Fragmented peri-urbanization led by autonomous village development under informal institution in high-density regions: the case of Nanhai, China

Jieming ZHU
Yan GUO

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Jieming ZHU and Yan GUO
Department of Real Estate, National University of Singapore
4 Architecture Drive, Singapore 117566
Tel: 65-6516-3422
E-mail: jmzhu@hotmail.com;

Abstract

Rapid urbanization in China has been a significant phenomenon with profound social, economic and environmental impacts. The most profound and intriguing changes occur in the interface between the central city and the suburbs, namely peri-urban areas. Being one of the dynamic urbanizing regions, Pearl River Delta has seen great transitions in its demography and built environment in the context of institutional change. Rapid urbanization in peri-urban Nanhai has been chiefly driven by the numerous autonomous rural collectives small-scale in land area, which has created a fragmented landscape. Urban and rural land uses are intensively mixed-up. The fragmentation and excessive conversion of farmland for industrial uses are brought about by the new institutions of village-based land shareholding cooperatives and their informal leasing of collective land. As a result, extremely scarce land resources are not utilized optimally, and ecological environment is deteriorating. Urbanization in the high-density peri-urban Nanhai is made unsustainable for the long term future.

1. Introduction

China’s urbanization since the late 1970s has been a historical phenomenon in terms of its economic and social impacts on the people of this vast country. Physical changes caused by urbanization in many growing regions are unprecedented in terms of scale and complexity. The magnitude of rural-to-urban migration is equally unprecedented. Migrants from the central and west regions are mainly attracted to the east (or coastal) region, which has made the coastal region one of the most economically dynamic regions in the world. The coastal region accounts for 13.5% of the national territory, but its population represent 44.7% of the national total, according to 2010 population census (NBSC, 2011a). Inflow of a large quantity of migrants into the already highly dense

1 This research is sponsored by Global Asia Institute, National University of Singapore.
regions (such as Yangtze River Delta and Pearl River Delta) has exacerbated the fierce competition for limited land resources (Sui and Zeng, 2001).

Intensified competition for land is well reflected in the areas where the process of urbanization is unfolding in the forms of land development and redevelopment. For the developing countries, the process of urbanization, incorporating social, economic and physical transformations, often takes places in the form of urban activities penetrating into rural areas. The most profound and intriguing changes occur in the interface between the central city and the suburbs, namely peri-urban areas. Peri-urbanization is a term referring to a process in which rural areas located on the urban outskirts become more urban in terms of economic structure, social fabric and physical appearance, while the areas in question still, to a great extent, remain dominated by the rural institutions (Webster and Muller, 2002). Peri-urbanization is particularly phenomenal in the East and Southeast Asian developing countries where rural-to-urban transformation occurs in the context of high population density. McGee (1991) has coined the term “desakota” that captures the unique feature of peri-urbanization in Asian developing countries, i.e. intense mixture of agricultural and non-agricultural land uses in the urban periphery.

Urbanization has resulted in transition of both people and land: rural villagers becoming urban residents, and agricultural land being converted for urban uses. In China’s peri-urban areas, it also entails institutional transition from the rural collective land ownership to the urban state land ownership. The land conversion takes place extensively at the peripheries or in the suburbs of metropolises where competition for land between urban governments and rural villages is explicitly demonstrated. Based on the premise that built environments should be moulded within an institutional framework where land rights are critically influential, the main objective of the paper is to uncover the impact of institutional change on the formation of built environments in Nanhai, one of the peri-urban areas in Guangzhou metropolitan region.

The competition between the urban and rural interests constitutes one of the driving forces behind institutional change. In facing infiltration of urban-sponsored developments into the rural territories, rural villages initiated bottom-up institutional change in the best interest of rural communities. Institutional change results in new institutions, formal and informal. On the one hand, formally legitimized by the state, Nanhai’s villages have become a chief actor developing village economies. On the other hand, it is observed that Nanhai’s very limited land resources (measured by population density) have not been utilized efficiently and effectively under the informal institution of collective land leasing that is not recognized by the state. Suboptimal land use prevails, caused by short-term competition for land rents. Given the autonomous villages small-scale in land area, fragmented bottom-up peri-urbanization ensues as a result of self-contained village development. Long-term sustainability of the high-density Nanhai is made vulnerable.

2. Institutional change from the below: bottom-up urbanization under uncertainty
Societies and markets are bound by institutions that are “the humanly devised constraints that structure political, economic, and social interactions” (North, 1991, p. 97). A society is deemed an organized community because individuals living together as group members share the same rules and customs that regulate their social behaviors. Institutions thus provide “regularities in behavior which are agreed to by all members of a society and which specify behavior in specific recurrent situations” (Schotter, 1981, p. 9). From the economic perspective, institutions are deemed “sets of rights and obligations affecting people in their economic lives” (Matthews, 1986, p. 905). The functioning of an economic system depends on a whole set of institutional conditions. The World Bank (2002) pragmatically defines institutions as rules, enforcement mechanisms and organizations. Organizations, whether they are political, economic or social, behave and perform as collective actors within a framework defined by institutions (Knight, 1992; Weimer, 1997).

Economic and social transitions suggest profound institutional change. Since 1978, significant changes with the single goal of national economic growth have occurred in China where a social transition is being spearheaded by the economic reforms. The reforms are meant to raise economic productivity—that was in a dire situation under the central planning system—and install a market system to aggregate individual choices. Because of political constraints, gradualism prevails, which brings in an approach of trial and error in the implementation of new initiatives. In North’s (1990) and Eggertsson’s (1994) views, institutional change is always made marginal, incremental and path-dependent by an immense stock of social capital in the form of an institutional matrix. Institutional change is thus related to social choices that are constrained by cultural norms. Institutions are composed of both formal rules like constitutions, regulations and laws, and informal constraints such as conventions, moral rules and social norms. Formal institutions are explicitly enforced by the state. When formal institutions are in the process of transformation and thus not able to effectively maintain order and manage interactions, informal institutions, often unwritten and implicit, may emerge to fill the gap left by inept formal institutions.

Institutions, generated in the context of pervasive uncertainty in human interactions, are fundamental to mitigating uncertainty. Institutions as social norms intend to make human behavior predictable by bounding individuals and providing regularity (North, 1990; Cornell and Kalt, 1997). Although informal institutions can provide a framework for social and economic activities during the dynamic transition, the informality of the institutional environment creates uncertainty in the context of rapid social and economic changes. In a close-knit homogeneous community, informal institutions as a product of collective action and unwritten codes of social conduct may serve to coordinate members’ expectation and behavior. Being culture-specific, informal institutions may not be sufficient to provide order in the absence of formal institutions when society becomes diverse and heterogeneous (World Bank, 2002). Conventions, moral rules and social norms are not necessarily shared and observed among members of a diverse community (Mantzavinos, 2001; Elster, 1989). Uncertainty could induce disorderly short-term behaviors. When uncertainty occurs, it prevents individuals from making rational and most appropriate decisions because of not knowing the causality.
Being the basic social unit in rural China, natural villages have been a very stable and steady institution in the long Chinese history (Gao, 1999). Since 1949 revolution, China’s villages have also become the basic collective economic organization for the rural economy, and rural communities have been managed by a three-tiered governance system which is the cornerstone for the collective land ownership as well [townships (xiang/zhen), administrative villages (xingzhengcun), and natural villages (zirancun), replacing the commune, the brigade, and the production team, respectively, since the 1980s] (Smil. 1999; Ho, 2001; Tang, 2009). Since collective farming was abolished and replaced by the Household Production Responsibility System (HPRS) in the early 1980s, agricultural production has been decentralized to village households that till the land leased from their village. Village land stock is equally distributed among all village households. The practice of the HPRS seems to echo the principle that villages are the default autonomous social and economic organization, and the basic holder of collective land.

In the peri-urban areas where urbanization is penetrating into the countryside, agricultural lands are increasingly converted for non-agricultural uses. There is fierce competition for land between rural villages and urban agents (Zhu and Hu, 2009; Shieh, 2011). Competition for land during transition could instigate institutional change, aiming to make land rights conducive to social and economic growth. Without endorsement of the state, however, this institutional change likely leads to informal institutions. Informal institutions may serve the purpose of providing certainty to a steady and homogeneous community and enhance its welfare. In a dynamic and heterogeneous environment, informal institutions may not be able to provide certainty for increasingly complicated social and economic transactions. In this case, institutional uncertainty does not facilitate a long-term perspective. Short-termism prevails. Autonomous villages develop their land resources for their short-term interests, which could be a suboptimal mode in the face of acute land scarcity and small-sized villages in terms of land area. Collaboration between villages for economies of scale in the utilization of limited land resources could be hampered by uncertain informal institutions which work only within a homogeneous village.

3. Rapid and fragmented urbanization in peri-urban Naihai

Since the late 1970s, China’s economic reforms, aiming at building a socialist market economy, have brought about tremendous changes to the country. Driven by market orientation and opening-up to the world, China has created an economic miracle, demonstrated by the remarkable economic growth in GDP at an average rate of about 9

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2 The Household Production Responsibility System, introduced by the economic reforms since 1978, contracts the use rights of agricultural land to individual farm households over a period of 30 years. It terminated the collective farming system which had been in practice since 1953. Replacing the People’s Commune, farm households become production units making decisions on what to grow and to sell at market prices after fulfilling the required planned output quotas.
percent per year for three decades since 1978 (Zhu, 2005). Concurrent with the economic growth is the prominent phenomenon of rapid urbanization. During the autarkic and centrally-controlled era between 1949 and 1978, urbanization was suppressed because of the ideology of socialist industrialization (Ma, 1976). Urban residents only accounted for 17.9 percent of the total population in 1978, rising from 12.5 percent in 1950 (NBSC, 2006). Urbanization has gone rapidly since 1978, due to the marketization and pent-up demand for industrialization. By 2010, 50.0 percent of the national population had been urbanized (NBSC, 2011b). The physical change of China’s cities is equally significant, especially in the economically dynamic coastal regions, shown by the uncontrolled urban expansion (Lin and Ho, 2005).

As an integrated “economic zone”, Pearl River Delta region (PRD, see Figure 1) has been the pioneer of China’s new practice of ‘reform and openness’ (Vogel, 1989). Driven by the two engines of industrialization and market-oriented land development, it has become one of the most dynamic regions in the world, known as the ‘world’s manufacturing factory’. Rapid urbanization manifested by its unprecedented expansion of built-up land is well pronounced (Weng, 2002). With a total area of 41,690 km², the PRD saw its built-up land area increased by 2.86 times between 1988 and 2008, rising from 1765.13 km² to 6816.04 km² (Yang and Yuan, 2010). While the old central cities are restructured substantially driven by new equilibrium of demand for and supply of land, the rapid urban expansion is marked by the extensive land development in the outskirts to accommodate incoming industrial investments and rural-to-urban migrants. The built environment in the interface between the core cities and traditional rural areas, namely peri-urban areas, has been experiencing dramatic change.

Nanhai is located to the immediate west of Guangzhou, the capital city of Guangdong Province, and to the north of Foshan central city that is the third largest city in the PRD after Guangzhou and Shenzhen (see Figure 1). Naihai used to be a rural county, and it has become an urban district annexed to Foshan municipality since 2003. Located in the fringe of both central cities, it has been receiving substantial outside investments, and becoming a dynamically growing district in the PRD. From 1982 to 2010, its total gross economic output increased from ¥ 0.8 billion to ¥179.67 billion (at current price) at an annual growth rate of 22.2%. With the economic development, the total number of population in 2008 was 2.6 time of that in 1978, reaching 2.1 million, among which 55.8% (1.2 millions) were local residents with a certificate of household registration (hukou), and 44.2% (0.9 millions) were non-residents working and living temporarily in Nanhai (NHBDPS, 2011). As a rural county initially, Nanhai has been experiencing rapid urbanization since the 1980s, demonstrated by its large-scale and high-speed land conversion from agricultural uses to urban uses. It saw its built-up land area reached 568.8 km² in 2008, rising from 114.5 km² in 1990. The built-up area as a percentage of the total land area (1073.9 km²) rose from 10.7% in 1990 to 53.0% in 2008 (see Table 1 and Figure 2).
Figure 1: Location of Naihai in the Pearl River Delta

Table 1: Built-up areas in Nanhai, 1990 – 2008

<table>
<thead>
<tr>
<th>Year</th>
<th>Built-up areas (km²)</th>
<th>Built-up areas as % of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>114.5</td>
<td>10.7</td>
</tr>
<tr>
<td>1995</td>
<td>255.0</td>
<td>23.7</td>
</tr>
<tr>
<td>2000</td>
<td>335.1</td>
<td>31.2</td>
</tr>
<tr>
<td>2005</td>
<td>415.6</td>
<td>38.7</td>
</tr>
<tr>
<td>2008</td>
<td>568.8</td>
<td>53.0</td>
</tr>
</tbody>
</table>

Note: The estimations are based on data from satellite remote sensing maps at http://datamirror.csdb.cn/admin/introlandsat.jsp
Further analyses reveal that the built-up land has been developed in a spatially dispersed pattern. As a result, rural and urban areas are intensively mixed-up (see Figure 2). A
Fragstate\textsuperscript{3} patch analysis highlights that farmland has become increasingly fragmented over time, indicated by an increase of patch numbers from 77 (1990) to 885 (2008), and the gradual fall of the mean patch size from 1,245 hectare to 63 hectare per patch (see Table 2). The continuous dropping off of the contagion index over time shows that Naihai’s landscape is increasingly fragmented (see Table 2), with farmland and built-up land extensively piecemealed and spatially intermingled. Intensive mixture of urban and rural land uses is conducive to neither urban living nor rural farming, as efficient provision of facilities for living and farming requires urban compactness and sizeable farmland.

Fragmented land development in peri-urban Nanhai seems to be caused by diverse landed interests and various modes of land development. It is observed that there are two types of urbanization spatially intermingled in general. One is the top-down penetration of urban projects sponsored by the urban state (34.8%); the other is the bottom-up rural industrialization and rural housing construction initiated by the village collective (65.2%) (See Figure 3). The former entails the change of landownership from the collective to the state, while the later does not change the collective landownership.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|}
\hline
Year & Number of Patches & Mean patch size & Contagion index \textsuperscript{*} \\
\hline
1990 & 77 & 1245.5 & 62.70 \\
1995 & 314 & 260.7 & 40.78 \\
2000 & 448 & 164.8 & 38.02 \\
2005 & 680 & 96.8 & 33.91 \\
2008 & 885 & 63.3 & 30.28 \\
\hline
\end{tabular}
\caption{Patch analysis of farmland and contagion index, Nanhai}
\end{table}

Notes: \textsuperscript{*} Patch is a terminology in the discipline of landscape ecology, defined as spatially consistent areas with similar thematic features as basic homogeneous entities, in describing or representing a landscape (McGarial and Marks, 1994). A farmland patch is thus defined as a complete plot of farmland without spatial separation. The contagion index measures the extent to which land uses are aggregated or fragmented. The landscape is aggregated at high values, and dissected into small patches at low values (O’Neil et al, 1988)

Source: The estimations are based on data from satellite remote sensing maps at \url{http://datamirror.csdb.cn/admin/introlandsat.jsp}

\textsuperscript{3} Fragstates is a computer software program for spatial pattern analysis.
4. Institutional change driven by the rural collective

4.1 Collective land ownership as a unique institution

China’s land is governed by a dual framework of state and collective land ownership. According to China’s Constitution, in principle, urban land belongs to the state with the municipal government as its agent, and rural land is collectively owned by the agrarian
community. As a key component in the program of economic reforms, the 1988 amendments (Article 10) to the Constitution formally declare that land should be recognized as a special commodity and its use rights, separated from ownership, can be leased to developers or users for a fixed period after a payment of rental in lump sum. The invention of public land leasehold has explicitly made the state-owned land economic assets. Property rights are clearly defined over the land supplied under the leasehold (Tang, 1989). An emerging urban land market has been evolving ever since (Zhu, 2005).

However, China’s collective land is a unique institution. The idiosyncrasy of the collective land ownership is that it is based on the Marxist doctrine that land should be treated as a means of production, not an economic asset. Land is owned by the rural communities on the condition that it is only used for economic production. Collective land ownership is thus defined as such that the collective has neither the right to derive income from land by letting it out, nor the right to change its form and substance by developing it for non-agricultural activities without approval from the government at the county level or above. The right to develop rural land for village industries should be granted by the urban state (Byrd and Lin, 1990). The right to alienate collective land is restricted to the situation where the other party in the transaction is the state (Lin and Ho, 2005).

Moreover, ownership of rural land is vested with the collective entities at three hierarchical levels (township, administrative village, natural village). An official maxim describes owners of the collective land as sanji suoyou, dui wei jichu [collective ownership belonging to three entities (the commune, the brigade, and the team), and with the team being the basic holder]. Thus, the collective land ownership is ambiguous to its nominal owners, as how much each entity is entitled to have never been clearly delineated. The collective land rights are also incomplete in that the collective landowners do not autonomously possess the right to develop land or change its agricultural uses to non-agricultural uses. The villagers as members of the collective owners are explicitly entitled to 1) the use right over farm land allocated to them under the HPRS and the right to residual income of farming; 2) the use right over a small plot of land to build housing for the household; and 3) the right to benefit from land held under a three-tier hierarchy of management of the rural communities.

4.2 Formal institution change: village-based Land Shareholding Cooperatives

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4 If land is an asset, its owner has the property rights over land. Land rights are primarily a bundle of rights associated with ownership which consists of the right to use land, the right to derive income from it, the right to change its form and substance, and the right to transfer the rights mentioned above to another party at a price mutually agreed upon (Pejovich, 1990).

5 Although this official definition was made known in 1962 (Tang, 2009), it has become a cornerstone for the collective land ownership ever since.
Since the implementation of the HPRS, farmland has been let, for a 15-year lease initially in 1984 (subsequently 30-year lease), to village households equally in terms of land quality and quantity based on the egalitarian principle (Kung, 1995; 2000). More often than not, households have several pieces of farmland with various degree of fertility, not adjacent to each other (Wang, 1994; Ministry of Agriculture, China, 1993). Nanhai is a county with high population density and thus severe land scarcity. Farmland per capita was only 400m² in the early 1990s, only one-third of the national average (Ministry of Agriculture, China, 1993). Village land distribution had to be readjusted periodically because of change in village population, and each readjustment aggravated the problem of land fragmentation. As a result of land allocation based on the HPRS, further improvement in agricultural productivity was seriously hampered by the extremely piecemeal land subdivisions that do not allow economies of scale. Meanwhile, off-farm jobs have become abundant in Nanhai and cities in the PRD that is rapidly industrializing since the 1980s. Instead of tilling the meagre landholding, young villagers went to the mills to seek better remunerations. Twenty per cent of the rural labours had already been engaged in non-agricultural employment by 1990 (Hou and Zeng, 1991). Farmland was left idle as a result. The nature of collective landownership forbad land transfer between households, let along land sub-lease to farmers outside the village (Fu and Davis, 1998; Yao, 2000). The dire situation called for institutional change.

Guangdong has been the vanguard of economic reforms which chiefly promote the participation of non-state actors in the economic development. In the early 1980s, Nanhai government announced and implemented the ground-breaking policy-guideline that has created the well-known so-called “Nanhai model”. The key characteristic of the Nanhai model is to develop a decentralized economy by engaging six “engines” that are county-owned enterprises (state-owned); enterprises owned by townships, administrative villages and villages (collectively-owned); privately-owned enterprises and joint-ventures with foreign capital (http://www.wzg.net.cn/city/toRead.php?vid=324, accessed on June 30, 2012). The gist of the Nanhai model is to make a decentralized economy by the participation of all sorts of market actors.

Endorsed by the Nanhai district government that promotes village economies, village-based Land Shareholding Cooperatives (LSCs) have been created in Nanhai since 1993 as an experiment of rural reforms (Fu and Davis, 1998). There were 1765 LSCs in total in 2008, in which 224 LSCs were administrative-village-based, and 1,541 LSCs were natural-village-based (Division of Social Works, Nanhai Government, 2009). All land parcels except family housing plots in the village are re-collectivized in order to conduct non-agricultural development. The beckoning rural collective industrialization needs consolidated large land parcels. Farmland lots need to be pooled so as to enable agricultural production with economies of scale. Only village members can hold the shares of LSCs, and those shares cannot be transferred and sold. If a member has to quit the village (for example, death and migration), his or her shares have to be surrendered to the cooperative. Shares are distributed to the cooperative members equally based on a formula which takes into consideration of members’ prior contribution towards the collective assets. Incomes from village enterprises and properties are distributed among cooperative members according to their shares, albeit more than 40 per cent of the
collective incomes will be held by the cooperative organization for future collective development. A LSC is run by a management committee elected by its members, not controlled by professional managers as normal business undertakings are. Since villagers are the nature members of LSCs, LSCs are reckoned as both social and economic autonomous organizations.

4.3 Informal institution change: LSCs’ land leasing

While the official doctrines of collective land ownership remain unchanged, LSCs manage to strengthen their holding of the collective land by stipulating that an agreement from two-third cooperative members is required in the case of alteration of cooperative assets where land stock is the major component. It is most significant to the villages as the power of the urban state in land acquisition is curbed. Village enterprises had been growing at a high speed until market competition became intense. The number of village enterprises had reached the zenith of 3,878 by 1996 (392 in 1978) (NHBDPS, 1998). The village industries contributed 31.2% to the Nanhai’s total industrial output in 1984, and the share rose to 47.2% in 1995 (NHBDPS, 1998). Correspondingly, the built-up land as a percentage of the total rose from 10.7% (1990) to 27.9% (1996) (Nanhai Land and Resource Bureau, 1996), and agricultural labours as a percentage of the total rural workforce declined from 38.1% to 24.9% in the same period (NHBDPS, 1998).

Nevertheless, rudimentary rural enterprises faced increasingly fierce competition from inward foreign and private investments which had industrial expertise and understood modern business management. Privately-owned enterprises and joint-ventures gradually took over, while village factories withered, either bankrupt or privatised (Che and Qian, 1998; Vermeer, 1999; Pei, 2002; Li and Rozelle, 2003). Collectively-owned enterprises’ share in the total industrial output declined drastically from 50.2% (1998) to 2.9% (2008), while the foreign and private enterprises’ industrial output as a percentage of the total jumped from 40.9 (1998) to 96.4 (2008) (NHBDPS, 1998; 2009) ⁶. LSC economies were in peril in the face of market competition, which prompted an informal institutional change from the below. Aspiring to lead the way of industrializing villages, LSCs gradually took the role of landlords leasing land to private enterprises and their migrant workers so as to capture land rent differentials. ⁷ The rights of the state to develop

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⁶ The calculations are based on the data of the total industrial output by those enterprises that have annual output above ¥5 millions. In 1998, the total industrial output contributed by the enterprises with annual output above ¥5 millions accounted for 55.5% of the total. In 2008, the figure was 86.2%. Collectively-owned village enterprises tend to be small. Therefore, it is reasonable to reckon that collectively-owned enterprises’ share in the total could be higher than the percentage indicated above in 1998. Statistics of village industries have not been recorded by the Nanhai Statistics Bureau since 1999. Village industries are captured under the umbrella of collectively-owned enterprises. During 1984 – 1998, village industries’ share in the collectively-owned enterprises in terms of the total industrial output was 57%.

⁷ Land rents are the value of land appropriated in economic transactions, as the market price of land is interpreted as capitalized land rents. The rental value of a land plot is largely determined by the equilibrium of demand for and supply of land as commodity in it use designated by zoning (agricultural, residential, commercial and so on). The potential land rent represents the amount of rent that can be capitalized under
agricultural land for non-agricultural uses (such as manufacturing and services) and to lease it to tenants were somehow “encroached” upon by the village collectives, without an explicit agreement with the urban government as the agent of the state.  

5. Bottom-up land development by the autonomous LSCs and fragmented urbanization

5.1 Opportunistic land development under uncertainty

The LSCs have managed to grab more rights over controlled landholdings than their predecessors (village collectives). However, informal institutional change is not formally recognized by the state, and there is no existence of long-term certainty and security of the informally acquired land rights. When uncertainty occurs, it prevents one from making rational and long-term planning. Instead, uncertainty can induce short-term behaviour. It is observed that most industrial sites in the LSCs are developed opportunistically in a piecemeal and casual manner. Factories were built of low quality, and thus attracted low-standard industrial tenants (see more elaboration in 5.2 Case study of Xiabei administrative village).

The usual low living standard in the village presses the LSC management to place improvement of villagers’ welfare as the first priority. Land rental incomes from the existing industrial land stock (which is not used efficiently) are not able to meet the LSC members’ rising expectation for a better life, due to the high population density of the villages. LSC management committees scramble for more land available for leasing, and thus “illegally” develop village farmland for industrial uses. Because of the status of informality, or strictly speaking, illegality of land conversion, LSCs are unable to raise loans from the market for the industrial property development. It explains the low standard of industrial buildings and non-existent services for the industrial sites. The informal land conversion is motivated by the capture of land rent differentials, which strategically pre-empt the urban state’s land acquisition at compensation rates for land in agricultural uses. An informant revealed that the compensation rate for one mu \(^9\) farmland was only ¥28,000 at a time in the 1990s, while the rental income from one mu industrial land could be as high as ¥70,000 per annum. Impending land acquisition by the state makes villages anxious and restless, and LSCs have all incentives to convert farmland for non-agricultural uses under their control.

In the process of economic reforms and decentralization, China’s local governments have become the local developmental state committed to the local economic development

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the “highest and best use”. The gap between the potential land rent and actual land rent capitalized under the present land use is the land rent differential.

\(^8\) It is “illegal” as the rural collective does not have the rights to develop agricultural land for non-agricultural uses without the approval from the county government or above. Doing so is considered as appropriating state-owned land development rights.

\(^9\) Mu is a traditional measurement for farmland in China. One hectare is equal to 15 mu.
(White and Wade, 1988; Woo-Cumings, 1999; Zhu, 2005). Nanhai district government has been an active actor in the development of urban industrial zones and urban centres. As LSCs have strengthened their holding of village land, it is difficult for the urban state to urbanize the rural areas adjacent to the urban district in a wholesale manner. Conversion of a whole village into an urban area by the urban government is practically impossible, as villagers would be deprived of their livelihood. The urban government has to negotiate with every LSC for land acquisition opportunistically to build urban projects. As a result, urban projects (land acquired by the state) are dispersed spatially with 789 patches across 181 administrative villages (see Figure 4).

![Figure 4: Dispersed urban state led land developments across villages, 2008](source: Archives of Nanhai Bureau of Land and Resources)
5.2 Case study of Xiabei administrative village

Composed of five natural villages together with an entity of administrative village committee, Xiabei administrative village is located immediately next to the central city of Nanhai (see Figure 5). Like many other villages, Xiabei has had its rudimentary cottage industries since the late 1950s. In 1983, the HPRS terminated the collective farming system and collective lands were allocated equally to the village households. In the early 1980s, Xiabei had a territory of 9,750 mu. The Nanhai urban government acquired 1,055 mu of its farmland in 1988 to build an urban industrial zone, and further expropriated a great amount of farmland (4,930 mu) up to 1995. After those land acquisitions by the state, the total land area of Xiabei has been reduced to 3,765 mu (251 ha) (see Figure 6). The local community has been steady with marginal increment of its villagers (registered as local residents with Nanhai hukou), but it is evident that Xiabei has attracted an influx of migrants (registered as temporary residents without Nanhai hukou) (see Table 3). Xiabei epitomizes the rapid urbanization driven both by the urban state and rural collectives.

![Figure 5: Location of Xiabei administrative village in Nanhai](source: Drawn by the authors, 2012)
Figure 6: Xiabei administrative village before and after land acquisitions

Source: Archives of Nanhai Planning Bureau
Table 3: The total numbers of local villagers and migrants in Xiabei

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of local villagers</th>
<th>Number of migrants living in the village</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>5,749</td>
<td>355</td>
</tr>
<tr>
<td>2000</td>
<td>6,483</td>
<td>6,560</td>
</tr>
<tr>
<td>2008</td>
<td>6,663</td>
<td>8,796</td>
</tr>
</tbody>
</table>

Source: Nanhai Archives

Table 4: Land area and the total number of local villagers of Xiabei LSCs

<table>
<thead>
<tr>
<th>LSC</th>
<th>Area (ha)</th>
<th>No. of local residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH</td>
<td>31.5</td>
<td>1,135</td>
</tr>
<tr>
<td>YS</td>
<td>46.6</td>
<td>1,827</td>
</tr>
<tr>
<td>LB</td>
<td>21.2</td>
<td>765</td>
</tr>
<tr>
<td>LN</td>
<td>30.6</td>
<td>946</td>
</tr>
<tr>
<td>ZB</td>
<td>67.4</td>
<td>1,990</td>
</tr>
<tr>
<td>Administrative village committee</td>
<td>51.3</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>251.0</td>
<td>6,663</td>
</tr>
</tbody>
</table>

Note: Data of local residents were as of 2009. Data of LSCs’ land areas were valid in the period 1995 – 2009.
Source: Archives of Nanhai Planning Bureau

Village boundaries were adjusted after about 60% of the original land stock had been acquired by the state. Figure 7 shows how the remaining land areas are distributed among five natural villages and the administrative village committee. The assets of the administrative village committee belong to all community members within the Xiabei administrative village. Five natural-village-based LSCs and one administrative-village-committee LSC were set up in 1994 (see Table 4). Each natural-village-based LSC designated residential areas, economic development area, and preserved farmland (see Figure 8). In 2000, there were 54.8 ha of residential land areas, and 45.3 ha of land areas for economic development (manufacturing and commerce) (see Table 5). The built-up area accounted for 39.8% of the total area of Xiabei. By 2009, the total residential land area had reached 70.1 ha, and the total land area for economic development had amounted to 109.2 ha, out of which 95.7 ha industrial land areas were rented out to 382 manufacturing firms (authors’ survey in 2012). The built-up area stood at 89.4% of the total area in 2009 (see Tables 6 and 7).
**Figure 8: Land uses of five villages and administrative village committee, 2000**

**Table 5: Statistics of built-up areas in seven LSCs, 2000**

<table>
<thead>
<tr>
<th>LSC</th>
<th>Residential land uses</th>
<th>Economic development land uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land area (ha)</td>
<td>As % of the total LSC area</td>
</tr>
<tr>
<td>BH</td>
<td>6.5</td>
<td>20.6</td>
</tr>
<tr>
<td>YS</td>
<td>11.8</td>
<td>24.1</td>
</tr>
<tr>
<td>LB</td>
<td>5.9</td>
<td>27.8</td>
</tr>
<tr>
<td>LN</td>
<td>6.8</td>
<td>22.2</td>
</tr>
<tr>
<td>ZB</td>
<td>23.3</td>
<td>34.6</td>
</tr>
<tr>
<td>Administrative village committee</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>54.8</td>
<td>21.8</td>
</tr>
</tbody>
</table>

Source: Archives of Nanhai Planning Bureau
Figure 9: Land uses of five villages and administrative village committee, 2009

Table 6: Statistics of built-up areas in LSCs, 2009

<table>
<thead>
<tr>
<th>LSC</th>
<th>Residential land uses</th>
<th>Economic development land uses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land area (ha)</td>
<td>As % of the total LSC area</td>
</tr>
<tr>
<td>BH</td>
<td>8.2</td>
<td>26.0</td>
</tr>
<tr>
<td>YS</td>
<td>15.0</td>
<td>32.2</td>
</tr>
<tr>
<td>LB</td>
<td>7.0</td>
<td>23.0</td>
</tr>
<tr>
<td>LN</td>
<td>8.0</td>
<td>26.1</td>
</tr>
<tr>
<td>ZB</td>
<td>28.8</td>
<td>42.7</td>
</tr>
<tr>
<td>Administrative village committee</td>
<td>3.1</td>
<td>6.0</td>
</tr>
<tr>
<td>Total</td>
<td>70.1</td>
<td>27.9</td>
</tr>
</tbody>
</table>

Source: Archives of Nanhai Planning Bureau

Table 7: Land use statistics in Xiabei administrative village, 2009

<table>
<thead>
<tr>
<th>Land use</th>
<th>Area (ha)</th>
<th>% of the total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Built-up land:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for residential</td>
<td>70.1</td>
<td>27.9</td>
</tr>
<tr>
<td>for economic development</td>
<td>109.2</td>
<td>43.5</td>
</tr>
<tr>
<td>in which: for manufacturing</td>
<td>95.7</td>
<td>--</td>
</tr>
<tr>
<td>for commerce</td>
<td>13.5</td>
<td>--</td>
</tr>
<tr>
<td>Others (including roads and parks)</td>
<td>45.2</td>
<td>18.0</td>
</tr>
<tr>
<td><strong>Agricultural land</strong></td>
<td>18.5</td>
<td>7.4</td>
</tr>
</tbody>
</table>
Autonomous and independent LSCs make village economies self-contained. Every village has a substantial amount of land used for economic activities (mainly manufacturing) and its own housing areas for the villagers (see Tables 5 and 6). Two noticeable changes during the period 2000 – 2009 are observed. The first phenomenon is that land for economic activities witnesses a substantial surge over the period, increased by 1.4 times. In 2000, 45.3 ha land, accounting for 18.0% of the total, was used for non-agricultural economic activities. The figure rose to 109.2 ha, representing 43.5% of the total area. Xiabei is not an isolated case. In the whole Nanhai, 31.0% of the total land area, or 58.5% of the total built-up area, was used for manufacturing. It is extraordinary and excessive that almost half of village land resources are used for manufacturing. Industrial productivity and thus rentals from industrial sites should have been low, so that more and more farmland was informally developed for industrial uses, in order to increase the taking of land rent differentials to satisfy the rising needs of the villagers. Low productivity of industrial land uses has wasted Xiabei village’s scarce land resources to the extent of sacrificing its environmental quality (see Figure 9).

According to village’s statistics, there were 168 small manufacturing plants in operation in 2002. Each plant occupied a site of 2,700 m\(^2\) on average. By 2009, the number of manufacturing plants had jumped to 382, at an average land size of 2,500m\(^2\) per plant. All of them were low-technological plants with simple equipment and low-cost labours. Collective land leasing is considered as “illegal” at worst or informal at best, and thus LSCs are not able to use the land in question as collateral to raise land development finance. Authors’ site reconnaissance has revealed that industrial sites are not properly serviced by necessary infrastructure of sewage and drainage, let along land use planning that safeguards environmental quality. Factories are built at low cost and in simple structure. Substandard industrial estates do not appeal to high-standard industrial tenants, and only those opportunistic low-standard pollution-prone factories are attracted, evidenced by their short-term leases (12-month term) and low productivity. It is common that, without waste treatment facilities, those plants discharge waste water and gases directly into the rivers and atmosphere, causing damages to the local ecological environment.

The second phenomenon is that land for residential uses increased by 27.9% during the period. Residential land area per capita was 84.5m\(^2\) in 2000. It increased to 105.2m\(^2\) in 2009. There has been a strong and rising demand for housing from migrants. In 2008, the number of migrants was even 32.0% more than the locals. Driven by this housing demand, LSCs converted farmland to residential land and allocated additional residential land parcels to village households. Housing space was built by the villagers and rented to migrant residents. As a result, village households could make rental incomes from the migrants who worked in the industries in the villages. It shows that LSCs and villagers are no longer engaged in agricultural and industrial production. LSCs have become entities of landlord economies, relying on rental incomes from industrial land leasing and housing space leasing.
5.3 Fragmented urbanization: self-contained development of the autonomous LSCs in high-density peri-urban Nanhai

Nanhai was a rural county in 1988 when urban and town centres only accounted for 1.4% of the total built-up land, while rural built-up land amounted to 94.6% of the total (irrigational infrastructure taking the remaining 4%). During the period 1988 – 2000, 328.3 km² of land, or 30.6% of the total territory, was converted from farmland to land for non-agricultural uses, among which 20.8 km² were for rural housing, 153.7 km² for industries, 60.8 km² for urban and town centres. Two phenomena stand out from the land use statistics in 2008 (see Table 8). The first is that bottom-up urbanization is well pronounced as urban built-up land only accounts for one-third of the total, and the remaining two-thirds belong to rural built-up land which is overwhelmingly used by rural housing and industries. The second is that industrialization has been significantly propelling urbanization, evident by industrial land amounting to 57.0% of the total built-up land and the rural industries take three-quarters of it.

As a result of rural urbanization, peri-urban Nanhai has become substantially fragmented in terms of its spatial structure. There are 1,776 natural villages in total, out of which 1,541 villages have set up LSCs. On average, each village or LSC has an area of about 41 ha. LSC-based land development has produced 1,868 industrial land patches spatially dispersed, and farmland has been disintegrated into 1,862 patches (see Figure 10). Self-contained development of the small villages in terms of land area due to land scarcity and high population density creates, in aggregate, a fragmented peri-urban area.

### Table 8: Land use change in Nanhai, 1988 – 2008

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (ha)</td>
<td>As % of the total built-up area</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>Built-up land</td>
<td>12,374.2</td>
<td>100.0</td>
<td>32,122.1</td>
</tr>
<tr>
<td>Urban and town centers</td>
<td>177.7</td>
<td>1.4</td>
<td>4,129.9</td>
</tr>
<tr>
<td>Rural housing</td>
<td>9,323.6</td>
<td>75.3</td>
<td>9,787.9</td>
</tr>
<tr>
<td>Industries</td>
<td>2,384.8</td>
<td>19.3</td>
<td>12,179.9</td>
</tr>
<tr>
<td>Others:</td>
<td>488.1</td>
<td>3.9</td>
<td>6,024.3</td>
</tr>
<tr>
<td>Agricultural land</td>
<td>NA</td>
<td>-</td>
<td>78,968.0</td>
</tr>
<tr>
<td>Farmland</td>
<td>-</td>
<td>-</td>
<td>41,609.3</td>
</tr>
<tr>
<td>Woodland</td>
<td>-</td>
<td>-</td>
<td>8,397.8</td>
</tr>
<tr>
<td>Pasture</td>
<td>-</td>
<td>-</td>
<td>34.2</td>
</tr>
<tr>
<td>Water body</td>
<td>-</td>
<td>-</td>
<td>28,926.7</td>
</tr>
<tr>
<td>Unutilized land</td>
<td>-</td>
<td>-</td>
<td>3,919.9</td>
</tr>
<tr>
<td>Total</td>
<td>115,010</td>
<td>-</td>
<td>115,010</td>
</tr>
</tbody>
</table>

Note: The total land area of Nanhai was 1,150.1km² until 2003 when a fairly urbanized township of 76.2km² was severed off. Since then, Nanhai has a land area of 1,073.9km².

Source: Archives of Nanhai Planning Bureau
This bottom-up urbanization may have reflected the interests of the rural communities. However, very limited land resources are not efficiently utilized in the best interest of long-term sustainability. Self-contained mode of village-based industrialization impedes the economic provision of industrial infrastructure (such as waste water treatment and other necessary services) which is essential for the improvement of industrial productivity. Poor quality industrialization jeopardizes the fragile ecological environment. Houses and factories are intensively mixed up in small villages. Polluting and hazardous plants are widely spatially dispersed, exacerbating the living environment of village communities. One notorious case was reported that one village in Nanhai had become a recycling centre of British plastic waste. Villagers as young as fourteen made a meagre living by reprocessing mountains of toxic rubbish (http://news.sky.com/home/article/13553680, access on July 29, 2012).

It is not exaggerating to claim that the whole Nanhai is a big factory. Land used by manufacturing accounts for 57.0% of the total built-up land area, or 332.8km² which represent 31.0% of Nanhai’s total territory. Three-quarters of industrial land is located in LSCs. Excessive land development for manufacturing is caused by the informal institution of collective land leasing. The precious land assets are used extremely
inefficient, which could be otherwise used for social purposes, or remained as open space. Neither the formal institution of LSCs nor the informal institution of collective land leasing corroborates the long-term sustainable urbanization in the context of high population density. Further institutional change is called upon.

7. Conclusion

Rapid urbanization in the high density regions suggests a great challenge to the effective utilization of scarce land resources, as the influx of additional migrants exacerbate the magnitude of population pressure on the environment. This challenge is well reflected in the peri-urban areas where significant economic, social and environmental transitions occur, together with the transition of land ownership from the rural collective to the urban state. The Nanhai model emphasizes the participation of multiple actors in urbanization, and grants villages autonomy in the management of their own economies and communities. Because land held by the collectives accounts for a great majority (81.1% of the total), local villagers are effectively given preference over other actors in the land development. As a result, nature villages evolve into LSCs that become the key driving force for bottom-up urbanization.

Family-based intensive farming may be a viable mode of production in high-population-density rural regions. Nevertheless, allured by industrialization and urbanization, villagers in peri-urban Nanhai abandoned household farming because of its comparatively low productivity. Re-collectivization of farmland to the village level as an institutional change was initiated in order to consolidate village land holdings for agricultural economies of scale. Villages as a basic social and economic unit for rural China are conducive to the agricultural farming with low land holdings per capita because of land scarcity. This premise may not be valid when villages are industrialized and urbanized in the peri-urban regions.

Bottom-up urbanization has its own merits as it reflects the interests of local communities. Local villagers’ interests are well taken care of, unlike in other localities where villagers are reportedly sidelined (Brown, 2009; Epstein, 2009). Its negative impact on the land use cannot be ignored, nevertheless. Urbanization is considerably fragmented as a result of village-based land development by the autonomous LSCs small-scale in land area, which compromises industrial productivity and ecological environment. The peri-urbanization is further complicated by the informal institution of collective land leasing that has induced short-term land exploitation and suboptimal land development. As a result, LSCs have become mainly landlords without their own substantive economies.

Decentralization and empowerment of local communities are essential for inclusive development. However, coordination of local development in the high-density developing regions has to be at an appropriate level (such as township or city) to ensure that extremely scarce land resources are efficiently and effectively utilized. It is indisputable that sustainability for the developing countries hinges on their economic sustainability which, in turn, relies to a large extent on the efficiency of their economic
development. Inefficient economic development wastes resources unnecessarily, and thus adds to tension in social relations (between locals and new migrants, in particular) and heightens pressure on the environment. Deficiency of wealth often leads to social injustice and environmental un-sustainability. It calls for further institutional change to the Nanhai model.

References:


Tang, J. J. (2009) Sanji Suoyou, Dui Wei Jichu (Collective ownership belonging to three entities [the commune, the brigade, and the team], and with the team being the basic holder), *Archives World*, 4, pp. 17-21. (in Chinese)


