

# Ecological City Planning and Construction Research

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## ABSTRACT

In the process of modern urbanization, the construction of ecological city has become an inevitable trend. With the improvement of economic level, people are increasingly demanding a higher quality of life. Cities are the broadest living space for human beings and the foothold for improving the quality of life. The planning and construction of eco-cities satisfy the harmonious relationship between cities and ecological environment, which is of great significance for the sustainable development of urbanization and conforms to the urbanization requirements of harmonious coexistence between human and nature. There have been a lot of researches on eco-city, mainly involving the path exploration of eco-city construction, the practice situation, and the research related to different factors. At present, the construction of eco-city is in the initial stage of exploration, and still faces some development problems. This paper summarizes the connotation of eco-city, analyzes the problems existing in the current stage of eco-city construction, and puts forward some solutions to these obstacles, aiming at promoting the steady development of eco-city construction.

## KEYWORDS

Ecological City; Connotation; Construction; Planning.

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## 1. INTRODUCTION

Since the reform and opening up, China's urbanization construction has developed rapidly, the number of cities has increased substantially, the volume has gradually expanded, and has been in the rapid development stage of urbanization, but the too fast speed has led to many environmental and quality problems, affecting the living standards of urban residents and destroying the ecological balance. Eco-city construction is a powerful measure to solve the current environmental problems. While improving the environmental quality, it meets people's pursuit of high-quality production and living environment and explores the ecological path of urbanization construction. At present, there are a number of ecological city models, such as Longyan, Qingdao, Wuxi and other cities have been selected as the top ten ecological civilization cities, ecological construction has become the key development direction of cities, and China's urbanization has shifted from the high-speed development stage to the high-quality development stage.

China's academic research on eco-city construction started relatively late, and currently mainly focuses on the connotation, path and problems of eco-city construction [5]. On the whole, China's eco-city planning and construction is still in the exploratory stage [14]. This paper summarizes the connotation and planning principles of China's eco-city, analyzes the problems in the process of eco-city construction, and puts forward four specific and effective eco-city planning strategies, hoping to provide help for the construction of modern eco-city.

## **2. OVERVIEW OF ECO-CITY**

Eco-city Eco-city is a new concept of place produced on the basis of human's deeper understanding of the relationship between man and nature. It designs, builds and updates the urban environment according to the idea of ecology, and realizes the goal of highly harmonious coexistence between man and nature. An eco-city is a highly developed economy, a prosperous society, people living and working in peace and contentment, and a virtuous ecological cycle that maintains a high degree of harmony. The urban environment and living environment are clean, beautiful, comfortable and safe, the unemployment rate is low, the social security is perfect, high-tech is dominant, technology and nature are fully integrated, and people's creativity and productivity are fully brought into play. The artificial composite ecosystem is conducive to the stable, coordinated and sustainable development of urban civilization.

Eco-city is to integrate ecological concepts in the process of urban construction, take the quality of urban construction as the construction focus, and take the ecological environment construction as an important part of promoting economic development. China's urban ecological civilization construction has entered a stage of benign cycle development. In the future, emphasis will be placed on the coordinated development of rural areas and cities, the optimal allocation of urban resources will be realized, the harmonious coexistence between man and nature will be promoted, the effective urban resources will be rationally developed, and the quality of life of urban residents will be comprehensively improved [18].

## **3. PROBLEMS IN ECO-CITY PLANNING AND CONSTRUCTION**

In the process of new-type urbanization construction, the overall situation of eco-city construction is good, but it is still in the initial stage. According to the existing literature, the research finds that the institutional system needs to be improved, and there is a gap between the planning scheme and the reality, so there are still some development barriers in the implementation process, and the problems are as follows:

### **3.1. Lack of Systematizms and Backward System**

At present, in terms of eco-city planning and design, China's guidance at the national level is not enough, no long-term development plan has been established, the eco-city index system is not perfect enough, and a set of reasonable and scientific eco-city index system has not been formed, which lacks systematicness and integrity, and authoritative evaluation criteria, and cannot really play the role of eco-city planning and construction [12].

In addition, China's urban and rural planning preparation time cycle is long, the span is large, the planning process of various departments lack of communication, policy implementation lack of consistency, ecological planning concept is difficult to run through the whole planning, the different subjects in the planning can not be efficiently connected, affecting the efficiency of project planning.

### **3.2. Lack of Execution**

Some cities in the process of ecological construction, the specific implementation is not in place, leading to the construction of ecological city deviates from the expected goals, this situation is mainly caused by the following three reasons, first, ecological city planning and the actual situation of the region is far from the operation is difficult, not applicable to local urban construction. Second, it only focuses on short-term interests, does not consider the overall and long-term development of the city, and lacks foresight for the problems that may occur in the construction process, which is not conducive to the orderly construction of ecological cities. Third, in the ecological planning of urban

construction, there is a lack of data support and supervision is not rigorous, and a complete feedback system has not been formed [12].

### **3.3. Lack of Scientific Ecological Direction**

The long-term urbanization process has changed the original ecological environment of the city and replaced it with man-made landscape. Urban construction lacks ecological concept, and due to the wide range of urban land, the overall ecological concept is not clear, and there is no clear direction of action. Based on the concept of sustainable development, the construction of ecological cities needs to start from land transformation and spatial planning, which are effective ways of human intervention in the natural ecological environment. Modern urban planning is difficult to guarantee the harmony and stability of restoring nature and transforming nature.

### **3.4. Weak Mechanism and Low Participation**

The construction of ecological cities also needs economic support, but the current ecological city construction considers the use of new technologies and new energy, and does not fully consider the cost of the transformation and upgrading of existing industrial technologies, and the market operation is relatively lagging behind. The development and construction of eco-cities in China are mostly led by the government and lack of market regulation mechanism. The construction of ecological city needs the joint efforts of the whole society, but the overall ecological awareness of the society is still weak, and resource waste, littering and environmental pollution often occur. It is a long process to change the concept of development and build an ecological civilization city.

### **3.5. Lack of Innovation Ability, Unbalanced Development**

The construction of eco-city needs technical support, such as green transportation, ecological water system, and low-carbon energy system[10]. The construction of eco-city needs to solve local practical problems according to local conditions, and the implementation plan is different, and the application technology and resource elements are also different, so it is necessary to innovate the development mode of eco-city construction. Due to the advantages of cities in the national development strategy, they are in a central position, so the resource factors and policy welfare tend to favor big cities, which leads to the difference between urban and rural areas. However, in the construction of ecological city, small cities and rural areas have more advantages, less efforts to transform the natural environment, and rich and diverse natural landscapes, so we should pay attention to the integration of urban and rural development. Small towns connect cities and villages in urban development and play a role in linking the past and the future, and should also play a role in the construction of ecological cities [10].

## **4. ECOLOGICAL CITY PLANNING AND CONSTRUCTION STRATEGY**

In view of the problems existing in eco-city planning and construction, the following strategies are put forward:

### **4.1. Scientific Planning for Ecological City Construction**

Ecological construction is an important part of urban planning, and it is necessary to closely combine the current ecological situation, scientifically analyze the planning, improve the ecological city planning system, and improve the practicability of planning to promote the construction of ecological cities. First of all, it is necessary to consider a number of six subjects, establish a sound ecological city planning review system, formulate construction and quality standards, provide a reference basis for the scientific and rational urban construction, and build a harmonious human-land relationship. Secondly, field visits should be conducted to ensure that the eco-city planning is scientific and

effective, to ensure that the design can be truly implemented, and to solicit the opinions of residents, to ensure that the public is open and the public is listened to. Finally, the establishment of demonstration parks can be adopted to verify whether ecological integrity is satisfied.

#### **4.2. Strengthen Publicity and Attention**

Increase the publicity of ecological concepts and strengthen the importance of ecological planning to build an ecological city is a people's livelihood process, which requires the participation of the whole society, and the ecology of the whole people is an important prerequisite to ensure the smooth development of ecological city planning and construction. Only when everyone has a strong ecological awareness can the ecological city problem be solved. The construction of ecological city is a lasting project, and ecological awareness also needs long-term publicity to eventually integrate into life and build an ecological city.

First, all relevant local departments should do a good job in publicity work, such as environmental protection departments and planning departments can carry out ecological small classes, or take the community as a unit, the responsibility of the main body to the individual, increase the publicity of ecological concepts, so that people fully realize the importance of ecological city planning, and actively invest in the construction of ecological cities with great enthusiasm.

Second, the staff involved in urban planning should be trained to fill their knowledge blind spots, so that they can understand what ecology is and form a correct ecological view. At the same time, the responsibility consciousness of relevant staff should be enhanced to ensure the efficiency of planning and construction and build a high-quality ecological city.

Third, actively promote the theory of sustainable development, ecological construction is a key measure to ensure the harmonious coexistence of witnesses and nature, sustainable means continuous, long-term integration of human and nature survival, so we must adhere to sustainable ecological construction, green mountains, gold and silver mountains, maintain the ecological environment, human beings can enjoy high-quality pastoral life, landscape life.

#### **4.3. Overall and Coordinated Development**

The construction of an eco-city should follow the principle of "people-oriented" and give full consideration to the needs of people. For example, the residential area should be made green to ensure the air quality is up to standard, so that people can breathe fresh air. At the same time, the residential area should also expand its service functions, such as setting exercise and fitness venues and entertainment venues, so as to enrich the spiritual life of residents and improve the quality of life [27]. Urban and rural construction has different residents' demands, so it is necessary to rationally plan space according to local conditions, maximize the man-made landscape in line with natural elements, and coordinate the natural environment and social environment. Ecological construction is not only about maintaining the natural environment, but also the coordination of residents' lives. The urban environment must meet the production and living requirements of residents, and the development of urban economic, cultural, political and other undertakings must meet the material and spiritual needs of people. While meeting the requirements of the ecological environment, it must also ensure the living standards of the people.

#### **4.4. Strengthen Innovation and Keep Pace with The Times**

Ecological city construction needs the investment and application of environmental protection technology, although China's science and technology is advancing by leaps and bounds, but the technical level of the construction of ecological city, still need to be improved, so we must strengthen scientific and technological innovation, to ensure that the quality of urban construction meets the standard requirements. At the same time, we should mobilize the enthusiasm of market participation,

and form a development pattern of government guidance and market participation. First of all, it is necessary to give full play to the guiding role of financial funds in improving the innovation ability of eco-technology-related enterprises, and stimulate the innovation consciousness of enterprises through the support of special financial funds, so that they can strengthen their cognition in technological research, improvement and innovation, and implement technological upgrading in practice [20]. Second, establish a close cooperative relationship between large enterprises and financial institutions to ensure the financial support for technological innovation and ensure the smooth development of ecological construction. In practical work, it is necessary to give play to the advantages of technical personnel and train more talents in ecological technology, so that ecological technology can be improved and innovated, and then provide talent support for ecological city planning and improve the effect of ecological city planning. Finally, eco-city is the long-term development direction, but the balance between man and nature is constantly changing with time, and the construction of eco-city should follow this change. When carrying out eco-city planning and design, planners and designers should make long-term planning based on ecological constraints and reserve enough “opportunity space” for the subsequent development of urban ecosystem infrastructure and other aspects of the city [14]. For the existing ecological infrastructure in the city, planners and designers should actively use new ideas and new methods to promote the integration of urban space and natural ecological environment.

## 5. SUMMARY

The construction of ecological city is an important way of urban sustainable development. The study of eco-city is inseparable from the integration of multiple disciplines, which needs to incorporate fresh knowledge and integrate the application of new technologies. At present, many new technologies have been used to study eco-cities. Future eco-city research will continue to be carried out on the basis of interdisciplinary research, and urban ecological resilience, smart city construction, urban system security and risk will become the key research directions, complex system science and comprehensive integration technology will be the main development direction and an important way to solve problems in the integrated development of ecology and city. The future research of eco-city needs to make pioneering use of the theory of the relationship between eco-city and man and land, and seek development in innovation, which should not only integrate the scientific concept, but also pay attention to the application of practice. Eco-city planning is a systematic process, which needs long-term practice and continuous improvement. Therefore, ecological city planning and design research should not only focus on the increase of urban area and green space, but also take energy saving and low-carbon as the core principle, refer to the latest cases and data, plan all levels of urban development as a whole, and formulate sustainable development measures with the help of advanced technologies or auxiliary tools. The construction of ecological city has reference significance for modernization development. We should give full play to the role of ecology, maintain a good living environment, and promote the sustainable development of mankind.

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