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Ecological Strategy of City Sustainable Development

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Abstract

The city has inherent unsustainability, so the development strategies of eco-city must be implemented, and it is the most effective way to achieve sustainable development of city. The core of eco-city development is to realize organic balance and sustainability of interactions and feedbacks between the socio-economic and the ecological dimensions. In view of policy and management, the policy focus of ecological urban construction and development is on the planning and development of the eco-city, the saving-typed urban construction, the effective treatment and management of urban wastes and the assessment and accounting of urban ecological footprint.

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1. Introduction

The emergence and development of modern city has brought great convenience to the people's production and life. However, at the same time, with the increasing of urban factor intensity and the constant expansion of city size, the problems such as the traffic, security and environment and others are growing, too [1]. In particular, the environmental problems of the city are increasingly serious along with the increasing development of city, which not only affects the sustainable development of city, and more importantly, the great hazards to the health of the city's residents have been brought, too.

In essence, the city is a socio-economic entity of high concentration of the production and living factors

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composed of the mutual integration of the natural, artificial, and socio-economic environment [2]. This determines the survival and development of the city is bound to consume a large amount of material and natural resources. Meanwhile, in this process, it will also produce a lot of wastes, which causes a devastating effect on the natural environment, eventually leading to the unsustainable development of the city. How to solve the above problems? To completely change the traditional philosophy and pattern of urban development, and to implement the development strategy of eco-city, is the most effective way to achieve sustainable development of urban [3].

2. City and its Inherent Unsustainability

The city is a regional and geographical community composed of the mutual integration of the natural, artificial, and socio-economic environment, and its basic characteristics are the high density of the population, materials and capitals, space, and activities. From the aspect of system theory to view, the city is a complex great system composed of the subsystem such as the natural, economic, social, construction system and so on [4]. In this complex great system, the natural system including the natural conditions, the natural resources and the natural environment is a basis, and the change and development of the economic, social, and building system is built on the basis of natural system. Obviously, if the city's natural system is out of balance or has been seriously damaged, then the development of the city as a whole will be difficult to sustain.

However, from the aspect of natural ecology to view, the city has the inherent unsustainability. First of all, because the city's survival and development depends on a lot of resource and energy inputs, yet many among them are non-renewable. On the one hand, compared to the countryside, because the city is an important conglomerate entity of factors, which determines the normal operation of the city to rely more on artificial environment system, not just the natural environment system, so the consumption of the resources and energy on unit volume rate is more, which will undoubtedly exacerbate the shortage of resources and energy of the city. On the other hand, the city's own resource and energy supply, after all, is limited, so a lot of resource and energy supply in the city mainly depends on the outside of the city. However, in the process it will inevitably result in a certain level of energy consumption and friction cost, this more exacerbates the shortage of the resources and energy of the city. From the modern practice of urban development to view, the shortage of resources and energy has become one of the principal contradictions hindering urban development, causing a great threat to the sustainable development of the cities.

Secondly, in the survival and development process of the city, a lot of wastes will be produced. The generation of municipal wastes is mainly from two aspects. The first is the wastes generated from a variety of production activities in the city, which in turn is closely related to the developed degree of urban industries and the intensive degree of urban. Generally speaking, the more developed industries and the higher density of factors in the city, then more wastes will be caused. The second is the wastes generated from the daily life of urban residents, including all kinds of scrap items and garbages, etc.. Especially, with the continuous improvement of the living standards of urban residents, the wastes generated from the daily life will be more and more. Whether the production wastes or the life wastes, because some of them can not be naturally degraded and absorbed, or need a long time to be able to be naturally degraded and absorbed, so with the growing number of all kinds of wastes, both not only cause great harm to the natural environment of the city, but also cause great harm to the health of the residents of the city, which severely restricts the sustainable development of cities. How to effectively deal with the wastes of urban has become one of the most important issues to be addressed in the development of modern city [2].

In addition, with the increasing intensity of urban factors and the continuous expansion of city size, the problems such as the traffic congestion, the deterioration of law and order situation, the shrinking of green areas, the noise pollution, and the heat island effect, are increasingly serious, too. In these negative factors,

some have a direct negative impact on the sustainable development of the city, and the others may cause indirect negative impact.

3. The Ecology-oriented Strategy of City Sustainable Development

Urbanization is the result of industrialization and technological advance. However, with the development of industrialization and technology advance, the surge in urban population and the increasing expansion of the scale of city will inevitably appear, too. Although the urban areas account for only 2% of the Earth's land surface, but they generate greenhouse gases 78 percent of the total greenhouse gas emissions. Therefore, the development of urban has a greater impact on climate and environmental change [5]. This effect is mainly from two aspects. On the one hand, the city's development is bound to occupy a lot of land and consume other natural resources, and this will undoubtedly cause a certain degree impact on natural ecosystem. On the other hand, the development of city will have a greater impact on the biochemical cycle on the Earth, and this will cause a certain extent adverse impact on natural ecosystem, especially biodiversity, but furthermore its impact goes far beyond the scope of the city itself [5].

In fact, the fundamental reason causing the above problems is that, the balanced relationship between the human socio-economic activities and the natural ecosystem has not been correctly handled. Because natural ecosystem is the results of the long-term evolution of the great nature, so the natural ecological environment is scarce resources limited. However, for the short-term economic interests, people often tend to make excessive development and utilization on the natural ecosystem. Especially in the development of the city, because the city is a conglomerate entity of factors, so the consumption of natural and environment resources in the development of the city is usually enormous, and often exceeds the carrying capacity of natural ecosystem. Therefore, in order to achieve the sustainable development of city, we must respect the objective laws of the development of natural ecosystem, and realize the balanced development between the city's socio-economic and natural ecosystem. From a strategic point of view, that is to make ecological strategy as an orientation to achieve the sustainable development of city.

The core of eco-city development is to achieve the organic balance and sustainability of interactions and feedbacks between the socio-economic and ecological dimensions [6]. In fact, the size and prosperity of city mainly depends on the potentials of regional productivity, energy, resources and environment. Therefore, the scarcity of urban ecology and the stability of socio-economic system of urban are the most basic factors that determine urban planning and development, and the basic objective of eco-city development is to fundamentally solve this problem [7]. The primary problem of the eco-city construction and development is on the premise of respect for the laws of nature, as much as possible to reduce the negative impact of human activities on the natural environment. Specifically speaking, on the one hand, the planning and development of the city should be built on the basis of material carrying capacity of the natural ecosystem of the region. Especially on the land use, the protection of biological resources, the natural resource use and the generation of wastes, we can not be beyond the reality of the allowable limit of natural ecological system, which is the basic requirement of the eco-city development [5]. On the other hand, we should fully use the energy-saving and recycling technologies so that the rate of resource consumption is kept to a minimum, in order to ensure the long-term use and the availability of the resources of the field of basic needs such as the food, energy, water resources, building materials and other necessities, etc. [7].

Another problem in the construction and development of eco-city is that we must effectively guide and regulate the way of production and life of the city, in order to maintain the stability of highly sensitive socio-economic system of the city [7]. With the development of modern material technology, the convenience has become the basic means of production and lifestyle what people pursue. However, this convenience is built on the basis of a lot of resource and energy consumption, at the same time it will also increase the generation of

wastes, which will exacerbate the contradictions of the city's energy shortage and environmental deterioration. Therefore, it is necessary to take modern ecological civilization as core values to build economic ethics and codes of conduct, and by it to guide and regulate all social and economic activities of the city. This is an important content of the eco-city construction and development.

4. The Related Policy of Ecological City Construction

4.1. The planning and development of eco-city

At present, the main problem in the urban planning and development is the growing size and population density of the city. Although the size and population density of the city is not certainly related to the energy and environmental problem of the city, yet the size and population density of the city beyond the specific regional productivity, resources, energy and environmental potentials is bound to cause adversely effect on the natural ecological environment system. Therefore, in the planning and development of city, it is necessary to take full account of the constraints of the ecological scarcity and system stability of city, taking it as a basis to promote the construction and development of city [7].

Because the urban development has the internal expansion impulsivity, so the state and local governments need to draw up and improve the related regulations and policies of the planning and development of the ecological urban to guide, regulate and promote the construction and development of the eco-city. Especially on the aspects of the rational layout of the city, the determination of the reasonable size of the city, the space planning of urban green and the micro-ecological system construction of urban, the green public infrastructure of urban, the green building construction of urban, the construction of ecological industrial parks of urban and the building of urban green community [8], the related regulations and policies should be formulated to guide and promote their development. This is the basic requirement of the construction and development of an eco-city.

4.2. The construction of saving-typed urban

The construction of saving-typed urban is an important aspect of the construction and development of ecological urban. The significance of the onstruction of saving-typed city is that, it is not only conducive to the realization of the reduction of resource and energy inputs, but also conducive to the realization of the minimization of waste emissions, which are conducive to the conservation of resources and energy and the protection of ecological environment.

The core of the construction of saving-typed city is the energy saving and the consumption reduction and the reduction of emissions in the areas of the production and living. Among them, the basis of the energy saving and the consumption reduction and the reduction of emissions in the areas of the production is technological progress and management innovation, but the key to the areas of living is the change of the philosophy and pattern of people's consumption. To this end, it is necessary to draw up and implement appropriate regulations and policies according to the characteristics of the energy saving and the consumption reduction and the reduction of emissions in the different areas.

4.3. The effective treatment and management of municipal wastes

With the construction and development of the city, the contradiction of a large number of wastes generated in the urban is becoming more and more striking. The generation of a large number of wastes in the city not only affects the appearance and image of the city, and more importantly causes great harm to people's health.

Therefore, how to effectively deal with and manage the wastes of city has become the major issues that need to be solved in the construction and development of modern city.

From the international experience of urban development to view, the basic means to solve municipal wastes are to use 3R (Reduce, Reuse and Recycle) technologies for the scientific processing of the wastes, in order to achieve the purpose of recycling use of resources and the reduce of emissions. However, the promotion and application of the 3R technologies requires a certain economic base for support, so for some countries of low and middle income it is difficult to be fully implemented. In this case, it is necessary for the state and government to give strong policy support and financial aid.

The management of the wastes in the city involves in many of linkages such as the generation, collection, transportation, resource recovery and harmless treatment, ultimate landfilling of the wastes and the others. Therefore, it is necessary to adopt an integrated management mode to be able to obtain the best management effect. This requires the states and government draws up appropriate regulations and policies in the clean production, the implementation of public health standards, the classification collection and processing of garbage, the disposal and landfilling of the wastes, the technological innovation, the financial support and organizational arrangements, to create a good system and policy environment for the effective treatment and management of the wastes in the city [9].

4.4. The assessment and accounting of urban ecological footprint

The ecological footprint of urban is the reflect of the reality of urban ecological development, and the state of the ecological footprint of the urban determines whether the urban development has sustainability. Therefore, it is necessary to carry out the assessment and accounting of urban ecological footprint, so as to provide scientific decision-making basis for the development and management of the eco-city.

Because the assessment and accounting of the ecological footprint of urban involves a series of complex issues such as the relevant standards and evaluation system and others, so it is necessary for the state to draw up and promulgate the relevant assessment standards and normative documents. In addition, it is still necessary to make great efforts to cultivate and develop independent assessment agencies, in order to provide better services for the assessment and accounting of ecological footprint of urban.

5. Conclusions

The city is a regional and geographical community composed of the mutual integration of the natural, artificial, and socio-economic environment. Because it has the characteristics of the high density of the population, materials and capitals, space, and activities, so it has the inherent unsustainability. Therefore, it is necessary to implement the development strategy of eco-city, and it is the most effective way to achieve sustainable development of urban.

The core of the eco-city development is to achieve the organic balance and sustainability of interactions and feedbacks between the socio-economic and ecological dimensions. The primary problem of the eco-city construction and development is on the premise of respect for the laws of nature, as much as possible to reduce the negative impact of human activities on the natural environment. Another problem is to effectively guide and regulate the way of people's production and life in the city, in order to maintain the stability of highly sensitive socio-economic system of the city. In view of policy and management, the policy focus of the construction and development of ecological urban is the planning and development of eco-city, the construction of saving-typed urban, the effective treatment and management of municipal wastes, and the assessment and accounting of urban ecological footprint.

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