Analysis on the Green Development Model of Urban Agglomeration in China

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Abstract: Urban agglomeration is an important carrier to promote China's economic development. The current development model of urban agglomerations in China has problems such as lack of overall planning, unbalanced development, poor ecological environment, and low quality of human settlements. Based on the analysis of the current development problems of Chinese urban agglomerations, the research puts forward the content of the generalized green urban agglomeration system. The research results have certain theoretical value and practical significance for promoting the transformation of urban agglomeration from traditional to green.

1. Introduction

Urban agglomeration is an advanced product of urbanization development to a certain stage. It is not only compact in space, but also has very close economic and social ties within and between urban agglomerations. As a highly concentrated area of human production and life, urban agglomeration promotes economic development, social progress and improves the living standards of residents. At the same time, various urban problems have emerged: rapid expansion of urban space, rapid expansion of urban population, excessive consumption of resources and energy, and continuous deterioration of ecological environment[1,2]. From 2001 to 2015, China's total energy consumption ranked first in the world, increasing from 1.5 billion tons of standard coal to 4.3 billion tons of standard coal. China's energy consumption per unit GDP is among the highest in the world. In 2017, China's energy consumption required to create one dollar of GDP was about 2.5 times that of the United States and 4.1 times that of Japan[3]. In the process of extensive urban expansion with such high consumption and low efficiency, the pressure of ecological environment is also increasing. In 2017, only 29.3% of China's urban air quality reached the standard. Therefore, it is of great significance to realize the green development of cities with low energy consumption, high energy efficiency, low environmental pressure and high quality of life of residents[4].

At present, the research contents of green development mainly focus on the following aspects. 1, The connotation of green development. The related research mainly focuses on the analysis of the intrinsic meaning and mechanism of green development theory, explores the function of green development theory, and puts forward the application strategy of green development theory in practice[5,6]. 2, Measurement of green development level. Based on the connotation of green development, related researches construct an index system and measure the level of region green
development by different methods[7]. The influence mechanism of green development. The purpose is to reveal the influencing factors of green development, so as to enhance the key elements of green development[8]. Researches on the problems and Countermeasures of green development. Related researches mainly focus on theoretical research and put forward countermeasures and suggestions aiming at improving the level of green development[9].

As mentioned above, growing interest in the research of green development has been witness. However, the research area mainly takes the provincial, municipal or national administrative regions as the research unit, and the coverage is relatively single, and there is no research on the regions with close inter regional ties. China’s urbanization has entered the deceleration stage of the rapid development stage, and it is also a stage of high-quality development[10](Figure 1). As an important carrier to promote China's new urbanization and urban-rural integration[11], urban agglomerations will certainly become the forefront of the promotion of green development as the core areas for the development of human economic activities, so it is necessary to study the green development of urban agglomerations.

2. Problems existing in the development mode of China's Urban Agglomerations

2.1. Lack of overall planning for Urban Agglomerations
There is a lack of overall planning and system design in the industrial development of urban agglomerations in China. First, the industrial homogeneity among cities in urban agglomeration is very high, which is in a kind of homogenization and low-level competition rather than forming the resultant force of industrial development. Taking the urban agglomeration in the middle reaches of the Yangtze River as an example, the similarity of the main industries in Hubei, Hunan and Jiangxi reaches 90%. The direct competition in many major industries is very fierce, and the fierce competition among industries also affects the cooperation and integration of urban agglomerations. The second is the disordered development of urban space, which shows that the intensity of urban development is too high, the proportion of industrial land is high, and the proportion of residential and ecological land is low.

2.2. Unbalanced development of urban agglomerations in China
In the process of the development of urban agglomerations in China, the production factors and resources are highly concentrated to the core mega cities and big cities, resulting in the excessive expansion of the core cities. Small and medium-sized cities and towns are underdeveloped or even shrinking, showing a bad development trend of "one city dominating". Taking the national Chengdu Chongqing urban agglomeration as an example, in 2014, the total GDP of Chengdu Chongqing urban agglomeration was 3.7 trillion yuan, of which the GDP of two core cities of Chengdu and Chongqing
accounted for 64.8% of the total GDP, and the GDP of the remaining 11 cities accounted for 35.2% of the total GDP. Mianyang, the top city in the list of 11 cities, has GDP equivalent to 12.7% of Chongqing and 11.1% of Chengdu. The problems of immature development of secondary central cities, unreasonable hierarchical structure of urban agglomerations and uncoordinated regional economic development are still obvious.

2.3. Bad ecological environment of Urban Agglomeration
In the process of agglomeration development of traditional urban agglomerations, the demand for land, energy, fresh water and other resources also presents a trend of agglomeration. The resource and energy consumption of urban agglomeration is far greater than its own carrying capacity and recycling capacity, which leads to the sharp increase of ecological pressure. China's cities and towns consume 84% of the country's chemical energy, of which 35 large cities account for 40% of the country's total energy consumption and carbon emissions[12]. Carbon emission is one of the important causes of greenhouse effect and air pollution. At present, the problem of urban ecological environment pollution in China is very serious. China accounts for 7 of the world's top ten air pollution cities. The direct economic loss caused by environmental pollution accounts for 8% - 15% of GDP.

2.4. Poor living quality of Urban Agglomeration
First, the urban population density is high and the living space is crowded. High population density leads to the reduction of human settlements infrastructure resources, high building density and insufficient per capita public green space. Second, the high cost of living in urban agglomerations leads to the decline of life happiness. The high concentration of population and the scarcity of land resources lead to the continuous growth of housing cost. At the same time, high population density also leads to serious traffic congestion and high traffic time cost. Traffic congestion also brings psychological anxiety, tension, uneasiness, anger and other adverse reactions, which will harm their physical and mental health.

3. Countermeasures and suggestions on promoting green development of Urban Agglomeration

3.1. Formulate green development strategy of Urban Agglomeration
Firstly, the goal of green development of urban agglomerations is to achieve efficient and sustainable economic development, instead of the economic development mode of "high energy consumption" and "non cycle" in the original industrial cities. Secondly, we should give full consideration to the regional development differences of the city, including regional imbalance, structural imbalance and urban-rural imbalance. Thirdly, the green development of urban agglomeration emphasizes the overall optimization. Green urban agglomeration is not the pursuit of the optimal single goal, but the the pursuit of the overall interests of the composite system consist of economic, social and environmental benefits. This integrity embodies and runs through all aspects of the overall concept, planning design and construction of green city development.

3.2. Implement the “five-in-one” development model under the thought of ecological civilization
Firstly, promote the construction of smart cities. Smart city has changed the traditional mode of promoting economic growth with investment. It emphasizes realizing the high sharing of social resources, improving the matching degree of supply and demand, and realizing the optimal allocation of resources scientifically and efficiently, so as to realize the high-quality development of urban economy through the application of information technology in urban operation and management. Secondly, the dynamic balance of ecological environment carrying capacity is used to explore the development path. To evaluate the urban environment with the concept of urban green system, the city should be regarded as an urban ecosystem rather than an isolated plot. This system not only adapts to the needs of people's life, employment, rest and transportation, but also produces the least disturbance to the natural ecosystem.
3.3. Create a green "people-oriented" living environment
Firstly, green urban agglomeration should provide the most suitable living space for residents. Green urban agglomeration emphasizes the harmonious integration of ecological environment and human characteristics. It starts from mountains and returns from water. Urban planning and construction endows urban agglomerations with life and spirituality. At the same time, green city group takes the environmental protection consciousness, lifestyle and concept of urban residents as the premise and guarantee of its sustainable development. Secondly, green urban agglomeration should adhere to the people-oriented urbanization, focus on the spatial imbalance, opportunity imbalance and resource imbalance in urban development, study the relationship among employment opportunities, public services, spatial connectivity and population coverage, strengthen the relationship between employment posts, industry and population quality, and realize the transformation from high-speed development to high-efficiency development.

4. Conclusion
The "National New Urbanization Plan (2014-2020)" clearly pointed out that the development of urbanization and the concept of ecological civilization should be fully integrated, focusing on promoting low-carbon, circular, and green sustainable development, and gradually establishing a sustainable urban construction and operation mode and low-carbon and environmentally friendly production and lifestyle. Urban agglomerations are an important carrier leading China's urbanization. Based on the requirements of this era, this article puts forward some measures to promote the green development of urban agglomerations in a broad scope by analyzing the current development status of urban agglomerations in China.

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