Transformation and upgrading of old industrial zones on collective land: Empirical study on revitalization in Nanshan

Mingmin Pan, Hongyang Song*

College of Art and Design, Shenzhen University, Shenzhen, China

A R T I C L E   I N F O

Article history:
Received 5 November 2016
Received in revised form 19 April 2017
Accepted 24 April 2017
Available online 4 May 2017

Keywords:
Old industrial zones
Revitalization
Policy evaluation
Urban regeneration
Industry cluster
Transformation

A B S T R A C T

To advance industrial upgrading, the Government of Shenzhen Nanshan District constantly loosens restrictions and offers more funding for revitalization, creating incentives for village shareholding corporations (VSCs) to revitalize old industrial zones. Focusing on the transformation and upgrading of old industrial zones on collective land based on the case study of Longjing Industrial Zone, this paper investigates the implementation and effectiveness of the new revitalization policies. First of all, by comparing the industrial zone before and after the revitalization, the results of the revitalization are summed up: the renovation of physical environment and infrastructure, the professionalization of operational models, the diversification of enterprise composition, and the demographic change (the move-in of more high-income white-collar workers). Then, the performance of the revitalization is assessed in the aspects of industry cluster and social costs, and the limitation of the transformation and upgrading of industrial zones is identified. In comparison to government-led revitalization projects, based on the analysis of the motives and actions of the stakeholders (district government, VSCs, industrial park operators [IPOs] and tenant enterprises), three underlying factors that exert negative impact on the effectiveness of revitalization have been found: 1) formalistic industry planning; 2) recruiting enterprises with loose restrictions; and 3) imperfect regulation, supervision and final acceptance standards. Finally, based on the above-mentioned limitations and underlying reasons, the paper proposes suggestions on improving the revitalization of old industrial zones.

1. Introduction

Industrial zones¹ play an important role in the economic development of China (Yan, 2016a, 2016b; Altrock & Schoon, 2014). Having been through rapid industrialization and urbanization since reform and opening up, China has reached the stage where industrial upgrading is needed to achieve sustainable economic growth, that is, to replace labor-intensive manufacturing and low value-added industries with knowledge-based and higher value-added industries (Cheong & Wu, 2014; Lin, 2007; Ye, 2009). As a result, transformation and upgrading of industrial zones is needed due to the restructuring of the Chinese economy and industrial upgrading (Ye, 2011; Lai, Peng, Li & Lin, 2014; Ye, 2010). Shenzhen, the first special economic zone of China and a model city for research on urbanization and urban regeneration in China, is confronted with sharp contradiction between the extreme scarcity of space needed for industrial upgrading and the inefficient use of massive industrial space (Wei & Cong, 2005; Yan & Zhou, 2015; Altrock & Schoon, 2014). The Municipal Government of Shenzhen and the governments of districts in Shenzhen have respectively introduced a series of policies on the revitalization of old industrial zones.

Due to China’s urban-rural dual land system,² compared with

http://dx.doi.org/10.1016/j.habitatint.2017.04.014
0197-3975/© 2017 Elsevier Ltd. All rights reserved.

* Corresponding author.
E-mail addresses: mingminpan@foxmail.com (M. Pan), songhongyang@szu.edu.cn (H. Song).

¹ An early industrial zone refers to an area on vast land with an agglomeration of several enterprises. With later and further development, various and specialized industrial zones emerged. Synonyms and types of industrial zones include industrial districts, industrial estates, industrial clusters, industrial parks, export processing zones, science and research parks, business parks, bio-technology parks and eco-industrial parks. In Shenzhen, a revitalized industrial zone will be renamed an “industrial park”. To avoid ambiguity, this paper adopts the term “industrial zone”.

² According to the Land Administration Law of the People’s Republic of China (2004 Amendment), there are two types of land ownership coexisting in the current land administration system of China, namely, state ownership and collective ownership. The state owns the urban land, while village collectives own the rural land. Urban land use rights can be transferred; however, the sales, transfer and lease for urban use of collective land are prohibited.
state-owned industrial land, the revitalization of collective industrial land presents a more complicated policy and practice issue, as the right of use of collective land is reserved by village collectives (Ding, 2007; Choy, Lai, & Lok, 2013). That is to say, the government is not an absolute leader in the revitalization of collective land and the effectiveness of policies on transformation is limited (Zhang & Li, 2011; Wu, Webster, He, & Liu, 2010; Po, 2008; Bach, 2010). With the revitalization of collective land, an increasing number of government officials and scholars have realized the transformation and upgrading of old collective industrial zones are constrained by many barriers and confronted with several dilemmas (Lai et al., 2014; Lai & Zhang, 2016; Tan & Altrock, 2016). Without the regulation of the government, these widely scattered industrial zones feature intensive labor, high pollution, extensive use of land, un-sanctioned transactions, crude and shabby buildings and environment, and faulty supporting facilities (Choy et al., 2013; Zhang & Li, 2011). On the other hand, there are no long-term investments incentives and villagers are accustomed to gaining profits by renting out factories (Lai et al., 2014). As a consequence, they are not enthusiastic about revitalization, which increases the difficulty of the revitalization of old industrial zones. Lai et al. (2014) proves that when compared with state-owned industrial land, the development and revitalization of collective industrial land are constrained from the perspective of property rights; Lai and Zhang (2016) believes that only collective industrial land with good transportation and location (close to city center) is likely to be revitalized, whereas less accessible industrial land does not really stand a chance of undergoing revitalization. Thus, the transformation and upgrading of collective industrial land present a tremendous challenge for the government and city planners amid urban regeneration.

However, although industrial zones in China have undergone massive redevelopment in recent years, a fair amount of existing research on urban regeneration focuses on urban villages and inner-city old towns; there is not adequate systematic and monographic research on the transformation of old industrial zones on collective land amid urban regeneration; particularly, there is a lack of up-to-date studies after this recent round of revitalization measures with big moves implemented in Guangdong Province since 2009 while enormous socio-economic changes have taken place during these processes (Tan & Altrock, 2016).

Therefore, this research aims at filling this gap by investigating the transformation and upgrading of old industrial zones in Nanshan, Shenzhen, evaluating the effectiveness of the new policies of revitalization and providing implications to revitalization of industrial space in other areas facing similar issues. The framework of this paper is as follows: through a brief review, it first introduces the background of the transformation of old industrial zones on collective land and identifies the research gap which this paper aims to address. Section 2 elaborates the theoretical concepts in the context of China. It then analyzes the obstacles to the revitalization of old industrial zones in Nanshan District, the content of the increasingly supportive policies on revitalization introduced by the District Government, and the overview of the revitalization projects implemented since the introduction of the policy 4 years ago. Section 4 raises specific research questions and research methods. Section 5 compares the before and after situations of the case, Longjing Industrial Zone. Next, section 6 discusses the deficiency of the revitalization of collective industrial zones, and explores the reasons for such deficiency based on the motives and actions of all stakeholders with a comparative perspective to the government-led revitalization of industrial zones. Finally, some implications of the findings are provided in the last section.

2. Theoretical background

The reuse and revitalization of brownfields, or industrial sites which are outmoded and fail to meet the contemporary requirement of the user or potential user (Ren, Shih, & McKercher, 2014), has become an important task in urban regeneration in many industrialized cities over the past decades (Dixon, 2007; Kazimierzczal, 2012; National Round Table on Environment and the Economy, 2003). Although the discourses and practices of revitalizing industrial sites vary in different places, the essence of revitalization lies in a series of integrated and comprehensive actions designed to resolve issues of regional development, promote regional sustainable development and improve regional competitiveness (Kiss, 2004; Chmielewska & Otto, 2013; Frantál et al., 2015; Loures, 2015).

Because the degraded industrial space differs enormously in history, size, character and potential, policy makers need to introduce different strategies of revitalization to suit local circumstances, and monitoring the outcomes of revitalization has been a major field of urban studies. Researchers evaluate revitalization projects and policies of industrial space from different perspectives, including urban competitiveness (e.g. Xian & Chen, 2015), industry cluster (e.g. Sellar, Emilova, Petkova-Tancheva, & McNeill, 2011), environmental sustainability (e.g. Williams & Dair, 2007; Wedding & Crawford-Brown, 2007), economic restructuring (e.g. Hudalah & Firman, 2012; Kiss, 2007), creative class and creative cities (e.g. Evans, 2009), socio-cultural conditions (e.g. Chan, Cheung, & Wong, 2015), gentrification (e.g. Bryson, 2012; Lees, 2003), public participation (e.g. Li, Hong, Wang, Liu, & Li, 2016) and so on (e.g. Tang & Ho, 2014).

In China, old industrial zones do not have to be “old” in physical terms, yet they are those whose utilization of land and industrial output fails to meet the needs of regional development and economic performance (Shenzhen Municipal Government, 2009). The transformation and upgrading of old industrial zones involve 3 aspects: 1) physical renovation – the transformation (refurbish, reconstruction, etc.) of original industrial space; 2) economic redevelopment (e.g. industrial upgrading, the introduction of new functions); 3) social changes – behind the revitalization of old industrial space is the competition and alternation of different social forces, e.g. changes in demographic structures, relationship between stakeholders, and their say and gained interests (Yan, 2016b). Apparently, the ultimate objective of revitalization is more about economic growth.

3. Nanshan District: old industrial zones on collective land & increasingly supportive policies on revitalization

Nanshan serves as a significant base and cluster for the innovative and high-tech industry of Shenzhen. It is proposed in Nanshan Districts’ outline of the 13th Five-Year Plan (Nanshan District Government, 2016) that Nanshan will be built into an international innovation district by 2020 by means of industrial upgrading. Based on the statistics published by Nanshan District Government in 2007, there are 46 village-owned collective industrial zones in Nanshan, covering an area of 4.08 km², accounting for 24.7% of Nanshan’s total industrial land. “Low-tech foreign capital + cheap migrant labor + cheap collective land” is still the production model of collective industrial land; most tenant enterprises in such industrial zones are traditional processors of hardware, electronics, clothing, etc.; the annual output values are low and the annual rent

---

1 The notion of “brownfield” refers to underused, abandoned, derelict and often contaminated lands and premises.
ranges from 10 through 25 yuan/m² (Nanshan District Government, 2007). The backward production model and industrial structure of collective industrial zones fail to meet the requirements of Nanshan’s industrial upgrading; thus, advancing transformation of collective industrial zones, eliminating low-end manufacturers and processors, and reserving industrial space for high-tech R&D enterprises, will become the emphases of district government in the process of urban regeneration (Nanshan District Government, 2013).

3.1. Obstacles to transformation & upgrading of old industrial zones on collective land

3.1.1. Numerous unauthorized buildings & complex, tangled ownership

According to the report on collective industrial zones of Nanshan (2007), land with legitimate approval and authorization only takes up an area of 0.818 km². Collectively-owned industrial zones involve informal transactions that are not authorized by the state and underwent multiple times of property rights division and transfer, which formed a landscape featuring numerous proprietors and scattered ownerships (Yan, 2016a; Lai & Zhang, 2016). Different proprietors’ willingness and expectations for revitalization are not the same, causing heavy workload for coordinators. Additionally, due to a lack of governmental supervision and driven by profits, villagers have built numerous illegal buildings and altered land use without authorization (Song, Pan, & Chen, 2016). Therefore, in the negotiations of demolition and relocation, revitalization is severely hampered by incomplete and obscure ownership of land and buildings, numerous unauthorized buildings, and illegal occupation of land (Wang, 2011).

3.1.2. Small-scale land use & widely, chaotically scattered industrial zones

The average size of each old industrial zone in Nanshan District is 8.9 ha; 26 out of all 46 old industrial zones, accounting for 57%, are smaller than 5 ha (Ge, Qiu, Wang, & Fan, 2013). The small scale of land use makes it difficult to economically deploy municipal infrastructure and public service facilities in such industrial zones. Moreover, the 46 zones are scattered in every corner of Nanshan District and most of them are located in urban villages, making it more difficult to bring out the industry cluster effect (Hao, Geertman, Hooimeijer, & Sliuzas, 2012).

3.1.3. High costs of revitalization

Of all factories in the old industrial zones, those above 20 years old account for 27% and those above 15 and under 20 years old account for 45%; they have generally been run-down in disrepair (Nanshan District Government, 2007). Additionally, the existing infrastructure in these industrial zones are faulty – fire-prevention facilities are absent and water and power supply facilities are aging (Ge et al., 2013). Revitalization inevitably involves the overhaul of infrastructure including water supply, power supply, pipes and sewer networks and thus calls for big investment, which poses a challenge for corporations in poor financial conditions.

3.1.4. Great social costs

Most enterprises in the old industrial zones are labor intensive with massive employees. There are approximately 88 thousand employers working and 51 thousand people living in the industrial zones respectively (Nanshan District Government, 2007). Based on the research group’s field observations, some proprietors alter the use of buildings without authorization, making the old factories incorporate production, storage, business operation and accommodation. Nevertheless, these old factories concern the accommodation and employment of numerous migrant workers. Therefore, accommodating the interests of these migrant workers signifies bearing tremendous social costs during the relocation of original enterprises.

3.1.5. Proprietors’ weak willingness for revitalization

In early 2013, the research group attended a seminar with representatives from VSCs in Nanshan and surveyed them for their willingness for revitalization and reasons behind that. The research group randomly selected 18 proprietors for semi-structured interviews, where only 5 of them clearly expressed willingness for revitalization while others said they had no intention or that they were taking a wait-and-see attitude. There are mainly 4 reasons for their weak willingness for revitalization. Firstly, some proprietors think the government’s funding for the revitalization is not plentiful, and some believe the profits which they will gain “will not increase very much”. Secondly, some old industrial zones are lacking in sufficient operating funds to revitalize the zones by themselves. Thirdly, as mentioned in section 3.1.3, some property rights remain unclear, or the proprietors do not want the government to discover their unsanctioned buildings. Fourthly, many proprietors say “the government has introduced too many policies and the revitalization-application formalities are too numerous and cumbersome”. Some proprietors say that some policies are tangled and intertwined so it is difficult for them to make sense of them – for example, Measures on Urban Renewal of Shenzhen City and Implementation Rules of Nanshan District on Accelerating the Implementation of the Upgrading & Revitalization of Old Industrial Zones (Interim) are inconsistent in stipulations on the application for revitalization; some say that new policies are introduced quite often so they find it difficult to make final decisions; others complain about the numerous and cumbersome revitalization-application procedures – it took some corporations almost two years to go through all formalities for the application for revitalization.

3.2. Policies of Nanshan District on revitalization of old industrial zones

Confronted with barriers to the revitalization of old industrial zones, Nanshan District Government has successively introduced a series of policies to encourage VSCs and other social resources to implement revitalization. The policies introduced in 2008 and 2009 received a cold response from the corporations, causing the deadlock in revitalization. To break the deadlock, the District Government introduced the “One Sub-district, One Industrial Zone” policy in 2013, further loosening restrictions and increasing funding. As we can see from Table 1, 1) restrictions on revitalizing organizations have been loosened; the “One Sub-district, One Industrial Zone” policy is not only applicable to VSCs – the policy also allows IPOs4 and property developers to apply for funding projects, and allows multi-lateral cooperation; 2) the objectives of and guidance on revitalization have moved from being general to presenting more specific and targeted revitalizing strategies for each industrial zone, including spatial transformation and industry planning; 3) the government has scaled up support for revitalization; it does not
only finance the spatial design, planning and the construction of revitalization, but also funds the supporting services, operation and management of industrial zones (Nanshan District Government, 2013).

With soaring supportive funding, the “One Sub-district, One Industrial Zone” policy was well-received and responded by many proprietors of old industrial zones. So far, 15 old industrial zones have been approved by the government for revitalization, among which 13 have been revitalized (Fig. 1).

4. Research methods

As for the 15 revitalized industrial zones mentioned in Section 3, have they truly been transformed and upgraded? What are the intended and unintended consequences of the “One Sub-district, One Industrial Zone” policy? During the process of the revitalization, what are the stakeholders’ intentions and actions? What are the underlying factors which influence the performance of revitalization on industrial zones? What role should governments play to fulfill the goals of industrial upgrading and address the interests of different stakeholders? To address these specific questions, the following sections will open up discussions with the case study of Longjing Industrial Zone, which is a representative case among the “One Sub-district, One Industrial Zone” projects and a revitalization project which the research group took part in during the whole course.

4.1. Participant observation

Participant observation is applicable to research topics which are not easy to look into with a quantitative method. Researchers can directly observe and experience a social phenomenon and thus, they have more in-depth and comprehensive knowledge of it (Babbie, 1998). As observation takes place in natural situations, researchers can collect most abundant and vivid information (Wimmer & Dominick, 2002).

The research group participated entirely in and completed revitalization projects of several industrial zones in Shenzhen. During the entire process of revitalization, we, as designers, have dealt with all stakeholders and we have obtained the first-hand information necessary for our research. Such insights and data gather are indispensable for the current study as policymakers and local government administrators are the key actors in revitalization. Also, according to our observations and personal experience, we think that in the current case, there are still some rooms for improvement.

Table 1

<table>
<thead>
<tr>
<th>Year</th>
<th>Revitalizing organization(s)</th>
<th>Objectives of &amp; guidance on revitalization</th>
<th>Supportive policies/Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>VSCs</td>
<td>The revitalization of the following four types of old industrial zones is encouraged: industrial zones 1) not in line with modern industrial development; 2) fail to meet the requirements of safe production and environmental protection; 3) with low floor area ratio and low land utilization ratio; 4) with unreasonable internal planning, faulty infrastructure and of poor construction quality. Central priority is given to transforming old factories into R&amp;D offices.</td>
<td>1) The government subsidizes the overhaul of some municipal infrastructure; 2) After the partial reconstruction or total reconstruction of an industrial zone, if the revitalized building area is larger than the original area, the land premium of the added area will only be half the current land price; 3) A proper increase on land for producer services in revitalized industrial zones (e.g. land for logistics, information and intermediary services, and public canteens) is allowed.</td>
</tr>
<tr>
<td>2009</td>
<td>VSCs</td>
<td>The following types of enterprises are to be relocated: enterprises 1) not in line with the industry planning and development of Nanshan; 2) highly polluting; 3) labor intensive; 4) with low added value. Enterprises that are in line with the requirements of Nanshan's industry planning and development are welcomed.</td>
<td>1) The government pays the penalties for breach of contract induced by the relocation of low-grade enterprises and compensates for the rental losses during revitalization; 2) The government subsidizes the expenditure for professional research (i.e. spatial planning and design); 3) The government finances the overhaul of all municipal infrastructure involved in revitalization; 4) The government subsidizes the first-2-year interest of loans obtained for revitalization; 5) An increase on land for supporting facilities is allowed (less than 7% of the total area of the zone).</td>
</tr>
<tr>
<td>2013</td>
<td>VSCs, IPOs, and property developers</td>
<td>The revitalization of old industrial zones that is in line with Nanshan's industrial development planning is encouraged. A group of revitalization facilitation is set up for each revitalization project in order to assist proprietors in industry positioning, planning, design, construction, recruiting enterprises, etc. Objectives: 1) To obsolete low-grade industries, recruit high-grade industries, promote industrial cluster development, and achieve industrial upgrading; 2) To focus on comprehensive improvement, optimize supporting facilities, and achieve a better quality of environment.</td>
<td>1) The government pays no more than 2 million yuan for the penalties for breach of contract induced by the relocation of low-grade enterprises and the rental losses during revitalization; 2) The government pays in a lump-sum manner for no more than 50% of the expenditure for planning and design; the total payment by the government must not exceed 2 million yuan; 3) The government pays in a lump-sum manner for no more than 20% of the expenditure for revitalization and construction; the total payment by the government must not exceed 3 million yuan; 4) The government subsidizes the interest of loans with no more than 3 million yuan, for no more than 3 years; 5) For managerial bodies of each industrial zone, the government annually subsidizes the expenditure for management with no more than 300 thousand yuan, for no more than 3 years; 6) The government subsidizes the construction of public services platforms with no more than 1.5 million yuan; For each industrial zone, the total subsidies of the above items shall not exceed 10 million yuan, or no more than 12 million yuan under exceptionally significant circumstances.</td>
</tr>
</tbody>
</table>

information of revitalization. As a result, we can study such information rather than merely study the second-hand information published by the government. Such a case study more veritably evaluates the actual performance of the revitalization and reveals existing issues.

4.2. Interviews

To explore the underlying factors that influence the performance of revitalization and learn about the intentions and engagement of different stakeholders, the researchers interviewed five types of stakeholders: a) officials from the Bureau of Economic Promotion of Nanshan District, who are in charge of the formulation and implementation of the “One Sub-district, One Industrial Zone” policy — they were asked about the standards for project examination and approval, as well as whether the result of revitalization reached the objectives of the policy; b) entrepreneurs of higher value-added enterprises which are recruited — they were asked about their opinions on the Longjing Industrial Zone; 3) presidents and managers of VSCs, who are the proprietors of the industrial zones — they were asked about the development of the zones, their motives for and attitudes towards revitalization, as well as their understanding of the planning, operation and management of the industrial zones; d) employees from original enterprises which were relocated, who are migrant workers without a say — they were asked about compensation and the fate of their original enterprises after relocation; e) operation managers, or IPOs of the industrial zones, who are in charge of recruiting enterprises and

Fig. 1. The distribution of industrial zones on collective land in Nanshan. Source: Bureau of Economic Promotion of Nanshan District.
management of the revitalized industrial zones — they were asked about admittance standards and rationales, as well as the operational models of the industrial zones.

4.3. Secondary sources

Three categories of secondary data will be collected to provide evidence for the case study. The first category of secondary data is the investigation report on collective industrial zones of Nanshan and information of the 15 “One Sub-district, One Industrial Zone” projects (including size, industry planning, process of revitalization, etc.) provided by the Bureau of Economic Promotion of Nanshan District. The next category is the drawings and site plans of the projects and the information of the original enterprises before revitalization, which are provided by VSCs. The last category comes from the IPOs of the industrial zones, including the composition of new tenant enterprises and annual output values before and after revitalization.

5. Case study: revitalization of Longjing Industrial Zone

5.1. Background of revitalization

Situated in Longjing Village on the foot of Tanglang Hill, Nanshan District, Longjing Industrial Zone covers an area of 23,280 square meters and its total floor area is 54,602 square meters (Fig. 2). The Industrial Zone was first built in 1980s. After the expropriation of some land of Longjing Village by the government in 1992, the Longjing Village Collective Economic Cooperative founded the Longjing Industrial Corporation Limited and built another four 7-storey factory buildings and one 8-storey dormitory with the compensation for land expropriation. The head of Longjing Village says that the factories have been very popular since they were built, that they have recruited numerous processors of electronics and low-grade components, and that scarcely any of the factories has been idle. However, since 2005, many processors have moved out of the Shenzhen Special Economic Zone (covering only four out of six districts of Shenzhen City back then) into areas with low production costs such as Longgang, Ba'an, Dongguan and Huizhou; Longjing Industrial Zone frequently witnessed back pay and abrupt bankruptcies among enterprises in the Zone, which severely impacted the profits of the Corporation. Additionally, based on the research group’s field observations and information gained, the old factories had poor infrastructure and supporting facilities as well as aging buildings, which are a potential safety liability; the traffic system was poorly planned — the Industrial Zone and the neighboring densely populated residential area (Longjing Village is an urban village) shared the same entrance/exit, worsening traffic congestion; Content with the profit model featuring land and factory rental, the villagers did not have the awareness of industry planning in the Industrial Zone. As a consequence, the Industrial Zone incurred a bottleneck to development. The Corporation had been hesitant about investing in the revitalization of the Zone, until they learned of the “One Sub-district, One Industrial Zone” policy implemented by Nanshan District Government.

5.2. Process of revitalization

Due to a lack of awareness of professional operation and management, or for the sake of expenses reduction, most industrial zones on collective land are directly operated by VSCs, instead of professional industrial zone managers or IPOs entrusted by VSCs. Longjing Industrial Zone is one of such industrial zones. In early 2014, introduced by acquaintances, the Longjing Industrial Corporation Limited entrusted a design company, which the research group was engaged, to redesign and renovate the Zone. According to the stipulated requirements of the new policy, proprietors shall turn over both the industry planning and the spatial planning design scheme of the industrial zone. However, to save on expenses, the Corporation did not engage a professional company to work out the industry planning; instead, the Corporation asked the design company to work it out. From March through July, 2014, the research group worked out the industrial analysis of the Zone, determined automotive electronics as the mainstay industry of the Industrial Zone, and modified the spatial planning and design based on the industry planning, including spatial layout, traffic planning, building façade design, landscape design and street furniture design. The following procedures are shown in Fig. 3 — the revitalization plan provided by the design company was approved by the District Government. In August, the District Government approved the project and listed it as one of the “One Sub-district, One Industrial Zone” projects; as a consequence, the progress of the project needed to be reported to the Group of Revitalization Facilitation quarterly. In October, an open tender for the revitalization and construction of the Industrial Zone was put out. To avoid enormous compensation induced by the relocation of the original low-grade enterprises, a progressive approach was adopted — once a building was emptied, it would be immediately revitalized and rented out after revitalization, instead of revitalizing the entire industrial area after all the buildings were emptied. The revitalizing construction was initiated in March, 2015, and the entire revitalization project was completed in February, 2016. In January, 2016, the Corporation outsourced the Industrial Zone to an IPO: since then, the IPO has been responsible for all the operation and management of the Industrial Zone. After negotiation between both sides, they agree that the rent is shared based on the “45 + 5” model, that is to say, the Corporation charges a rental of 45 yuan/m² and pays the IPO a managerial fee of 5 yuan/m² every month. On this basis, the IPO charges tenant enterprises actual fees based on market prices. The current rent of Longjing Industrial Zone is 65 yuan/m². Meanwhile, the IPO recruits enterprises. Up to September, 2016, there are 45 tenant enterprises in the Industrial Zone and the remaining 5000 m² area is still available. A total fund of 33.58 million yuan was invested in the revitalization project of Longjing Industrial Zone, and the fund was advanced by the Corporation. As the process of recruiting tenant enterprises is near completion, the Corporation is applying to Nanshan District Government for a subsidy of 7.49 million yuan. Relevant departments of Nanshan District Government will grant the subsidy after examining and approving the project.

5.3. Result of revitalization

5.3.1. Improvement in infrastructure & environment

To tackle environment-related issues, the revitalization mainly involved: 1) the overhaul of public utilities (electricity, sewerage, gas, telecommunication, etc.); 2) the renovation of traffic lanes and fire engine access to meet fire prevention requirements; 3) the construction of new sidewalks to create a safe and pleasant environment for pedestrians; 4) the construction of an exclusive entrance for the Industrial Zone so that it does not have to share the entrance with the village any more and traffic congestion can be tackled; 5) the renovation of the external façades of five buildings; 6) the replacement of old elevators; 7) the expansion of the parking to tackle issues with parking; 8) the building of a platform for public services, including a center for enterprise services and a public exhibition hall; 9) the enhancement of landscape and environment, including cleaning up waste on the foot of the hill, adding greenery, street furniture and public art, and bettering public
Fig. 2. The land use surrounding Longjing Industrial Zone.

Fig. 3. Four key players in the revitalization of old industrial zones.
spaces in the Zone. Since the completion of the entire revitalization project, the environment of Longjing Industrial Zone has been largely improved, providing tenant enterprises with a safe, cozy and convenient office space (Fig. 4).

5.3.2. Progress in operational models

On the one hand, the Corporation does not operate the Industrial Zone any more; it entrusted a professional IPO to manage and recruit enterprises. On the other, to recruit more high-tech enterprises and talents into the Industrial Zone, the IPO has a stronger sense of service — it is no longer prone to the unitary profit model featuring rental and property services; instead, it focuses on offering better and more perfect services: 1) the IPO offers industrial services, e.g. assisting SMEs in business development and expansion, negotiating preferential taxation and project promotion with governments, and offering personnel recruitment services; 2) to enhance supporting facilities and amenities, the IPO brings in hotels, apartments, catering, retailing and fitness enterprises, which makes the Industrial Zone a service complex with functions of accommodation, livelihood, shopping, recreation, etc., and facilitates the life and work of the employees of the tenant enterprises.

5.3.3. Change in composition of tenant enterprises

Fig. 5 shows the composition of tenant enterprises in Longjing Industrial Zone before and after the revitalization. The composition before the revitalization was rather unitary — most tenant enterprises were electronics and assembly enterprises with two small restaurants. After the original 24 processing and manufacturing enterprises were relocated, the new 45 tenant enterprises are much more diverse, coming from different industries including construction industry, environmental protection & chemical products R&D, intelligent transportation system R&D & manufacturing, biopharmaceuticals R&D, financial intermediaries, IT services, cultural and creative industry, electronic devices R&D & sales, sports & entertainment industry, retailing industry, accommodation & leasing industry, catering industry, and entrepreneurship service organizations. Among them, there are 25 high-tech, cultural and creative enterprises, accounting for 55.6% of the total number of the tenant enterprises.

There is yet another important point to make: to the government’s dissatisfaction, the IPO has rented out one revitalized building to Vienna Hotels Group. That is to say, 20% of the floor area that should have been used for developing high-tech industries is now being used for a hotel. The Hotel positions itself as a mid-range business hotel. There are altogether 206 guest rooms and 338 beds in the hotel. According to the Hotel’s market survey report of the 4th quarter of 2016, the occupancy rate in the 4th quarter is 78.65% and there are mainly 6 categories of guests: business travelers (58%), families (with children) (10%), lovers (12%), groups (14%), solo travelers (2%), and others (4%).

5.3.4. Adjustments in demographic structure

All original migrant workers who used to work in the Zone were dismissed; to their distress, they have lost both their job and their accommodation. Approximately half of the original workers lived in the employees’ dormitories in the Industrial Zone, which have been transformed into bachelor pads rented to the employees of the tenant enterprises and high-income white-collar workers nearby. The rest of the migrant workers lived in the rental houses in the urban village in front of the Industrial Zone, mostly with family. When asked about their plans, some said they “plan to return to their hometown”, some said they would “try getting a job in Ba’nan and Longgang, where many manufacturers are still hiring”, and others said they would stay in the urban village and run small businesses.

6. Discussion

6.1. Deficiencies in transformation and upgrading of old industrial zones on collective land

6.1.1. Failure to perform social responsibilities

In the research on the revitalization of industrial buildings in Hong Kong, Xian and Chen (2015) believed when introducing revitalization policies for the cities facing transformation and renovation of industrial spaces, social costs and quality of life should be taken into consideration. However, when the original enterprises in Longjing Industrial Zone were being relocated, the interests of these low-income employees were not taken into account. According to our interviews, only the original enterprises were compensated for the relocation with a total of 1.71 million yuan, while the dismissed employees have not been compensated by their employers. On the one hand, the proprietor of the Industrial Zone did not assume their social responsibilities and neglected those low-income workers in need of help, because they wished to minimize compensation as much as possible when relocating enterprises. On the other hand, the replacement of low-come migrant workers with high-income residents is a change in demographic structure which the government welcomes (Zhang, Hu, Skitmore, & Leung, 2014). However, giving consideration to the interests of numerous migrant workers signifies bearing tremendous social costs. As a result, the interests of such inferior groups that do not have property right or a say are doomed to be sacrificed.

6.1.2. A lack of dominant industries & industrial interconnections: from the perspective of industry clusters

Industry clusters are regarded as important elements in national and regional competitiveness (Porter, 1998; Morgan, 2007;
Malmberg & Maskell, 2002; Martin & Sunley, 2003). Sellars et al. (2011) indicated that to gain a long-term industrial competitive edge, industry clusters are an inevitable choice of the development of industrial zones. When it comes to the change in the composition of tenant enterprises of the revitalized Longjing Industrial Zone as mentioned above, in terms of industrial structure, the revitalized Industrial Zone indeed underwent the upgrading from the secondary industry to the tertiary industry, and evolved from the unitary function of production to diverse functions of R&D, production and services. However, in terms of industry clusters, these high-tech enterprises are merely geographically concentrated and they will not form a genuine industry cluster because the Industrial Zone fails to meet all the standards of an industry cluster. First of all, the enterprises and institutions in the Industrial Zone are not “in a particular field”, that is to say, they do not work on a common theme or take on a certain technological proximity or remain along a value chain which stands for the foundation for complementarities, cooperation and synergies (Malmberg & Maskell, 2002; Porter, 2000; Bathelt, 2002). There is no dominant industry in the Industrial Zone since there is only one general admittance standard - “technological enterprises or innovative enterprises”, with no attention paid to which industry or which link on the industry chain these enterprises belong to. Secondly, the companies and institutions are not “interconnected”. The interconnections refer to traded and untraded interdependencies, such as transactions of goods and services, constant flows of information, social networks, flows of talents, and person-to-person interaction and collaboration (Porter, 2003; Connell & Voula, 2013; Depner & Bathelt, 2005). However, based on the interviews conducted by us, these enterprises are not inclined to cooperate or compete with one another because most of them are not industrially interconnected. One of the interviewed entrepreneurs of the tenant enterprises expressed his wish for the Industrial Zone to create an innovation atmosphere of the IT industry. “I look forward to an innovation atmosphere like the Silicon Valley, where enterprises can promptly share industrial information and latest technology, cooperate and compete with each other, so that a good brand image will be built and more talents and clients will be attracted,” he said. However, he said his company was the only mobile application software company in the Industrial Zone.

An official responsible for “One Sub-district, One Industrial Zone” projects from the Bureau of Economic Promotion of Nanshan District also says that the industries in most revitalized industrial zones are rather different than the original industry positioning and planning. According to their original proposals, each of the revitalized industrial zones should recruit high-value-added enterprises of certain relevant areas based on how they position themselves industrially. However, IPOs and VSCs ended up repositioning their industrial zones based on the types of their tenant enterprises. As a result, among the 15 projects, 6 are positioned as cultural and creative industrial zones and the other 9 as high-tech industrial zones. Moreover, these creative parks and high-tech industrial zones are similar in terms of composition of tenant enterprises, thus inducing stark assimilation and a lack of industrial division of labor and unique industrial features. To the government’s dissatisfaction, some industrial zones changed land use without permission, using industrial buildings for commercial or residential purposes. The official says, “It is still tolerable to recruit other enterprises. But they have gone overboard by renting out a whole building to Vienna Hotel”. After all, this is by no means relevant to Nanshan’s objective of developing the high-tech industry. With the huge signboard and the pronounced European-style façades (Fig. 6), people may misconstrue or call into question the industrial image of Longjing Industrial Zone.

Based on the process and results of the revitalization of Longjing Industrial Zone, there are still deficiencies in the transformation and upgrading of collective industrial zones in terms of social costs and industry cluster, although the policy indeed incents VSCs to revitalize old industrial zones, helps sweep away potential fire hazards, dilapidated buildings and fifth, and improves the operational models of industrial zones. Different than the village-led revitalization of collective industrial zones, Majialong Industrial Zone (Site 04-05-17), a government-led revitalization project, has become a base for headquarters of modern service outsourcing enterprises (Nanshan District Government, 2012). In the following, based on comparison between government-led revitalization projects and revitalization projects of collective industrial zones, reasons for the performance of revitalization are discussed with the analysis of motives and actions of all stakeholders.

6.2. Underlying factors that impact effectiveness of policies

6.2.1. Formalistic industry planning

Industry clusters have performed remarkably in driving regional and even national economic development. Therefore, some scholars attempt to analyze the elements of representative industry clusters in order to duplicate the models of such successful clusters and artificially create industry clusters (Feldman & Francis, 2004; Casper, 2007; Stam, 2009; Klepper, 2010). For example, Sölvell, Lindqvist, and Ketels (2003), in their book The Cluster Initiative...
Greenbook, advocated that industry clusters should be gradually nurtured and formed from the three respects of regional pre-conditions, implementation objectives and implementation process. In China, such a plan to achieve industry clusters is called "industry planning". Industry planning is an oriented plan of the industrial development of industrial zones, which is crucial to the formation of industry clusters (Sun, 2004; Wang, 2010). However, the report on industry planning that the Longjing Industrial Corporation turned over was a perfunctory formality to meet the requirements of the policies and obtain subsidies and funds from the government. "Everyone has been talking about building high-tech industrial zones, so we did it. It is alright as long as the government approves the project application," says a board member of the Corporation. In comparison with industry planning, the Corporation pays more attention to the renovation of factories, roads, greenery, landscape and municipal infrastructure, because as long as the environment improves, the Corporation can charge higher rent and obtain more funds from the government. Their cognition of the transformation and upgrading of industrial zones still remains at the physical and superficial improvement in spaces and facilities; they have not realized the importance of both industry planning and soft services to the sustainable development of industrial zones.

In contrast, Majialong Industrial Zone's industry planning is not a formalistic document. In Special Plan for Upgrading & Revitalization of Majialong Industrial Zone (2009), the Nanshan District Government formulated a clear, specific and definite industry planning; after the Plan was approved, it was confirmed that Majialong Industrial Zone was to be transformed into a base for headquarters of modern service outsourcing enterprises; the Government also formulated detailed regulations and regularized specific procedures to achieve objectives of industrial development (Nanshan District Government, 2011), providing policy guarantee for the implementation of the industry planning.

6.2.2. Recruiting enterprises with loose restrictions

Longjing Industrial Zone lacks both dominant industries and industrial interconnections among tenant enterprises. The lack is due to the issues in the link of recruiting enterprises. To rent out or sell industrial spaces as soon as possible and recoup their investment, IPOs accept various industries and lower admittance standards so that enterprises roughly meeting the basic requirements of their industrial zones can be accepted and become tenants. As the manager of Nanshan Yungu Innovative Industrial Zone tells us, "most industrial zones cut down expenditures and prioritize recruiting enterprises, because only can industrial zones sustain..."
their operation when factories are rented out and rent is gained."

Such issues did not occur in the government-led revitalization project of Majialong Industrial Zone. There are several reasons. Firstly, after the government’s approval of the industry planning, enterprises with intentions to be tenants had to apply to the government for industrial buildings and offer to buy them in advance. Based on the type of industry and the state of business of the applicants, the government composed a proposed list of tenant enterprises (Nanshan District Government, 2011). Moreover, Majialong Industrial Zone was defined by the government as non-direct-profit industrial land used to guarantee industrial upgrading. As a result, there was no concern over economic losses induced by idle buildings, so the recruiting of enterprises was not so urgent as that of collective industrial zones - the government could sift through tenant enterprises strictly based on the industry positioning, laying a solid foundation for industry cluster.

6.2.3. Imperfect regulation, supervision and acceptance standards

During the government-led revitalization of old industrial zones, in accordance with detailed regulations on the process and implementation of revitalization, the government exercises effective supervision or direct intervention in all links ranging from industry planning to planning approval, demolition, reconstruction, enterprise adherence, restrictions on land use, operation and management, thus ensuring the actual transformation and upgrading of industrial zones (Yan, 2016b).

When implementing the “One Sub-district, One Industrial Zone” policy, competent authorities pursue higher speed and larger scale of revitalization, higher post-revitalization annual production value, and higher added value in annual tax revenue; moreover, they are not knowledgeable about the professional operation of industrial zones and neglect issues of policy implementation. According to the official from the Bureau of Economic Promotion of Nanshan District, during the post-revitalization inspection of projects, the government only sets two acceptance standards: the appearance of industrial zones, and whether fire safety and prevention meet the requirements. As long as a project meets the two physical standards, it can be granted subsidy by the government. The above-mentioned social responsibilities, operational models and industry cluster are not taken into account as acceptance standards. Moreover, there is no detailed regulations formulated or stringent supervision for enterprise relocation, project application and enterprise recruitment. Imperfect acceptance standards and inadequate supervision for the revitalization of collective industrial zones contribute to the unsanctioned and self-interested activities of VSCs and IPOs, and exert negative impact on the performance of revitalization.

7. Conclusion

Collective land in Shenzhen is a special product of rapid urbanization under China’s unique urban-rural dual system. In order to provide adequate industrial space for high-tech enterprises and materialize industrial upgrading, by offering financial support, the government encourages VSCs and other social resources to transform low-end manufacturing space to high-end industrial space.

Based on the case study of Longjing Industrial Zone, this paper illustrates the renovation of physical environment and infrastructure, the professionalization of operational models, the diversification of enterprise composition, and the demographic change which have taken place in industrial zones guided and supported by the “One Sub-district, One Industrial Zone” policy. However, it is found that it is far from enough to simply provide more subsidies or loosen restrictions. This is because industrial redevelopment and urban transformation demand better and more professional revitalized industrial space, which does not only involve physical space, operation, management, and supporting services, but also involves the level of industry cluster and the fulfillment of social responsibilities; however, village-led revitalization models are naturally self-interested and backward in professional knowledge. Thus, based on the deficiencies of the revitalization of Longjing Industrial Zone and the underlying reasons, the government should enhance the following links of the revitalization of collective industrial zones so as to fulfill the objectives of industrial upgrading: 1) during the relocation of original enterprises, the government should try to accommodate the interests of different stakeholders, including low-income migrant workers - for example, it can provide compensation, new jobs or accommodation for them; 2) the government should strictly and earnestly examine and approve industry planning, and guide VSCs, IPOs to formulate practicable industry planning with professional knowledge based on the regional preconditions of different industrial zones; 3) during the recruitment of enterprises, the government should clearly stipulate that types of tenant enterprises and admittance standards, and provide appropriate assistance for IPOs who may be in fear of economic losses and extended time span of enterprise recruitment induced by raised thresholds; 4) during examination and final acceptance, the government should take into account such factors as social responsibilities, operational models and industry cluster; taking government-led revitalization of industrial zones as a reference, the government should formulate detailed regulations on all links, establish a stringent investigation and supervision system, regularize the profit-driven actions of VSCs and IPOs, and truly transform and upgrade collective industrial space on the basis of specialized industry cluster.

The key to the transformation and upgrading of old collective industrial zones is the mutual coordination between the government’s “top-down” dominance in industrial upgrading and the market economic organizations’ “bottom-up” revitalization of industrial space. Analyzing the specific process and actual performance of the revitalization of industrial zones in Nanshan, this research helps policymakers and implementers better understand the revitalization of old collective industrial zones, the challenges it faces, and the most valuable assistance government can provide. In future policymaking and revitalization, the mentality of government-supported revitalization can be used as a reference for areas which are facing similar issues and in need of revitalization in transitional China.

References

Connell, J., & Voola, R. (2013). Knowledge integration and competitiveness: A