Clarification of collective land rights and its impact on non-agricultural land use in the Pearl River Delta of China: A case of Shunde

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During the past several decades the rural industrialization process has exploded in many developed areas of China, which has greatly affected land use in the rural China. This paper argues that the double-track land use and management system is one of the major institutional settings behind non-agricultural land uses and demonstrates how the bottom-up institutional reform, the land share-holding cooperative, has influenced non-agricultural land uses in the Pearl River Delta. Taking Shunde as a case study, this paper analyzes land use dynamics and characteristics in Shunde. It finds that the establishment of land shareholding cooperatives has facilitated the industrialization process on a low cost basis through pooling the fragmentally-held land plots. Meanwhile, however, the village-based development has caused the fragmentation of construction land due to the governance fragmentation. It concludes that solutions to the problems will come from the negotiated relationship between top-down and bottom-up approaches, a combination of the two.

Introduction

Since the opening-up reform, the industrialization in rural China has exploded, particularly in the coastal region where its population density is high and its economy is most prosperous in China. This rapid increase in the industrialization output has caused substantial amount of rural land to be converted into non-agricultural uses. Over the past several decades, the traditional countryside landscape has been gradually replaced by multi-storey residential blocks and scattered factory buildings. There has been massive literature on the drivers behind land use change in rural area. Seto and Kaufmann (2003) find that land expansion is associated with foreign direct investment, instead of local land users, and relative rates of productivity generated by land associated with agricultural and urban uses. Ho and Lin (2004) point out that the rural–urban migration, urbanization and accelerated development are the most important factors contributing to expansion of non-agricultural land use. By taking Kunshan as a case study, Long, Tang, Li, and Heilig (2007) identify industrialization, urbanization, economic growth, and China’s economic measures as the main driving force behind land use change. Most of these literatures address the influence of top-down factors on rural land uses, the bottom-up impact of rural economic organization on non-agricultural land uses, however, is very scarce.

Meanwhile, China has long been perplexed with its double-track land ownership system. The property rights over state-owned land have been clearly defined, but the property rights over the collective land have always been criticized for its ambiguity and insecurity, leading to many social and economic problems (Tian, 2008; Zhu & Hu, 2009). While the dismantling of the double-track system seems an impossible task, the bottom-up institutional innovation, the establishment of Land Share-holding Cooperatives (LSCs) in the Pearl River Delta in the early 1990s, provides at least a partial solution to the dilemma. Yep (2001) explains the evolution of rural shareholding reform in terms of the changing balance of power over economic management at grassroots level. Ho and Lin (2003, 2004) discuss the emergence of LSCs in the rural land market of China. Po (2008) argues that LSCs have been designed to mitigate and contain the conflicts in the land conversion. However, the heterogeneity and complexity of the co-operatives in present-day rural China have not been fully understood and examined as an independent theme (Zhao, Develtere, Cui, & Wang, 2009). Its impact on rural development, particularly on non-agricultural land uses, seems unclear and requires in-depth research.

By taking Shunde, a previous county-level-city in the Pearl River Delta where LSCs have been widely established, as a case study, this paper examines the emergence of LSCs and the resultant property rights restructuring. Then it applies the high-resolution Landsat TM data of different time periods in Shunde to analyze its characteristics of land use changes. Meanwhile, social-economic data are collected to analyze the role of LSCs in non-agricultural
land use change. It finds out that LSCs have facilitated the rural industrialization process at a lower cost basis in Shunde, nevertheless, the land development induced by LSCs on the village level have also contributed to the increasing sprawl and degree of fragmentation of non-agricultural land. It concludes with policy implications in order to improve the non-agricultural land use in rural China.

The nature of collective land and its role in rural industrialization

Urban China and rural China are two institutionally distinctive domains (Fredmann, 2006). According to the 1998 Land Administration Law, all urban land belongs to the state, while land in the rural areas and villages belongs to the collective. Urban lands as assets are managed by municipal governments, but rural lands are controlled collectively by the township governments, village committees and villagers. Land use and development control are regulated stringently in the cities by the planning bureaus. However, the decision over land use and development in the countryside is decentralized to the villages (Tian, 2008). Thus, throughout China, there is a dual land management system, rural and urban.

Collective land ownership has been institutionalized since the collectivization movement in the 1950s. The nature of collective land ownership is that collectively owned rural land has been managed by a three-tiered governance system. During the era of the People’s Commune movement, the three entities were the commune, the brigade and the team. Since the agricultural reform initiated in the early 1980s, when the collective farming was replaced by the Household Contract Responsibility System (HCRS), the three governance entities have been changed to the township, the administrative village and the natural village (Ho, 2001).

Ownership of the rural land is vested with the collective entities at three hierarchical levels. However, how much each entity is entitled to has never been clearly delineated, and the ownership boundary of the collective is not fixed. Thus, collective land ownership is ambiguous to its nominal owners (Cai, 2003). Ambiguous collective land rights are incomplete as well. According to China’s Constitution (1954), only the state has the right to expropriate collectively-owned rural land and then allocate it to urban users.

In collective land ownership, 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 an approval from the government at the county level or above. The land development right over the rural land should be granted by the urban state. The right to alienate collective land is restricted only when the other party of transactions is the state. Villagers, as members of the collective are explicitly entitled to (1) the use right of farm land allocated to them under the HCRS with a leasehold of 30 years and the right to residual income from 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.

There are two general categories of land uses in rural China: agricultural and non-agricultural. One of the effects of the Great Leap Forward (1958–1960) was the initiation of rural industrialization where the “commune-brigade enterprises” (sheduqiyi) used local materials and laborers to support agricultural production (Byrd & Lin, 1990). Rural industries became one of the major forces improving villagers’ life and building up a local social service system. For those villages in the peri-urban areas, agricultural land is increasingly converted for industrial uses, and thus rural industrialization, even decades after the Great Leap Forward, flourishes.

Based on the Marxist ideology which considers land a means of production, instead of an asset, the right to develop land is not unambiguously assigned to the rural collective. As a matter of fact, the urban state 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.

Land shareholding cooperatives – bottom-up institutional change to clarify collective land rights

Emergence of LSCs

Agricultural lands were allocated to village households on a 15-year lease initially since the implementation of the HCRS in the early 1980s, followed by a renewed lease of 30 years in 1998. Based on the egalitarian principles embedded in collective ownership, lands were leased to village households fairly and equally in terms of quantity and quality. Nevertheless, land holdings became piece-meal and fragmented, caused by a limited land stock shared by a large number of villagers (indicated by a high population density). Frequent redistribution of lands to village households to adjust for demographic changes has prevented farmers from cultivating and making long-term investments in infrastructure. As a result, agricultural productivity has declined (Tan, Heerink, & Qu, 2006). Many villagers in Guangdong gave up tilling and sub-contracted their land lots to other households in the village, beckoned by manufacturing jobs which paid higher wages than agricultural farming. In the rural Shunde, local villagers were engaged more in the service industries (such as retailing and rental housing) than in manufacturing, as dynamic industrialization in Shunde had attracted an influx of migrant workers who needed services and housing (Guanzhou Daily, 2008/02/29).

Land sub-contracting was lawful between collective members, but legal status of the transactions was unclear until the promulgation of 1986 Land Management Law. Article 2 stated, “the right to the use of land... by the collective may be lawfully transferred”. Land sub-contracting between a collective member and a non-collective member was not allowed until the 1998 Land Management Law which declared that sub-leasing land use rights to non-members of the collective was allowed as long as two-thirds of the collective members agreed (Ho & Lin, 2003). Even though land could be sub-contracted to those who were good at farming, land fragmentation remained a critical issue which impeded efficient land utilization. While the allure of using land for non-agricultural activities increased, state-led industrialization and urbanization did not benefit rural villagers as much as expected because villages received only meager compensation from the state for the land it acquired.

Although the introduction of HCRS has facilitated the clarification of individual property rights over collective land, the egalitarian principles used in distributing and reallocating land use rights to households have caused land fragmentation in China to a large extent (Tan, Heerink and Qu, 2006). Meanwhile, urbanization in China is also a process of transforming land rights from collective ownership to state ownership. Urban governments have been the dominant actors in the conversion of rural land to urban uses during China’s rapid urbanization. All decisions were made by the upper-level government. When agricultural land is acquired for urban uses, villagers losing land via this form of eminent domain will be compensated and offered resettlement. The compensation is based on land in agricultural uses, as land owned by the collective is for farming only. Cai (2003) argues that conflicts often occur in farmland acquisition because under-compensated peasants are weak. Due to the strong top-down management, in the land acquisition process, peasants can only take ex post action. Compared with ex post action, ex ante action is more effective in the
protected of peasant interests. One method is to prevent the local government from taking away their land by adopting the land share-holding system. Land re-collectivisation was called upon, and Land Share-holding Cooperatives (LSCs) emerged in Nanhai in 1992 (Po, 2008).

Being in the forefront of economic reforms, the Pearl River Delta region was conferred autonomy for experimenting with new land use ideas and measures. In the spirit of promoting rural industrialization, the Guangdong provincial government endorsed the initiative of land share-holding cooperatives. By pooling the village land together, the new organization makes large-scale farming and non-farming activities possible, and binds the interests of villagers together (Cai, 2003).

Operating mechanism of LSCs

The operation of LSCs requires two key steps: the first is called “Hezi”, which means assessment of the value of collective assets such as collective land and buildings owned by the collective. The second step is to make clear the individual’s property rights with respect to collective assets. ‘Quequan’ literally means clarification of property rights (Po, 2008). The cooperatives need to make policies to decide who are qualified to be shareholders in the village and how to allocate the shares. LSC dividends will be distributed according to the structure of shareholding. LSCs provide social welfare and social security as well. Moreover, the institutional arrangement of LSCs has multiple objectives. The shareholding is composed of collective shares and individual shares, and the dividends of collective shares are used for public projects, such as construction of roads and parks (Jiang & Liu, 2004).

After the completion of “Hezi” and ‘Quequan’, LSCs assemble land from individual households, and prepare land use plans which designate the boundary of farmland, non-agricultural land and industrial patches. Then LSCs build roads and infrastructure facilities such as water pipes, sewer pipes, gas, and other public facilities based on the plan. After centralizing the management of land resources, the cooperatives lease the land out through auction; collect land rents and other fees; manage land asset investment; and distribute dividends to the shareholders.

Political and economic power restructuring with the establishment of LSCs

The process of pooling fragmented land resources by the land shareholding cooperative is not simply an administrative procedure, but a process of reconfiguring property rights over collective land and reaching consensus on share allocation. It was also a bottom-up initiative for the collectives to assert their rights over village land, as collective land rights had been ambiguous and incomplete (Zhu & Hu, 2009).

Under the HCRS, collective land is subcontracted to village households, and the households thus own contract and management rights over the collective land. Under the LSC system, contract and management rights are separated: villagers still own contract rights, but the management rights are transferred to LSCs. Villagers can claim income from the economic activities by LSCs. In other words, LSCs have been based on the gathering of contract rights of farmers as stock. Meanwhile villagers can monitor the operation of the LSC to ensure its operation is in their interests, and thus they maintain de facto ownership over collective land.

Through the establishment of LSCs, villagers have gained more bargaining power in the cases of land acquisition. LSCs take ex ante action through making land use plans. Since there are land rent differentials between land in agricultural uses and land in urban uses, the gap between the potential land rent and actual land rent capitalized under present land use constitutes the land rent differential. Bearing resentment against deprivation of land development rights, rural collectives have launched covert operations, in defiance of the urban state, to take hold of those rights. They designate land for different uses: industrial development, commercial use, housing and farming (Jiang & Liu, 2004). As a result, when the local government acquires land, it has to negotiate with LSCs, instead of individual villagers. Because LSCs can easily mobilize the entire village and obtain strong support, the local government has to pay reasonable compensation to acquire the land (Cai, 2003). With the adoption of this system, the conflicts between villagers and local governments in the land acquisition process have diminished in these places.

Ambiguous and incomplete property rights over rural land help to generate a land development market where covert and disorderly competition for land rent differentials prevails. This disorderly competition is evidenced by ubiquitous informal land developments. In the name of promoting local growth, these informal land development projects are carried out under the guise of land development for lawful owner-occupation. However, the real motivation for these land development deals is to capture the land rent differentials, thus, enriching local revenues. Development becomes a pre-emptive measure against potential rent-taking by other joint nominal owners, resulting in land development for the sake of rent-taking under the guise of land development for the economic growth of townships and villages.

Distribution of LSCs in the rural China

Only after their introduction in Guangdong, LSCs have witnessed rapid growth in rural China. Fig. 1 shows the distribution of LSCs in China. We can see that most LSCs have been established in the three major economic regions of China: Yangtze River Delta (YRD), Pearl River Delta (PRD), and Bohai Rim. In Jiangsu Province of YRD, for example, by the end of 2009, 1130 LSCs had been established. While in Suzhou City alone, more than 290,000 households and land of 700,000 Mu were involved in 577 LSCs (Sun, Luo, & Zhao, 2010). In the other province of YRD, Zhejiang Province, by the end of October 2005, there were 502 villages that applied the shareholding co-operative system, in which RMB14.93 billion assets, and 535 thousand members were involved. In the PRD, LSCs were first set up in Foshan City, where 2957 shareholding co-operatives had been established by the end of 2007. The land area involved in this system accounts for 97.73% of the total areas of land transfer (Zhao et al., 2009). In spite of the lack of statistics data, LSCs have been widely adopted in other cities of PRD, such as Dongguan, Zhuhai and Shenzhen city. In the Bohai Rim, the
application of LSCs is not as wide as in the coastal area, but there are some examples of suburban Beijing, Liaozhong County of Liaoning province, Weifang and Penglai city of Shandong province. Except for the three major economic regions, LSCs have been also established in some areas of Fujian province, such as Sha County. Looking at the areas where LSCs are adopted, we can find that they have something in common: (1) non-agricultural industry has been developed, and most farmers are no longer engaged in farming; (2) the collective economy has been fairly strong so that it can assemble land from individual farmers and invest in improvement of land; (3) the cadre leaders have been competent enough to manage the LSCs.

Land shareholding cooperatives and their impact on non-agricultural land use: a case of Shunde

Study area

Shunde is located in one of the most prosperous areas in China—the Pearl River Delta (PRD), to the east of Guangzhou, the center city of southern China (Fig. 2). It covers a land area of 806 km², and the population reached 2.46 million in 2010. It was annexed to Foshan municipality in 2003, becoming one of its districts (Fig. 3).

Owing to its proximity to Guangzhou and Hong Kong, the economy of Shunde has been vibrant since the economic reform. Its GDP has grown 465 fold from 1978 to 2011,¹ and it was ranked the first from 2000 to 2003 among 100 top counties in terms of economic strength.² Within the boundary of Shunde, there are ten townships and 198 administrative villages (Fig. 4).

In 1993, the Shunde government issued “Policies on Establishment of Village Share-holding Cooperatives” (Tongji University, 2010). After these policies were implemented, more than 2000 production teams were merged into 199 brigades to set up LSCs. By 2008, 261 land shareholding cooperatives have been established in the rural Shunde.

Data source and research methods

The land use data are taken from the historical Landsat TM images of Shunde in 1985, 1995, and 2005 (see Fig.5), and the more detailed and accurate land use data are derived from the land use maps of 2002 and 2009. Landsat TM data include different land use types such as farmland, forested land, water area, urban settlements, rural settlements, and isolated land for industry, mining, and transportation, but urban settlements or rural settlements cannot be differentiated into residential, industry, commercial and office land use etc. The land use maps provide more detailed information about non-agricultural land uses. Through the pixel-to-pixel comparison of remote sensing maps, we can detect the changes of non-agricultural land use in the rural Shunde during different time periods, and thus outline a picture of land use change in Shunde over last more than twenty years. Meanwhile, through overlapping the land use maps in 2002 and 2009, we apply some landscape indices, such as number of patches, average area

¹ Source: Shunde Statistics Bureau.
² Source: China Statistics Yearbook. After 2003, Shunde became a district of Foshan city, and was no longer a county.
per patch, shape index, landscape fragmentation index, to examine the characteristics of non-agricultural land use change in the rural area, namely, rural residential land and industrial land. Moreover, the social and economic data, especially the data of LSCs, are collected from the Shunde Statistics Yearbook and Shunde Rural Development Committee to explain their influence on the land use change.

Land use change characteristics in Shunde

Sprawl of non-agricultural land in Shunde

Over twenty years, the total amount of non-agricultural land grew from 8988.7 ha in 1985 to 26528.6 ha in 2005. Both urban and rural settlements have expanded at the same speed (see Table 1). Table 1 shows that non-agricultural land grew slowly from 1995 to 2000, but grew quickly from 1985 to 1995 and 2000 to 2005. This is due to the influence of the 1997 Asian Financial Crisis and a moratorium of the central government on land supply for profitable developments in 1997.3

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban settlement</td>
<td>2374.7</td>
<td>4434.6</td>
<td>4260.6</td>
<td>7157.5</td>
</tr>
<tr>
<td>Rural settlement</td>
<td>5861.5</td>
<td>9017.9</td>
<td>11,402</td>
<td>17658.4</td>
</tr>
<tr>
<td>Othersa</td>
<td>752.5</td>
<td>2576.7</td>
<td>952.3</td>
<td>1712.7</td>
</tr>
<tr>
<td>Total</td>
<td>8988.7</td>
<td>16029.3</td>
<td>16614.9</td>
<td>26528.6</td>
</tr>
</tbody>
</table>

a Others mean land for isolated manufacturing land and infrastructure land.

Changes of land use in Shunde, 1985–2005

The accelerating urbanization process may increase the structural complexity of land use (Jenerette & Wu, 2001). Table 2 presents that cultivated land, forested land and grassland decreased by 64%, 16.6%, and 2.0%, respectively, from 1985 to 1995. During the same period, land for urban settlement, rural settlement, water area and other construction land increased by 86.7%, 53.8%, 21.4%, 242.4%, respectively. The rapid growth of non-agricultural land has been mainly at the cost of loss of cultivated land and forested land, and the growth of water area is due to the increase of fishing ponds.4 This trend changed to some extent from 1995 to 2005. Due to the strict control of farmland protection and the program of farmland reclamation, the cultivated land and forested land increased by 11.5% and 4%. Rural settlement grew most quickly by 95.8%, and this is mainly because that the rural industrialization exploded and the land for factories increased substantially.


The fishing industry used to be a major part of agricultural business of Shunde during the period of 1985–1995.
Urban settlement also increased by 46.5%. Meanwhile, grassland, water area, and other construction land decreased by 56.6%, 87.8%, and 33.5%, respectively. During this period, the land use change has been characterized by the replacement of grassland, water area with urban settlement and rural settlement. Much grassland and many fishing ponds disappeared since their role in economic growth has been weakened dramatically and the expansion of urban settlement and rural settlement requires much land. The decrease of other construction land, however, is due to the sprawl of urban settlement, which connects the isolated land with the established urban area.

In order to further understand the characteristics in land use changes, we use several landscape ecological indices (see Table 3) to measure the degree of fragmentation of urban settlement, rural residential land, and rural industrial land, by overlapping the land use maps of 2002 and 2009 (see Fig. 6). The results have shown that the number of patches of urban settlement and rural residential land decreased, and the sizes of minimum area and average area of patches increased. The land use shape index of urban settlement became closer to 1, and that of rural residential land just changed slightly. Therefore, urban settlements and rural residential sites have been consolidated, and this is mainly due to accelerating urbanization and city expansion. However, industrial land holding has become more fragmented over the period. The number of industrial land patches increased from 480 to 697, while the minimum area of patch decreased from 94 sqm to 50 sqm. Meanwhile, the total area of rural industrial land increased by 89% over the period from 2002 to 2009, much higher than the growth rates of 27% for urban settlements and 33% for rural residential land over the same period. The expansion and fragmentation of rural industrial land have been mostly caused by the village-based rural development facilitated by the LSCs.

### Impacts of LSCs on non-agricultural land use in Shunde

**Rural industrialization facilitated by LSCs**

With accelerated industrialization in the rural areas, the major industry of the rural economy has shifted from farming to manufacturing in Shunde. From 1978 to 2011, the share of agriculture in GDP decreased from 36.8% to 1.7%, while the share of manufacturing in GDP increased from 44.9% to 61.0% (Shunde Statistics Yearbook, 2012). Although the service industry has been growing, manufacturing has remained its dominant position in the economic structure. Table 4 shows the income of LSCs in

### Table 3

Change of land use patches of Shunde in 2002 and 2009.

<table>
<thead>
<tr>
<th>Land use type</th>
<th>Number of patches</th>
<th>Average area (m²)</th>
<th>Minimum area (m²)</th>
<th>Maximum area (m²)</th>
<th>Total area (1000 m²)</th>
<th>Landscape shape index</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL</td>
<td>626</td>
<td>27022</td>
<td>140</td>
<td>245,655</td>
<td>10</td>
<td>15.5</td>
</tr>
<tr>
<td>GL</td>
<td>64.5</td>
<td>48.7</td>
<td>54.9</td>
<td>40,824.4</td>
<td>1</td>
<td>24.6</td>
</tr>
<tr>
<td>WA</td>
<td>19,298</td>
<td>113.1</td>
<td>1,248</td>
<td>921.3</td>
<td>24</td>
<td>347.7</td>
</tr>
<tr>
<td>US</td>
<td>2844.3</td>
<td>143.6</td>
<td>1,542.9</td>
<td>484.7</td>
<td>1</td>
<td>2913.7</td>
</tr>
<tr>
<td>RL</td>
<td>612.1</td>
<td>216.3</td>
<td>783.6</td>
<td>303.5</td>
<td>24</td>
<td>203.7</td>
</tr>
<tr>
<td>OC</td>
<td>24735.3</td>
<td>4237.6</td>
<td>43791.8</td>
<td>2374.7</td>
<td>175</td>
<td>5861.5</td>
</tr>
<tr>
<td>Change in 2005</td>
<td>64.0%</td>
<td>-16.6%</td>
<td>-2.0%</td>
<td>21.4%</td>
<td>86.7%</td>
<td>53.8%</td>
</tr>
</tbody>
</table>

### Note

- CL = Cultivated land; FL = Forested land; GL = Grass land; WA = Water area; US = Urban settlement; RS = Rural settlement; OC = Other construction land such as isolated manufacturing and mining land.

(see Table 3). Urban settlement also increased by 46.5%. Meanwhile, grassland, water area, and other construction land decreased by 56.6%, 87.8%, and 33.5%, respectively. During this period, the land use change has been characterized by the replacement of grassland, water area with urban settlement and rural settlement. Much grassland and many fishing ponds disappeared since their role in economic growth has been weakened dramatically and the expansion of urban settlement and rural settlement requires much land. The decrease of other construction land, however, is due to the sprawl of urban settlement, which connects the isolated land with the established urban area.

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2008, and we can see that the income from land renting and subcontracting took the share of more than 80% of total income of LSCs in Shunde. 66.8% of the collective income was distributed to farmers as dividends, and 16.1% was retained by the collectives as public expenditure, such as village security, and land consolidation etc.

In China, since the early 2000s, the central government has issued a policy called “Township-Budget-Supervised-By-County” (TBSC), which gradually abolishes township level of budget in order to limit the fiscal autonomy of township governments originated from the decentralized policy in the mid-1980s (Hou & Yang, 2008). It has been argued that the TBSC policy, on the one hand, can help reduce the income disparity among different regions, and alleviate the problems caused by the weak management capability of township government; on the other hand, the bottom-up initiatives of townships and villages have been seriously discouraged, which adversely affects rural development. In Shunde, however, LSCs have provided extra-budgetary income for local

Fig. 6. Land use of Shunde in 2002 and 2009.
collectives and villagers. Extensive interviews with 10 townships in Shunde and other townships without LSCs in other provinces have shown that a strong collective economy is absolutely necessary for rural industrialization and development. LSCs have played an important role in facilitating rural industrialization in Shunde.

Village-based development induced by village-based cooperatives

In order to achieve the goal of economic growth, each administrative village sets up one or more land cooperatives to manage land pooling and land use. Through the establishment of LSCs, farmland and non-agricultural lands have now concentrated in the hands of village economic organizations. Table 5 compares the numbers of administrative villages, land share-holding cooperatives and industrial zones in Shunde. In general, nearly all administrative villages have their own LSCs, and most cooperatives have set up their own industrial zones (see Fig. 7). There are exceptions in Daliang and Junan. Daliang’s economy is of the service industry, and the number of industrial zones there is much less than that of land cooperatives. Junan is located in the south end of Shunde, an inferior location. This area is not easily accessible, and for this reason it has been shunned by investors and manufacturers. Since its manufacturing industry is not developed, the number of industrial zones is less than that of land cooperatives.

In order to understand the impact of LSCs on land development in Shunde, we investigated three administrative villages in Xingtan township: Lvdi, Guanghua and Nanhua (see Fig. 8), which represent two different types of LSCs: LSCs in Guanghua and Lvdi are based on administrative village (hereafter administrative cooperative), and the LSC in Nanhua is based on natural villages (hereafter natural cooperative).

Lvdi is located on the periphery of central area of Xingtan township, and established its shareholding cooperative (including 6 brigades) in 1998. At the beginning of establishment, the land originally owned by the natural village collective was calculated as shares. Cash or property could also be calculated as shares of the cooperatives. With the urban expansion, around 1/3 of land

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**Table 4**


<table>
<thead>
<tr>
<th>Township</th>
<th>Income (1000 Yuan)</th>
<th>Source of income (percentage in income)</th>
<th>Income distribution (percentage in income)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daliang</td>
<td>4800.5</td>
<td>Land rent (%) 66.03, Subcontracting (%) 25.53, Others (%) 8.44</td>
<td>Cost (%) 17.7, Retained by collective (%) 16.4, Bonus of farmer (%) 65.9</td>
</tr>
<tr>
<td>Ronggui</td>
<td>150407.5</td>
<td>75.33, 18.81, 5.86</td>
<td>35.3, 12.6, 52.1</td>
</tr>
<tr>
<td>Lunijiao</td>
<td>88793.8</td>
<td>14.28, 69.84, 15.88</td>
<td>13.1, 15.1, 71.8</td>
</tr>
<tr>
<td>Beijiao</td>
<td>141240.6</td>
<td>8.15, 79.79, 12.06</td>
<td>10.6, 13, 76.4</td>
</tr>
<tr>
<td>Chengcun</td>
<td>75,050</td>
<td>16.24, 76.68, 7.08</td>
<td>16, 22.1, 61.9</td>
</tr>
<tr>
<td>Lecong</td>
<td>303,306.2</td>
<td>57.92, 10.51, 31.57</td>
<td>11.2, 12, 76.8</td>
</tr>
<tr>
<td>Longjiang</td>
<td>108,062.4</td>
<td>52.79, 33.29, 13.92</td>
<td>21.4, 15.2, 63.4</td>
</tr>
<tr>
<td>Leliu</td>
<td>120,528.8</td>
<td>15.72, 59.39, 24.89</td>
<td>17.2, 21.6, 61.2</td>
</tr>
<tr>
<td>Xingtian</td>
<td>92,262.6</td>
<td>22.73, 65.10, 12.17</td>
<td>15.6, 14.9, 69.5</td>
</tr>
<tr>
<td>Junan</td>
<td>61,502</td>
<td>8.52, 47.15, 44.33</td>
<td>17.3, 39.8, 42.9</td>
</tr>
<tr>
<td>Total</td>
<td>1191,159.4</td>
<td>38.72, 42.08, 19.2</td>
<td>17.1, 16.1, 66.8</td>
</tr>
</tbody>
</table>

* Others mean income from investment and other sources.

**Table 5**

Number of administrative villages, land cooperatives and industrial zones in 10 townships. Source: Shunde district government.

<table>
<thead>
<tr>
<th>Township</th>
<th>Number of administrative village</th>
<th>Number of land cooperatives</th>
<th>Number of industrial zones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daliang</td>
<td>20</td>
<td>19</td>
<td>5</td>
</tr>
<tr>
<td>Ronggui</td>
<td>26</td>
<td>48</td>
<td>44</td>
</tr>
<tr>
<td>Lunijiao</td>
<td>10</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Beijiao</td>
<td>18</td>
<td>20</td>
<td>23</td>
</tr>
<tr>
<td>Chengcun</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Lecong</td>
<td>23</td>
<td>26</td>
<td>52</td>
</tr>
<tr>
<td>Longjiang</td>
<td>22</td>
<td>27</td>
<td>46</td>
</tr>
<tr>
<td>Leliu</td>
<td>22</td>
<td>45</td>
<td>24</td>
</tr>
<tr>
<td>Xingtian</td>
<td>30</td>
<td>32</td>
<td>34</td>
</tr>
<tr>
<td>Junan</td>
<td>13</td>
<td>18</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>199</td>
<td>261</td>
<td>269</td>
</tr>
</tbody>
</table>

owned by the cooperative has been acquired by the municipal government, and now the cooperative owns 70 ha of land, among which 37 ha is utilized for industrial and commercial use, and 33 ha is for agricultural use.

Guanghua established its village cooperative in 1998, and its locational advantage lies in its transportation accessibility to two highways. Much land is rented out to outside enterprises, and 76% of cooperative income was from land rents in 2008. The cooperative also leased land on an annual base, with the contract renewed every five years. The cooperative provided land, and the tenants built their own factory buildings.

Nanhua has 9 natural villages, and it did not set up a LSC at the administrative village level, but formed 9 natural village cooperatives. The main economic activity of Nanhua is agriculture, and the income varies significantly from village to village, depending on the amount of land owned by the natural village. The highest yearly dividend reached 800 Yuan/person, and the lowest one is only 20 Yuan/person.

---

Table 6

<table>
<thead>
<tr>
<th>Source: Shunde district government.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lvdi</td>
</tr>
<tr>
<td>Income of cooperative (1000 Yuan)</td>
</tr>
<tr>
<td>Among</td>
</tr>
<tr>
<td>Income from management * (1000 Yuan)</td>
</tr>
<tr>
<td>Land rent (1000 Yuan)</td>
</tr>
<tr>
<td>Income from subcontracting (1000 Yuan)</td>
</tr>
<tr>
<td>others (1000 Yuan)</td>
</tr>
<tr>
<td>Retained by the collective</td>
</tr>
<tr>
<td>Dividend of farmers (1000 Yuan)</td>
</tr>
<tr>
<td>Dividend per farmer (Yuan)</td>
</tr>
</tbody>
</table>

Note: Income from administration fee and rent of collectively-owned property.

---

According to interview with local cadres, the collective economy was not strong enough to assemble land at the administrative village level in the middle 1990s and the village leaders gave up setting up administrative village cooperative.
Table 6 compares the income and dividends to villagers in these three villages, and it shows that compared with the natural village cooperatives, the administrative village cooperatives have stronger capability to consolidate the land, adjust land use, improve the efficiency of land use, and thus could earn more from land rents. We can also see from Fig. 6 that the land use in Nanhua village is more fragmented.

Overall, village-based land cooperatives have provided local officials with a strong tool to attract outside investors in labor-intensive manufacturing and other industries. The result has been a growth of industries and a rise in disorganized village-based expansion of non-agricultural land and particularly industrial land. A fragmented governance regime based on different levels (from township to administrative cooperative to natural cooperative) has been actively seeking for profits from land without hierarchical coordination, leading to sprawl and fragmentation of non-agricultural land. Decentralized profit-making activities and the lack of macro control have resulted in the unique landscape labeled as “Factories in every village, workshop in every family” (Cuncun dianhua, jiajia maoyuan) in the PRD, which then caused the serious environmental pollution and low-efficient land use.

Conclusions

The evolution of shareholding reform provides a detailed account of the mechanism by which social actors can pursue their interest in reforming China (Cai, 2003). While the double track land use and management system has been regarded as a top-down institution in the rural regions, LSCs have been widely acknowledged as a bottom-up institutional innovation in clarifying the ambiguous property rights over collective land and protecting the interests of collectives and villagers. Through pooling the fragmentally-held land plots, LSCs provide the possibility of scale farming and industrial development, and thus contributed to the industrialization process on a basis of low cost in the PRD (Jiang & Liu, 2004). Therefore, bottom-up local experiments are critical for the progress of the gradual, evolutionary reform that continues to reshape China's economy and society in rural region. However, motivated by profit maximization from land leasing, these cooperatives have been actively seeking land rents from non-agricultural uses. Fragmentation of governance, from township to various cooperatives, has led to fragmentation of land use and loss of cultivated land in the PRD. In this sense, the introduction of LSCs has been a two-edged sword.

While more and more regions introduced the LSCs into the rural area, this institutional reform has gained the support from the central government.7 We can anticipate that with the development of industrialization and urbanization, the land shareholding cooperative system will become more popular, especially in the rural areas where the non-agricultural industries have been growing fast. Nevertheless, the form of LSCs matters. Township-based LSCs, administrative village cooperatives or natural village cooperatives have different impacts on land use. The experience of Shunde has shown that the village-based LSCs induce fragmented land development. Compared with Shunde, the township-based LSCs in Jiangsu and Zhejiang province where government control is more stringent have brought much less fragmented land development (Xie, 2002). Viable solutions to these problems will most likely not be found completely in either top-down nor bottom-up approaches in peri-urban China (Leaf, 2002). Instead, solutions will be derived from the negotiated relationship between and a combination of the two. A comparative study on the impacts of complexity and variety of LSCs on land use in China, therefore, has important policy implications for sustainable land use in the rural China, worthy of future intensive and extensive research.

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