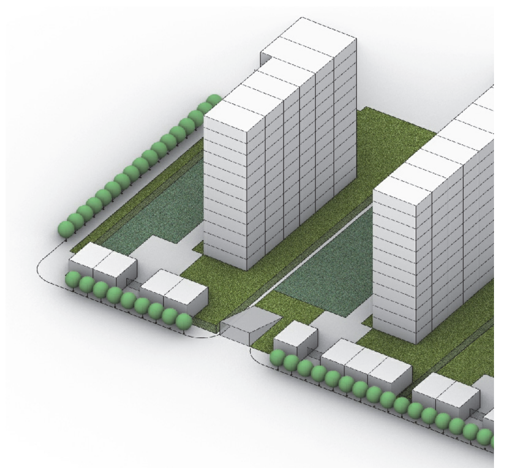
Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when $90m^2$<unit floor area<$140m^2$ 0.8, when $60m^2$<unit floor area<$90m^2$
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-8 Detailed reconstruction process - small scale - phase 2/3



Economic and technical indexes before and after

	Before	After
Site area (m²)	4088	
Building coverage area (m²)	1136	814
Floor area above ground (m²)	4544	8050
Floor area underground (m²)	-	3800
FAR	1.1	2.0
BCR	27.5%	19.9%
Households	72	106
Max building height (m)	17.4	36
Green coverage ratio	48.9%	62.0%
Parking spot	6+1 (unauthorized)	103
Parking spot per household	0.10	0.97

Estimation of economic balance in reconstruction project

Reconstruction costs and housing price

Demolition cost (CNY/m²)	200
Design fee (CNY/m²)	20
(Re)construction cost of mid-grade housing in Zhoushan (CNY/m²)	3350
Price of mid-grade housing in similar location in Zhoushan (CNY/m²)	16000

Calculation

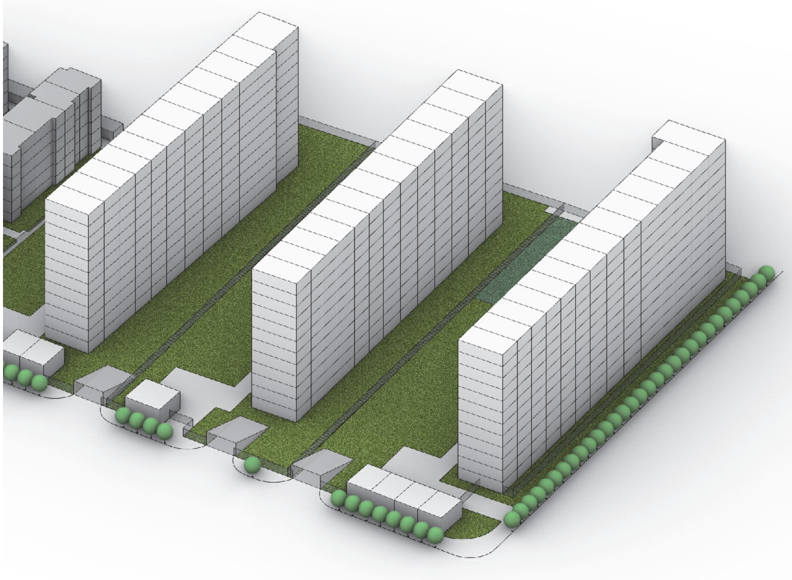
Let
X = Minimum extra floor area to balance reconstruction cost
since
Demolition cost + Design fee + (Re)construction cost = Sale of extra floor area
so
Demolition cost per m^2 × Floor area above ground before + (Design fee per m^2 + Reconstruction cost per m^2) × (Floor area above ground before + X)
= Housing price per m^2 × X
so
$200\times4544+(3350+20)\times(4544+X) = 16000\times X$
hence
Minimum extra floor area to balance reconstruction cost = 1284m^2

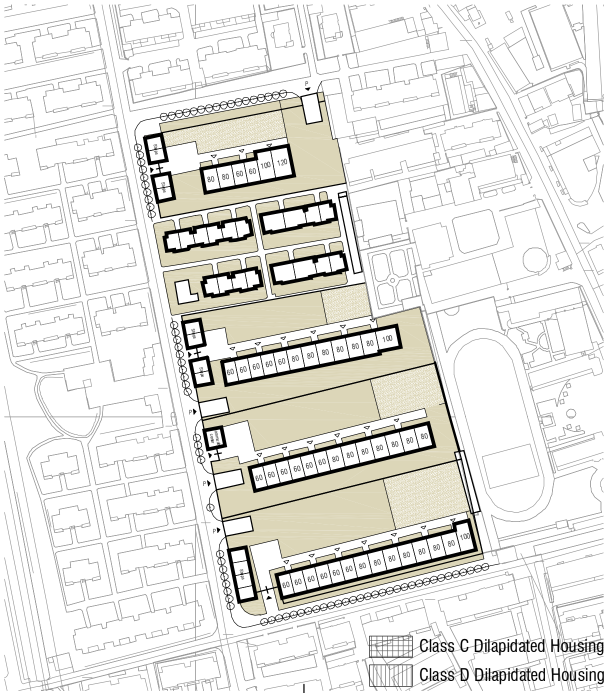
So developer's maximum profit = $(4088\times2\text{-}4544\text{-}1284)\times16000$ = 37568000 CNY
Total profit of three phases = 13984000+53248000+37568000 = 104800000 CNY

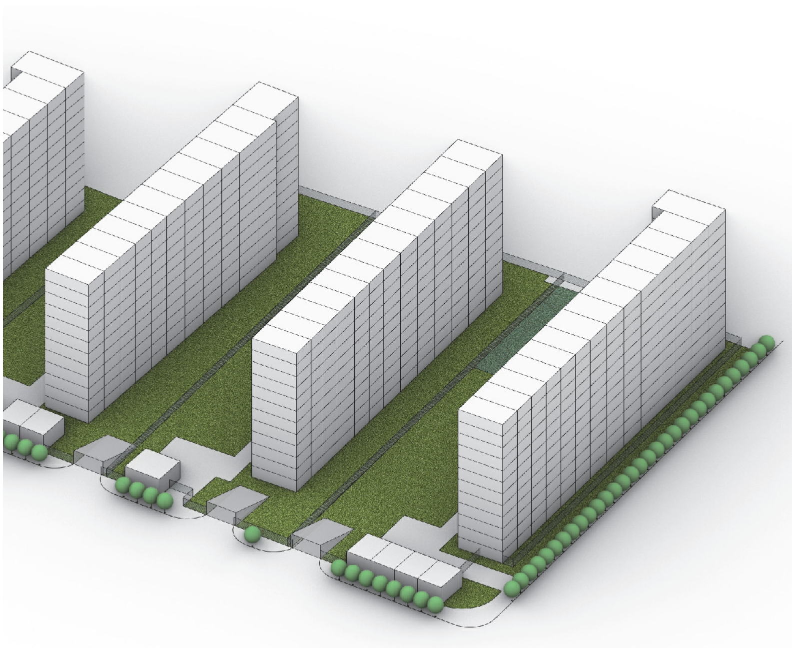
Distribution of layout types

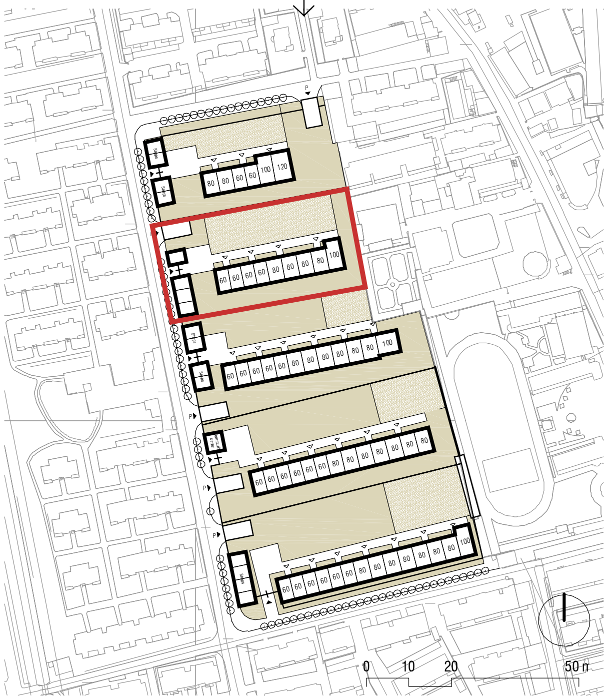
The distribution of layout types is in proportion to the selection of homeowners in Project Building No.4.

In Project Building No. 4, homeowners' selection, 38 households				
Type	60-65m²	80m²	100m²	120m²
Number	13	21	3	1
Percentage	34%	55%	8%	3%
In simulation project - For original homeowners, 72 households				
Number (total)	25	40	6	2
Number (per floor)	2	3	0	0
In simulation project - extra apartments, 106 households				
Number (total)	42	55	7	2
In simulation project - commercial and others, 4 units				
48m²×4=192m²				

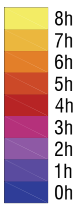


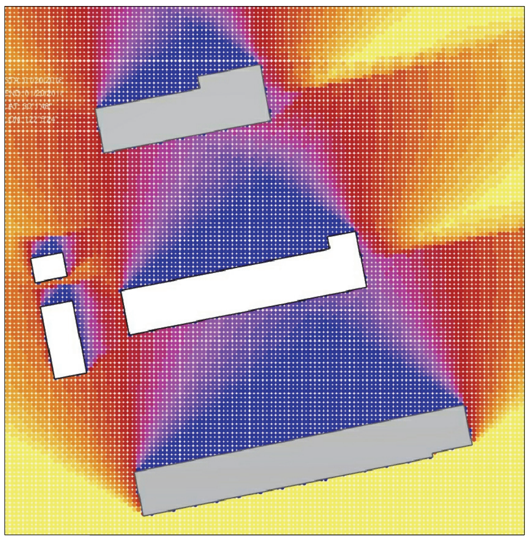






Sunlight hours simulation





Urban planning restrictions and building codes & standrds

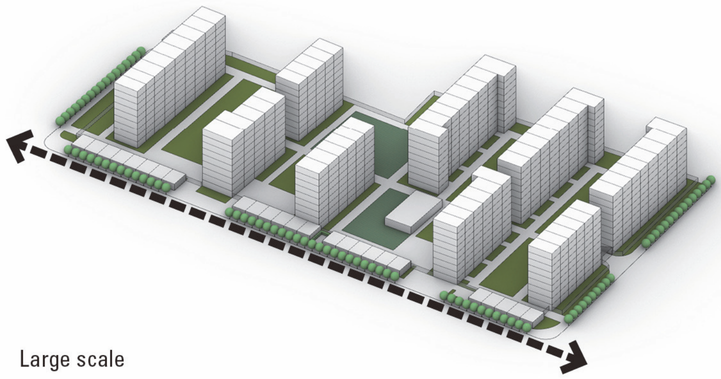
Land development intensity set by Detailed Control Plan of the area

Floor area ratio	>1.0, ≤2.0
Building coverage ratio	≤40%
Green coverage ratio	≥20%
Building height	≤60m

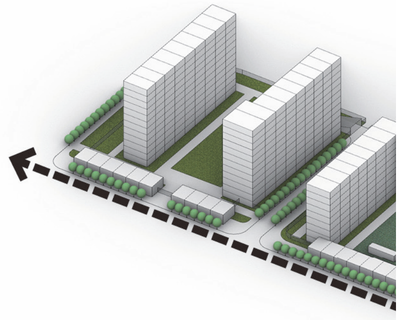
Main indexes set by building codes and standards

Code and standard	Content	
Code of Urban Residential Areas Planning and Design	Sunlight hours on January 20th	≥1
Standards for Planning Parking Lots (Garages) in Urban Architectural Engineering	Parking space / household	1.1, when 90m²<unit floor area<140m² 0.8, when 60m²<unit floor area<90m²
Code for Fire Protection Design of Buildings	Distance between buildings (A and B)	6m, when A<27m and B<27m 9m, when A or B<27m, B or A≥27m 13m, when A≥2m7 and ≥27m

Figure 7-9 Detailed reconstruction process - small scale - phase 3/3



Large scale



Intermediate scale

In the small scale process, the central main road and sidewalk is frequently interrupted by the entrances to underground parking lots.
In the large scale and intermediate scale process, the central main road is more continuous and sidewalk is more walkable. It is also possible to arrange pocket parks along the sidewalk under these two scales.

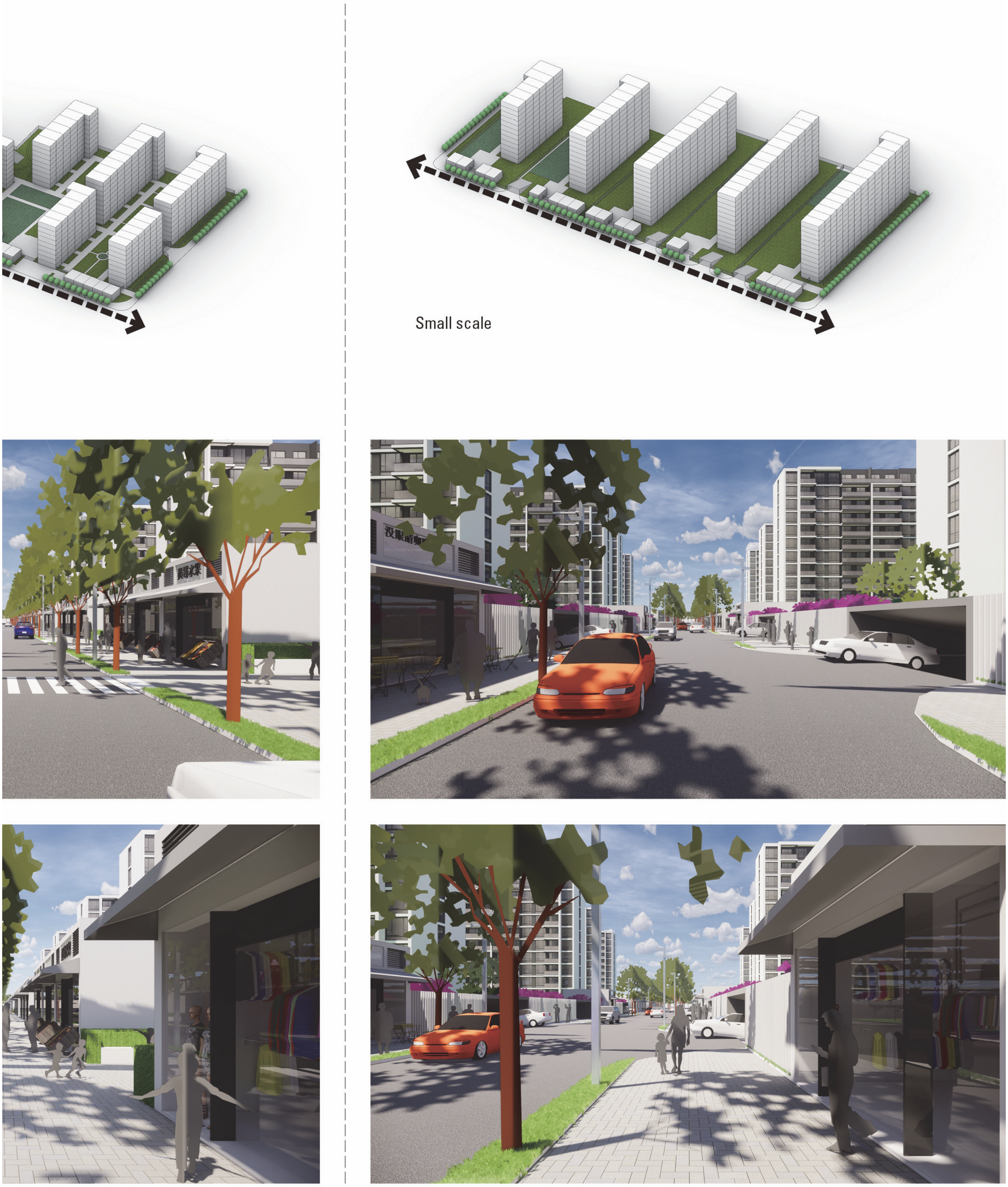
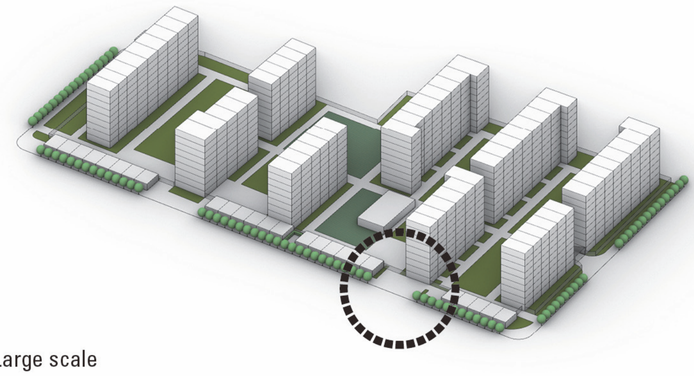
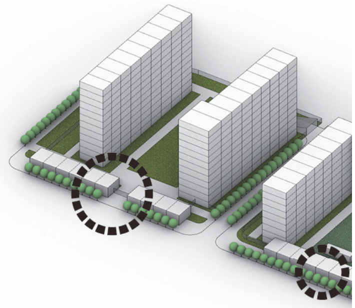


Figure 7-10 Comparison of central main road after reconstruction



Large scale



Intermediate scale

In all three process, the gated territories could all be easily accessed from urban road.
The entrance space in a larger scale will have more flexibility to integrate street furnitures due to its dimension, which contributes to a higher quality of ground level space.
The entrance space in a small scale process will be more likely to be affected by the entrance to underground parking lot.

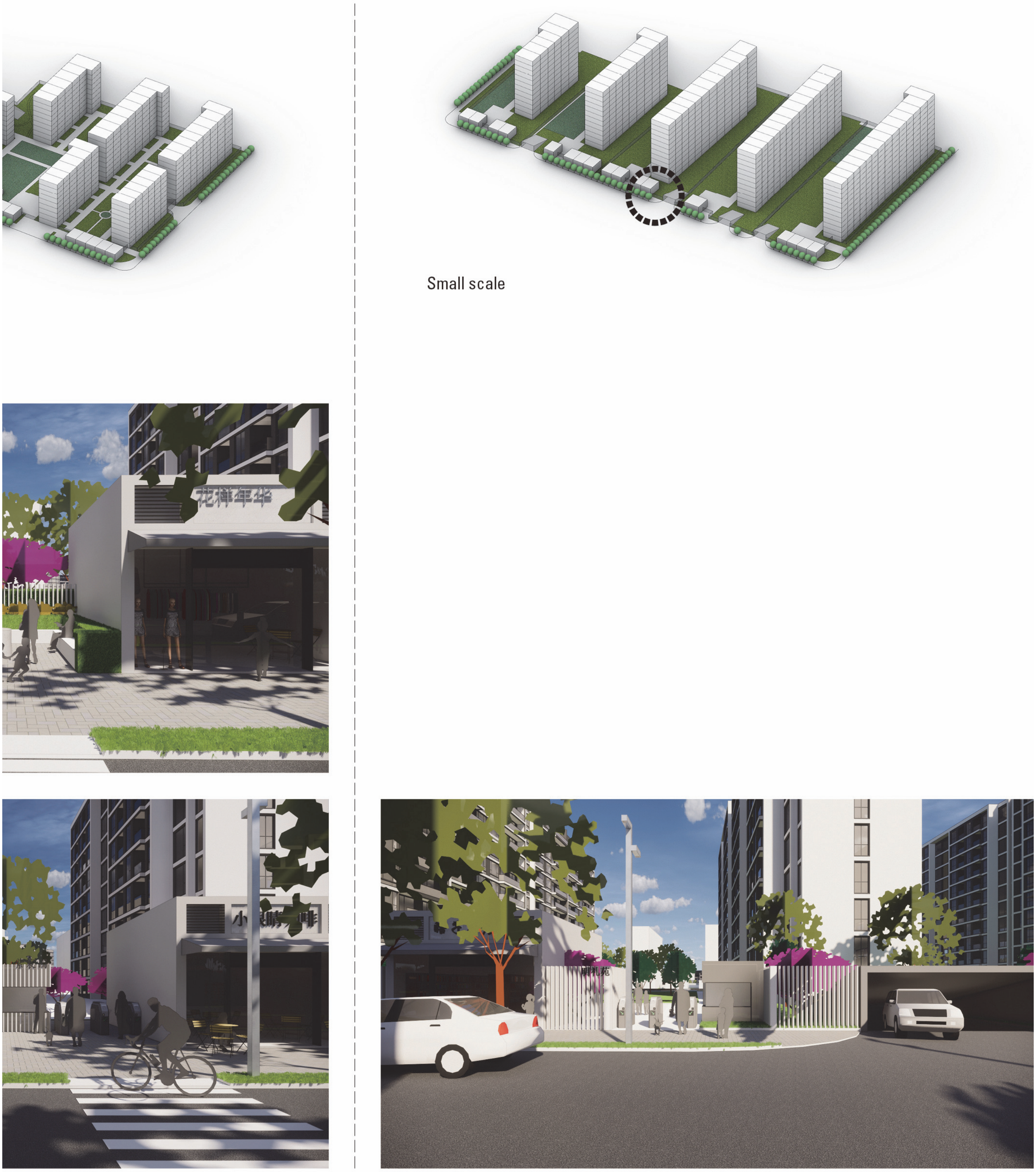
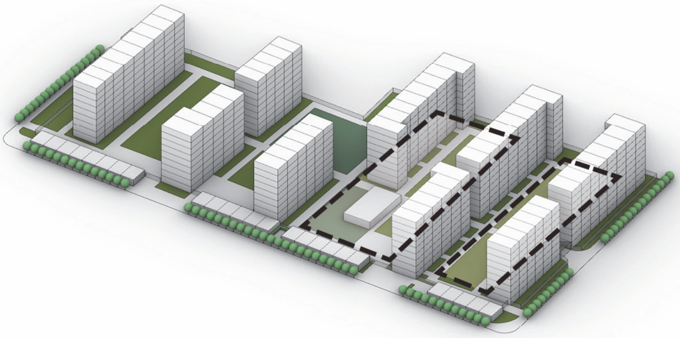
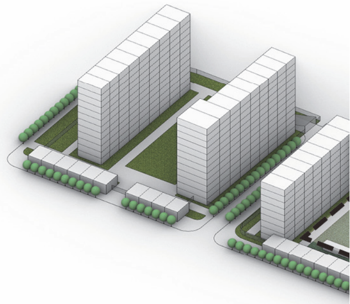


Figure 7-11 Comparison of entrances on central main road after reconstruction

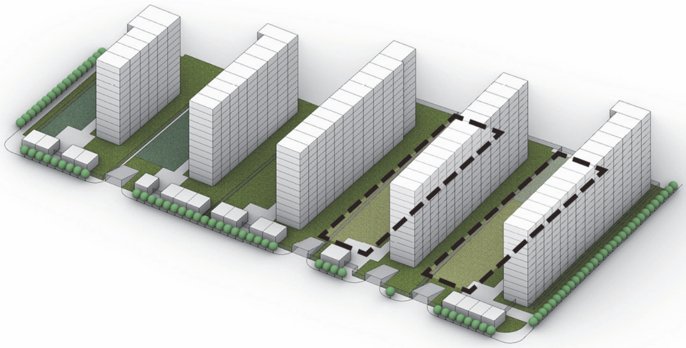


Large scale



Intermediate scale

Due to the flexibility in arranging building volumes, a larger scale process can provide a wider range of public facilities for different age groups of residents. For instance, the large scale subproject has included a daycare center, children's playground, swimming pool, courts, and farm. While a small scale process may end up in repeated and homogenized facilities between buildings.



Small scale

Figure 7-12 Comparison of open space between buildings after reconstruction

7).

7.3 Discussion on simulation and chapter conclusion

According to the calculation, in all three processes, even without FAR bonus and conducted under the most conservative condition that the evaluation price of the old property equals the price of newly developed mid-end property in nearby or similar sites, the reconstruction cost could be balanced by the sale of extra floor area (under the current FAR limit of 2.0), but the profit margin differs from each other. Although FAR limit is the same, smaller scale process tend to have lower profit for developers than larger scale process. This is because when a project is divided into more small sub projects, the reconstruction expense would be higher due to the necessity to build duplicated structure, for example, building three separated small underground parking lot costs more than one big parking lot with the same area. Another reason is that when a project is divided into too many sub projects, it is technically difficult to reach the FAR limit without violating the sunlight distance code, therefore compromise in building height and floor area is inevitable.

In terms of operation mode, corresponding to the different scope of consensus that could be possibly made among homeowners, a series of flexible processes to reconstruct the whole residential area in an incremental way have been presented. It is comparatively easier to reach a consensus among homeowners in a sub project in the small-scale process, since there are fewer homeowners involved than in a large-scale process. However, small scale process does not necessarily mean the whole area could be reconstructed at more ease, because it has lower profit and when the whole area is divided into too many sub projects, some of them may end up unchanged. Besides, a smaller scale process may lead to longer duration to reconstruct the whole residential area, and the construction of incremental projects could bring lasting negative impact to resident’s daily life.

Regarding the impact on physical environment of different processes, though they are under the same FAR limit of 2.0, a larger scale process has better flexibility to rearrange building volumes. As is revealed in the simulation, due to the need to achieve a high FAR without violating sunlight hour code, the small scale process will end up in repeated slab buildings (Figure 7-7, Figure 7-8, Figure 7-9).

Responding to improvements on the qualities with low ratings by homeowners in Jinshou Residential Area, on an urban scale, the improvement of accessibility after reconstruction is identical among three processes. Since the upper limit of large-scale process is defined by one block bounded by urban streets (Figure 7-3), each of the gated territory in three processes could be easily accessed. All the gated territories will also not hinder the surrounding urban street system. In practice, the upper limit of a large-scale reconstruction should be set carefully, when the dimension of a project exceeds a whole urban block, it may be necessary to think about possibilities to allow the urban street to run through.

On a residential area scale, since each sub-project will form a gated territory in the simulation, all three processes should have equally improved access control system. But the provision of parking space differs among three processes, the number of parking spots in smaller-scale process is unavoidably less than that that in a larger-scale process, due to its necessity to build separated small underground parking lots for each subproject. Another issue related to parking is walkability in the residential area, though the section cross central main road could be redesigned in all scale of processes, removing all the unauthorized parking and adding walkways and shops (Figure 7-13), a larger scale is able to provide more pedestrian friendly street as simulated in Figure 7-10 and Figure 7-11. This is because when a larger scale process is adopted, the walkway is less likely to be interrupted by entrances/exits to underground parking lots[53], which enables better continuity and safety for pedestrian.

[53] According to *Code for fire protection design of garage, motor repair shop and parking area (GB 50067-2014)*, in the large scale process (Figure 7-4), only 2 entrances/exits are needed for the big underground parking lot, the simulative master plan has arranged them on the branch roads. While a total number of 5 entrances/exits are needed for the 5 sub projects in the small scale process (Figure 7-9).

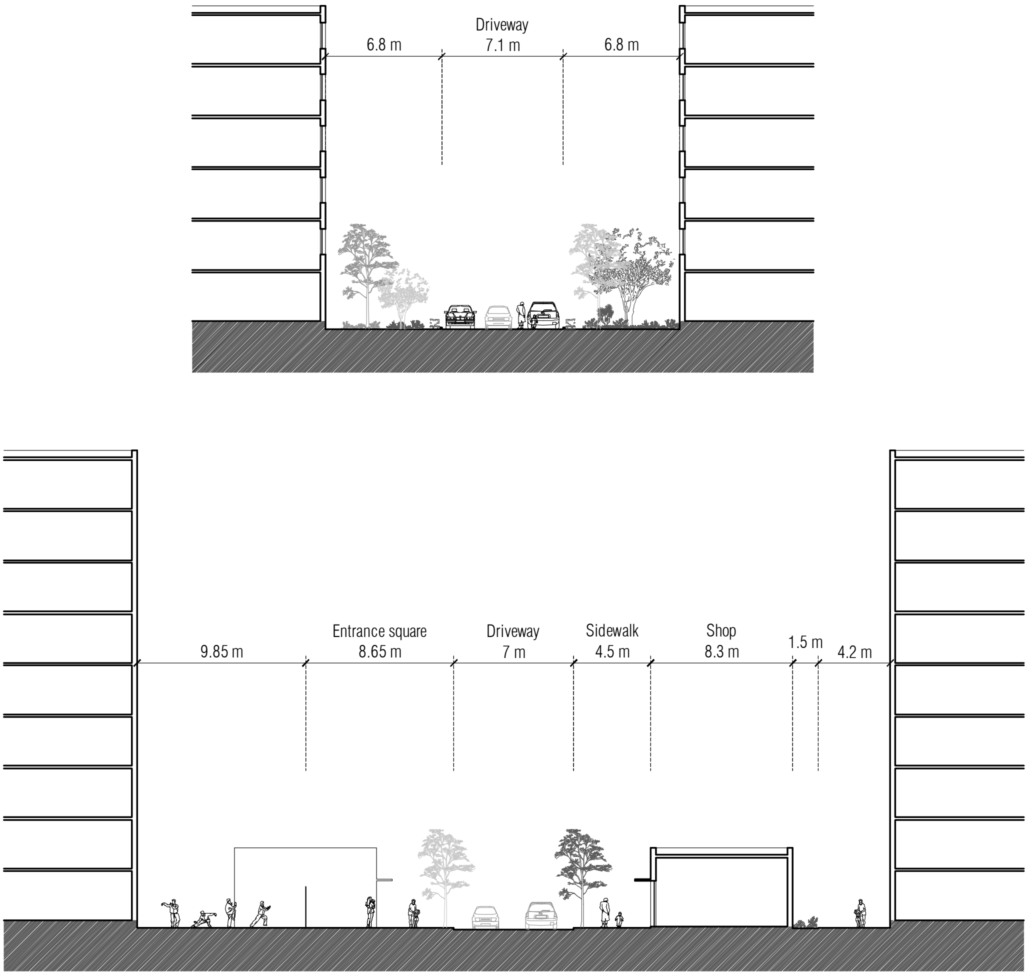


Figure 7-13 Comparison of central road section before and after reconstruction

In terms of the public facilities, all three processes attempt to include facilities for different age groups as much as possible in each subproject, including promenades and pavilions for aged residents to stroll and rest, swimming pools and courts for mid-aged residents to exercise, parks and playgrounds for children, and pocket farms for all age groups to enjoy. The capability to provide diversified facilities differs by the scale of the subproject. A smaller scale is less effective in providing varied facilities for residents, since a smaller scale is divided into more gated territories with access control, the facilities and open space in each small gated territory will be inevitably repeated and homogenized. For instance, a playground for children, a garden for elderly people, and a small pocket farm will take up all the space between buildings in a small-scale subproject (Figure 7-12). Other facilities such as daycare centers may need to be arranged along the central main road. While in a larger scale process, the building volumes could be arranged in more flexible ways, with more diversified public space and facilities placed between the buildings. For instance, the large-scale subproject in Figure 7-12 has included a daycare center, children's playground, swimming pool, courts, and farm in it.

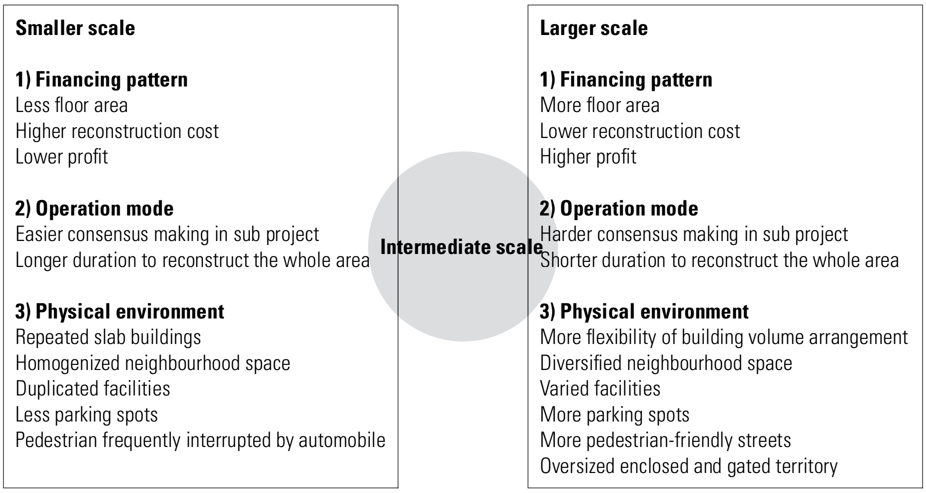


Figure 7-14 Summary of different scale process of reconstruction

To summarize, the simulation project in Jinshou has testified that preliminary recommendations on financing pattern, operation mode, and physical environment, which are generated from Japanese CCR, are applicable for the Chinese DUHR. According to the different scope of consensus that could be made among homeowners, a residential area could be reconstructed in several possible processes which leads to different financial profit and impact on physical environment. Generally speaking, a larger scale process will have higher profit, more flexibility to rearrange building volumes, more diversified neighborhood space and common facilities, more parking spots, and more pedestrian-friendly streets. But we shouldn't draw the conclusion that larger scale process is always better, since it may bring oversized gated territory into the city, and that has been criticized by many scholars (Miao, 2003; Wang, 2010; Xu, 2009; Xu and Yuan, 2015). Hence, in practice it is crucial to let homeowners understand the pros and cons of different possibilities, and an intermediate scale should be established based on the actual condition of each case. (Figure 7-14)

Chapter 8 Conclusions

Aiming to improve the Chinese DUHR system, this research gives the hypothesis that the financing pattern, operation mode, and design strategies in Japanese CCR could be applied to Chinese DUHR. The comparability of two systems is first clarified through documentary analysis, based on which this research then identified the problems of DUHR system, analyzed experience from the Japanese CCR system, and generated and testified recommendations for Chinese DUHR using a simulative reconstruction project. Rather than solely targeting on the economic issues or design strategies, this research takes a synthetic view of the financing pattern, operation mode, and physical environment aspects of housing renewal.

This final chapter first summarize the main research findings in previous chapters relating to the research questions and hypothesis given in Chapter 1, then final recommendations for Chinese DUHR are given, based on which an inclusionary program for district improvements in commodity housing areas in China is formed. At last, the limitations and future work are discussed.

8.1 Comparability of Chinese DUHR and Japanese CCR

To answer the first research question, this research justifies the comparability of Chinese DUHR and Japanese CCR that are set in different social and economic backgrounds. Through documentary study, Chapter 4 first finds the similarities in economic development, urbanization process, land system and housing system, which provides a background for the comparative study. Then it is argued that, the similarities in ownership pattern of Chinese residential area and Japanese condominium complex determines the referability of financing pattern and operation mode of Japanese CCR for Chinese DUHR; and the similarities in morphology and problems with old residential areas and condominium complex determines the referability of physical environmental design strategies of Japanese CCR for Chinese DUHR.

8.2 Reflections on Chinese DUHR system

Carried out in 2015, the DUHR is a government-dominated housing renewal mode targeted on those old residential areas without the best marketability and excluded from the marketized OCR mode.

Although at the moment, DUHR missions given by higher level could be accomplished by local government, a series of problems could be observed in the implementation of DUHR.

Through analyzing a typical case of DUHR in Zhejiang Province, Chapter 4 has answered the second research question. The rationality of selecting this single case is determined by two factors:

Current condition of the residential area: Being a typical residential area constructed in the 1980s at the beginning stage of Chinese housing reform, Jinshou Residential Area has been suffering from deterioration of building structure, aging of facilities, and outdated design and plan, like other residential areas of the same era;

Strategies adopted: From the four strategies provided by government, 38 out of 40 homeowners in this case selected c) and 2 selected d), which all lead to relocation. While a similar selection of strategy could be observed in other projects in Dinghai metropolitan area and other regions in Zhejiang Province.

From the perspective of financing pattern, it is concluded that the current DUHR mode is isolated from housing market and completely relying on government funding. Since the DUHR funding is mainly from upper-level administrative appropriation, local government finance, and bank loans, such financing pattern would lay a heavy burden on different levels of government. Because there is no extra FAR allowed, local government cannot retrieve their investment in DUHR. Considering the unpredictable government appropriation may not guarantee the increasing need for renewal in the future, the economic sustainability of DUHR is in question.

The operation mode problems with DUHR have been examined using documentary analysis of project report, questionnaire on homeowners, and semi-structured interview with homeowners and local government officers. It is concluded that the DUHR is a top-down system between government and homeowners following administrative files, local government controls most sections without supervisions or restrictions, leaving homeowners merely the right to select from a fixed menu (structural reinforcement, in-situ reconstruction, property swap with local government, and government buy-back). Although there have been no big conflicts between homeowner and local government nor any forced relocation, homeowners' reasons for final decision indicate their selection is in fact largely influenced by local government's preference, and constrained in property swap or government buy-back. On one hand, due to the urgency to accomplish the DUHR mission given by higher level as soon as possible, local government has provided better conditions for relocation; on the other hand, reinforcement or reconstruction is technically difficult and uneconomic under the current renewal mode which only work on single building plot. Even though homeowners can afford the reinforcement and reconstruction cost, DUHR's poor performance in improving the physical environment in old residential areas still puts an end to their idea of in-situ relocation

The decision-making period is too short as evaluated by homeowners, and there is only one consensus making procedure, which is the preliminary resolution on renewal strategy selection at the consultation meeting. This could be determined by the top-down nature of DUHR, due to which the local government usually seek for efficiency when making detailed policies.

The currently limited negotiation between local government and homeowners is one-way top-down information transfer, and there is not much room to compromise from the government's side, because they have to efficiently proceed DUHR projects according to administrative files. Homeowners are loosely organized in the project, without concrete organization to negotiate with local government effectively. In fact, the organization issue of homeowners not only occur in renewal of old residential areas like Jinshou, but also widely exist in the maintenance of new residential areas in China.

The physical environmental problems of DUHR is studied by field observation in Jinshou Residential Area. It is concluded that a variety of physical environmental issues exist in the residential area: including urban scale problems such as oversized enclosed territory and unfriendly urban interface; residential area scale problems such as lack of access system, insufficient parking space, unauthorized self construction, and insufficient public space for children and mid-aged; as well as building scale problems such as damage of building structure, small and outdated dwelling unit layout, lack of elevator, leaking roof, external wall, and floor slab. Only building scale problem of one single building could be solved, and some parking spots could be added in current DUHR project, while the other urban and residential area scale problems, along with building scale problem in the other buildings remain unsolved.

Local government should not take full responsibility for the problems identified, since the problems originate from the overall DUHR mechanism. Having in mind the similarities in the strategies adopted in projects in different cities in Zhejiang Province, and the fact that different cities are following the same administrative files on DUHR, the problems identified in the single case could also widely exist in other regions.

8.3 Experience from Japanese CCR system

Chapter 6 answers the third research question, summarizing the Japanese experience in dealing with similar issues in Chinese DUHR system using documentary study and field observation of reconstruction cases in Tokyo

From the perspective of financing pattern, Chapter 6 concludes that with property developer involved, the Japanese CCR system is not isolated from housing market as the Chinese DUHR. Using extra floor area to balance reconstruction cost, CCR projects does not rely on government funding. The government has also provided a variety of policies linking extra FAR with improvement of urban environment, for example, the Abolishment of Collective Housing Facilities relaxes the FAR limit for relatively large condominium complexes and integrates the new complex with District Plan, and the Comprehensive Design System that rewards extra floor area for providing open public space in dense urban areas. Besides, small government subsidy works as incentive to promote reconstruction projects.

For the operation mode of Japanese CCR, it is concluded that the Japanese CCR is a bottom-up system with top-down support and supervision. Homeowners could initiate a project and make final decisions depending on their own investigation and consensus making, while government does not influence homeowners' decision making and only act as law maker and supervisor of reconstruction projects. During the investigation and planning stage, homeowners are well organized as Investigation Group and Planning Committee to discuss and make reconstruction plan. Through working closely with developer and local government, homeowners could take part in the reconstruction plan making and district development plan making when necessary. Besides, third-party consultants could be hired during the investigation and planning stage to help homeowners make better choices.

On the improvement to physical environment in Japanese CCR, this system does not only reconstruct single buildings, but also has a focus on district improvements that deal with urban scale and residential area scale problems. On the urban scale, with recognized streets, redesigned open public space, walkway system, and boundaries, the reconstructed condominium complex could be better integrated with its urban context in a variety of ways as analyzed in the new town, commuter town, and city center case. On the residential area scale, building volumes are rearranged in a more efficient way to achieve a balance between higher FAR and qualities such as sunlight and ventilation, as well as to provide open space for residents. Up-to-date common facilities are added for convenience of resident's life.

Based on the comparison of DUHR and OCR, a series of preliminary recommendations are given for DUHR.

8.4 Recommendations for Chinese DUHR system

Responding to the fourth research question and the research hypothesis, Chapter 7 uses a simulative reconstruction project in Jinshou Residential Area to testify the applicability of Japanese CCR experience to Chinese DUHR.

The results indicate that, the preliminary recommendations on financing pattern, operation mode, and physical environment, which are generated from Japanese CCR, are applicable for the Chinese DUHR. According to the different scope of consensus that could be made among homeowners, a residential area could be reconstructed in several possible processes which leads to different financial profit and impact on physical environment. Generally speaking, a larger scale process will have higher profit and better flexibility to reorganize the physical setting of new residential area. But the downside of an uncontrolled large scale process is oversized gated territories. Hence in practice, an intermediate scale should be established based on the actual condition of each case, achieving a balance of the financing and physical environment aspects.

Responding to the initial purpose of giving recommendations to improve the Chinese DUHR system, final recommendations for DUHR are summarized as follows:

Recommendations for financing pattern

1) Include DUHR projects in the housing market, especially those projects with good marketability. When a few low-income families cannot afford to swap to new dwelling units, government subsidy could be helpful, or these homeowners may also end up being bought out by other homeowners. But when the majority of homeowners cannot afford, government dominated mode would still be the only choice in renewing dilapidated buildings.

2) Allow increase of floor area in reconstruction projects, and use the increased floor area to balance the reconstruction cost. Give FAR bonus for plans that improve the quality of ground level space, especially in dense built-up areas.

3) Use public money only as incitation to promote reconstruction projects and subsidies to low-income families, instead of building a government voluntary system totally relying on government funding.

Recommendations for operation mode

4) Construct a legal framework on reconstruction like the AFRC law in Japan which ensures the project could be proceeded smoothly.

5) Make official reconstruction manuals that present a clear process for homeowners to follow. Break down a project into four stages including initiation, preliminary investigation, formal reconstruction plan making, and implementation. Each phase should be based on homeowners' resolution from last phase, so that the project does not start over constantly. This also make it easier for local government to authorize, monitor, and supervise reconstruction projects.

6) Give homeowners the right to initiate a project. Let homeowners take part in the investigation

on size of project in relation to way of financing patterns, the formal planning, and decision-making process.

7) Educate homeowners their rights and responsibilities of owning their property. Encourage homeowners to form groups to study reconstruction strategies, and involve third-party consultants to help homeowners' decision making. After the developer is involved, encourage homeowners to take part in the planning of new residential area by meetings with the developer, including the layout of building volumes, the unit floor plan layouts, the ground level environment, as well as new public facilities.

Recommendations for improvement of physical environment

8) Include multiple buildings instead of single buildings in a project, to create higher flexibility in rearranging building volumes and space between buildings, as well as in providing diversified facilities.

9) Integrate residential area reconstruction projects with larger scale urban renewal plans, reconsider the connection of the residential area with its urban surrounding, and improve the boundaries of gated territories.

8.5 Forming an inclusionary program

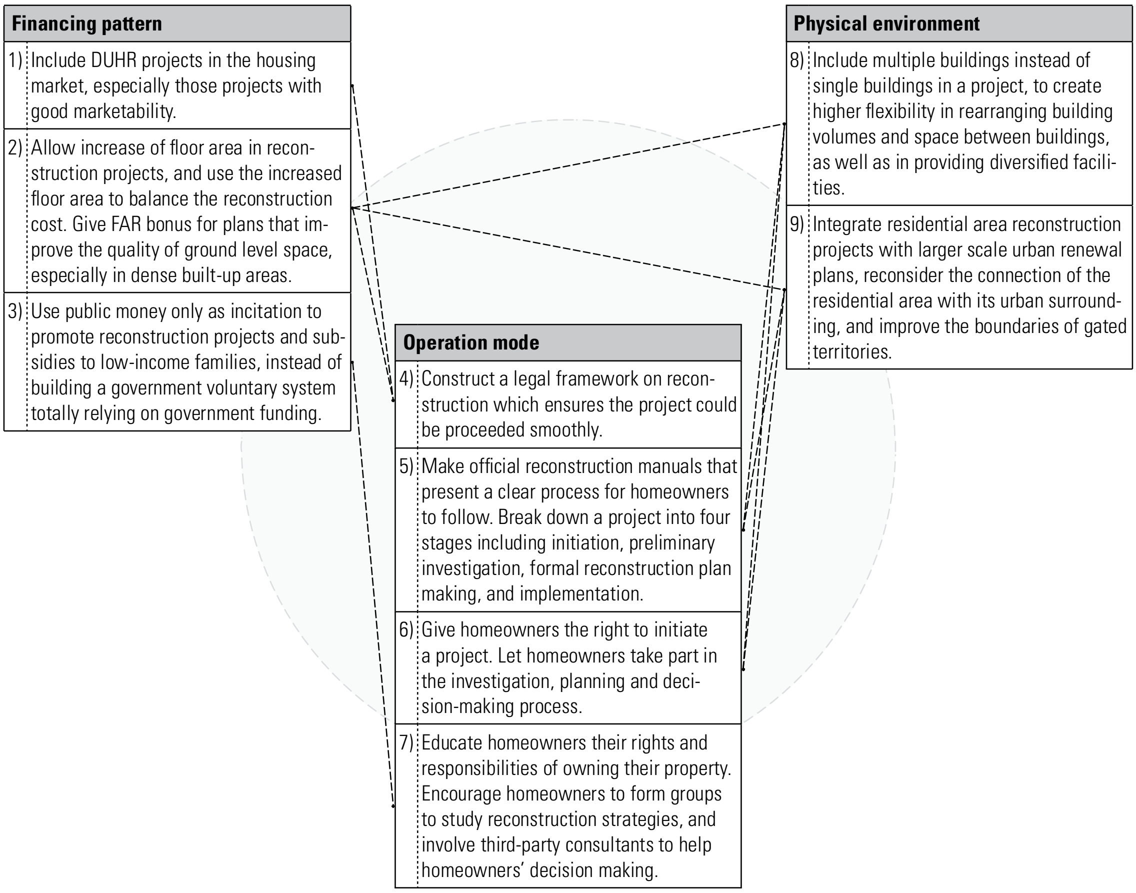


Figure 8-1 Relationship between different aspects of inclusionary program

The recommendations given above are interrelated with each other and therefore should not be taken separately. For example, the extra floor area enables a project from a financing angle, while permission of extra floor area is bound with improvement of physical environment on urban scale. While from the operational side, homeowners' decision-making process is a repeated consideration of the balance between economic benefit (building volume and floor area) and living environment (open space, sunlight, ventilation, and common facilities).

Therefore, it is essential to form an inclusionary program that comprehensively integrates financing, operational and physical environmental aspects (Figure 8-1), not only for its practicability, but also for the fact that the three aspects may support and strengthen each other. This inclusionary program, with a clear focus on district improvements, which is learned from Japanese CCR system, has proved to be effective in dealing with the issues in current Chinese DUHR system. And this program is expected to create a process to balance the interest of different stakeholders, and a manner to bring bottom-up approach to private housing renewal in Chinese cities.

8.6 Limitations and future work

Though the applicability of Japanese CCR experience to Chinese DUHR has been testified on paper in this research, several limitations are detected during this research, which actually suggest the direction of future work. The limitations involve the financing, operational, and physical environment aspect.

8.6.1 Limitations of "building more"

The core concept of the financing recommendations given in this research is to allow a certain amount of extra floor area, so that reconstruction is economically feasible, based on which different physical environmental design strategies are tried corresponding to a variety of possible consensus making results. An inevitable problem that comes behind is, does "building more" solves everything?

Apparently, "building more" only works when there is market. To avoid its weakness as much as possible, the research scope was set at the beginning of this dissertation to Yangtze River Delta area of China, which is one of the most developed regions in China, where most cities are still growing. Besides, most of the class D dilapidated buildings in recent years will still be buildings constructed in the late 1980s and early 1990s at the beginning stage of housing reform, since building standard was low and construction quality was poor at that time. These buildings are usually located in the old city area, where the marketability is relatively good.

Nonetheless, "building more" has proved not to be a panacea for any situation. As mentioned in section 6.5.2, in developed countries like Japan, researchers have also started to look for solutions for old condominium in less marketable areas. Therefore, a longer-term plan needs to be considered when "building more" is no longer effective for Chinese cities.

8.6.2 Applicability to different regions of China

As an extension of the first limitation, a second limitation of this research is the applicability of the recommendations to different regions in China. Since China is a vast country whose regional inequalities are among the world's most extreme, the recommendations are more likely to be suitable for rapidly growing regions like Pearl River Delta, Beijing-Tianjin-Hebei urban agglomeration, and Shandong peninsula urban agglomeration, aside from Yangtze River Delta area. While for underdevelopment areas, especially cities who adopted land finance for short term rapid accumulation, government funding would still be the most effective solution for dilapidated buildings.

8.6.3 Realizability of inclusionary program

The ultimate goal of this research is that the recommendations generated could be useful for the field of practice. However the immense gap between complicated housing renewal practice and paper talk is real, and the knowledge and skill required for each field differ. Though this research has identified current DUHR problems from in-depth study of real-life cases, and used simulation project to testify the applicability of Japanese experience to China, the actual condition in real projects could involve more complicated and thorny issues.

From an administrative point of view, such a new mode for housing renewal must be carried out according to administrative files enacted by the central government. But policy makers in the central government cannot be aware and respond instantly to the problems in local cities and in the communities. Besides, the making of a law on reconstruction and the amendment of related building codes could meet unexpected difficulties in a social condition affected by radical administrative instructions in China. Furthermore, the likely time-consuming consensus making process among homeowners recommended in this inclusionary program might degrade local government's achievement, and thus making the whole mode against the logic of governance in China. Aside from that, the changes in the role of local government over a long period of time could be a tough job for both government and citizens, which is also related to a homeowners' point of view. Nonetheless, it is impossible and inevitable for local government to stick to a government dominated DUHR mode, since an increasing amount of appropriation and loan, and a large team of public servants is needed to deal with the increasing number of dilapidated residential buildings. In fact, the government has already shown their interest to promote the collaboration between public and private sectors, and introduce new models such as PPP in the administrative files[54] listed in Figure 1-5, to which the inclusionary program recommended in this research could be helpful.

As mentioned in Chapter 2, China has shifted from a planned economy to a market economy after the Economic Reform, but there is still much inheritance from the planned economy era. Citizens' expectation of the government's role is one of them, as in reality many homeowners still anticipate local government to be fully responsible for dealing with their dilapidated property. Another issue is housing renewal in Chinese cities today is homeowners may become very sensitive when there is a possibility to involve in renewal projects, and that is due to the high compensation rate in OCR projects (as stated in Subsection 1.1.2) in the past years of real estate industry booming. Even marketability of their property has determined they will not be included in OCR projects soon, many homeowners are still not willing to active positively to deal with their property, but wait for the chance of another OCR project. This requires the government to actively educate homeowners of their responsibilities and rights regarding the maintenance and renewal of their property. Based on that, more specific knowledge could be transmitted to homeowners, such as the stages and processes of a reconstruction project recommended in this research. By acquiring this knowledge, homeowners may be better aware of their own rights and power and participate in projects in a more effective and efficient way.

From developer's angle, new development projects and OCR projects are presently still more

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[54] For example, *Guiding Opinions of the General Office of the State Council on Redevelopment of Shanty Areas and Dilapidated Buildings and Improving Supporting Facilities* mentioned: "… （二）推广政府与社会资本合作模式。在城市基础设施建设运营中积极推广特许经营等各种政府与社会资本合作（PPP）模式。各地应建立健全城市基础设施建设财政投入与价格补偿统筹协调机制，合理确定服务价格，深化政府与社会资本合作，推动可持续发展 …". *Implementation Opinions of the People's Government of Zhoushan on Advancing the Work of Renovating Urban Dilapidated Housing* mentioned: "… 政府应加大资金投入，通过争取金融机构贷款、吸引民间资本参与、发行各类债券等多种方式筹集资金 …". *Implementation Measures of Dinghai District on Renovating Urban Dilapidated Housing* mentioned: "… 第三十八条鼓励和引导民间资本通过直接投资、间接投资、委托代建等多种方式参与成片危旧住宅区改造，吸引有实力、信誉好的开发建设单位及社会力量参与 …".

profitable than the DUHR mode suggested in this research, but this newly recommended DUHR mode will be a choice when they need to expand business, especially after the real estate industry cools down. In fact, Vanke has started similar pilot projects in Shenzhen. The Yutian Village Project in 2018 was an attempt to renew an urban village without wholesale land acquisition and clearance. And it is predictable that developers may be interested in the DUHR mode recommended by this study.

To summarize, the inclusionary program is necessary and feasible in China, but the difficulties in practice calls for more joint efforts between government, developer, and homeowners to overcome. These difficulties also to some extent strengthened the necessity of forming an inclusionary program in housing renewal.

8.6.4 Planners' role in inclusionary program

During the past years of real estate industry booming and the dominance of OCR mode, Chinese planners have been used to work on a blank sheet of paper, regardless of existing social cultural conditions. Their work is mostly limited to speak truth to the power through drawings, reports, and presentations. However, in most cases these efforts cannot ccontribute to the decisions of the person in power. Instead, the person in power's values, specific views on a certain urban problem, and his trade-off between political and economic solutions usually play a more important role.

The inclusionary program recommended in this research demands a change of role for Chinese planners. Since this program intents to bring bottom-up approach to the housing renewal practice in China, it will be a dynamic process in which the attitudes of all stakeholders involved will also be changing. Their changing attitudes are the result of their deeper understanding of the problems and other stakeholders' positions when they are participating the decision-making process. Hence, planning here is not to produce beautiful drawings and loud statements, but to enable stakeholders to communicate, negotiate, coordinate, and reach consensus.

Therefore, in the planning stage of a project under inclusionary program, planners' job is to:

1) Work as the organizer who set up a discussion table for different stakeholders to communicate

with each other. It is also necessary for planners to make a standardized procedure for the discussion, so that the project could proceed smoothly under different people and conditions. Besides, planners should be able to identify the key people or departments to solve problems and achieve the planning, and then lead them to the discussion table, promoting communication and achieving consensus. This job is closely related to the operation mode aspect of the inclusionary program.

2) Develop new ideas based on homeowners' needs and present them in an understandable way using tools such as visualization and models. In the meantime, planners should also learn from experience form other cities and regions, since homeowners do not have enough knowledge of successful models in other cities. In addition, based on the practice in real world, planners should recommend modifications to regulations and building codes related to reconstruction projects, such as the bonus of extra FAR and homeowners' way of involvement. This job is related to the physical environment and operation mode aspect.

3) Work as the coordinator who communicates with different stakeholders involved in the project, listen to their opinions, resolve conflicts between different stakeholders and between different homeowners. This role is connected with the financing pattern and operation mode aspect of the inclusionary program.

8.6.5 Involvement of public funding and integration with public housing provision

This research discussed the necessity of including DUHR projects in the housing market, and allowing property developers to take part in the projects. Yet based on the actual condition of each city, there are more possibilities could be tested, especially the integration with public housing provision. Not only could developers be included, public money could also be used in a wiser way than the current situation. For instance, government could afford part of the reconstruction cost in some projects while at the same time use the extra dwelling units as public housing. On one hand, this strategy could relieve the shortage of public housing in many Chinese cities (Li, 2017); on the other hand, local government's investment could be gradually retrieved from the rent. Yet, the payback period of government's investment needs to be further studied, and the ownership issue of such kind of hybrid buildings also needs to be considered in future researches.

8.6.6 Modification of building codes related to housing renewal in old city area

The sunlight hour (or sunlight distance) code for residential planning in China is among the strictest in the world (Zhang and Zhao, 2010), but the rationality of such strict code has been questioned by scholars and designers (Li, 2005). Although the sunlight distance is relaxed for renewal projects in the old city area in local building codes[55], in the simulation part of this research, it is still observed that this overly strict sunlight distance could be an obstacle when dealing with small-scale reconstruction projects in old residential areas. The flexibility to rearrange building volumes is very small due to the restriction of sunlight code. Therefore the sunlight code may need to be modified to promote reconstruction projects in old city area. In addition to sunlight code, parameters and indexes such as the amount of extra FAR that could be rewarded to promote reconstruction projects also need to be discussed in future works.

8.6.7 Establishment of related laws and guidelines

For the operation mode of DUHR this research recommends to construct a legal framework on reconstruction like the AFRC law in Japan which ensures the project could be proceeded smoothly, and make official reconstruction manuals that present a clear process for homeowners to follow. However, the detailed procedures that gives enough time and discussion before making a final decision, and the percentages of consensus making have not been proposed in this dissertation. Besides, third-party consultants' way of involvement could be explored in future studies, in order to assist decision making from a professional view. These issues must be addressed by long term trial and error in the in actual projects.

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[55] Take Zhoushan for example, according to *Technical Regulations of Zhoushan Municipality on Urban Planning Administration (2005)*, the smallest distance between buildings is 5.7% smaller than that in the new city area. ("… 平行布置的条式（长度超过 30 米）低、多层住宅建筑的间距（L），朝向为南北向的，其间距在旧城区不小于产生遮挡建筑的相对建筑高度 1.15 倍，在新区不小于南侧相对建筑高度的 1.22 倍 …")

Appendices

Appendix A: Questionnaire to homeowners in Jinshou Project

关于金寿新村四幢危房改造项目的调查问卷

1 基本情况

1.1 您的性别

☐男 ☐女

1.2 您的年龄

☐20–30 ☐30–40 ☐40–55 ☐55–65 ☐65 以上

1.3 您的家庭成员构成和年龄是？__________

1.4 您的工作类型是

☐事业单位/公务员/政府工作人员 ☐专业技术人员（教师、医生、工程技术人员、作家等）

☐公司职员 ☐商人 ☐服务业人员 ☐工人 ☐农林牧渔业人员 ☐家庭主妇

☐失业 ☐离退休人员 ☐其他__________

1.5 您的工作地点在什么区位？__________

1.6 您的个人月收入是？

☐500 以下 ☐500–1500 ☐1500–3000 ☐3000–5000 ☐5000–10000 ☐10000 以上

1.7 您从哪年起居住在金寿新村？__________

1.8 您原有金寿新村 4 幢住房在腾空前的用途是？

☐自己住 ☐出租 ☐办公 ☐空置 ☐其他__________

1.9 在金寿新村 4 幢危房改造项目前，您的家庭在舟山是否拥有其它住房的产权？

☐是，位于__________区 ☐否

2 关于危房改造项目运作模式

2.1 异地置换是否是您在召开意见征询会之初的第一选择？

☐是 ☐否，本来的第一选择是☐维修加固 ☐原地重建 ☐货币补偿

因为：☐旧房距离子女、亲戚住处较近 ☐旧房距离子女学校较近

☐旧房距离工作地点较近 ☐旧房周边配套设施便利 ☐多年形成的邻里关系和睦

☐动迁不方便 ☐急需现金 ☐其它__________

2.2 您最终选择异地置换的主要原因是？（可多选）

☐政府给出的补偿政策较为丰厚 ☐新房离子女、亲戚住处较近 ☐新房距离子女学校较近

☐新房离工作地点较近 ☐原有房屋面积太小 ☐金寿新村居住环境太差 ☐其它__________

2.3 您认为政府给出的四种解危策略（维修加固、原地重建、异地置换、货币补偿）是否足够？

☐是 ☐否，因为__________

2.4 在 2016 年 3 月 8 日的意见征询会中进行政策介绍之后，继而在 3 月 9 日的会议中进行了解危措施表决。您认为决策时间是否充足？

☐是 ☐否，应给予至少___个月的决策时间

2.5 **您认为是否有必要召开业主会议，讨论采用何种解危措施？**

☐是　　☐否

2.6 **您是否尝试过与政府交涉过危房改造的相关问题？**

☐是，通过何种方式__________________　　☐否

2.7 **目前的危房改造模式中，您认为是否有必要让政府以外的第三方专业人士介入，以帮助业主做出合适的决策？（原因可多选）**

☐是，因为：☐业住自己很难全面把握危房相关专业问题

☐主要环节都由政府控制引导，自己对很多问题较为模糊　　☐其他_________

☐否，因为：☐自己可以明确地判断应该选用　　☐不信任第三方专业人士　　☐其他_________

3 关于居住环境

3.1 **您金寿四幢房产的楼层是_____，您上下楼是否需要电梯？**

☐需要　　☐无所谓　　☐不需要

3.2 **您的家庭是否拥有小汽车？**☐是　　☐否　　**您是否有固定的停车位？**☐是　　☐否

3.3 **您的家庭中老年人在金寿新村内的户外活动空间为_________，您的家庭中儿童在金寿新村内的户外活动空间为_________，您的家庭中青年人在金寿新村内的户外活动空间为_________。（可多选）**

A.小公园　　B.店铺附近　　C.住宅楼间的空地　　D.没有

3.4 **您对金寿新村和新的置换小区居住环境的满意度**

	金寿新村					新居住区				
	很好	较好	中	较差	很差	很好	较好	中	较差	很差
与小区外城市环境的连接便利度										
小区门禁系统										
小区治安状况										
停车位数量										
违章建筑管理										
公共活动空间（老年人）										
公共活动空间（儿童）										
公共活动空间（青年人）										
旧房户型大小										
旧房户型布局										
邻里和睦程度										

Appendix B: Interviewee list and main questions in semi-structured interview

<table>
<tr><th>Category</th><th>Time</th><th>Position</th></tr>
<tr><td>Bureau for Housing and Urban-rural Development of Zhoushan</td><td>2016. 12</td><td>Vice director, Mr. Lin</td></tr>
<tr><td>Bureau for Housing and Urban-rural Development of Dinghai District</td><td>2016. 12</td><td>Vice director, Mr. Sun
(In charge of the implementation of DUHR in Dinghai District)</td></tr>
<tr><td>Subdistrict office</td><td>2017. 03</td><td>Director of Changguo Subdistrict Office, Mr. Yao
(In charge of the implementation of DUHR in Changguo District)</td></tr>
<tr><td>Community office</td><td>2017. 03</td><td>Director of Jinshou Community Office, secretary of Jinshou Community Party Committee, Mrs. Fang
(In cooperation with the subdistrict office)</td></tr>
<tr><td colspan="3">1) Part of the project being responsible for
2) Overall opinions on the DUHR mode
3) Opinions on the selections provided for homeowners
4) Difficulties in promoting projects</td></tr>
<tr><td>Homeowner</td><td>2017. 03
2018. 12</td><td>2 Homeowners in Building No.4 who selected property swap</td></tr>
<tr><td colspan="3">1) Original selection at the beginning of the project and reasons
2) Reasons for final selection
3) Negotiation with the local government
4) Opinions on the project procedure
5) Opinions on the living environment of old and new residential area</td></tr>
</table>

Appendix C: 74 reconstruction cases utilizing AFRC in Japan by 2017

Source: マンション再生協議会

#	Project	Location	Households (before/after)		Building age as of approval of construction union	Approval time of reconstruction union	Approval time of property swap scheme
1	諏訪町住宅	東京都新宿区	60	96	46	2003.9	2004.1
2	第 5 レジデンス・ サンシャイン	仙台市宮城野区	38	45	22	2003.1	2004.5
3	萩中住宅	東京都大田区	368	534	35	2003.11	2004.2
4	桜新町グリーンハイツ 2 号館	東京都世田谷区	24	57	33	2004.1	2004.3
5	小笹団地 50 号棟・51 号棟	福岡市中央区	32	50	35	2004.9	2004.11
6	赤坂コーポラス	東京都港区	32	64	48	2004.1	2005.7
7	野方団地	東京都中野区	44	56	42	2004.12	2005.8
8	大宮スカイハイツ	さいたま市大宮区	24	24	24	2005.1	2005.6
9	上作延第三住宅	川崎市高津区	48	91	39	2005.1	2005.9
10	ベルエール多摩川	川崎市高津区	34	85	26	2005.7	2005.9
11	金王高桑ビル	東京都渋谷区	81	124	49	2005.8	2005.12
12	新赤坂マンション	東京都港区	63	97	40	2005.9	2006.4
13	新蒲田住宅	東京都大田区	134	202	36	2005.1	2006.3
14	国領住宅	東京都調布市	144	320	41	2005.11	2006.3
15	富士マンション	新潟県新潟市	54	44	40	2005.11	2006.5
16	上尾スカイマンション	埼玉県上尾市	20	20	31	2005.12	2007.2
17	高野台サブ近隣センター	大阪府吹田市	19	58	40	2006.2	2006.7
18	下高宮分譲住宅 1・2	福岡市南区	40	90	36	2006.4	2006.7
19	稲毛台住宅	千葉市稲毛区	240	249	51	2006.6	2006.12
20	野毛山住宅	横浜市西区	120	142	50	2006.8	2007.3
21	藤沢コーポラス	神奈川県藤沢市	34	38	36	2006.1	2008.6
22	天城六本木マンション	東京都港区	24	90	35	2006.1	2007.5
23	広町住宅	東京都中野区	40	66	43	2006.11	2007.3
24	町田山崎団地	東京都町田市	300	305	38	2006.12	2007.7
25	帝塚山団地住宅	大阪市阿倍野区	51	76	48	2007.1	2007.7
26	井口鈴が台Ｋ棟・Ｌ棟・Ｍ棟・Ｎ棟	広島市西区	80	200	44	2007.3	2007.7
27	林町住宅	東京都文京区	56	75	51	2007.9	2008.3
28	初台サンハイツ	東京都渋谷区	40	86	29	2007.1	2008.2
29	宝塚第 3 コーポラス	兵庫県宝塚市	131	73	33	2007.11	2008.5
30	港南台うぐいす住宅	横浜市港南区	96	265	30	2008.2	2009.2
31	大京町住宅	東京都新宿区	24	35	51	2008.2	2008.7
32	下連雀住宅	東京都三鷹市	79	108	39	2008.4	2008.8
33	かみさく 7・8 号棟	川崎市高津区	48	92	46	2008.4	2008.1
34	エビスマンション	東京都渋谷区	44	77	39	2008.5	2008.8
35	花咲団地	横浜市西区	88	368	51	2008.7	2009.12

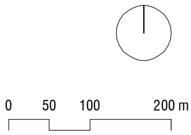
36	深谷第三住宅	大阪府豊中市	68	115	39	2009.2	2011.3
37	川崎駅北口地区第二街区 10 番地地区	川崎市川崎区	15	5	39	2009.4	2009.7
38	美竹ビル	東京都渋谷区	40	168	50	2009.4	2010.11
39	五番町マンション	東京都千代田区	39	52	46	2009.5	2011.7
40	東丘住宅	大阪府豊中市	152	246	41	2009.11	2010.6
41	クレストフォルム南町田	東京都町田市	23	23	12	2010.6	2010.9
42	桜上水団地	東京都世田谷区	404	880	45	2010.7	2011.7
43	原宿住宅	東京都渋谷区	112	220	53	2010.8	2011.2
44	諏訪 2 丁目住宅	東京都多摩市	640	1249	39	2010.12	2011.11
45	宇田川町住宅	東京都渋谷区	16	49	49	2011.3	2012.1
46	ライオンズマンション向ヶ丘遊園	神奈川県川崎市	15	15	28	2011.3	-
47	シャトー三田	東京都港区	95	270	47	2011.6	2012.2
48	池尻団地	東京都世田谷区	125	205	48	2011.8	2012.3
49	ハイツ駒込	東京都文京区	25	49	40	2011.11	2012.8
50	二子玉川第一スカイハイツ	東京都世田谷区	53	119	36	2011.12	2012.5
51	調布富士見町住宅	東京都調布市	176	331	41	2012.5	2013.4
52	藤崎住宅	福岡市早良区	130	232	41	2012.1	2013.7
53	同潤会上野下アパート	東京都台東区	71	128	83	2012.1	2013.5
54	茅ヶ崎駅前分譲共同ビル	神奈川県茅ヶ崎市	40	78	46	2013.1	2013.8
55	セントラル美竹	東京都渋谷区	33	60	43	2013.2	2014.7
56	ジークレフ駒場	東京都渋谷区	9	23	32	2013.4	2013.9
57	川崎市大島 4 丁目店舗・市営大島住宅	川崎市川崎区	78	71	56	2013.4	2014.8
58	丸竹ファミリーマンション	沖縄県那覇市	25	22	39	2013.5	2013.8
59	小金井コーポラス	東京都小金井市	80	114	48	2013.6	2014.1
60	宮益坂ビルディング	東京都渋谷区	70	151	60	2013.8	2016.11
61	河田町住宅	東京都新宿区	34	41	57	2013.9	2014.4
62	山本団地	大阪府八尾市	24	59	57	2013.9	2013.12
63	大宮高鼻町ハイツ	さいたま市大宮区	52	100	33	2013.9	2014.1
64	多摩ニュータウン松が谷団地	東京都八王子市	80	239	37	2014.3	-
65	石澄団地	大阪府池田市	184	120	46	2014.3	2015.5
66	乃木坂ナショナルコート	東京都港区	51	87	36	2014.7	-
67	葺出ハイツ	東京都港区	31	67	41	2014.9	-
68	宮前グリーンハイツ	神戸市灘区	36	69	33	2014.1	2015.3
69	アルカサーノ東が丘	東京都目黒区	19	37	40	2014.11	2016.1
70	府中セントラルハイツ	東京都府中市	37	98	36	2015.1	2016.2
71	大秦ハイツ	神奈川県秦野市	-	-	-	2015.3	-
72	藤沢住宅	神奈川県藤沢市	170	360	50	2015.5	2015.11
73	花の北モール	兵庫県姫路市	-	-	-	2015.5	-
74	本郷ハイツ	東京都文京区	43	59	41	2015.9	2016.11

Appendix D: Condominium complex reconstruction projects (utilizing AFRC) in Tokyo by 2017

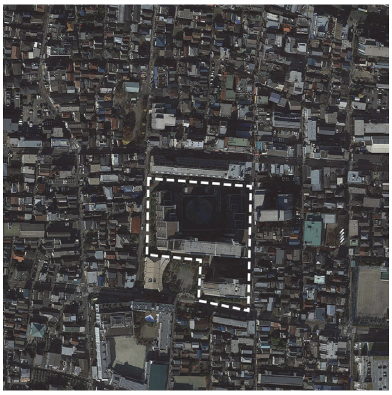
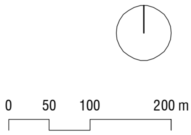
Compiled by author from マンション再生協議会

#	Project	Location	Completion of original building/reconstruction	Building age as of project approval	Site area (before/after)	Floor area (before/after)	FAR (before/after/increase rate)		Number of buildings and floors (before/after)	Households (before/after)	Developer involved
1	諏訪町住宅 東京都住宅供給公社	新宿区	1957	46	3,960	3,100	0.78	2.18	2*3F, 3*4F	60	旭化成
			2005		3,870	6,600	1.71		1*(5+1)F	96	
2	萩中住宅 東京都住宅供給公社	大田区	1968	35	15,935	18,511	1.16	2.63	8*5F	368	長谷工
			2006		15,953	48,801	3.06		2*(18+1)F	534	
3	野方団地 （財）首都圏不燃建築公社	中野区	1963	42	1,600	2,800	1.75	1.54	2*4F	44	-
			2007		1,600	4,300	2.69		1*(5+1)	56	
4	新蒲田住宅 東京都住宅供給公社	大田区	1969	36	5,467	8,736	1.60	1.86	3*5F	134	新日鉄都市開発
			2007		5,461	16,237	2.97		1*(11+1)F	202	
5	国領住宅 日本住宅公団	調布市	1964	41	13,216	7,363	0.56	4.40	7*4F	144	旭化成
			2008		13,282	32,587	2.45		7*(14+1)F	320	
6	町田山崎団地 日本住宅公団	町田市	1968	38	28,905	15,399	0.53	2.62	9*5F, 1*1F	300	-
			2009		14,887	20,806	1.40		2*10F	305	
7	林町住宅 東京都住宅供給公社	文京区	1956	51	3,563	2,915	0.82	2.33	2*4F	56	松下産業
			2010		3,563	6,802	1.91		1*(5+1)F	75	
8	下連雀住宅 東京都住宅供給公社	三鷹市	1969	39	3,994	3,907	0.98	2.38	2*5F	79	旭化成
			2010		3,988	9,274	2.33		1*(8+1)F	108	
9	桜上水団地 日本住宅公団	世田谷区	1965	45	47,900	30,500	0.64	3.32	17*4~5F	404	野村不動産 三井不動産
			2015		46,595	98,551	2.12		8*(6~14+1)F	880	
10	原宿住宅 日本住宅公団	渋谷区	1957	53	5,341	4,523	0.85	6.05	4*5F, 2*4F	112	新日鉄興和不動産 三井物産
			2013		5,176	26,517	5.12		1*(18+2)F	220	
11	諏訪２丁目住宅 日本住宅公団	多摩市	1971	39	64,400	34,037	0.53	3.67	23*5F	640	東京建物
			2013		64,400	124,871	1.94		7*11~14F	1,249	
12	シャトー三田 民間事業者	港区	1964	47	3,327	16,750	5.03	1.78	2*8F	95	野村不動産 三井不動産
			2014		3,717	33,313	8.96		4*(2+2)F	254	
13	池尻団地 （財）首都圏不燃建築公社	世田谷区	1963	48	6,019	11,286	1.88	1.81	3*5F	125	旭化成
			2014		5,993	20,309	3.39		1*(11+1)F	205	
14	調布富士見町住宅 東京都住宅供給公社	調布市	1971	41	12,507	10,470	0.84	3.37	5*5F	176	旭化成
			2015		12,446	35,060	2.82		2*(6~8+1)F	331	
15	同潤会上野下アパート （財）同潤会	台東区	1929	83	1,148	2,094	1.82	4.02	2*4F	71	三菱地所
			2015		1,148	8,416	7.33		1*(14+1)F	128	
16	小金井コーポラス 民間事業者	小金井市	1965	48	5,356	4,915	0.92	1.90	3*4F	80	東京建物
			2016		5,219	9,081	1.74		1*8F	114	
17	河田町住宅 東京都住宅供給公社	新宿区	1956	57	1,952	1,776	0.91	1.69	2*(4+1)F	34	旭化成
			2015		1,952	2,995	1.53		1*6F	41	

01 諏訪町住宅（東京都住宅供給公社）　　新宿区高田馬場

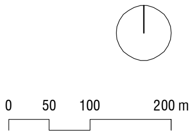


		Before	After
Time of construction		1957	2005
Site area		3,960 m²	3,870 m²
Total floor area		3,100 m²	9,800 m² (FAR=1.75)
FAR limit		3.0	
Building condition	Number of floors and buildings	3F above ground × 2 4F above ground × 1	5F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	60	96
	Layout	3K	1DK - 4LDK
	Unit floor area	44.09 m²	34.4 m² - 102.64 m² (avg. 67.38 m²)
Previous situation of utilization		self-occupied residence 25, non-residence 20 rental 15	
Resolution		Based on ABUO, Article 62	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		Special allocation system of municipal housing for temporary dwelling	
Features		- Female staff in the cooperator team, introduce temporary housing to elderly homeowners - Homeowners negotiate with tenants (18 tenants moved out before approval of property swap schema) - 45 out of 54 homeowners acquired new apartment after reconstruction	
Progress		1990　建替え検討組織を設置 2001.07　都公社とコンサルタント契約締結 2002.05　事業協力者の選定 2003.05　建替え決議成立 2003.09　マンション建替組合設立認可 2004.01　権利変換計画認可 2004.04　工事着手 2005.07　マンション建替え事業完了 2005.12　解散認可	
Cooperator (developer)		㈱旭化成ホームズ	
Consultant		東京都住宅供給公社	

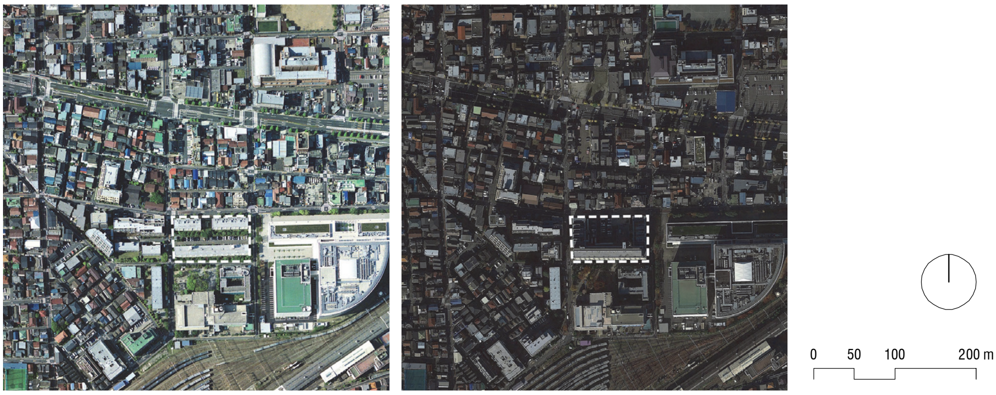
		Before	After
Time of construction		1968	2006
Site area		15,934.91 m²	15,952.91 m²
Total floor area		18,510.87 m²	48,801.38 m² (FAR=2.40)
FAR limit		2.0	2.4
Building condition	Number of floors and buildings	5F above ground × 8	18F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	368	534
	Layout	3K, 3DK	1LDK - 4LDK
	Unit floor area	44.40 m², 47.95 m² (avg. 43.5 m²)	44.82 m² - 88.38 m² (avg. 67 m²)
Previous situation of utilization		self-occupied residence 234 rental 134	
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		- 優良建築物等整備事業 - 21 世紀都市居住緊急促進事業	
Features		- 総合設計制度 - 高齢者向け返済特例制度公庫融資 - 仮住居への都営住宅の特別割当制度	
Progress		1994　「建替え準備委員会」発足 2000.12　建替え推進決議成立 2002.12　旧区分所有法による建替え決議（不成立） 2003.06　改正区分所有法による建替え決議成立 2003.11　円滑化法に基づくマンション建替組合設立認可 2004.02　権利変換計画認可 2007.03　解散認可	
Cooperator (developer)		㈱有楽土地	
Consultant		㈱シティコンサルタンツ	

03 野方団地（(財)首都圏不燃建築公社） 中野区野方



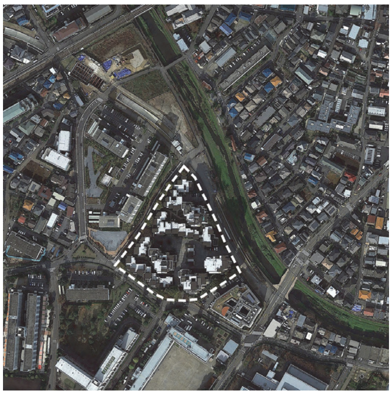
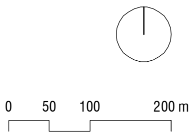
		Before	After
Time of construction		1963	2007
Site area		1,600 m²	1,600 m²
Total floor area		2,800 m²	4,300 m²
FAR limit		2.0	
Building condition	Number of floors and buildings	4F above ground × 2	5F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	44	56
	Layout	2DK	1K - 3LDK
	Unit floor area	50.72 m² - 55.90 m²	25.36 m² - 84.00 m²
Previous situation of utilization		self-occupied residence 33 rental 11	
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- Reconstruction Union is formed by property owners only, without developer company involved - the reconstructed buildings eliminate existing ineligibility conditions (既存不適格状態) such as inadequate sunlight distance - Loan from Japan Housing Finance Agency	
Progress		1989　マンション建替えの検討開始 2002.12　建替え推進決議成立 2004.06　団地一括建替え決議成立 2004.12　円滑化法に基づくマンション建替組合設立認可 2005.08　権利変換計画認可 2005.12　工事着手 2007.10　解散認可	
Cooperator (developer)		None	
Consultant		㈱ケア・ジャパン	

04 新蒲田住宅（東京都住宅供給公社）　大田区新蒲田



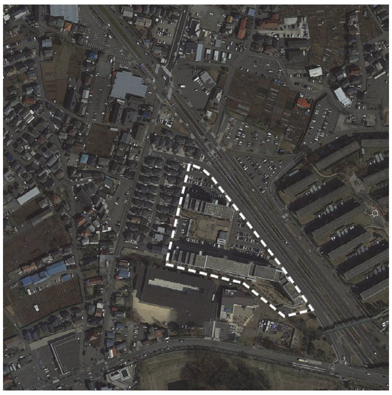
		Before	After
Time of construction		1969	2007
Site area		5,466.88 m²	5,460.85 m²
Total floor area		7,780 m²	16,236.85 m² (FAR=2.75)
FAR limit		3.0	
Building condition	Number of floors and buildings	5F above ground × 3	11F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	134	202
	Layout	2DK	1LDK - 5LDK
	Unit floor area	44 m² - 48 m²	46 m² - 147 m² (32 types, avg. 68.27 m²)
Previous situation of utilization		self-occupied residence 92, non-residence 18 rental 24	
Resolution		Based on ABUO, Article 62 and 69	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		Special allocation system of municipal housing for temporary dwelling	
Features		- Since each building is managed on its own, a resolution in each building and a resolution in the whole owners' association were made. - Loan from Japan Housing Finance Agency	
Progress		2003.06　「新蒲田住宅改善委員会」を発足 2003.12　新蒲田住宅管理組合設立、新蒲田住宅建替え計画委員会設立（建替え推進決議の承認） 2004.09　事業協力者選定 2005.07　建替え決議総会 2005.11　建替組合設立認可 2006.01　権利変換計画認可申請 2006.04　着工 2007.12　竣工 2008.08　解散認可	
Cooperator (developer)		㈱新日鉄都市開発	
Consultant		東京都住宅供給公社	

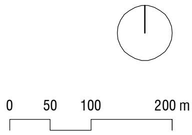
05 国領住宅（日本住宅公団） 調布市国領町

		Before	After
Time of construction		1964	2008
Site area		13,216 m²	13,282 m²
Total floor area		7,363 m²	32,587 m² (FAR=2.00)
FAR limit		0.7	2.0
Building condition	Number of floors and buildings	4F above ground × 7	14F above ground 1F underground × 7
	Structure type	RC	RC
Dwelling unit condition	Number of households	144	320
	Layout	3K, 3DK	1LDK - 4LDK
	Unit floor area	46 m², 48 m²	57.16 m² - 107.41 m² (avg. 78 m²)
Previous situation of utilization		self-occupied residence 62, non-residence 35 rental 47	
Resolution		Based on ABUO, Article 62	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- A new FAR of 2.00 due to the abolishment of Ichi-Danchi	
Progress		1987 建替えの検討を開始（分譲主の住宅・都市整備公団の協力） 1991 検討の中断 1993 検討の再開 2000 住都公団の分譲撤退により民間事業者を選定 2004.10 「国領駅周辺地区地区計画」の都市計画決定 2005.07 団地内の建物の一括建替え決議成立 2005.11 建替組合の設立認可 2006.03 権利変換計画認可 2008.08 解散認可	
Cooperator (developer)		㈱新日鉄都市開発	
Consultant		東京都住宅供給公社，協同組合都市設計連合	

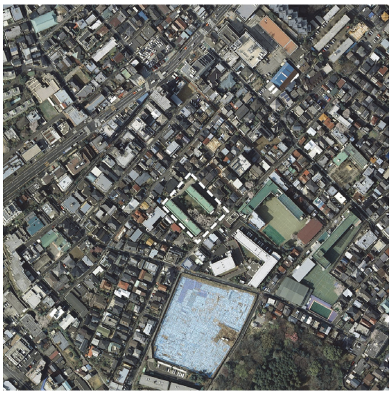
06 町田山崎団地 町田市山崎町

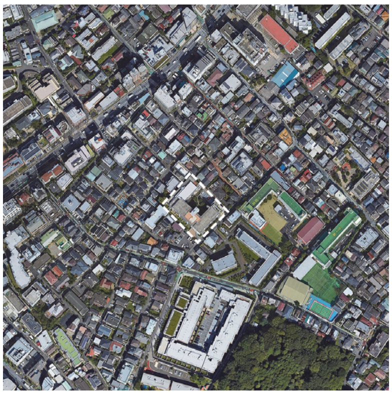


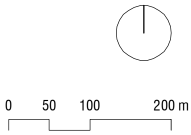


		Before	After
Time of construction		1968	2009
Site area		28,905.21 m²	14,887.48 m²
Total floor area		15,399 m²	20,806 m² (FAR=1.48)
FAR limit		0.5	1.5
Building condition	Number of floors and buildings	5F above ground × 9 1F above ground × 1	10F above ground × 2
	Structure type	RC	RC
Dwelling unit condition	Number of households	300	305
	Layout	3DK	1K - 4LDK
	Unit floor area	47.99 m²	30.95 m² - 82.96 m² (avg. 61 m²)
Previous situation of utilization		self-occupied residence 253, rental 20, empty 27	
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- No developer involved due to the profitability - Part of land was sold to balance the reconstruction cost - Abolishment of Ichi-Danchi	
Progress		1990.05 建替論議発生 1995.05 建替プロジェクトチーム設置 2003.11 等価交換方式の建替決議事業を断念し、それ以外の事業方式（土地一部処分型）の検討開始 建替組合設立準備委員会設立 2006.05 一括建替決議成立 2006.12 建替組合設立認可 2007.07 権利変換計画認可 2008.07 本工事着工 2009.09 建物完成	
Cooperator (developer)		None	
Consultant		㈱都市研究所	

07 林町住宅（東京都住宅供給公社） 文京区千石

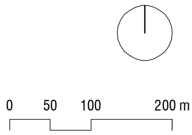






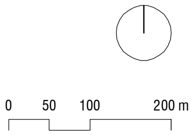
		Before	After
Time of construction		1956	2010
Site area		3,562.85 m²	3,562.85 m²
Total floor area		2,915.15 m²	6,801.96 m² (FAR=1.58)
FAR limit		2.0	
Building condition	Number of floors and buildings	4F above ground × 2	5F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	56	75
	Layout	3K	2K - 4LDK
	Unit floor area	43.61 m²	47 m² - 120 m² (avg. 67.89 m²)
Previous situation of utilization		self-occupied residence 46 rental 10	
Resolution		Based on ABUO, Article 62	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- Homeowners are able to have the same floor area of their previous apartment for free	
Progress		2005.05 建替えか大規模修繕か等のアンケートを実施し、5年を目途に建替えを実施することになり、同年6月建替え準備委員会を設立 2006.09 事業協力者及び参加組合員決定 2007.04 区分所有法に基づく建替え決議 2007.09 建替組合設立認可 2007.11 事業協力者及び参加組合員の撤退、新たな事業協力者及び参加組合員の決定 2008.02 定款及び事業計画の変更の認可 2008.03 権利変換計画の認可 2008.05 解体工事着手 2008.10 新築工事着工 2010.03 竣工	
Cooperator (developer)		㈱アーバンアセット研究所	
Consultant		㈱総合不動産鑑定コンサルタント	

08 下連雀住宅（東京都住宅供給公社）　　三鷹市下連雀

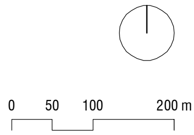


		Before	After
Time of construction		1969	2010
Site area		3,993.86 m²	3,988.1 m²
Total floor area		3,907.2 m²	9,274.19 m² (FAR=1.99)
FAR limit		2.0	
Building condition	Number of floors and buildings	5F above ground × 2	8F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	79	108
	Layout	3DK	1DK - 4LDK
	Unit floor area	42.07 m²	41.40 m² - 128.28 m² (avg. 65 m²)
Previous situation of utilization		self-occupied residence 54, non-residence 9 rental 16	
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		三鷹市特別都市型産業等育成地区内における建築制限に関する条例	
Features		「三鷹市特別都市型産業等育成地区内における建築制限に関する条例」 was adopted because part of the floor area was used as factory, office, or public facilities	
Progress		2004.09　理事会にて住宅再生検討委員会立上げの必要性について意見が出る 2006.02　建替え検討と建替計画委員会の承認（臨時総会） 2006.06　コンサルタント会社承認（定期総会） 2006.02　事業協力者決定 2006　建替え決議までに、説明会 4 回、個別面談 3 回を実施した 2007.11　建替え決議成立 2008.04　マンション建替組合設立認可 2008.08　権利変換計画認可 2008.09　解体着手 2010.03　工事完了	
Cooperator (developer)		㈱旭化成ホームズ	
Consultant		㈱アークブレイン	

09 桜上水団地（日本住宅公団） 世田谷区桜上水

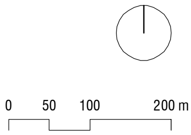


		Before	After
Time of construction		1965	2015
Site area		47,900 m²	46,595.42 m²
Total floor area		30,500 m²	98,550.98 m² (FAR=1.62)
FAR limit		0.6	2.0
Building condition	Number of floors and buildings	4F and 5F above ground × 17	6-14 F above ground 1F underground×8
	Structure type	RC	RC
Dwelling unit condition	Number of households	404	878
	Layout	2LDK, 3LDK	2LDK - 4LDK
	Unit floor area	58.73 m², 69.77 m²	58.48 m² - 115.47 m²
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		（東京都）マンション建替え円滑化モデル事業	
Features		- Abolishment of Ichi-Danchi - Guarantee of obligation by 全国市街地再開発協会	
Progress		1989.06 「桜上水団地の将来を考える会」発足 1994.10 「桜上水団地の将来計画推進委員会」設置 1998.07 「建替基本計画委員会」発足 1999.06 ㈱日建設計を事業コンサルタントに選定 2001.06 「建替検討委員会」設置 2002.05 野村不動産㈱、三井不動産㈱を事業協力企業に選定 二社の要請により、㈱大林組、清水建設㈱が参加 2003.07 「建替え推進決議」可決 ㈱大林組、清水建設㈱を事業協力企業として承認 2005.11 「桜上水三、四丁目中部地区 地区計画」都市計画決定告示 一団地の住宅施設廃止 2006.04 建替え決議不成立 （同意率：全体 4/5 達成、各棟 2/3 未達成） 2007.12 建替え決議不成立 （同上） 2009.09 一括建替え決議成立 2010.07 建替組合設立認可 2011.07 権利変換計画認可 2013.06 解体工事着工 2013.09 本体工事着工 2015.08 竣工 2016 建替組合解散	
Cooperator (developer)		㈱野村不動産, ㈱三井不動産レジデンシャル	
Consultant		㈱日建設計	



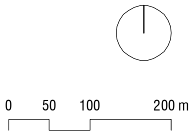
		Before	After
Time of construction		1957	2013
Site area		5,341.40 m²	5,176.40 m²
Total floor area		4,523.35 m²	2,6517.49 m² (FAR=3.46)
FAR limit		2.0	3.53
Building condition	Number of floors and buildings	5F above ground × 4 4F above ground × 2	18F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	112	220
	Layout	2DK	1LDK - 3LDK
	Unit floor area	35.38 m²	50.03 m² - 122.86 m² (avg. 77.84 m²)
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		（東京都）マンション建替え円滑化モデル事業	
Features		- A new FAR of 3.53 due to the Comprehensive Design system	
Progress		2010.02　団地一括建替え決議可決 2010.08　建替組合設立認可 2011.03　権利変換計画認可 2011.05　本体工事着工 2013.07　竣工	
Cooperator (developer)		㈱新日鉄興和不動産, ㈱三井物産	
Consultant		㈱シティコンサルタンツ	

11 諏訪２丁目住宅（日本住宅公団） 多摩市諏訪



		Before	After
Time of construction		1971	2013
Site area		64,399.93 m²	64,399.93 m²
Total floor area		34,037.13 m²	124,870.97 m²
FAR limit		0.5	2.0
Building condition	Number of floors and buildings	5F above ground × 23	11-14F above ground × 7
	Structure type	RC	RC
Dwelling unit condition	Number of households	640	1249
	Layout	3DK	2DK - 4LDK
	Unit floor area	48.85 m²	43 m² - 101 m²
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		- 優良建築物等整備事業 - 先導型再開発緊急促進事業 - マンション等安心居住推進事業 - （東京都）マンション建替え円滑化モデル事業	
Features		- Abolishment of Ichi-Danchi	
Progress		1988 建替え検討準備委員会（「有志の会」）設置 1991 住宅建替え委員会設置 2004.05 「建替え推進決議」成立 2006.12 諏訪地区計画の都市計画決定 2007.05 事業協力者に東京建物㈱を選定 2007.06 事業コンサルタントに㈱シティコンサルタンツを選定 2007 施設計画の設計者に㈱松田平田設計を選定 2010.03 「建替え決議」成立 2010.12 マンション建替組合設立認可 2011.04 建築基準法第８６条の２認定取得 2011.11 権利変換計画認可、権利変換期日 2011.12 本体工事本格着工 2013.10 竣工 2014 建替組合解散	
Cooperator (developer)		㈱東京建物	
Consultant		㈱シティコンサルタンツ	

12 池尻団地（(財)首都圏不燃建築公社） 世田谷区池尻

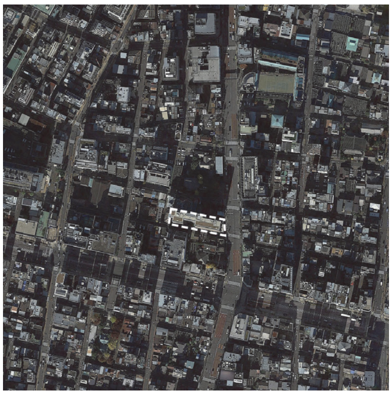


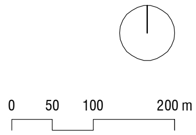
		Before	After
Time of construction		1963	2014
Site area		6,019.43 m^2	5,992.86 m^2
Total floor area		11,286.13 m^2	20,309.39 m^2
FAR limit		0.7	2.0
Building condition	Number of floors and buildings	5F above ground × 3	11F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	125	205
	Layout	3K	1DK - 4LDK
	Unit floor area	44.10 m^2 - 45.41 m^2	31.20 m^2 - 94.76 m^2
Resolution		Based on ABUO, Article 62	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- Abolishment of Ichi-Danchi - Include land leasehold right issues	
Progress		2008.09 ㈱総合不動産鑑定コンサルタントをコンサルタントに決定 2009.06 建替え推進決議 2009.08 事業協力者選定コンペティションの実施 2009.10 旭化成ホームズ㈱を事業協力者に選定 2010.12 建替え決議 2011.08 池尻団地マンション建替組合の設立 2012.02 解体工事着手（専有部） 2012.03 権利変換計画認可 2012.09 本体着工 2014.03 竣工、引渡し	
Cooperator (developer)		㈱旭化成ホームズ	
Consultant		㈱総合不動産鑑定コンサルタント	

13 調布富士見町住宅（東京都住宅供給公社） 調布市富士見町

		Before	After
Time of construction		1971	2015
Site area		12,507 m²	12,446.42 m²
Total floor area		10,470 m²	35,060 m²
FAR limit		0.8	2.0
Building condition	Number of floors and buildings	5F above ground × 5	6F, 8F above ground 1F underground × 2
	Structure type	RC	RC
Dwelling unit condition	Number of households	176	331
	Layout	3DK	2LDK - 3LDK
	Unit floor area	50.83 m²	56.14 m² - 94.64 m²
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		- Abolishment of Ichi-Danchi - Readjustment of street system	
Progress		2006 東京都住宅供給公社への償還完了、管理組合発足 2008.08 建替え推進決議、旭化成ホームズ㈱開発営業本部（現:旭化成不動産レジデンス㈱）を事業協力者に決定 2011.03 一団地規制の廃止、地区計画・地区整備計画制定 2011.12 一括建替え決議成立 2012.05 マンション建替組合設立認可（調布市第一号） 2012.07 居住者の退去 2012.08 付替え道路工事着手 2013.02 道路（第１期工事）完成、建築確認申請提出 2013.04 権利変換計画認可、解体工事着工 2013.07 本体工事着工 2015.05 竣工	
Cooperator (developer)		㈱旭化成不動産レジデンス	
Consultant		None	

14 同潤会上野下アパート（(財) 同潤会 ）　　台東区東上野

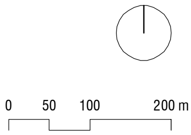




		Before	After
Time of construction		1929	2015
Site area		1,147.63 m²	1,147.82 m²
Total floor area		2,093.99 m²	8,415.84 m²
FAR limit		-	6.0
Building condition	Number of floors and buildings	4F above ground × 2	14F above ground 1F underground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	71	128
	Layout	2K1R	1R - 3LDK
	Unit floor area	15 m² - 39 m²	25 m² - 74 m²
Resolution		Based on ABUO, Article 62, 69	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		優良建築物等整備事業	
Features		- Reconstruction of the last existing Dunjunkai apartment	
Progress		2009.10　団地管理組合発足 2011.01　建替え推進決議 2011.06　評価基準可決 2012.04　建替え決議・建替え承認決議 2012.10　マンション建替組合設立認可 2013.05　権利変換計画認可 2013.05　解体工事着工 2013.08　本体工事着工 2015.08　施工再建マンション工事完了 2015.10　引渡し 2016.03　建替組合解散	
Cooperator (developer)		㈱三菱地所レジデンス	
Consultant		㈱UG 都市建築	

15 小金井コーポラス　　小金井市桜町２丁目

		Before	After
Time of construction		1964	2016
Site area		5,356.35 m²	5,219.46 m²
Total floor area		4,914.57 m²	9,081.48 m²
FAR limit		1.5	
Building condition	Number of floors and buildings	4F above ground × 3	8F above ground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	80	114
	Layout	2DK, 3DK	1LDK - 4LDK
	Unit floor area	54.24 m² - 55.44 m²	46.75 m² - 84.96 m²
Resolution		Based on ABUO, Article 62	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		平成２２年度 「マンション等安心居住推進事業（モデル支援に係る事業）」	
Features		- Combination of three condominiums on two separate plot into one	
Progress		2009.01　修繕か建替えか検討の開始 2011.03　建替え推進決議 2011.11　事業協力者選定コンペティションの実施 2012.04　東京建物㈱を事業協力者に選定 2013.01　建替え決議 2013.06　建替組合設立認可 2014.10　権利変換計画認可 2014.10　解体着工 2015.01　本体着工 2016.04　竣工	
Cooperator (developer)		㈱東京建物	
Consultant		ＮＰＯ法人マンション再生なび ㈱佐藤不動産鑑定コンサルティング	



		Before	After
Time of construction		1956	2015
Site area		1,952.3 m²	1,952.3 m²
Total floor area		1,775.94 m²	2,995.35 m²
Total floor area limit		Total floor area limited to 3000 m²	
Building condition	Number of floors and buildings	4F above ground 1F underground × 2	6F above ground × 1
	Structure type	RC	RC
Dwelling unit condition	Number of households	34	41
	Layout	2DK	1LDK - 3LDK
	Unit floor area	43.47 m² - 54.51 m²	45.52 m² - 84.41 m²
Resolution		Based on ABUO, Article 70	
Operation mode		Utilizing AFRC, with Reconstruction Union	
Subsidy system adopted		None	
Features		Limited FAR due to the narrow street adjacent to the site	
Progress		2011.05　建替え推進決議 2011.10　事業協力者選定コンペティションの実施 2012.03　旭化成不動産レジデンス㈱を事業協力者に選定 2013.03　建替え決議 2013.09　建替組合設立認可 2014.04　権利変換計画認可 2014.07　解体着工 2014.08　本体着工 2015.12　竣工	
Cooperator (developer)		㈱旭化成不動産レジデンス	
Consultant		None	

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