

Greenway as a New Path for the Exploration of Urban-Rural Coordinate based on a Low-Carbon Model: A Case Study of Greenway Planning and Construction in Dongguan, Guangdong province (China)

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1. Introduction

Since the beginning of the reform and opening-up policy, China's economic development has made remarkable achievements; however, the widening urban-rural gap has become important reasons leading to a lot of social and urban problems. How to achieve coordinate urban-rural development is an important problem China is required to face in terms of its future development. In general, urban-rural dual structure¹ is the fundamental reason why urban-rural gap is widening, which cannot be solved in one move; it still continues to exist in the near future even under the macro background of currently deepening structural reform. Therefore, when negatively expecting institutional innovation, actively seeking for an overall urban-rural development path which bypasses the current institutional barriers should be paid high attention to.

Coordinate urban-rural development does not indicate that rural development should follow the urban development mode, which is determined by different urban-rural resource endowment, and simple replication is inconsistent with objective development laws. On the one hand, most of cities in China adopt high-carbon development mode (Gu, C.L. et. al., 2013), and replicating this mode in countryside will further increase the difficulties for our county to build a low-carbon society, and is inconsistent with global low-carbon development trend; on the other hand, such replication will lead to urban-rural homogenization phenomenon in terms of features and styles, and countryside's unique ecological characteristics, cultural characteristics and social characteristics will also disappear, which should be avoided obviously. Therefore, only actively exploring different urban-rural development paths under the low-carbon model should be the right choice.

As a hot research topic for Chinese planning scholars in recent years, the existing studies on coordinate urban-rural development problem mainly focus on the following three aspects: The first one is theoretical construction for coordinate urban-rural development plan, in which Zhao (2006) proposed that symbiosis theory, phased theory on industrial expansion and space growth and sustainable development theory are the theoretical basis for coordinate urban-rural development plan, Wang (2012) analyzed the complex relative relationship system on coordinate urban-rural development plan, proposed the basic concept of coordinate urban-rural development and built the theory of coordinate urban-rural development plan; the second one is comparative study for domestic and foreign coordinate urban-rural development cases, Zhang, et. al., (2009) summarized 7 suggestions by combing developed and developing countries' successful experiences in coordinate urban-rural development; the third one is the study on coordinate urban-rural development plan compilation and management, Zeng (2012) analyzed Chengdu's innovation in coordinate urban-rural development plan compilation and management, and pointed out that, close integration between compilation and management as well as multi-sector cooperation are the features for Chengdu's coordinate urban-rural development plan. Based on the existing studies, we may discover that, the study on coordinate urban-rural development combined with low-carbon concept is little, and the author thinks that low carbon is an important mean for human society to achieve sustainable development, while coordinate urban-rural

development is a core problem China must solve appropriately to achieve sustainable development; thus, the study on a combination of both has important practical significance and academic value, and it is necessary to conduct the corresponding research in the paper. In 2010, GPC, as one of implementation actions for Guangdong regional integration development strategy, was conducted very quickly in Guangdong province, which was designed to promote the urban-rural construction and improve the urbanization quality, and it also took the lead in exploring China's coordinate urban-rural development path based on the low-carbon model. The paper selects the case of GPC in Dongguan, Guangdong province as the object of empirical study, and will review the general situation of GPC in Dongguan, deeply analyze its management measures and implementation effects, summarize its successful experiences in promoting coordinate urban-rural development based on the low-carbon model, and finally discuss its limitation in promotion and potential problems.

2. Methods

2.1. Concept Definition

Many scholars at home and abroad define the greenway. For example, Guo (2003) put forward "the greenway usually goes along the natural corridors such as the water's edge, valley, ridge or railway and it can also be used for recreation or as the traffic road, landscape road, pedestrian crossing or bikeway. The open space that connects the park, nature protection area, cultural features, historical site, densely inhabited district and regional long and narrow or linear park is usually designed as the greenbelt or aesthetic road". This definition basically includes the key points concerned by all scholars. The research finds that it can clarify the connotation of greenway. And I agree and accept this definition.

2.2. Research Emphasis

Since the term of greenway was first created and used by William H. White in his monograph *Protect the Open Space of American Cities* published in 1959 (Little, C.E. 1990), it has been widely and deeply researched by scholars around the world for over 50 years. Their research focuses on environmental protection, historical and cultural heritage corridors travel and leisure development, green infrastructure and so on (Dai and Hu, 2013). The paper is different from the past research and puts emphasis on two aspects: First, how does the greenway affect the method of daily traveling of urban and rural residents in Dongguan to be low carbon as it is introduced into Guangdong of China as a new object that is beneficial to the common people? Second, how does the greenway play a part in promoting coordinating urban and rural development in Dongguan on the basis of satisfying the primary need in a popular style with the characteristic of low carbon? The two aspects include how does the specific policy of greenway avoid the current institutional barrier of city-countryside dualization, how to realize urban and rural green space integrated construction in Dongguan with the help of greenway and how does the rural tourism initiated by greenway promote the rural economy to develop in low carbon mode and promote the differentiation development with urban and rural characteristics, etc.

2.3. Study Area

Dongguan is located in southern Guangdong, at the east coast of Pearl River Estuary, bordered by Huizhou in the east, Shenzhen in the south, Guangzhou in the west and Zengcheng in the north. The city covers 2,465 square kilometers in total, with about 8,500,000 permanent residents in 2011. The weather in Dongguan bears a subtropical monsoon climate, with an annual average temperature of 22.7°C and annual average rainfall of 1,879mm over the period of 2002 to 2011 (Dongguan Municipal Bureau of Statistics & Survey Office of the National Bureau of Statistics in Dongguan, 2012); such comfortable climate creates conditions for residents to travel outside. Meanwhile, Dongguan has mountains in the southeast, waterfronts in the northwest, and rivers scattering in the middle,

which also provides a good foundation for building urban-rural green space with rich types and distinct characteristics.

2.4. Overviews of GPC

- *Overall objective*

The objective is, by investing about RMB 3 billion over the period from 2011 to 2014, to construct Dongguan greenway with 2263 kilometers (including regional greenway of about 225 kilometers, urban greenway of about 781 kilometers, and community greenway of about 1257 kilometers), achieve greenway network density of 0.9 kilometer/square kilometer, establish Dongguan 10-minute greenway riding cycle, build Dongguan greenway network system with regional, urban and community greenways linking closely and functioning reasonable, and build Dongguan greenway network into a people project with ecological, social, economic and cultural functions.

- *Overall Layout*

The greenways in Dongguan are classified into three categories, i.e. regional greenway, urban greenway and community greenway. There are three greenways passing through Pearl River Delta and 21 neighborhoods in Dongguan, with about 225 kilometers in total, which constitutes the framework (Figure 1) of greenway network in Dongguan, along with 26 service stations to serve about 4 million people; urban greenways are classified into five regions of “central part, Putian part, mountain forest, water village and coastal area”, covering 32 towns in Dongguan, with a length of 781 kilometers, forming Dongguan greenway network (Figure 1), connecting major natural and human resources points in Dongguan, along with about 173 interest points; community greenways, about 1257 kilometers, connect community parks, small gardens and roadside green space, provide residents with convenient greenways in slow traffic system, and are cell and micro-circulation tissue for greenway network.

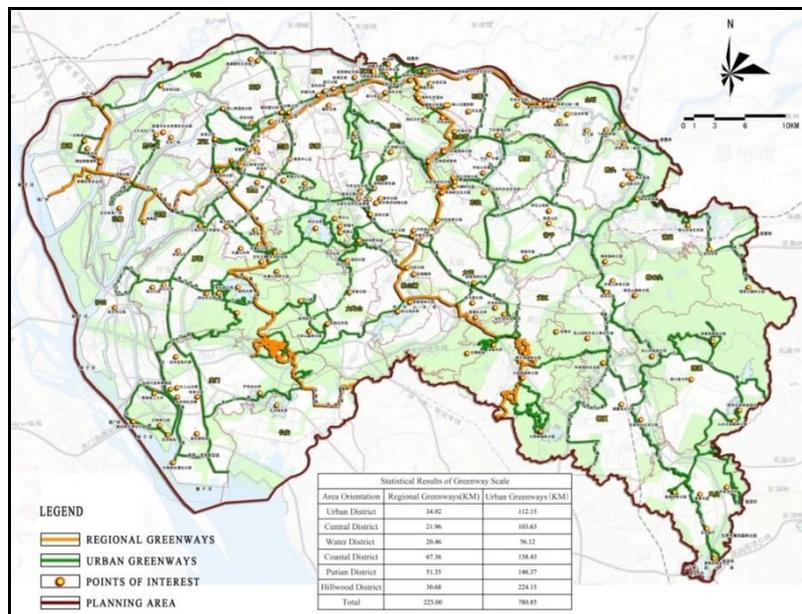


Figure 1: Dongguan Greenway Overall Layout
 (Source: The Comprehensive Planning of Greenway in Dongguan (2010-2020))

- *Construction Achievements*

Through more than two years' construction, Dongguan greenway network has achieved initial success. By the end of 2012, Dongguan has constructed greenways with a length of 1148 kilometers in total, including having been built regional greenways of 225 kilometers, constructing 26 regional service area, and connecting over 200 tourist attractions and interest points along the way; urban and community greenways of accumulative 923

kilometers have been built, and 61 urban and community service area have been built (Figure 2).



Figure 2: Dongguan Greenway Service Area, Identifying & Landscape
(Source: Authors)

2.5. Analyses on Management Measures

Dongguan's management measures on GPC are designed to not only effectively promote the construction work, but also facilitate the management maintenance after the construction, and the measures include the following aspects.

- *Organization*

A team especially for Dongguan greenway network construction is established, consisting of Dongguan's relevant leaders as well as the principals of more than 20 relevant functional departments, such as development and reform bureau, finance bureau, land resources bureau and urban and rural planning bureau, to be responsible for Dongguan's overall arrangement on greenway network construction. An office is under the team, set up in Dongguan's urban and rural planning bureau, and is responsible for comprehensively coordinating and guiding the greenway network construction. The relevant functional departments, on the one hand, attach great importance to performing their own duties, on the other hand, try to simplify the procedures and improve the efficiency within the scope permitted by the policy, to ensure the effective promotion of greenway network construction.

- *Land for Project*

The land for greenway construction project is provided by each section, renting or acquiring land can be adopted not to change the ownership and property of the original land. To reduce the demolition, the land for greenway's trail, station and interchange station may be combined with farmland, water conservation, tourism and ecological land, and the construction land index would not be occupied in principle.

- *Financing*

City- and town-level greenway construction special funds are established through city- and town-level annual budgets. The construction capital for regional greenway is provided by city-level finance bureau, land demolition expenses, pipeline transfer expense, bridge construction and earthwork expenses occurred for urban greenways and community greenways in each town are provided by each town, while the project construction capital (including slow road, greening, sign system, water and electricity, station) is shared by city-level finance bureau and town-level finance bureau in accordance with 50%:50%. If the greenway in each town satisfies certain conditions and standards, city-level finance bureau will give back greenway construction subsidy.

- *Operation Management*

Dongguan urban comprehensive administration is responsible for formulating the uniform operation management standards for greenways (including regional greenway, urban greenway and community greenway) in Dongguan jurisdictions. Dongguan urban

comprehensive administration is responsible for managing the operation of greenways at each level within the road scope uniformly managed by Dongguan urban comprehensive administration, and the expenses are arranged by city-level finance bureau. The operation of the greenways at each level in other regions is managed by each region, and the expenses are arranged by town-level finance bureau.

2.6. Analyses on Implementation Effect

By the end of 2012, a professional research company has conducted an evaluation on Dongguan’s constructed greenways that the public participates in, applied questionnaire survey (about 9000 effective questionnaires), depth interview (more than 30 greenway users), enterprise merchant investigation (150 related merchants), network consensus combing (about 300 network reports), field observation (1 hour each for three times every day in 12 typical places) and network survey (more than 6600 netizens participating in), and made a comprehensive and deep summary about Dongguan greenway’s service efficiency, and completed the following analysis based on the data from the evaluation.

- *Service Efficiency and Purposes of Greenway*

In the investigation and evaluation, 80% of respondents know Dongguan greenway, 70% of respondents have used Dongguan greenway. Greenway’s usage frequency is closely related to the greenway’s construction level and location, the usage rate of the greenway located at place of residence nearby and tourism scenic spot is obviously higher than that in other regions (Figure 3), meanwhile, the recreation & entertainment, fitness and family activities are in the front rank (Figure 4) in the investigation in terms of the greenway’s intended use. Considering that such activities are basically conducted in holidays, still 30% of the respondents often or every day use the greenway to implement such activities, which indicates that greenway has been incorporated into the life of residents in Dongguan. In addition, besides using the greenway in the life, 11.6% of the respondents select greenway as the transportation means for commuting, while 64.1% of such respondents often or every day use the greenway (Table 1).

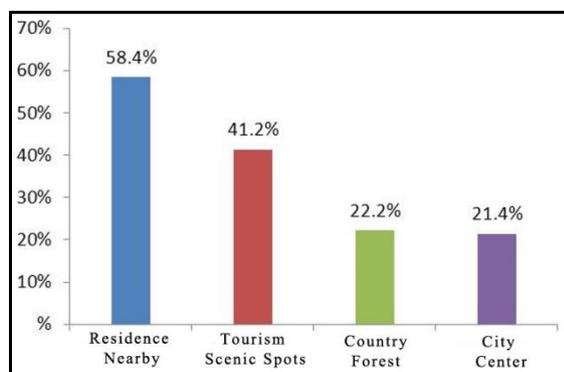


Figure 3: Service Efficiency of Different Regional Greenway
 (Source: Dongguan Greenway Comprehensive Evaluation Report, 2012)

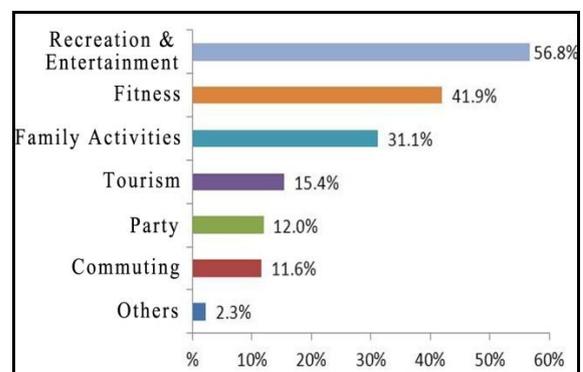


Figure 4: Rank of Intended Use of Greenway
 (Source: Dongguan Greenway Comprehensive Evaluation Report, 2012)

Purpose	Frequency	Almost Every Day	Often	Sometimes	Seldom
	Recreation & Entertainment		5.2%	19.3%	57.9%
Fitness		5.6%	24.0%	56.3%	14.2%
Family Activities		4.0%	21.1%	60.4%	14.5%
Tourism		4.9%	24.1%	53.8%	17.2%
Party		9.9%	27.4%	48.3%	14.4%
Commuting		30.8%	33.3%	27.5%	8.4%
Others		7.0%	14.8%	39.1%	39.1%

Table 1: Greenway Service Efficiency Based on Different Purposes
 (Source: Dongguan Greenway Comprehensive Evaluation Report, 2012)

• Social Economic Benefits of Greenway

After the greenway in Dongguan is put into use, the greenway has produced sound social benefits (Figure 5). Firstly, more than 90% of the respondents think that, the ecological environment surrounding greenways has been improved than before; secondly, the greenway has become an important place for Dongguan residents to communicate and interact, more than 75% of the greenway users often come to the greenway to play with their family members during the holidays, nearly 75% of the respondents think they are healthier than before after using the greenway, more than 85% of the respondents think they feel more comfortable than before after using the greenway. Therefore, the greenway has also been affirmed by the residents in Dongguan, nearly 60% of the greenway users are satisfied with the greenway, especially the greenway’s environment comfort level, scenery along the way, construction quality and convenience.

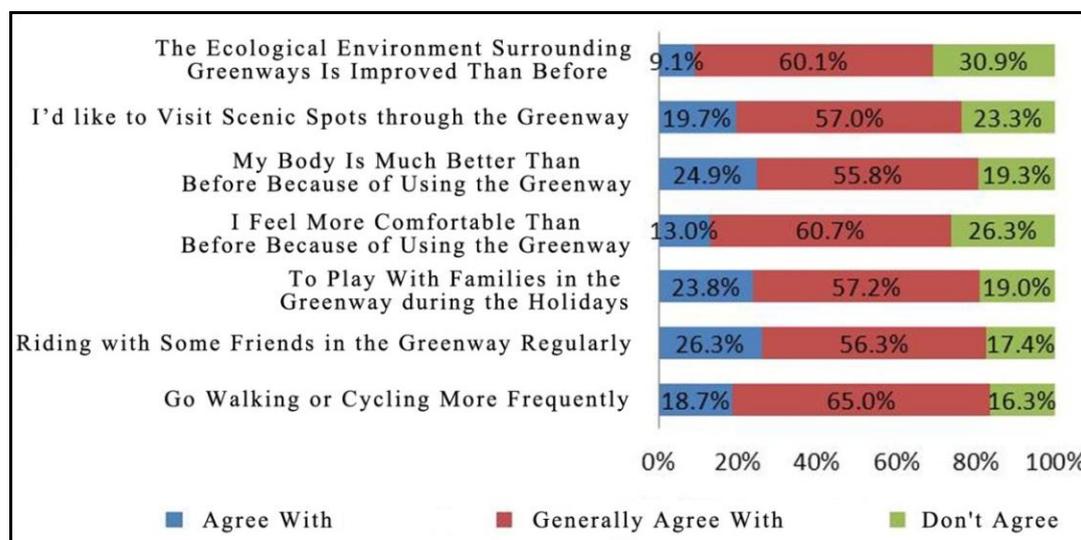


Figure 5: Greenway’s Impact on Residents in Dongguan
 (Source: Dongguan Greenway Comprehensive Evaluation Report, 2012)

In terms of the economic benefits, the greenway also performs well. In the depth interview and questionnaire survey with enterprises, such as restaurants, convenience stores and bicycle sales and rental along the greenway, more than 60% of the enterprises think that, the greenway has increased the passenger flow volume and turnover. Currently, the greenway exerts the biggest impact on bicycle sales and rental, including the following two aspects: One is an increase in the number of branded bike stores; Dongguan’s branded bike stores are increased from 42 in 2009 to 99 in 2012, forming a fierce competition pattern (Figure 6) since different brand stores densely open in the same district; the other is to promote the sales of the bikes. Take Mérida bicycle that captures 50% of the upscale bicycle market as an example, the annual sales increase from 5000 bikes in 2010 to 10000 bikes in both 2011

and 2012, and the accumulative sales amount exceeds RMB 60,000,000 during the past 3 years in accordance with the average market price of RMB 2,500 per bike. The sales volume of ordinary bicycles is also amazing; the sales volume of ordinary bicycles is 1,000,000 in 2011 and the sales amount exceeds RMB 500,000,000 in accordance with the average market price of RMB 500 per bike. It is expected that, as the greenway's supporting facilities are further constructed and improved, the greenway will comprehensively enhance the economic benefits of the related industries, such as restaurants and convenience stores, and provide a lot of jobs for society, and further enhance the social benefits.

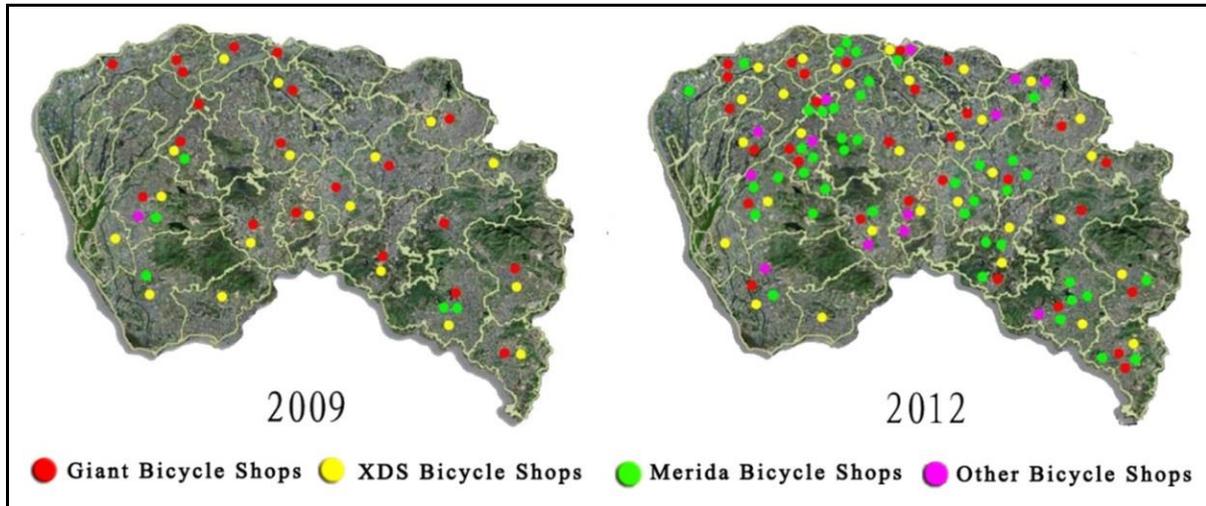


Figure 6: Dongguan Branded Bicycle Stores Layout in 2009 and 2010
(Source: Dongguan Greenway Comprehensive Evaluation Report, 2012)

3. Results

3.1 Contributions of Promoting Low-Carbon Travel

Since 2007, transportation has become the industry in China with the fastest consumption growth in the energy especially the oil, and the vehicle fuel consumed by vehicles on the road account for almost 70% of the total energy consumption of the transportation industry (Compile Committee of the Second National Assessment Report on Climate Change, 2011). A surge in private motorized vehicles is the primary reason why transportation energy consumption stays at a high level, and this problem is particularly prominent in Dongguan. In accordance with data from Dongguan statistical yearbook, over the period from 2001 to the end of 2011, Dongguan civilian vehicle ownership increases sharply from 183,600 to 1,061,400 by almost 6 times, including civilian passenger car ownership increases sharply from 89,700 to 906,500 by almost 10 times, and amazing automobile exhaust emissions and increasingly crowded traffic condition also appear. Therefore, low-carbon travel should become one of necessary means for Dongguan to achieve sustainable development in the future.

The current international main stream believes that a low carbon trip refers to travel on foot or by bike or other public transport means and the Factors of Energy Consumption of Each Transport Mode (Table 2) shows that pedestrian and travel by bike are absolutely the greenest transport modes. Though travel with public transport means should be the first choice to develop low carbon traffic as for transportation demand in modern city, to travel on foot and by bike should still be the most low carbon travel modes and be widely promoted, and the planning and construction of greenway offers a good spatial carrier for it. We can easily find from the analysis from the above text that the residents in Dongguan have widely adopted traveling in the greenway as a method of relaxation and body-building. It is thus clear that the planning and construction of greenway offers a simple and easy way for the

low carbon trip of Dongguan residents that is closely connected with life. It also provides an opportunity to let people gradually accept and pursue the idea of low carbon trip, which creates a good beginning for the change of trip mode of Dongguan residents to be more low carbon.

Transport Mode	Rail Transit	Bus	Motorcycle	Private Car	Taxi	Bicycle	Pedestrian
Energy Consumption (MJ / person-kilometer)	0.322	0.714	1.495	2.795	5.59	0	0

Table 2: Factors of Energy Consumption of Each Transport Mode

(Source: Lv, SH., Tian, F., Li, X.H. (2007) *Study on the Optimized Model of Urban Passenger Traffic Structure, Journal of Highway and Transportation Research and Development, Vol.24, No.7, pp.117-118.*)

3.2 Contributions of Promoting Urban-Rural Coordinate Development

- *Bypass Institutional Barrier*

China's urban-rural dual structure mainly reflects in urban and rural different management systems in land, population, industry, environment and public services, and land system is the core of so many problems. The urban land right is owned by the state, and is able to become capital by transferring the land use right in the land market, while rural land is owned by the collective, however, the village collective has no right to buy and sell it, which can only be purchased by the government; the government can obtain huge land capital gains by purchasing low and selling high, while the village collective cannot share such capital gains, which leads to a series of problems of urban-rural social conflicts and livelihood and social security of land-lost farmers. Therefore, the reform and innovation of the land system is the key to solve the coordinate urban-rural development dilemma, and cannot be solved overnight.

The land for greenways at all levels in Dongguan includes both urban state-owned land and rural collective land. If in accordance with the traditional management methods, the procedures on land acquisition and nature conversion are required before conducting the construction, and the dilemma incurred by the institutional barriers must replay, and the GPC may also be affected. However, Dongguan's GPC has relatively successfully avoided the dilemma, and the key is that the land for greenway construction project does not change the ownership and property of the original land, all the greenway land involved in the collective land are solved by rental, villagers are encouraged and guided to develop happy farmhouse along the greenway, share the benefits brought by the greenway construction, and largely arouse the enthusiasm of villagers to participate in and jointly promote the smooth development of Dongguan's greenway construction.

- *Promotion of Green Infrastructure Integration Construction*

In the traditional urban-rural dual management system, all urban green spaces and rural mountains, fields and rivers belong to different management systems and lack of coordinate operation platform and spatial paths, therefore, they exhibit relatively segmented cracked plaques in the spatial distribution, while overall layout and orderly development of urban-rural space should be based on sound networking green ecological foundation, which is also beneficial to deal with the increasingly remarkable climate change. Therefore, promoting urban-rural integration of green infrastructureⁱⁱ is a very important content in China's coordinate urban-rural development. It is required to incorporate building greening, roadside green space, park, scenic spot and green corridor into overall urban-rural structure on different scales to form greening ecological network (Zhou, L et. al., 2010), and the greenway is undoubtedly able to become the most effective way to achieve the objective.

The Dongguan City greenway planning takes coordinating the city green space as the basic goal at the beginning of the design and takes the integration of resource factors as the

important basis for deciding the route selection of greenway (Table 3). The planning analyzes all kinds of elements such as the natural ecology, historical humanism, urban traffic and cities and towns spatial arrangement to integrate all kinds of green spaces through the route selection of greenway as far as possible.

Type of Element	Content of Element	Specific Influence
Element of Natural Ecology	Places of interest, forest parks, nature protection areas, rivers and waterways, reservoirs, island, farming and sericulture fields and gardens, etc.	Guarantee the rational utilization of superior ecological bases; express the ecology landscape characteristics of different areas; and connect ecological resources.
Element of Historical Humanism	Historical remains, villages and traditional streets, etc.	Connect the human resources in various regions; enrich the connotation of greenway; and demonstrate the splendid culture of Lingnan.
Element of Urban Traffic	Traffic line network and traffic facilities such as the railway, motorway, expressway and arterial street	Demonstrate the urban construction characteristic of Dongguan; form multiple, convenient and fast transfer system and improve the accessibility of greenway.
Element of Spatial Arrangement of Cities and Towns	Current overall arrangement and the isolating greenbelt of the cities and towns	Improve the usage rate of greenway; control the disordered extension of city; and optimize the space environment of the cities and towns.

Table 3: Influence of Resource Factors to the Route Selection of Greenway in Dongguan (Source: Overall Planning of Greenway in Dongguan (2010-2020))

In accordance with Dongguan’s greenway planning, the ecological greenway constructed along the natural river, valley, coast and ridge line outside the city, relies on the open green space, water, coast and field surrounding the city’s built-up area to build suburban greenway, and relies on the human scenic spot, park square and green space on both sides of city roads to build urban greenway, both of which jointly constitute the linear green space network, and connect Dongguan’s 18 forest parks, 5 natural protection areas, 24 stream channels, 56 reservoirs, 5 islands, 14 fields and gardens as well as major parks and roadside green spaces in 32 towns, which integrates the green infrastructure within the city scope into a whole on the spatial layout. Meanwhile, due to that the existence of greenway construction work team and its office largely guarantees the orderly construction and effective management of the greenway, both the operation platform and spatial path effectively promote the integration construction of green infrastructure in Dongguan.

- *Promote Urban-rural Characteristic Differentiated Development by Pushing Rural Economic Development in a Low-Carbon Mode*

Under China’s traditional urbanizationⁱⁱⁱ model, the government development concept of “taking city as the core” reflects in favorable policy, capital and human resources concentrating on cities, which leads to the current prosperity of Chinese cities. By contrast, the countryside is underdeveloped, backward rural economy characterized by low-efficiency development of agricultural industry leads to farmers’ low income and lagging rural construction. And the chain reaction incurred is that, on the one hand, a lot of rural idle labor enters the city to work but is unable to enjoy fair treatment due to the existence of social dual structure, which incurs all kinds of social problems; on the other hand, the countryside’s original features disappear when pursuing the economic development by replicating the currently urban high-carbon mode, and what disappears includes not only low-carbon and ecology, but also the countryside’s unique social culture and landscape, which obviously is inconsistent with the ultimate goal of achieving sustainable development. Therefore, coordinate urban-rural development should not only break down the urban-rural dual structure barriers, but also select appropriate development mode combined with the countryside’s own characteristics, to avoid losing itself due to blindly replicating the urban

mode. From the perspective of reality, establishing low-carbon and ecological rural mode as well as preserving and developing material and non-material features should take developing rural economy and improving farmers' life level as the preconditions, while Dongguan's greenway, as a new path for coordinate urban-rural development, also makes good achievements in this aspect.

Dongguan greenway connects the major forest parks, natural protection areas, scenic spots and historical sites as well as human resources in the city; based on that, by combining tourist route setting and ecological agricultural sightseeing, combining greenway service area and happy farmhouse, travel and leisure will become a new growth point for rural economic development, which not only improves the economic efficiency of agricultural resources, but also extends and develops the countryside's production and life characteristics, and enhances the farmers' income. It is absolutely the right development pattern that suits the characteristic of the country in comparison with copying the high-carbon development pattern of the city and developing the process and manufacturing industry blindly. Considering that Dongguan's greenway construction begins to take shape, and it is difficult to obtain the data on the countryside's economic benefits along the way, the author uses the data on the contribution of greenway in Guangdong greenway pilot city - Zengcheng to the rural economy to verify the above analysis. Since constructing the greenway, Zengcheng's tourists and tourist income increase largely, only in 2012, it attracts greenway tourists of 526,100, driving the whole city's accumulative tourists of 17,640,000, achieving tourist income of RMB 4,580,000,000 (Chen, W.X. 2013), providing 1000 direct jobs and 3000 indirect jobs; the rural collective economy along the greenway develops faster than the countryside not along the greenway, the rural per-capita cash income is about RMB 10,000, increasing by 17%, and the greenway's contribution to increasing farmers' income is about 40% (Xiong, X.L. 2011). Dongguan, as a neighbor of Zengcheng, ranks first in Guangdong province in terms of per-capita disposable income, far exceeding Zengcheng, and theoretically have stronger economic consumption ability and more travel and leisure demand, therefore, Dongguan greenway will play a gradually prominent role in pushing rural economy along the greenway as the greenway is completed and improved.

4. Conclusions

4.1. Beneficial Exploration

Greenway, as a special channel for people's fitness and leisure, is able to provide a new idea on exploration of Chinese urban-rural coordinate, after thorough planning and construction as well as formulation of new management mode. Based on the above analysis, it is found that, Dongguan greenway connects the city's important natural and human resources points by selecting reasonable and careful routes, and is planned to push the coordinate urban-rural economy development, and management measures characterized by city and countryside integration as well as multi-sector cooperation have been formulated to ensure the smooth implementation of planning and construction, and Dongguan has made a bold attempt in promoting Dongguan residents to transform into low-carbon travel mode, implementing integrated construction for green infrastructure, developing urban-rural economy, protecting rural characteristics and bypassing institutional barriers, and has made remarkable achievements, and achieved beneficial exploration on a new path for Chinese urban-rural coordinate under low-carbon model.

4.2. Limitation of Dongguan's Experiences Promotion

Urban-rural coordinate is an exploration work, and the key to achieve it is, based on an overall scientific analysis of urban-rural difference and regional difference, to formulate appropriate policy guidance in accordance with the local conditions (Wang, G.T. 2012), and the success of Dongguan GPC in promoting urban-rural coordinate also comes from it. Dongguan greenway's successful experiences mainly reflect in two aspects, one is having

bypassed urban-rural dual land management system barrier, the other is pushing urban-rural coordinate by tourism and leisure, both of them are closely related to Dongguan's urbanization development stage and economic development level, which are also the limitations of Dongguan's experiences promotion by other regions in China.

Dongguan greenway construction bypassing urban-rural dual land management system barrier is mainly attributed to that all the greenway land involved in the collective land adopt rental method instead of land acquisition, and such choice has its underlying reasons. Due to the city's rapid development in the past 30 years, in 2006, Dongguan's built-up area accounted for 43% of the city's total area; on the premise of satisfying the requirements of ecological baseline, newly increased land resources are very limited, and limited land indicators are often used for the city's projects on investment attraction; even if the government is willing to provide the greenway with construction land indicator by converting the collective land, the cost is not low due to the strength of village collective economy. Thus, rental naturally becomes the best plan for the government a village collective to reach an agreement. While in China's other regions, especially the middle and western regions where urbanization level is relatively low and the rural economy development lags behind, there is a lower probability that the government adopts land rental since the construction land is relatively sufficient and the land transaction cost is low, which is why it is difficult to use Dongguan greenway experiences for reference.

Pushing urban-rural economic development by tourism and leisure require preconditions. Only when per capita income reaches or exceeds certain standards, people will begin to carefully consider participating in tourism and leisure activities and are able to achieve them. On the contrary, even if people have leisure time, they will use it to consider increasing income instead of consumption. It is the widely-held view in the international community that, per capita GDP exceeding USD 3000 is the basic standard to enter the leisure era, while Dongguan has met such standard in 2004, and Dongguan per capita GDP was USD 7847 in 2008, satisfying the standards for upper-middle income countries. Therefore, Dongguan residents are able to accept the greenway so quickly, and actively conduct tourism and leisure activities via it. Other cities in China that want to take example by the successful experience should be comprehensively assessed. The use of greenway will not be affected by the difference of regional economic development levels and difference of rich and poor residents as for the urban and rural residents' daily life and working trip, but the difference of economic development stages should be put with enough emphasis on if you hope the leisure tourism industry initiated by the greenway drives the urban and rural economies.

4.3. Potential Problems That Need to be concerned

- *Double-faced Influence to Regional Culture in the Country*

We've mentioned about the influence of greenway on the development of rural economy and promoting of urban and rural characteristic differentiation development. The essence of promoting the rural tourism industry with greenway as the supporter is to utilize the mutual affinity of different culture groups. The connotation that the characteristic of country is different from that of the city is also their cultural difference. Therefore, keeping the regional cultural characteristic of country is an important problem that needs to be emphasized and stressed in the future development of country.

From the dialectical standpoint, every coin has two sides. That also fits the influence of greenway to the regional culture of the country. The core of maintaining and inheriting any culture is people. The backward rural economy causes quite a number of rural populations, especially the young people who leave the country for work, which results in the hollowing out of large quantities of countries and the cultural fault in the development of rural regional culture. The planning and construction of greenway drives the rural tourism and brings new opportunities for the villagers to get job and become rich, which contributes to eliminating the phenomenon of hollowing out in the country to some extent. And the industrial characteristic

that it consumes rural regional culture also stimulates the renaissance and development of rural regional culture. As for the negative effects, the construction of greenway also offers a more convenient way and a more popularized platform for the contact of urban culture and rural culture. The conventional thinking in current China that “the city is more advanced while the country falls behind” and great potential difference of the two cultures causes the phenomena that the urban tourists despise rural culture and the villagers cater to the urban tourists, which will destroy the rural regional cultural connotation invisibly.

- *Possibility of Disorder Expansion of Town and Country Construction*

The adverse impacts of blind and disorder expansion of urban construction have gradually acknowledged by Chinese governments who have made corresponding management policies to control the expansion of cities. The greenways are the routes to provide relaxation, body-building and travel for the public. Though we can make strict construction and development system to avoid the spread of city boundary, the construction and improper activity of the greenway user may cause negative effects to the initial conditions of the urban and rural environment. Therefore, it is necessary to carry out comprehensive influence tracking assessment on greenway to find out the adverse impacts and make adjustment measures for effective control.

As for the construction of the country, as the greenway can effectively drive the development of rural tourist economy, it may cause profit-driven overdevelopment and disordered construction, which waste the rural resources and have negative influence on rural culture and profile control. We need to take comprehensive management measures after deep research to control the possible adverse impacts.

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Endnotes

ⁱ American economist Lewis W.A. proposed in 1954 that, the economy of the developing countries consisted of modern economic departments characterized by modern technology and traditional agricultural sector characterized by traditional backward technology, and the co-existence of such two departments is called as dual economy or dual structure. The dual economic theory has been quickly responded by Chinese academic society after being proposed. In 1988, the experts from the center for policy research of Ministry of Agriculture proposed Chinese dual social structure theory (Zeng, Y. 2012).

ⁱⁱ In 1999, a joint working team established by American Conservation Foundation and Forest Service of Ministry of Agriculture clearly proposed the concept of green infrastructure for the first time, defining it as national natural life support system, an interconnected network made up of water channel, wetland, forest, wildlife habitat and other wilderness and open space maintaining original species, promoting natural ecological process, protecting resources and improving people’s life quality (Zhang, Q.M. 2004).

ⁱⁱⁱ Chinese traditional urbanization refers to the urbanization road under the specific historical background since China’s reform and opening up, with the fundamental characteristics of labor non-agriculturalization taking city as the core and taking growth as orientation (Ye, Y.M. 2013).

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