



Institutional uncertainty, fragmented urbanization and spatial lock-in of the peri-urban area of China: A case of industrial land redevelopment in Panyu

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ABSTRACT

Institutional arrangements can exert significant impact on land use and the spatial pattern for a region. Since the reform opening, the Pearl River Delta (PRD) area of China has witnessed an explosive amount of bottom-up rural industrialization. This situation has given rise to a fragmented urbanized landscape in peri-urban areas. In 2009 the Guangdong government initiated a comprehensive urban and rural redevelopment plan known as the Three-Renewal Policy. This paper begins with an analysis of the double-track land system and their impact on fragmented urbanization in peri-urban areas. Taking a typical peri-urban area such as the Panyu district of Guangzhou as a case study, this paper demonstrates the industrial land redevelopment practice created by the Three-Renewal Policy. The paper argues that the existing fragmented land use pattern in Panyu has been somewhat locked in, and the redevelopment of rural industrial land has been difficult due to historical institutional uncertainty and path dependency. The uncertainty caused by volatile redevelopment policies, absence of trust between local government and villagers, long-time reliance of villages on land leasing income, and high transaction costs to achieve consensus among villages serve as key barriers to redevelopment. These problems have led to a prolonged redevelopment process and low participation of villages. The results suggest that further institutional change and more collaboration among various parties are necessary to overcome the current barriers of spatial lock-in to push forward the redevelopment of collective industrial land.

1. Introduction

Since the reform opening, China has witnessed rapid urbanization. Two distinct types of urbanization coexist, top-down urbanization led by the urban government, and bottom-up urbanization led by rural villages (Deng and Huang, 2004; Wei and Zhao, 2009). Village-based urbanization commonly occurs in peri-urban areas which lie between the central city and suburbs, and dominates the transformation of economic structure, social relations and the physical landscape (Tian, 2015). Many autonomous villages transfer agricultural land into non-agricultural use formally or informally, creating intensified land competition with the urban government. This process is often conducted at the expense of agricultural land loss, giving rise to a fragmented urban-rural landscape, inefficient land development, and other environmental problems (Zhu and Hu, 2009; Zhu and Guo, 2014; Tian, 2015).

In order to curb extensive urban sprawl, the state imposed a land quota system in 2003. This new system regulated the amount of new land that could be added at the subnational level each year. This led to a shift in emphasis from urban sprawl to redevelopment in order to ease

pressure of future land demand in most cities (Tian and Ma, 2009). In 2009, the Guangdong provincial government started a “national site of experiment” with their Three Renewal Policy (Lin, 2015). This policy involved redevelopment of three types of land use, namely, the “renewal of old factories, old neighborhoods, and old villages in the city” (Lin, 2015).

Existing literature on peri-urban areas in China has revealed its development, spatial characteristic, and negative impact on the environment during expansion (Zhu and Guo, 2014; Tian, 2015). Limited studies, however, have traced the land use change in peri-urban areas in the context of redevelopment (Wu et al., 2013; Lai and Tang, 2016). Taking Panyu district of Guangzhou as a case study, this paper studies the barriers of industrial land redevelopment under the Three Renewal Policy, and their impact on existing fragmented urbanization. The remainder of this paper is organized as follows: based on a review of institutional uncertainty and its impact on urban and rural spatial patterns, this paper first examines Panyu’s manufacturing-driven economic development and land use fragmentation dominated by collective industrial land since the 1990s. It then examines the current

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industrial land redevelopment practice in Panyu under the Three Renewal Policy. The following section identifies four barriers of collective industrial land redevelopment and elaborates how the existing fragmented land structure has been spatially locked-in. It concludes with policy implications needed to build a more compact land use in peri-urban areas of China.

2. Fragmented urbanization under institutional uncertainty

2.1. Institutional uncertainty and land rent capture of collective land

Urban and rural China are two institutionally distinct domains. Property rights over state-owned land have been clearly defined, but property rights over collective land have been ambiguous (Zhu and Hu, 2009; Tian and Zhu, 2013). In the early 1980s, official documents defined collective land ownership as *sanji suoyou* (the collective land belongs to three entities, the commune, the brigade and the team in villages), but how much each entity was entitled to was never clarified (Zhu and Hu, 2009). According to the Land Management Law (1986), villages must receive approval from the state in order to develop their collective land for non-agricultural activities and the land uses are limited to village housing, public facilities, or collectively-owned township-village enterprises (TVEs). The villages are not allowed to derive income from land by letting it for urban users, unless they give up collective land ownership through the land requisition process.

However, a distinctive land rent differential emerges when compensation for villages giving up collective land ownership is based on current agricultural land rent rather than potential rent of new urban land use. This amount represents only three to five percent of land conveyance revenue on average (Po, 2008). Disparity between capitalized and potential land rent constitutes the land rent differential, a major incentive for land development or redevelopment in the urban context. Over time, capitalized land rent, which represents the actual quantity of ground rent under the present land use, may decline due to the obsolescence of a land parcel. Meanwhile, potential land rent which would be gained if the land were converted to its 'highest and best use,' may remain stable or go up since the metropolitan area is growing (Smith, 1979). The existence of land rent differentials may create huge profits if land parcels are redeveloped or reinvested. As a matter of fact, the urban government in China is very keen in capturing land rents derived from land use change. Thus, there are formal and informal competitions between the urban government and rural communities over land use and development (Tian and Zhu, 2013).

Land rent capture for different stakeholders is governed by either formal or informal institutions. Formal institutions such as regulations or laws are usually developed by the state or in the formal market, whilst informal institutions like traditions, habits or social norms are often developed from the bottom up (North, 1990). Informal institutions may occur when there is a demand of providing certainty, but regulations and laws are inadequate or where transaction costs are too high. Alexander (2001) claims that many projects for urban development are undertaken in informal planning sessions by private firms when formal institutionalized planning is too costly. Given that the institutional context is changing constantly, if existing institutions were weakened and new institutions not established soon enough, the resulting vacuum could generate many uncertainties. In that case, informal institutions may replace the formal in order to provide much needed certainty.

A bottom-up institutional change during the 1990s, known as the village-based Land Shareholding Co-operatives (LSCs), was a response to the institutional uncertainties caused by the ambiguous and incomplete property rights of collective land. Under the LSC system, village collectives changed individual peasants' land rights into shares, pooling and planning the land together for both agricultural and non-agricultural activities (Cai, 2003). As a way to maximize their well-being, the autonomous villages under the LSCs could lease their land

resources to private enterprises to obtain land rentals, notwithstanding that the collective-owned land is prohibited for non-agricultural uses without official approval. As a result, an informal rural land market has gradually developed since the 1990s (Ho and Lin, 2003). Governed by the LSCs, the collectives have become active actors in the land rent competition and they hold a large quantity of built-up land without *de jure* property rights (Tian and Zhu, 2013).

2.2. Fragmented urbanization and spatial lock-in peri-urban areas

Efficient institutions contribute to lower transaction costs and help make the development process even more efficient (Webster, 1998). However, many institutions persist even when they are sometimes highly inefficient suggesting that existing institutions are not always moving towards lower transaction costs (Buitelaar, 2004). Informal institutions may be efficient and provide certainty and improve welfare for a homogeneous community during times of social and economic transition, but in the context of a dynamic and heterogeneous environment, they could hardly handle complicated economic and social changes (World Bank, 2002). In the absence of formal rules, activities under informal institutions may be confronted with many additional uncertainties and risks, such as possible legal sanctions, a lack of social security protection and a potential default risk (Chavdarova, 2014). In this case, participants tend to have short-term, risk-averse and opportunistic behaviors due to their bounded rationality which results in more transaction costs as deadweight losses (Williamson, 1985).

Although the development of LSCs allowed villages to benefit from increased land rental income and to better handle the social-political tensions of new-found prosperity (Cai, 2003; Po, 2008), the informality of the LSCs also caused uncertainty. Since the LSCs could not protect collective land from being purchased by the government at a relatively lower price, villages were still confronted with a high possibility of losing potential profitable land rent differentials. In addition to this, they also faced possible sanctions since non-agricultural land utilization of collective land was informal. Therefore, uncertainties led to short-sighted behaviors. Villages strived to maximize their own wellbeing rather than focus on long-term interests, converting more land into non-agricultural uses to capture additional income from land rent differentials (Zhu and Guo, 2014).

Informal land development dominated by autonomous villages may contribute to urban fragmentation since LSCs work within a homogeneous village rather than work across multiple villages. Driven by land rent capture, each village acts as an independent developer to plan and develop non-agricultural land within its own boundary (Tian and Zhu, 2013). In most areas around the Yangtze River Delta regions and the Pearl River Delta regions, traditional agricultural landscapes have already been replaced with fragmented and isolated cityscapes (Yu and Ng, 2007; Wei and Zhang, 2012; Tian, 2015). Accompanied by spatial fragmentation, land property rights have become fragmented and complex due to the coexistence of two types of land ownership. The state acquires farmland for urban projects along with non-agricultural land development dominated by villages, leading to a mixture of collectively-owned and state-owned land use pattern (Zhu and Guo, 2014).

In spite of the negative externalities of urban fragmentation demonstrated by many studies (Lin, 2005; Wei and Zhang, 2012), a spatial structure under a 'selected' institution may be difficult to alter. One of the major reasons is path dependence, which means 'history matters', describing a phenomenon that contingent events in the past will significantly shape current decisions (Pierson, 2000; Martin, 2009). Once random historical economic events have selected a particular institutional path, some dynamically increasing returns may drive institutions into a self-reinforcing and self-reproducing process (Arthur, 1989; Pierson, 2000). Moreover, existing institution, no matter formal or informal, clear or unclear, efficient or inefficient, cannot easily be replaced by newly-devised one, since it can perform a particular and necessary role function for society (Monkkonen, 2016; Ho, 2017).

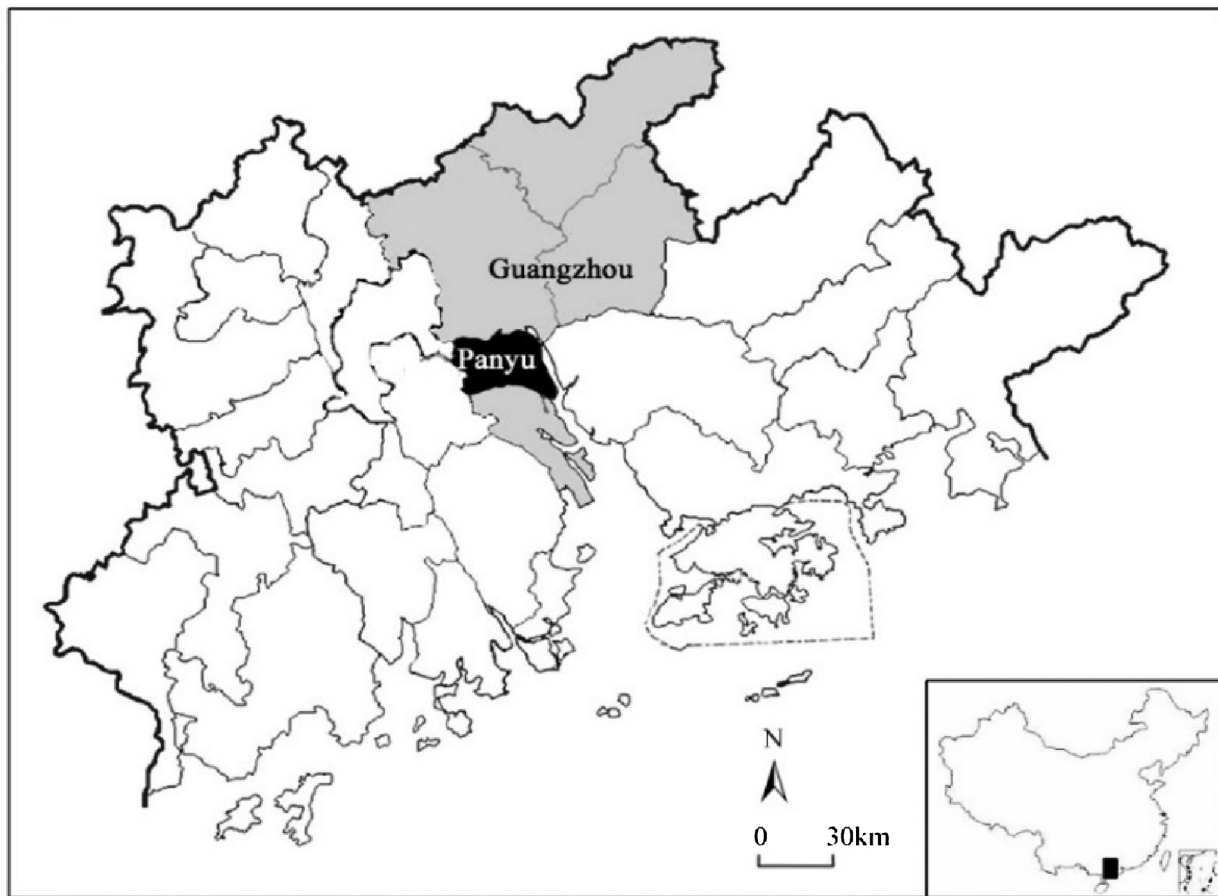


Fig. 1. Location of Panyu in Guangzhou and Pearl River Delta.
Source: Drawn by the authors

Reversely, newly-devised institution may evolve into symbolic rule without enforcement, or non-credible institution which disappear or fail to materialize in actors' endogenous interactions (Ho, 2016). In some cases, a potential 'lock-in' effect may occur when the transaction costs of changes are too high. Many empirical studies have demonstrated that a formed lock-in may continue for a few decades despite many new proposed planning policies (Nitsch, 2003; Meen and Nygaard, 2011; Nygaard and Meen, 2013).

A fragmented structure of land use which has already been formed makes further spatial change an arduous task. Villages have controlled a large amount of non-agricultural collective land and become *de facto* landholders with greater negotiating power (Tian and Zhu, 2013). In redevelopment of collective land, villages tend to over-extract land rents as they not only require retaining collective landownership, but also require more floor space or compensation from the government (Guo et al., 2016). Extremely high transaction costs, especially negotiation costs, are generated during this process, which makes redevelopment time-consuming. As Lai and Tang (2016) demonstrate, the Shenzhen government established various urban renewal policies and plans since 2004, but only 10 of 184 projects were implemented by 2009 due to frequent clashes between the government and villages. Therefore, the initial lay-out of land use may remain stable for a long time, inducing spatial lock-in.

3. Manufacturing-driven economy and land use characteristics in the peri-urban areas: the case of Panyu

Panyu is a typical peri-urban area in one of China's most prosperous regions, the Pearl River Delta (PRD) (Fig. 1). Panyu used to be a county-level city and has become an urban district annexed by the Guangzhou

municipality in 2000. Panyu covers a territory of about 530 km², and governs 177 administrative villages.¹ In 2014, its GDP reached RMB148.3 billion, and its total population was 146.75 million, consisting of 57% local residents with a household registration (*hukou*) while 43% were migrants (Panyu Statistics Yearbook, 2015).

3.1. Economic growth driven by rural industrialization

Since the 1990s, Panyu's economic growth has transitioned from industrial to service oriented. From 1994 to 2014, its GDP increased at an average annual growth rate of 14.67%. The percentage of primary, secondary and tertiary industries by 2014 was 1.78%, 35.85% and 62.39%, respectively. Before being merged into Guangzhou in 2000, Panyu's economic growth was mainly driven by industrialization. The secondary industry's contribution to GDP consistently accounted for over 50% during the 1990s and early 2000s. Since 2006, the proportion of the secondary industry's GDP dropped below 50% for the first time.

Rural industries have long played a key role in the Panyu economy. The evolution of rural industrialization can be divided into two major stages: in the 1980s and early 1990s, village collectives set up TVEs. Since the late 1990s, facing fierce competition due to globalization, most TVEs owned by collectives went bankrupt or were privatized. The bottom-up institutional change, LSCs, emerged during this period and enabled villages to lease land or property for outside enterprises, which propelled a new round of rural industrialization. From 1994 to 2010, Panyu's gross industrial output value of rural industry tripled from

¹ Administrative village is one of the tiers under China's hierarchical administrative system. The tiers after municipality and district successively are *jiedao* or township, and administrative villages or urban committee.

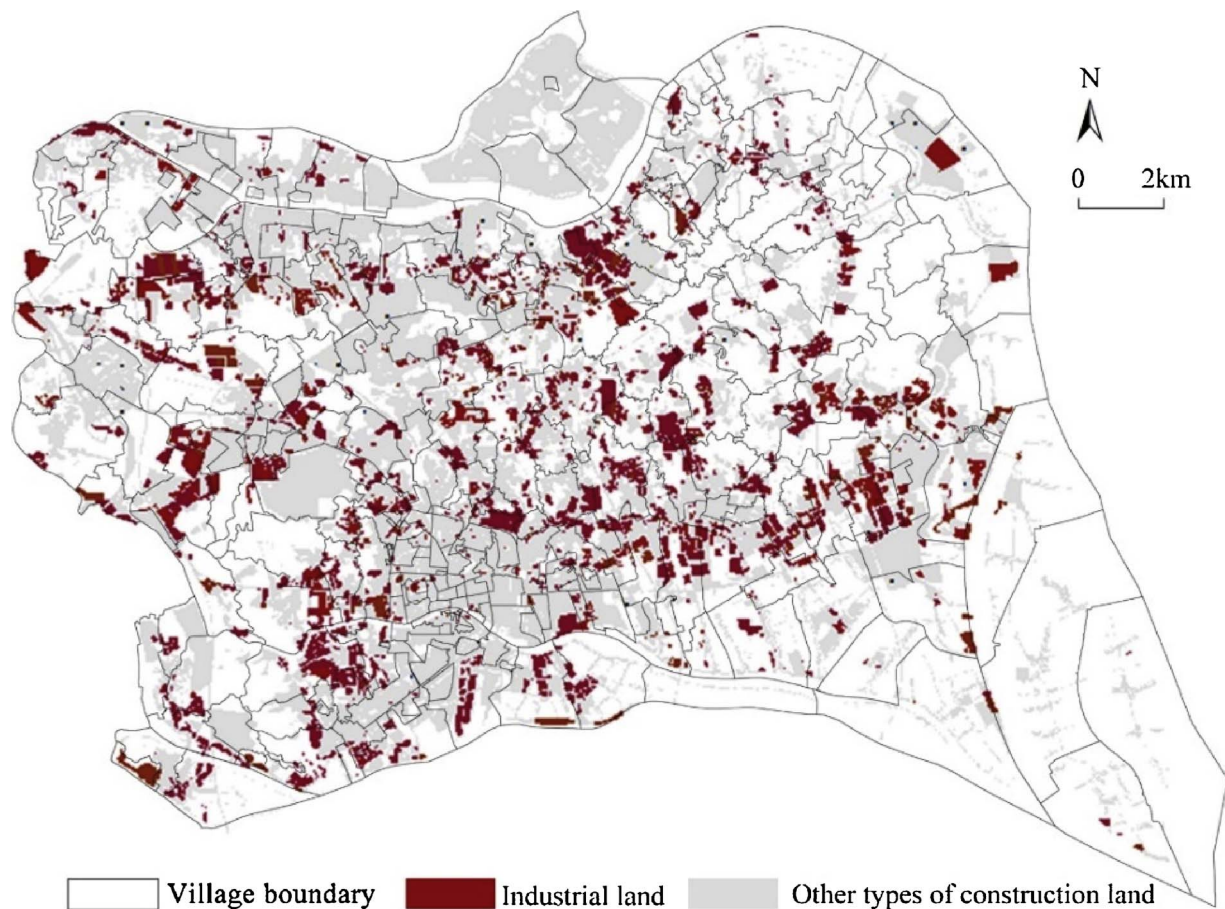


Fig. 2. Fragmented industrial land development across the district in 2014.
Source: Urban Planning Bureau of Panyu, 2016

RMB131.72 billion to 887.90 billion. This figure accounted for over 50% of the total amount until 2009.

3.2. Land use fragmentation dominated by collective industrial land

With a growing manufacturing sector in Panyu, a huge amount of agricultural land has been developed for industrial use in a fragmented and scattered pattern. The area of industrial land in Panyu reached 5465.6 km² in 2014, accounting for approximately 30.7% of total construction land. From a land patches analysis in landscape ecology, the total number of industrial land patches (NP) was 1792, with a mean patch size (MPS) of 3.05 hm² in 2014. Most of these patches were spatially dispersed rather than aggregated in industrial parks. Among the 177 administrative villages, 156 villages developed industrial land within their regions. On average, the area of industrial land in each village was about 23 hm² (Fig. 2).

Prevalent informal development of collective industrial land makes the land use pattern more complex and fragmented. According to the survey of The Urban Redevelopment Bureau (URB) of Panyu in 2009, over 50% of total industrial land area was collectively-owned. In order to earn land leasing income from outside enterprises, some village collectives still applied to use non-agricultural collective land under the guise of developing TVEs (Jiang and Liu, 2003). More commonly, many villages developed agricultural land for industrial use without government approval. The 2009 survey from the URB shows that over 60% of collective industrial land was developed without a land use certificate, the official approval from the government. As a result, industrial land patches with formal and informal land use rights are mixed, further deepening the degree and dimension of land use fragmentation.

3.3. The cases of Nanpu, Guantang, Xiecun, and Daling

In order to further examine the characteristics of industrial land use, four villages, namely Nanpu, Guantang, Xiecun and Daling, were chosen as case studies (Fig. 3). Their basic information is shown in Table 1. Each village has witnessed rapid industrialization since the 1980s. By 2014, industrial land area as a percentage of the total built-up area of each village was about 51.5% (37.17 hm²), 51.3% (26.94 hm²), 44.6% (104.64 hm²), and 43.09% (47.77 hm²) respectively. Most industrial land in Nanpu and Guantang was collectively-owned, accounting for about 84% and 81%, respectively. By contrast, a certain amount of land had already been converted into state-owned land during the 2000s in Xiecun and Daling, and collective-dominated and government-dominated industrialization coexisted (Table 1).

The spatial pattern for industrial land is fragmented in each of the studied villages (Table 2). Collective industrial land patches were commonly intermingled with or surrounded by rural residential land and state-owned land, with a mean patch size ranging from 1.29 hm² to 4.59 hm². Bottom-up industrialization dominated by villages intensifies land use fragmentation. In Xiecun and Daling where dual-industrialization coexisted, collective industrial land had more patch numbers, but a much smaller mean patch size than state-owned industrial land patches except in the case of Nanpu.

Informal industrial development over collective land has been widespread. Each of the four collectives studied have informally converted farmland into industrial land without applying for required land use certificates. The percentage of informal industrial land in the total of collective industrial land was generally over 50% (Table 3). In Nanpu and Daling, the percentage reached upwards of 97%. Many outside enterprises rent village factories or land because renting collective land

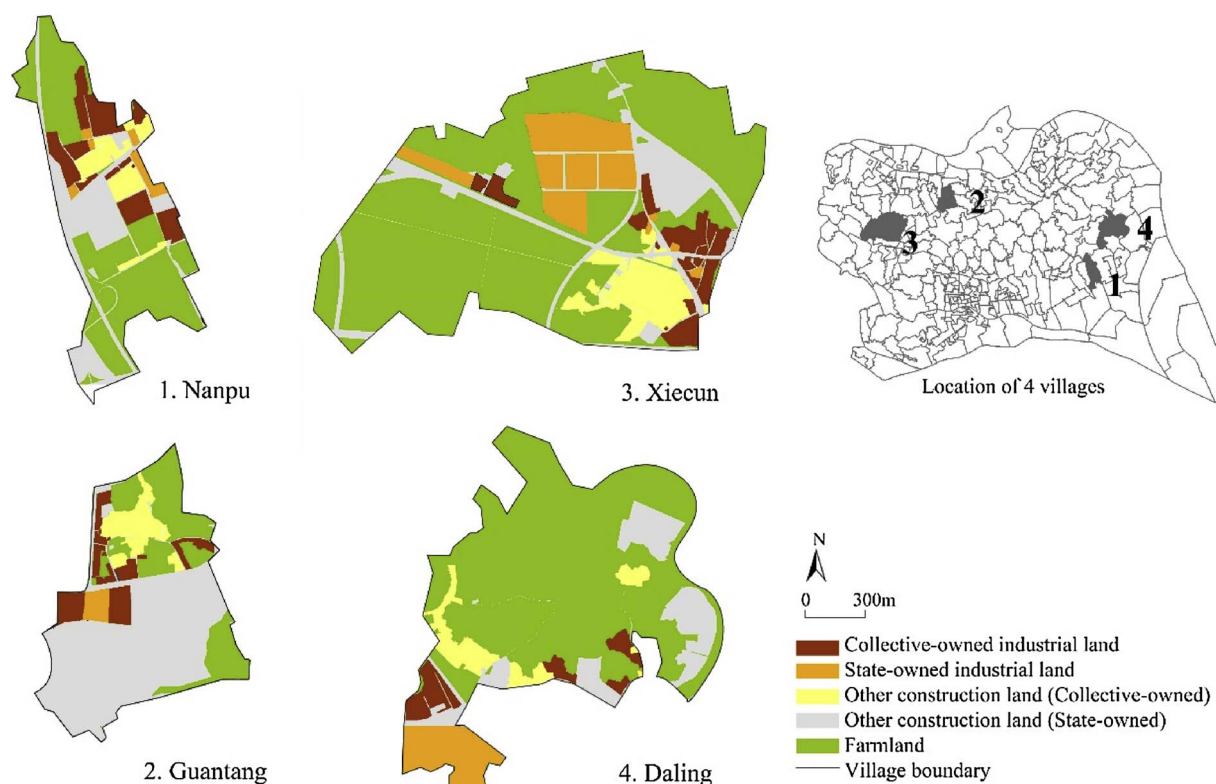


Fig. 3. Land uses of the four villages in 2014.
Source: Urban Planning Bureau of Panyu, 2016

Table 1
Social and economic information of four villages.
Source: Urban Redevelopment Bureau of Panyu, 2015.

Villages	Number of residents with local <i>hukou</i>	Number of migrants	Revenue of village (million)	Built-up area (hm ²)	Industrial land area (hm ²), percentage in total construction land (%)		
					State-owned	Collectively-owned	
<i>Nanpu</i>	1302	12204	14.74	72.21	37.17(51.5%)	5.80	31.37
<i>Guantang</i>	1703	6010	17.19	52.52	26.94(51.3%)	4.99	21.95
<i>Xiecun</i>	5716	12181	40.30	234.87	104.64(44.6%)	76.16	28.45
<i>Daling</i>	2452	4053	4.07	110.86	47.77(43.09%)	29.42	18.35

Note: Data for population and income were as of 2012; data for built-up area were as of 2014.

Table 2
Spatial characteristics of industrial land patches in four villages.
Source: Urban Redevelopment Bureau of Panyu, 2015.

	<i>Nanpu</i>			<i>Guantang</i>			<i>Xiecun</i>			<i>Daling</i>		
	Total	State	Collective	Total	State	Collective	Total	State	Collective	Total	State	Collective
Total area (hm ²)	37.17	5.80	31.37	26.94	4.99	21.95	104.64	76.16	28.45	47.77	29.42	18.35
NP	11	5	9	11	1	20	20	11	22	5	1	4
MPS (hm ²)	3.38	1.16	3.49	2.45	4.99	1.10	5.23	6.92	1.29	9.55	29.42	4.59

Note: 1. *State* means state-owned industrial land patches, and *Collective* means Collective-owned industrial land patches.

2. The indices are explained as follows: (1) NP means Number of Patches; (2) MPS means Mean Patch Size of patches.

or property is much less expensive than purchasing or renting state-owned land. In reality, these enterprises are generally small in scale (Source: interview with the four villages). In 2014, the number of industrial factories' users on collective land in *Nanpu*, *Guantang*, *Xiecun* and *Daling* were 19, 19, 37 and 22, respectively. The average leased land area per each enterprise was around 1 hm², and their informal bilateral contracts with village collectives were commonly signed

during the 1990s and 2000s. Taking *Daling* as an example, nearly half of their informal bilateral contracts remained in effect for another 20 years from 2015 and these types of contracts accounted for about 28% of total contracts. According to interviews, some enterprises subleased factories to other users, resulting in more complex relations of various interests over collective industrial land.

Table 3
Informal development over collective land in four villages.
Source: Urban Redevelopment Bureau of Panyu, 2015.

Villages	Total collective industrial land area (hm ²)	Collective industrial land area without land use certificate	
		Area (hm ²)	Percentage (%)
Nanpu	31.37	30.52	97
Guantang	21.95	11.95	54
Xiecun	28.45	17.57	62
Daling	18.35	17.87	97

4. An overview of Panyu industrial land redevelopment under the backdrop of institutional change

4.1. Institutional change initiated by the Three Renewal Policy

Before the announcement of the Three Renewal Policy, land expropriation conducted by the government was the only formal channel to redevelop collective built-up land. Since village collectives had already controlled a huge amount of collective land, they tended to use all means at their disposal, such as protests or political connections, to hold out for higher compensation (Wu et al., 2013). The government needed to negotiate with various village collectives under a way of “one village, one policy” (*yicun yice*), as a consequence, redevelopment projects were usually time-consuming and costly (Wu et al., 2013; Lin, 2015).

Confronted with such obstacles, new institutional arrangements for collective industrial land redevelopment under the Three Renewal Policy made two noteworthy changes to motivate redevelopment. First, villages are now entitled to acquire self-development rights of collective industrial land. Compared with the traditional land expropriation approach, villages now have the right to redevelop collective industrial land without converting the collective land into state land. Moreover, collective industrial land without governmental approval can also be redeveloped, but only on the condition that villages pay a penalty and give up about 30% of the land area to the government. Secondly, the new policy empowers village collectives with a right to share a significant percentage of land redevelopment profits with the local government. Self-redevelopment allows villages to earn land rental after redevelopment. Meanwhile, if villages transform the land from collectively-owned to state-owned, they can receive a maximum of 60% of land conveyance fees, with the other 40% going to the coffers of the local government. Under the traditional land acquisition approach, villages could only obtain compensation paid by the government.

4.2. The redevelopment of industrial land in Panyu since the Three Renewal

In the “Three renewal plan” of Panyu, “Three Renewal Patches” are designated by the local government through a combination of a bottom-up and a top-down process. It starts with the application of township government and village collectives followed by the local government evaluating the performance of these pieces of land. Usually, the land with low efficiency and bad environmental performance will be designated as “Three Renewal Patches”. In the redevelopment plan of Panyu, a considerable amount of industrial “Three Renewal Patches” has been scheduled for redevelopment, with an area of 35.61 km², comprising approximately 65.21% of all industrial land. Among the designated three renewal industrial land, the area of collective industrial land reached 19.33 km², making up 54.28% of the total amount. Among the collective patches, approximately 63% (an area of 12.3 km²) were developed without land use certificates (Fig. 4).

Between 2009 and 2015, 22 industrial land redevelopment projects with an area of 117.87 hm² were started or scheduled to begin,

comprising 3.31% of the total area in the planning list. According to land use planning of redevelopment, none of these industrial land patches were redeveloped for industry upgrading. About 35% and 49% of land area would be converted into commodity houses and commercial/office, respectively, with the remaining area planned for roads and open space. After redevelopment, average Floor Area Ratio (FAR) of these land patches would increase over 3 times from 0.73 to 2.43.

However, redevelopment of collective industrial land seems more difficult and time-consuming than local governments expected. Compared with state-owned land with well-defined land property rights, redevelopment of collective industrial land stagnated in the planning process. Among 22 projects, only 1 was built on collective land with the other 21 projects located on state-owned land. The area of the sole collective land project was 7.35 hm², accounting for about 6.24% of those 22 projects, and about 0.16% of all industrial “Three Renewal Patches.”

5. Spatial lock-in of collective industrial land in Panyu

Despite ongoing institutional change, the current slow progress of industrial land redevelopment suggests that its fragmented spatial structure has been somewhat “locked” in Panyu. This section identifies key barriers of redevelopment of industrial land and explains how they shape the villages’ perceptions and behaviors towards redevelopment and exert influence on spatial structure.

5.1. Uncertainty caused by volatile redevelopment policies

Three Renewal is basically a top-down process where local government is an active actor in initiating redevelopment projects. There is enough space for city government to exercise its discretionary power to execute three renewal policy according to its developmental agenda (Chung and Zhou, 2011). Under the Three Renewal Policy, although the government no longer plays the dominant role in redevelopment by delegating self-redevelopment rights and a certain amount of land redevelopment profits to villages, it attaches many subsidiary conditions to constrain such rights. For instance, the village collective can only give up collective land ownership rather than choose to self-redevelop if they decide to change the industrial land use for commodity housing. Besides, in order to redevelop collective land without a land use certificate, village collectives must transfer about 30% of land to the local government.

Nevertheless, the policy design of Three Renewal has been modified by the municipal government twice since 2009, revising some existing regulations and introducing several new constraints. For instance, since 2012, village collectives are no longer allowed to redevelop individual industrial land patches but instead, must take a holistic approach by redeveloping the industrial parks to which the individual land patches belong. Besides this change, profit sharing between local government and villages when land is transformed from collectively-owned to the state-owned used to be 30:70, but was changed to 40:60 since 2015.

The volatile redevelopment policies have given rise to an uncertainty of profit sharing and planning gains commitment, leading to the hesitance of villages to redevelop. If the current institutional constraints are loosened, village collectives may gain more compensation or reduce their land loss. With an expectation of such potential windfall profits, village collectives have tended to put off redevelopment in recent years, especially when village collectives find their vested interest will be unavoidably marred due to excess regulations.

5.2. Trust absence between local government and villages

During the long-period of bottom-up urbanization, the clan network played a more active role than the local government in village economic affairs. During the 1980s and 1990s, the pre-existing clan,

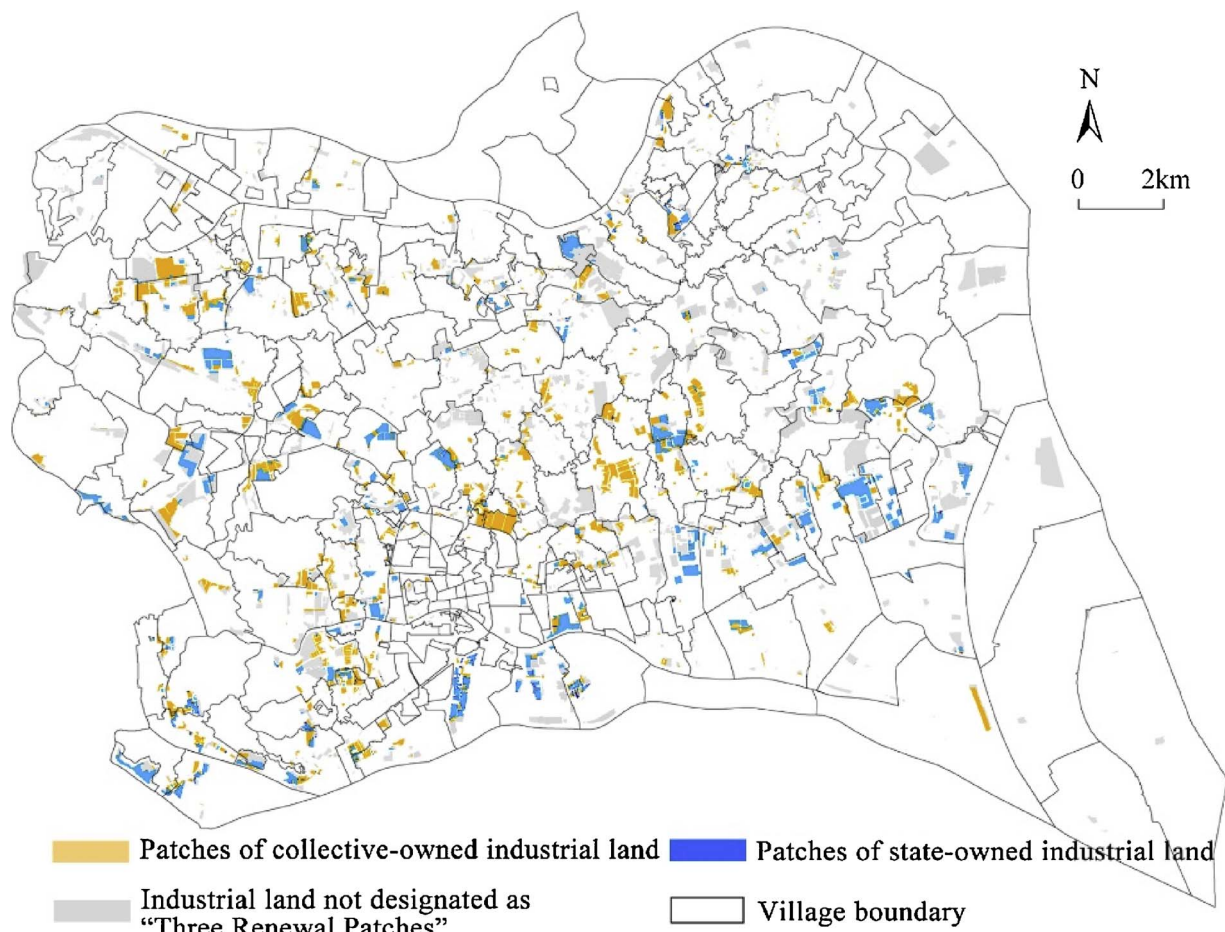


Fig. 4. “Three Renewal Patches” designated in Panyu by 2014.
Source: Urban Redevelopment Bureau of Panyu, 2016

kinship and other personal ties between villagers and outside investors contributed in a large part to attracting investments and providing mutual trust for rural industrialization (Lin, 2001). For instance, a study of Hong Kong’s production subcontracting activities conducted by Leung (1993) shows that many Hong Kong industrial enterprises in the rural area of Pearl River Delta were kinship factories owned by the relatives or friends of the respective Hong Kong investors. Respondents from Panyu in the study, confirm that some Hong Kong entrepreneurs preferred to locate their firm in their ancestral hometown.

Conflicts over historical land expropriation led to a distrust between the government and villagers. One of the major sources of conflict came from an “Economic Development Land (EDL)” (*jingji fazhan yongdi*) policy implemented in Guangzhou in 1993 which regulated that villages could receive an EDL of 10–20 % of the acquired farmland area for collective economic development. Under some circumstances, village collectives found it hard to work with such quotas due to high administrative fees or strict planning restrictions (Wei and Yuan, 2007). Until 2015, EDL land quotas had not been realized in 58 village collectives, a problem which challenged the credibility of the local government.

As a result, collectives and villagers show more trust towards the clan networks rather than government during redevelopment. Local government frequently faces the barrier to mobilize village collectives since most of them remain opposed to or are suspicious towards the government. For instance, a village cadre of *Tangbu* stated:

“We have not received enough EDL quotas from government for a historical land expropriation in 1993. If it remains unresolved, we will not consent to any property to be redeveloped.” (interview, March 2016).

5.3. Path dependence of village’s reliance on land leasing income

The economic significance of collective industrial land to villages is widely seen in Panyu. From 2010 to 2015, the total revenue of 177 villages rose from RMB23.97 billion to 30 billion (Panyu Statistics Yearbook, 2012–2016), and non-agricultural land rental has become a dominant revenue source in most villages. In 2012, this source of income accounted for over 50% of all revenue in two-thirds of the 177 villages and this figure was over 75% in 38% of all villages (Table 4). Stable and increasing land leasing income from collective industrial land finances the village collectives to help them address rural communal affairs, such as developing public facilities and meeting demands of LSC members for a higher dividend. It is no wonder that self-redevelopment is an optimal choice for most village collectives since they can continue to gain land leasing income. According to redevelopment plans for 2016 in *Nanpu*, *Guantang*, *Xiecuri*, and *Daling*, each of these villages chose to self-redevelop collective land rather than give up collective industrial land ownership.

Table 4
Contribution of land leasing income in total revenue of village in 2012.
Source: Urban Redevelopment Bureau of Panyu, 2015.

Land leasing income as a percentage of total revenue	Number of village (percentage, %)
75–100%	66(38%)
50–75%	47(27%)
25–50%	20(12%)
0–25%	40(23%)

As a result, if village collectives find their expected earnings based on the land use plan are not superior to their current status, they may choose to continue negotiating with the government or give up on the redevelopment altogether. Usually, village collectives wish to increase the floor area ratio (FAR) significantly and convert land from industrial use into commercial or office use, which may not be consistent with the plan objectives of the local government. In some cases, the government may loosen development control to facilitate the negotiations, even at the expense of the public interest. Taking *Guantang* as an example, the village should obtain a floor area of 238,900 m² to re-build according to the guidelines of the “Three Renewal” Policy, but after final negotiations, it obtained an extra 77,000 m² of floor space.

However, even if the demands of village collectives are achieved after negotiations, a potential loss of the vested interest may still cause them to withdraw from the redevelopment project. A villages’ decision to withdraw a project largely depends on the market after redevelopment, which can remain uncertain for a long period of time. But at the initial stage, when industrial factories are demolished and reconstructed, village collectives must bear not only a temporary loss of current rental income, their dominant income source, but also must dedicate a huge amount of investment beyond their capacity. According to redevelopment plans of four villages in our study, each village faced an estimated redevelopment cost of 959.01 million, 820.74 million, 1335.76 million, and 474.07 million, respectively.² By contrast, the annual revenue of all the four villages was less than 41 million in 2012. Some ambitious village collectives may seek collaboration with developers to share the huge costs and risks. Otherwise, villages tend to maintain the *status quo* rather than take a risk for an uncertain future benefit.

5.4. High transaction cost to achieve a consensus among villagers

Under the Three Renewal Policy, redevelopment plans are required to be accepted by 90% of all villagers before a plan can proceed. This agreement process involves three major rounds of consultations, of village committee members, household representatives and finally, all village residents. The high transaction cost to achieve a consensus among the numerous villagers is generally a major threshold to redevelopment.

Not all villagers show interest towards the redevelopment process, especially if the risks and benefits of redevelopment are not equally distributed. Currently, over 39.5% of revenue per villager comes from non-wage income from collective land (Panyu Statistics Yearbook, 2013), but that amount varies among different households. Taking *Guantang* as a case, the LSC member shares dividend from village land leasing income, ranged from 3000 to 7000 yuan/year per.³ Additionally, many villagers rent out their homes for migrants who work in village factories and gain 20–40 thousand yuan income per year (source: interview with village cadres and villagers, March 2016). Villagers who currently share more benefit from collective industrial land are not as interested in redevelopment as those with less income, since most of them present higher satisfaction with the status quo. Besides, their losses of dividend and housing rent will be higher during the demolition and reconstruction process, making them cautious when making a decision to redevelop or not.

To establish a collective action, a massive amount of transaction costs are generated which sometimes delays redevelopment projects. In

order to obtain support from 90% of villagers, local government and village cadres need to organize several meetings to explain the policy to villagers. However, if the required consensus of 90% of total villagers is not achieved, the only solution is to modify the redevelopment plan and go through the entire process again. In Panyu, this process is very time consuming, generally lasting over six months or even longer per attempt at consensus. Difficulty in achieving consensus and the long approval procedure suppress developers’ enthusiasm to engage in redevelopment.

6. Conclusion

The peri-urban areas in China are commonly criticized by their inefficient land use pattern (Wei and Zhang, 2012; Zhu and Guo, 2014; Tian, 2015). In the Pearl River Delta, informal land leasing on collective industrial land with ambiguous and incomplete property rights generate institutional uncertainty. This uncertainty has led to intensive land rent capture for village collectives, resulting in spatially fragmented and scattered land use patterns in most peri-urban areas since the 1990s. A top-down urban and rural redevelopment practice led by the Three Renewal Policy since 2009 contributes new insights into spatial evolution of these areas. This paper takes a typical peri-urban area, Panyu, as a case, and traces its industrial land development and redevelopment practice. It reveals that the difficulty of collective industrial land redevelopment acts as a key barrier to the current spatial change in Panyu. Four major factors which lead to this difficulty identified in this paper include the uncertainty caused by volatile redevelopment policies, the trust absence between local government and villages under a clan network, the long-time reliance of villages on land leasing income, and the high transaction costs to achieve consensus among villages. These barriers drive some villages to put off or give up on redevelopment under the current institutional arrangement, helping to contribute to a spatial lock-in of the fragmented spatial structure in Panyu.

The case of Panyu helps to examine the current land redevelopment practice and land policy reform in peri-urban areas. Some existing literature deems the Three Renewal Policy as a political compromise of the state, and infers that conceding certain land profits to landowners is an effective incentive to motivate their participation in redevelopment (Lin, 2015). However, the case of Panyu has displayed a more complex picture in peri-urban areas. Some problems, such as an unclear risk-sharing plan, a lack of sustainable village economy and an inefficient internal cooperative mechanism, can result in the failure of the renewal policy. On the other hand, the Three Renewal Policy seems to provide less credibility, and therefore less functional, to villages than the traditional state-led approach. In Panyu’ case, new institution can hardly reduce villages’ distrust towards government due to its volatility. If these issues remain unaddressed, the endeavor of the current institutional change may be offset, as Ho (2016) has criticized that a new institution will disappear when it is not credible. The resulting prolonged redevelopment process may reduce the final net profit of all involved parties, therefore, further institutional change and more collaboration among various parties are required to overcome current barriers to spatial change.

However, the question of how to walk the path of further change remains a challenge, especially given that village collectives will have opportunistic behaviors confronted with volatile policy which was observed in Panyu. According to current redevelopment practices, there exists a possibility that further institutional change will provide more benefits to villages. As North (1990) and Libecap (1986) point out, the evolution of institutions largely depends on the bargaining power of influential actors, rather than the hypothetical wealth maximizing norm. Moreover, it is notable that interests of some related groups, such as migrant workers and current enterprises rarely have their concerns addressed during the redevelopment process. As some critical pioneering studies have noted, the efficiency gained from institutional

² The estimated cost here is calculated based on the average standard in Panyu. It consists of a demolition cost of averagely 30 yuan/m², and the new construction cost of about 3000 yuan/m². Since there exists some other costs such as compensation for current enterprises, the real cost will be higher.

³ Only LSC members have dividend right from land leasing income of the collective land. The dividend depends on the shares they hold which was distributed when the LSCs was created in the 1990s (Jiang and Liu, 2003). In Panyu, about 80%–90% of the total villagers are LSC members generally (author’s survey).

change often comes with social costs (Lin, 2015; Guo, 2016). Further research on these issues must be conducted in order to provide guidance for future sustainable and inclusive redevelopment.

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