

ic pattern, including Chongqing. Practice shows that the process and effectiveness of Chongqing, based on the remodeling of the value chain, to carry out independent innovation on the need to protect the long-term stability of the system, including the construction of inland open in Chongqing, "The Belt and Road" strategy, the new inter governmental cooperation projects such as the opening of carrier, are integrated into the world economic environment, create a rule stable system approach. For the inland economy, need to draw on the experience of Chongqing, based on clarifying the government and the market, social relations, give full play a decisive role in the role of service-oriented government and the market, to better protect the economy transformation and upgrading, innovation and development.

References

- [1] Derong Zhang. Regional Financial Development and Regional Economic Growth: An Empirical Analysis of Suzhou City, China[J]. Chinese Geographical Science, 2010,(03): 269-274.
- [2] Yahua Wang. Multiple Forces Driving China's Economic Development:A New Analytic Framework[J]. China & World Economy, 2007, (03): 103-120.
- [3] Bing Yu, Xiao Li, Yuanbo Qiao, Lei Shi. Low-carbon transition of iron and steel industry in China:Carbon intensity, economic growth and policy intervention[J]. Journal of Environmental Sciences, 2015, (02): 137-147.
- [4] Li Ning. Spatial Variation and Space Optimization of the Development of China's Circular Economy[J]. Chinese Journal of Population,Resources and Environment, 2012, (02): 51-59.
- [5] John Wong. China's Economy in 2007/2008:Coping with Problems of Runaway Growth[J]. China & World Economy, 2008, (02): 1-18.

Analyzing Planning Intervention of Water Pollution and Urban Village in Shenzhen

Xinxuan YU

School of Economics and Management, Chongqing Jiaotong University, Chongqing, CHINA

Abstract: This paper concentrates on the two serious urban problems in Shenzhen and evaluates the planning intervention adopted by the public or private organizations. The impact of the two urban issues and planning interventions were analyzed and assessed. Finally, the paper gives the clear view of the evaluation of the planning intervention and provides the policy recommendation.

Keywords: Urban problems; Planning intervention; Water pollution; Urban village

1. Introduction

Shenzhen locates in the Guangdong province (China) and is a member of the Pearl River Delta (PRD). The city has transformed from the agriculture-based Baoan County into a 21st-century metropolis. Shenzhen provides housing for more and more people since China's first Special Economic Zone (SEZ) was established in 1980 [1]. Therefore, as the economic growth accelerates in fast pace recently due to the SEZ policy, Shenzhen became the new mega city and thus suffered from typical urban problems caused by urbanization. All over the world, significant urbanization has created many challenges in developing nations especially in the urban areas. Those problems comprise environmental pollution, overflowing urban population and economic inequality. Shenzhen is facing the difficulties to address two urban issues result from unprecedented urbanization: water pollution and urban informal settlement. This paper aims to focus on the two serious urban problems and evaluate the planning intervention taken by public and private organizations.

The impact and value of the two problems and planning intervention related to them will be analyzed and assessed. Finally, the paper will give a clear view of evaluation of the planning intervention and give several pieces of advice for future planning.

2. Water Pollution and the Planning Intervention in Shenzhen

2.1. Water pollution

Chinese cities now are suffering from the environmental problem created by urban sprawl. The traffic volume has increased more than ten times during past ten years. Fume emission causes severe air pollution in some big cities in China such as Beijing and Tianjin. In term of water pollution, although China has made a great effort in water environmental protection over the past 20 years, the research conduct by government proved that water pollution has not satisfactorily restrained. Surface water undergoes various extent of pollution; up to 80% rivers are contaminated in different degrees [2]. Pollution index

of Shenzhen ranked 48th compared with the cities around the world in 2015. Thus water pollution in Shenzhen is at a very high level. The value of water pollution index of Shenzhen is 80.88, the higher index value means greater pollution.

The gap between investment in environmental protection and rapid economic advances pose a serious threat to river water quality. In Shenzhen, water quality even cannot reach Class V standard, which is the worst water quality standard in China. The poor water quality makes the river system become difficult for irrigating, cultivating, and recreationally use [3]. Domestic and industrial sewage discharges, urban storm water run-off, and non-point source pollution from agricultural and livestock farm run-off are the major contamination types in the PRD. Sewage runs into rivers without supervision, although, Shenzhen has refined a small proportion of the wastewater. Policies for controlling the wastewater need improvement when the demand for improving energetic participation of private sectors increases as well. Insufficient management and low-price services are overburdening existing waste control facilities, for example, the cost of water supply and sewage treatment only constitute a small proportion of the real cost of these services. In Guangdong province, private sectors are excluded to involve in facilitating treatment of wastewater. However, reasonable participating chances provided for private sector actually could create greater efficiencies and financial benefits.

2.2. Environmental planning intervention by The World Bank

Guangdong Pearl River Delta urban environment project invested by The World Bank aims to solve the water problem in PRD. The objectives of the project contain supporting infrastructure investments and improving the terrible water quality. Also, Institutional Strengthening and Training (IST) are supported in the project as well. The government tried to increase the standard of the urban environment of important municipalities of the Pearl River Delta (PRD) by carrying out a coordinated regional pollution management plan to enhance continued economic and social developing progress.

The program involves investment to improve sewage treatment capacity and develop the hazardous wastewater management. The program planned to build construction of treatment centers and associated management program of landfill system. In addition, the project planned to conduct Incentive-based loans for building Inter-Municipal Environmental Infrastructure in a reasonable area, and finance the wastewater control facilities. Also, they invested for solid waste treatment management for those groups that are willing to design, develop and manage shared facilities. Another task is to develop a management information system to intensify the pollution

restraining ability. The project tried to modify the efficiency and effectiveness of Guangdong Provincial Environmental Protection Bureau, and at the same time, improve the information sharing ability of communication between cooperative countries through the UNEP/GEF South China Sea and Gulf of Thailand Project.

Institutional Strengthening and Training would form by five main sub-objectives. Firstly, the project planned to provide financial or institutional support, basic equipment and training for project implementing agencies. Second, project implementation support would be offered to help develop detailed plan and construction supervision. Then there would hold public awareness campaigns to raise public awareness of the municipal plans and possible goodness of the program, at the same time, attract public participation to mobilize protecting water environment activities. Strategic studies would be conducted afterwards for varying management, such as sewage and storm run-off management and public-private partnerships management about financing and operation of environmental facilities system, financial regulations and measures of keeping sustainable resources for environmental investments. Finally, government aimed to provide training in urban development, wastewater control management and water quality monitoring.

There are some indicators to show the realizing degree of the objectives in the project for the final analysis. Those important indicators include PDO indicator, GEO indicator and other key indicators such as increased proportion collection and treatment of domestic sewage and hazardous wastes.

PDO means original project development objective; it is supported by the regional planning approach to help to solve the environmental issues in the PRD. In the PDO indicator assessment, the objectives are moderately satisfied during the project period. The proportion of domestic wastewater collection and treatment increased from 50% in 2004 to 97% in 2011. While the percentage of pre-treatment of industrial wastewater before discharge and relocation of highly polluting industries reach at 90% in 2009, and increased 5% over next two years. However, the hazardous waste facility was not 100% completed during the project progress, while the trials of strengthening the financial sustainability of wastewater treatment achieved average tariff Y1.07/m³ in 2011. Global Environmental Objective (GEO) aims to improve the marine ecosystem in the South China Sea. It needs measures taken to address the threat of serious pollution from the rivers. This indicator assesses both the effectiveness of project-financed activities and the target values. The program tends not only to establish shared environmental facilities, but also to involve surrounding organizations to design, construct and operate the tasks collectively. In fact, there are two facilities constructed, but only one was in operation in 2011. Project operators try hard to en-

hance institutional arrangements, and finally, there is a new wastewater company established but is still working under a deficit.

Regarding other key indicators, the samples from the key rivers in PRD meeting Chinese surface water quality standard of Class III, the value of quality index increased gradually from 57% in 2003 to 70.4% in 2011. However, the length of sewerage network was reduced from 500km to 371km because of incorrect feasibility studies and construction problems. There was a precise survey conducted to assess the operating volume of the secure landfill. The processing capacity went up almost two folds (from 150,000 metric tons to 290,000 metric tons according to Shenzhen yearbook). By contrast, the fundamental facilities suffered extensive delays due to the difficult land acquisition and insufficient finance distribution. The project achieved on the concentration of treatment for specific types of water pollution and efficiency of coordinating stakeholders. But eventually facilities construction lack of good supervision and management due to design changes and long implementation delays.

The project report moderately evaluates their outcomes through the whole process of the project, they assessed the design and preparation period of the project, implementation efficiency, operation of sectors, achievement of objectives and the performance of bank and borrowers such as Chinese government and implement agencies. The project address the water pollution in a satisfactory condition, but Guangdong Provincial Audit Office report (2013) said that there still exists some illegal behavior using the funds because of deficiency of supervision.

Although the project gives a general positive image of restraining water pollution, however, the water condition now in Shenzhen is actually not as well as the previous perspective. A report from Shenzhen water resource bureau says that the Shenzhen environment bulletin in 2014 showed that the water quality increased from class III in 2009 to class I in 2012. By contrast, Guangdong Environmental Protection Department reported that the offshore water quality now in Shenzhen ranked the last place among ten coastal cities in Guangdong province. That means the project has not considered the comprehensive water pollution treatment and ignored some potential source of pollution that may go against improving water quality.

General scholars and media tend to focus on the bad aspect rather than finding the improved condition during the project. It will be useful if they transfer their concentration to both good and bad side of an issue. The project has addressed some serious problems in the area using some specific approaches, which will be helpful for other similar tasks. The failure, in the same way, could reflect some valued experience for future activities. A balanced assessment will offer useful advice for future. By evaluating the outcomes at both sides, it is found that effi-

cient socio-economic measures will mend water standard significantly by taking feasible measures, for example, constructing the infrastructure timely and upgrading the facilities frequently.

After Guangdong Pearl River Delta urban environment project, the municipal government never stops the pace to improve the water quality while allowing for rapid economic and population growth. Some experience could be learned from the project, and there are more public and private group aware of the issue and involve in helping protect the water environment. Therefore, people should not hold the totally passive view of the problem and the governance.

3. Urban Village and Planning intervention in Shenzhen

3.1. Urban village in Shenzhen

China has witnessed unprecedented urbanization process since the economic reforms of the late 1970s, and the urbanization rate of this country went up from 17.9% to 54.77% during the period from 1978 to 2014. Therefore, big cities in China have experienced a great rural-urban migration movement. Those migrants were encouraged by the rural-urban income gap and economic inequality [4]. The flow of migrants and growth of population will continue according to The World Bank statement: Chinese cities will contain more than 1 billion people by 2030. The situation will create more environmental and social challenges in the major big cities especially the mega cities in the country. Although, rapid urbanization in China has serious spatial, economic and social consequences, but Chinese cities do not have slums, which is popular in many other developing countries [5]. One of the most important and visible products of urbanization in the country is the urban village in China-the urban informal settlement.

Urban villages appear in many cities in China, especially this situation has cast a significant population growth in urban areas. In Shenzhen, some of the suburban villages gradually become part of the built-up areas result of the rapid urban sprawl. Urban village is a typical informal settlement in Shenzhen, which push a huge pressure on local government. Urban villages are usually regarded as "eyesores" in the mind of government and urban residents. However, the urban village provides a large number of housing for migrants who tend to live in an accommodation both at the low price and near the urban area. Urban village, on the other hand, solves the problem for the government, local village residents and migrant workers. By contrast, local villagers lost their chance making the profit by selling their agricultural products. Fortunately, urban village solves the problem satisfactorily for current situation by accommodate migrants in a reasonable location.

Although, the urban village seems to be helpful in recent years, it also results in social, economic and environmental problems. Buildings in urban villages actual are of very poor quality. Local people build high constructions at the maximum area (150 square meters) to increase the rooms for the sake of more rental income. At the same time, the roads in the urban village are very narrow and only allow for walking, public transport are not available in the area due to the poor permeability. It was predicted that there would be less need for urban village housing shortly, therefore, how to redevelop urban village become a challenge for the government [6]. In 2004, according to Shenzhen statistic bureau, the area of urban villages in Shenzhen was 93.5 square kilometers with a total floor area of 106 million square meters. The majority of the urban villages were not situated in the SEZ, covering the area constitute less than 10 percent of the urban village land.

3.2. Planning intervention by the Municipal Government

The population of Shenzhen rise from 114.6 in 1998 to 332.21 in 2014, almost three fold, GDP increased from 1954.17 in 2001 to 16001.82 in 2014. In general, Chinese urban villagers are poor than urban residents. There are a large proportion of female migrants, and they turned out to be younger than male migrants. Many migrant workers are at low level of education because they start working at a very young age. Thus they tend to be temporary migrants before get married. Migrant workers suffer from low income, poor housing condition and shortage of social life [7]. Great flow of migration lead to huge pressure on housing provision and other infrastructure in the city; the municipal government used to adapt the hands-off approach to solving the problem by housing market at the beginning. The method turned out to be a big mistake. In 2005, the government of Shenzhen introduced its first master plan for urban village redevelopment: the Comprehensive Planning Guidelines for Urban Village Redevelopment 2005–2010.

After SEZ was had been set up at the beginning of the 1980s, the local government failed to cope with the considerable arrangement for housing the original village residents and urban migrants. The original residents then started to build random constructions. The municipal government introduced a regulation to limit the housing area at less than 150 square meters. (Shenzhen municipal government document [1982] No.85) Original villagers lost their income of selling the land or housing due to the policy, they then find a new approach to making money: land and property related business, and this is how urban village begins. Local residents in urban villages redevelop their land by building dense housing buildings, then they rent housing to migrants. Without the control of municipal government, the village buildings become

denser (10 or 12 stories) and constructions are of poorer quality. The extreme narrow roads and very closed buildings become the character of urban villages. Due to their crowded and chaotic building environment, unhealthy living condition and the resulting security and social problems, urban villages in Chinese cities are widely criticized by the media, the government and even the scholars. This type of informal settlement in Shenzhen is usually associated with imbalanced land use, poor housing quality and severe infrastructure deficiencies [4]. In 2004, after carrying out a survey to learn the demands of urban villagers, local government then introduced the Rental Housing Comprehensive Management System. However, the policy offer migrants some benefit, the effectiveness is lower than perspective due to the unwillingness of landlords and tenant.

The local government introduced the first master plan in 2005 to redevelop the urban villages. Some policies and projects were created by public and private organizations associated with the master plan. Redevelopment of urban villages would demolish those affordable housing for migrant workers, which may lead to inconvenience for them to travel a long distance to work [7]. In the master plan, the urban village would be transformed to more valued construction such as formal residential buildings and office units. Living quality of these areas will significantly improve while the density reduced rapidly. However, in fact, projects were facing serious problems during the project implementation. In many towns, the implementation of programs encountered the obstacle, and many difficulties result of the social crisis of depriving the living space for migrants. There is the new investment to fund the regeneration of urban village in Dafen village of Longgang District, with new and good quality public space. Such project may become a good example to redevelop and revitalize the urban village area in other areas in Shenzhen if the project benefits both migrant workers and residents. However, it would be hard to satisfy the need for migrant workers; they might be excluded from the city if they cannot find a place both satisfy the affordable housing price and short travel distance from the work place.

Most of the scholars hold a positive view on urban villages and argues that urban village is necessary for contemporary Chinese cities. Urban villages attract broad attention from the public. However, major literature failed to focus on the reason and mechanism of its emergence. People also ignore the social status of urban villages. Social and demographic researches have illustrated the significant rural-to-urban migration process. Those researches indicate that the development of urban village is inevitable and satisfactory for the contemporary condition of Shenzhen. In summary of past studies, urban village, in the short term, is essential to be remained because of a large amount of housing provision for mi-

grants. However, researches in urban villages are usually isolated to economic and environmental influence. The business also appears in the urban villages; the commercial activities involve four major stakeholders: the village holding company, the local village residents, the migrant workers and the businessmen out of villages. It is helpful if the linkage between the urban village and other relevant factors, and redevelops housing based on wide consideration.

As housing in the urban village only meets the fundamental needs such as water and electricity supply for migrants, they are not willing to live there for long term. Migrants tend to move to a better place once they have the opportunity. General scholars hold a passive view on the policy that tries to redevelop the urban village buildings in a large scale; they believe that the approach is not sustainable for both economy and society due to a large amount of finance it will cost and the public criticism on heartless demolition. The achievement of local authorities is always neglected. Scholars concentrate on the failure and negative impact of the policy and related programs. Migrants and local villagers, in fact, are not mobilized to improve the living environment such as building quality and infrastructures. The imbalanced opinion towards policy, on the one hand, gives authority hints to avoid making same mistakes. On the other hand, it might be hard for them to find right direction when burdening huge pressures of criticizing.

4. Conclusion

The essay analysis two significant urban problems of the case study city Shenzhen and discuss two planning intervention conduct by World Bank and the municipal government. To some extent, water pollution in Shenzhen has improved significantly in certain category after the implementation of the environmental project. Also, the project offers the useful experience for the continued plan. It is crucial that during the original design process, the management and operation system be considered carefully. It turned out that poor management has led to uncompleted construction and longer construction period and higher cost and difficult operation. Public attention still tends to attract by the negative influence of water pollution. However, the environmental is no longer severe than the previous condition. According to the wa-

ter quality research of surface water and river water, the source of pollution is various, including more than five origins. Therefore, developing advanced sewage treatment system to restrain varying pollution will be a hard task in the future projects. Public and private sectors should be more co-operative and keep the balance of profit and achievement of objectiveness.

Regarding the problem of the urban village, the general literature holds opposite views on the intervention made by the municipal government. But it is undoubted that urban village should be replaced by qualified housing or commercial constructions. The approach to demolishing urban village was blamed because of ignorance of interest of rural-urban migrants who remarkably contribute to the urban economy in Shenzhen. There is a huge challenge to keep the balance of the demand for better living condition and the needs for affordable housing at the same time. Accelerating urbanization is inevitable. It is predictable that urban population growth will not stop and there will be more migrant workers in the urban area. A government with other organizations should spare no effort to work out the balanced approach to solving the issue. Many cities in China has successfully housing the migrants through the public rental housing; this model might be helpful for Shenzhen government to increase provision of affordable housing.

References

- [1] Qu J H, Fan M H. The Current State of Water Quality and Technology Development for Water Pollution Control in China[J]. *Critical Reviews in Environmental Science & Technology*, 2010, 40(6):519-560.
- [2] Bank T W. China - Guangdong Pearl River Delta Urban Environment Project[J]. 2012.
- [3] Zhang L, Zhao S X B, Tian J P. Self-help in housing and chengzhongcun in China's urbanization[J]. *International Journal of Urban & Regional Research*, 2003, 27(4):912-937.
- [4] Ya Ping Wang, Yanglin Wang, Jiansheng Wu. Housing Migrant Workers in Rapidly Urbanizing Regions: A Study of the Chinese Model in Shenzhen[J]. *Housing Studies*, 2010, 25(1):83-100.
- [5] Zacharias J, Tang Y. Restructuring and repositioning Shenzhen, China's new mega city[J]. *Progress in Planning*, 2010, 73(4):209-249.
- [6] Hussain A, Wang Y. Rural-Urban Migration in China: Scale, Composition, Pattern and Deprivation[M]// *Marginalization in Urban China*. 2010.