«Green cities» in China: philosophy and practice

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Abstract. The concept of a “green city” is now closely related to the concept of a “smart city” and is not limited by construction of recreational areas; in other words, a park in the center does not make the city “green”. First of all, “Green City” is an area with effective management, developed infrastructure, energy-saving and emission-reducing technologies that harmoniously integrate urban development and environment. The philosophy of the “green city” reflects the idea of an appropriate social structure and values existing in a particular society and is not completely new. For example, the idea of a “garden city” was formulated at the beginning of the XX century and associated with the agrarian-industrial characteristics of the economy, proposing the principles of self-government [1]. The modern concept of the “green city” appeared in Europe and spread fast all over the world, but in different countries this idea has its own interpretation. This article will analyze the specificity of the perception and implementation of the concept of “Green City” in China, which is distinguished by the integration of world experience and traditional Chinese values.

1 Introduction

The processes of active urban construction in China have been actively continuing over the past decades. At the same time, due to the rapid economic growth that began after the Openness Reforms in the PRC, the ecological situation in the country is continuously deteriorating, however, in 2008 the Olympic Games in Beijing received the status of “green games”, which was recognized by the world community at the UN level (The UN Environment Committee reported that the 2008 Beijing Olympics were the “Green Olympics”) [2]. Probably, it was coming up to the international level, because of holding the high level competitions, that attracted public attention to environmental problematic and demanded that the government solve the problems related to air purity in Beijing, Tianjin and Dalian, which led to structural changes in the transport, energy and industrial spheres.

The ideologeme “The Chinese Dream” declared by the President of the People's Republic of China Xi Jinping, the main provisions of which were announced in 2012, is also aimed at solving environmental problems. The fact is that in connection with the rapid

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economic growth after the Openness Reforms, the interests of the population and the environment were sacrificed to industrial growth. At the international level, these problems were most evident in connection with the 2008 Summer Olympics in Beijing, when the Olympic Committee raised concerns about the air quality in cities hosting athletes, as a result of which the organizers of the Games took urgent measures (restricting the movement of cars and trucks), transport, the closure of production and CHP in the suburbs of Beijing), which allowed Beijing to return the blue sky and the status of "Green Games".

Soon, in 2012, Xi Jinping proclaimed the idea of the "Great Revival of the Chinese Nation" 中华民族伟大复兴, which included the dream of the country's wealth and power 国家富强 (by the achievement of the average prosperity level of the Xiaokang society by 2021 and poverty eradication), creating the economic conditions for further transformation. The concept of "New normal" 新常态, also introduced by Chairman Xi, presupposes a balance between economic sectors and regions of the country, a reorientation from external to domestic markets and, as a result, attention to environmental problems: reducing the emission of harmful substances, reducing energy intensity, improving the living conditions of the population. It seems that these factors made the concepts of "green cities" especially popular in Chinese urban policy.

It is obvious that the formation of the urban environment is closely related to the basic ideas of society about space, social norms and values, the place of man in nature and society. In this regard, the study of green cities in the PRC is especially interesting, because offers a variant of interaction between Western and Chinese traditions. Obviously, in different periods, in different countries offer different approaches to the interpretation of these problems, so now the most important is understanding the deterioration of the environment, which affects the economic and social conditions of human existence. The city is the center of human activity, so the issues of energy consumption, energy conservation, distribution and processing of resources are very acute here. International documents such as the Paris Agreement on Climate, Transforming Our World: The 2030 Agenda for Sustainable Development (2015), New Urban Agenda - UN-Habitat etc, creating the basic principles of sustainable development aimed at achieving security, improving the quality of life and improving the prospects for all people around the world; at the same time, the principles and goals set out in these documents are key to understanding the philosophy of "green cities".

2 Research methods and principles

Before moving on to identifying the Chinese specifics of green urban planning, it is necessary to analyze the general principles of planning and development of eco-cities. The origin of the idea of a garden city is associated with the name of Ebenezer Govord, who published in 1899 a work in which, in order to solve the housing problem, substantiated the need to build independent, autonomous settlements in which there would be public self-government and collective ownership of land and real estate. Of course, E. Govord's concept reflected the economic and political realities of the early XX century, nevertheless, it is the concept of a garden city, which involves a combination of urban and rural areas, taking into account the landscape features in construction and design, observing the tradition of local self-government, is considered as a starting point in the development ideas of eco-cities. At the beginning of the XX century, a number of construction experiments were undertaken in Russia to create such settlements, located mainly near city-forming enterprises (factory, quarry, plant) or infrastructure facilities (railway); another interesting form is the country-resort villages. The ideologists of the garden city saw the goal in "the elimination of the exploitation of man by man in need of housing", since it is here that

tenants become owners, and the overcrowding inherent in large cities is eliminated. The horizontal structure of the garden city strives not only to organically combine the natural and human dimensions, but is also equipped with a developed network of cultural, educational, children's, medical and service institutions. Thus, the specificity of this kind of settlements lies not so much in the architectural and planning solution, but in the formation of a special socio-economic, socio-organizational and socio-political component; the poor unite to build their own homes and create comfortable living conditions.

Later was developed the idea of a vertical garden city, proposed by Le Corbusier. In the project "Radiant City" (Ville Radieuse), the architect proposed to raise buildings on pillars, arranging green areas, streets, and places for pedestrians to rest under them. The introduction of flat roof-terraces, instead of the traditional sloping roofs, would make it possible to build a garden upstairs or equip a place for relaxation. These projects were used in the future to develop social cities in USSR, where people can work, relax, without leaving the boundaries of their district.

After the Second World War, the development of the concept of nature-friendly construction was concentrated in the United States, the country least affected by the hostilities, where it was not required to solve the problems of rebuilding cities and it was possible to focus on the development of new territories. At the same time, with the growth of industrial production and increase in knowledge about climatic and natural changes, the ecological principles of urban structure became more and more popular, the concepts of sustainable development, coexistence with nature, an ecological city, a compact city, a healthy city, etc., appeared. All these principles can be considered the forerunner of the idea of a "green city", conceptualized in 1990 in the work of David Gordon "Green Cities: Ecologically Sound Approaches to Urban Space" [3], where the author offers a systematic description of this concept. The difference between Green City (Green Urbanism) is a conscious movement towards the harmonious development of urban and natural space, through achieving a balance between social, economic and ecological systems [4].

As for China, we can talk about the presence of its own, traditional Chinese concepts of the world order, which were implemented in urban planning until the middle of the 19th century. Chinese authors note that the ideas of the relationship between man and nature, inherent in traditional Chinese philosophy, have determined the modern tendencies of "green" construction in the PRC: a natural look at the "unity of man and nature", laid down in the "Book of Changes", endows "heaven" with "humanity", considers heaven, earth and man as a whole, reflecting the unity of man and nature. [5] The Tao Te Dzin says that "man is the law of the earth, the earth is the sky, the sky is the law, Tao is the law"; in "Guanzi" there was a whole set of rules for choosing a place and urban development based on the characteristics of the landscape. All this allowed the Chinese researchers to conclude that the Chinese traditional culture is saturated with such categories as the worship of Heaven, fulfilling the will of Heaven, harmony with Heaven, and it is these traditional eco-cultural concepts that have become fertile ground for ecological construction in China.

Later, the Opium wars and the subsequently-imposed treaties weakened the Chinese imperial government, that caused the fall in the social and economic level, so the trends of European urban planning described above did not have a serious impact on the development of construction in China. However, the architecture of Chinese cities in which foreign settlements were located (Shanghai, Xiamen, Harbin, Hong Kong, etc.) are brilliant examples of the interpenetration of various cultural traditions. Up to now days, these cities have areas with European buildings, which are clearly marked. Interesting the experience of Shanghai in the first half of the twentieth century, where a number of buildings in the Art Deco or Constructivism style are being built under the leadership of European architects. For example, the most recognizable apartment building is the Normandy apartment on the corner of Huaihai rd. and Wukan rd., reminiscent of the famous "iron" skyscraper designed

in 1924 or “Astrid” apartments, built in the Art Deco style in 1933 at the intersection of Nanchang Road and Maoming Road. However, these experiments were of a single nature, being, rather, an exception and not reflecting the specifics of the social space of Shanghai in the 1930s. Due to the specifics of socio-political development in the first half of the twentieth century (civil war, Sino-Japanese war, etc.), the majority of the population lived in rural areas. The agrarian nature of the country, the presence of a large number of people engaged in agriculture, the traditional communal, clan-based nature of the economy determined the priority of the rural population over the urban. So, according to the Statistical Yearbook of China, in 1978, 17.9% of the population was urban, but already in 1990 this figure doubled and amounted to 26.41%, reaching 58.52% in 2017. [6]

It is obvious that the government controls the population through dwellings: the mass of workers is formed into labor collectives, held together by a common way of life; the practical absence of individual housing makes it possible to deprive a person/family of autonomy, including them in a collective life. Of course, in traditional Chinese Hutongs, several generations of families lived together, but in this situation, the unification takes place not on a family basis, but on a professional basis, which leads to the formation of a new worldview that affirms the priority of the collective. A continuation of this trend, after the formation of the PRC, was the formation of workers' communes, which influenced the house building: now the buildings were, rather, the character of workers' barracks than individual housing.

Thus, until the beginning of the policy of Openness Reforms, the issue of "green cities" was not raised in the PRC, everything was subordinated to the development of industry and the creation of a collective spirit. However, already in 1972, China joined the Man and the Biosphere program; in the 1980s, environmental and geographic factors began to shift into urban planning, which required the scientific community to master modern achievements in this area. In 2002, following the results of the V International Symposium of Eco-Cities, the “Shenzhen Declaration on the Construction of Eco-Cities” was published.

3 Green cities in China today

Talking about Green cities in China, it is necessary to define the terms. The concept "green" 绿 means environmental friendliness, therefore, as borrowings from English language, there are concepts 绿色城市 “green city”, 绿色运动 “green movement”, 绿色产品 “green goods”. Also in Chinese language there is a concept 生态 “ecology” and related with it 生态文明 “eco-culture”. Being synonymous, these concepts are different in application: in state and legal documents, preference is given to the term 生态 (except stable combinations), in journalism more common 绿色. That because “green building” was a new problem for China and its development for a long time was abroad, being borrowed, the name retained the traditional American-European (foreign) connotations referring to advanced technologies, ideas and concepts. Next, we will focus on practical surveys related to the formalization of green building both on the ideological and government levels.

In order to effectively solve problems related to resources and the environment, the basic principles of eco-cultural construction have been consistently and clearly worked out since the 16th CPC Congress. Thus, at the 18th National Congress of the CPC, the concept of eco-cultural construction was introduced into the Party Charter, the 18th session of the 5th plenum of the Central Committee made the concept "green" one of the principles of the country's development, the 19th National Congress of the CPC proclaimed "eco-cultural construction and stimulation of green development" as one of the fundamental ideas of the

development of socialism with Chinese characteristics in a new era. Since 1992, various ministries and commissions of China's central government have adopted a pilot model promoting eco-cities. The leading ideologist of the revival of China's ecological philosophy was Xi Jinping, who proposed the concept of "Two Mountains", the essence of which is that "green mountains and emerald waters are untold treasures." The meaning of this concept is that a strong economy and the well-being of the population are inextricably linked with a good ecology and a healthy environment, the development of the economy and environmental protection should no longer be opposed to each other, but should become a single means to achieve the goal. The theory of the "living community" is that water and mountains, forests and fields, lakes and grasses - all this is a living community that people should respect, protect, listen to it, which will allow to recreate an integral ecosystem. Chinese ideologists insist that the achievements of Western industrial civilization contributed to the rapid development of industry in the New and Modern times, but the Eastern civilization, having assimilated its achievements, reawakened and revived the essence of Chinese traditional philosophy, which is the basis for modern eco-cultural construction in the PRC. In this regard, in order to solve modern problems, China must rely on traditional philosophy, accumulating the achievements of the past to solve the problems of the future.

Green cities in China should be created on the principles of sustainable development, combining in their nature the principles of economic, political, cultural, social and ecological construction. At the same time, in the center of the structure is the economy operating on the principles of high efficiency and safety; public construction is carried out on the principles of ergonomic and the environmental policy is aimed at protecting the environment. This concept "Five in One" (五位一体), reflects not only the relationship between man-nature (man inside nature), man and society (building "datong" 大同 society on the principles of morality and mutual respect, in contrast to the Xiaokang 小康 society, which is built on the principles of benefit and etiquette), which should be formed on the basis of mutual assistance and respect, but also the integration of the concepts of the past, present and future within the urban environment, which is reflected both in philosophy and in architectural solutions [8, 11].

Fig. 1 "Goals of creating a green city" shows the main activities within this concept. "Co-prosperity" 共荣 is a reference to economic construction, which aims to increase the economic well-being of cities; "Co-governance" 共治 refers to political construction, the purpose of which is to exercise co-management of markets, politics and society; "Growth Together" 共兴 describes cultural construction, the purpose of which is to recognize the heritage of traditional Chinese culture, its revival and integration into modern society; "Sharing" 共享 characterizes social construction, the goal is to guarantee the implementation of conditions for universal development, joint use of resources and material benefits; the concept of "Symbiosis" 共生 describes eco-cultural construction, the purpose of which is to create a community that maintains a close relationship between man and nature.

Thus, the "green city" model includes an ecological environment, territorial planning, infrastructure on the one hand, and the industrial system, political decisions on the other. From this point of view, the green city appears as a system that integrates all spheres of life, subordinate to the idea of harmony and mutual assistance, which is formed by creating a specific space, the important characteristics of which are safety, health, equality, prosperity, energy saving, etc., which is achieved through the use of technological, social, political instruments (Table 1) [7].

Fig 1. Goals of creating a green city

Now in various countries have been created a lot of different Green cities systems indices, that based on the described parameters. Though the criteria often are different, the basis is the same - assessment of the production, life environmental friendliness, and the quality of the environment [8].

Table 1. City environmental assessment system

Environmentally friendly	Woodlands
	Urban landscaping
	Urban park area per capita
	Air quality
	Centralized sources water quality
Ecofriendly development	City energy consumption per 10,000 RMB GDP (1 ton of standard coal / 10,000 RMB)
	Water consumption per 10,000 RMB GDP in the city (m3 / 10,000 RMB)
	Electricity consumption per 10,000 RMB GDP in the city (kWh / 10,000 RMB)
	Emission intensity of major pollutants per 10,000 RMB GDP in the city (kg / 10,000 RMB)
	Investing in the fight with industrial pollution
Ecofriendly resources	Percentage of harmless handling of household waste
	Centralized urban wastewater treatment rate
	Percentage of integrated use of solid urban industrial waste
	Percentage of recultivation of soil erosion
Ecofriendly society	Urbanization level
	Living space per capita
	Unemployment rate
Ecofriendly management	Share of the energy saving costs and protecting the environment in urban areas
	Number of public transport per 10,000 inhabitants
	Urban spending on health, welfare and employment per capita
	Satisfaction with the urban environment

Based on these parameters, cities in China can be divided into three levels. It should be noted that cities in China have a different status: areas of optimized and key development.

In the first case, we are talking about industrially developed territories, which are the engines of the national economy, in the second case, about industrially developed territories with good potential for development (Table 2).

Table 2. Distribution of cities in China based on the assessment of the level of environmental friendliness and urbanization

Development areas	Cities with a high level of environmental friendliness and urbanization	Cities with an average level of environmental friendliness and urbanization	Cities with a low level of environmental friendliness and urbanization
The territory of the optimized development	Beijing, Dalian, Shanghai, Hangzhou, Ningbo, Guangzhou, Shenzhen	Jinan, Qingdao	
The territory of the key development	Hefei, Xiamen, Wuhan, Changsha, Haikou, Chengdu, Kunming, Xian	Shijiazhuang, Hohhot, Changchun, Fuzhou, Zhengzhou, Chongqing.	Harbin, Lhasa

The analysis of these information let to conclude that the key to the success of "green" construction in China is effective economic development, which creates a material base for the further implementation of the whole range of environmentally friendly measures, balanced development, and the formation of a society of "joint prosperity" 共荣.

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