

LETTER TO THE EDITOR

Modeling and Evaluation of Diversification of Natural Ecological Resources under the Background of Rapid Urban Development

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With the rapid development of social economy, China has entered the stage of rapid urbanization, which is constrained by the past economic development model and urban development concept. Most cities in China are experiencing the pain of rapid development model of extensive cities at the expense of ecological environment and natural resources. After bearing the heavy cost of ecological environment deterioration and serious waste of natural resources, urban managers gradually realize the importance of updating the development model of urbanization. This paper analyses the characteristics of natural ecological resources under the background of rapid urban development, and establishes a diversified evaluation model based on the characteristics of natural ecological resources. The experimental results show that the evaluation accuracy of the proposed model can reach as high as 90%, which provides a reference for the further study of the ecological environment.)

Natural ecological resources; Rapid Urban Development; Diversification; Evaluate

1 INTRODUCTION

The precondition for the rapid development of urbanization in China is the dual security of ecological environment and resources. In the situation of relative scarcity of available urban resources, in order to achieve sustainable urbanization, we need to constantly improve the low-carbon model of urban planning, establish and improve the urban planning, construction and management system. Promote the use of low-carbon development in urban areas and establish a decentralized urban safety system. The purpose of the low-carbon model is to ensure the sustainable supply of urban resources and enhance the safety of urban system operation. On the premise of continuous progress in all areas of urban society and continuous improvement of residents' quality of life, we should try our best to reduce energy consumption per unit of production and living, reduce pollution sources and achieve a basic balance of carbon emission and carbon sink capacity, so as to achieve the goal of building a livable and sustainable low-carbon city (Kropáčková et al. 2017).

Galina P. Novikova, Elena A. Kaptelinina, Dmitriy A et al. published an article in the Ekoloji (Issue 107, 2019), entitled "Personality Ecological Culture: Universals of Ethical Principles of Human-Environment Interaction", On the basis of the principle of unity of human and environment, the leading position of this document is devoted to rethinking the ethical values of individual eco-culture, organizing economic activities on the basis of the moral values of natural management, and predicting the impact of their actions on the environment (Novikova et al. 2019).

Recognize the rights of wildlife and the equal value of human life on earth. This strategy decides the need to rethink the scientific evidence of the theory and method of the principle of interaction between human beings and the environment, provides the formation of value system, value orientation, interests, needs, attitudes and individual experiences, and creates new environment-oriented decision-making and behavioral norms related to the natural environment. In this regard, the main content of this paper is devoted to the development and test of the universal ethical principles of the innovative mode of individual ecological culture, and to upgrade the development of the equal coexistence of man and nature and the sustainable interaction of ecology to the level of law. With the help of environmental monitoring, as a main research method, the validity of the universality of the ethical principle of the coexistence mode of human and nature equality has been tested and proved by experiments. This paper has obtained good research results in this field. On this basis, this paper establishes an evaluation model for the diversity of natural ecological resources under the background of rapid urban development.

2 IDEA DESCRIPTION

2.1 Rapid Urbanization

China is still in the stage of centralized urbanization, but in general, it is in the early stage of urbanization development, and has entered the stage of rapid rise. The difference between the development of urbanization and that of the world lies in the fact that the phenomenon of urbanization and re-urbanization in China is not obvious or even reverse at the same time (Shen et al. 2018). While some cities in China are suburbanizing, the economy and urban construction of urban central areas continue to flourish, showing a stronger centralized role. The urbanization promoted by multi-investment channels diversifies the development of cities and buildings. Cities and buildings show more humanistic tendencies. The privatization and privacy of building space have also been strengthened, which has been witnessed by the rapid development of commercial housing industry and housing design in China. Housing industry has become the largest proportion of fixed assets investment. It has also led to the rapid development of related industries such as interior design, decorative building materials, household appliances and so on. The level of urbanization development is not balanced, and the focus of urbanization is still in the eastern region. It is gradually advancing to the central and Western regions. Since the founding of New China (Cline et al. 2017). In the first 30 years, the focus of urbanization has increased slightly faster in the north than in the south. After the reform and opening up, the regional focus of urbanization has obviously shifted from west to east. The growth rate of the number of cities in the south is obviously faster than that in the north. The structure of urban construction land has been improved greatly. Since the 1980s, urban infrastructure construction and environmental construction have been gradually paid attention to and strengthened. Urban facilities are improving day by day. In particular, green space, road square land, municipal public facilities land and public facilities, land use has increased rapidly. Urban economy and society begin to enter the track of coordinated and healthy development (Tian et al. 2016). Accordingly, the total amount of urban construction land and the per capita level have been greatly improved. However, the phenomenon of waste of land is more serious (Levis et al. 2017).

2.2 Analysis on the Characteristics of Natural Ecological Resources under the Background of Rapid Urban Development

2.2.1 Rural Land Ecological Environment Construction Model

Rural land refers to the areas where agriculture is the main land use area, including towns, villages, farmlands, water networks, hills and so on. The landform is dominated by natural environment, green plants and natural villages. For Qinhuangdao City, the rural land use pattern should fully reflect the combination of ecological and social economic benefits. In the process of rural land use, we should focus on developing ecological agriculture and

forestry, adjust the rural land use pattern and strengthen the construction of ecological environment. On the basis of strengthening the construction of agricultural infrastructure and public facilities, we should attach importance to the formulation of village planning, incorporate village planning into the work scope of governments at all levels, and carry out pilot projects of village governance. Combined with the construction of new socialist countryside, rural construction land should vigorously carry out the construction of ecological demonstration villages (gardens) in accordance with the requirements of ecological town construction, properly relocate villages and merge small villages with less than 300 people to form modern residential communities with reasonable layout and beautiful environment. At the same time, we should actively optimize the industrial structure and ecological environment of agriculture, develop characteristic planting and animal husbandry and aquatic industry, consolidate and develop traditional superior planting industry, vigorously cultivate and develop characteristic planting industry, and form a pattern in which characteristic agricultural product planting is relatively concentrated in superior producing areas, so as to realize the double bumper harvest of economic benefits and ecological benefits of rural land use (Wan et al. 2017).

2.2.2 Ecological Buffer Model in Urban-Rural Junction

Urban-rural fringe is the area where urban land use and rural land use intersect each other. It is the buffer area for urban to peripheral development and the key area for coordinating urban-rural relations. Qinhuangdao City is rich in natural and cultural landscapes, so as a buffer area for urban development, the urban-rural fringe is very suitable for the development of eco-tourism agriculture, in order to ensure adequate vegetable supply for cities and towns. On the basis of land use for agricultural by-products, relying on rural natural landscape and agricultural production and operation activities, the scope of ecological sightseeing agricultural areas such as grapes, apples and cherries is scientifically planned, and a series of tourism projects for tourists are carefully designed to improve the ornamental and interesting nature of sightseeing agriculture, increase the potential of tourism and enhance the taste of cities (Forstmann, Sagioglou 2017).

2.2.3 Eco-environmental Conservation Model of Coastal Tourist Areas

Coastal types in coastal tourism area are various, including bedrock headland coast, gravel coast, sandy coast, silt-silt coastal lagoon, and there are coastal shelter forests and many rivers entering the sea. In the process of land use in this area, ecological environment conservation model should be vigorously implemented and comprehensive harnessing should be carried out. At the same time, we should actively take measures to protect the environment and strengthen the infrastructure construction of urban road traffic and urban greening, while building the coastal tourism area in accordance with the goal of the new leisure tourism culture zone in northern China with humanities and ecology as the core and the high starting point of the internationally renowned coastal tourism and vacation destination. Strict zoning management should be carried out in shallow aquaculture areas and bathing areas, the construction of coastal shelter forest system should be improved, and the greening isolation zones in urban areas should be strictly protected, and urban forests should be constructed. Strengthen the construction of nature reserves mainly consisting of coastal wetlands and protect the habitats of rare birds. At the same time, in the process of regional land use, we can also draw lessons from the utilization mode of industrial development zones with tourism and leisure industry as the main part.

2.3 Evaluation Model of Diversification of Natural Ecological Resources

Different from the traditional urban space development research, which does not attach much importance to the “green” effect of urban space, the main purpose of the evaluation and analysis of the diversity of natural ecological resources is to analyze the sensitivity and stability of the ecosystem involved in urban development by using the principles and methods of ecology, to understand the ecological potential of natural resources and the possible

constraints on urban development, so as to guide urban space. Reasonable development. The evaluation and analysis of the diversity of natural ecological resources emphasizes the harmony between urban spatial design and natural conditions, insists that urban development should be based on the maintenance of nature, and the natural environment and its evolution process should be protected to the maximum extent, so as to rationally develop and utilize all natural resources called life support system. It is believed that any city is an open system for continuous material and energy exchange with the natural ecological environment. Water, atmosphere, vegetation, soil, biodiversity and other factors should be included in the scope of urban research. The idea of urban development is not based on the fact that human beings are the dominant part of nature, but on the harmony with natural ecology. This kind of humble Oriental philosophical thought of mutual courtesy between human beings and nature is the ideological origin of the diversification evaluation of natural ecological resources. The evaluation and analysis of the diversity of natural ecological resources starts with the analysis of natural factors, studies the natural environmental advantages of cities and regions, and makes them become the balance mechanism and dynamic mechanism of the sustainable development of cities. This paper analyses the impact of urban development on the natural environment, and puts forward some suggestions on ecological compensation measures for the destructive impact, so as to put forward some guiding strategies for urban spatial development, such as direction, shape and structure. Assessment and analysis of natural ecological resources diversification focuses on natural ecological processes (such as the relationship between land carrying capacity, water balance, landscape spatial pattern and urban development and environmental protection), ecological potential (reaching the level of primary productivity per unit area of land), natural ecological pattern (natural rivers, mountains, remaining natural mosaics, corridors, etc.) and self-determination. However, ecological sensitivity analysis (the degree of response of different natural systems to human disturbances, etc.). The research on the Countermeasures for the evaluation and analysis of the diversity of natural ecological resources can be regarded as an organic part of ecological planning, and it is a guidance for urban spatial development from the perspective of natural ecological resources specialty. The conclusions are analyzed from the social and economic perspectives and the results are mutually referenced, thus comprehensively guiding the development of urban space.

3 RESULTS

In order to verify the validity of the evaluation model, a test is needed. The model is tested by MATLAB7.0 software. The operating system is Windows XP and the memory is 244 B. In the test, 1000 real data sets of ecological environment are randomly selected, including the information of ecological pollution index and ecological greening factor.

The evaluation accuracy of this model is compared with that of the traditional model. The results are shown in Fig. 1.

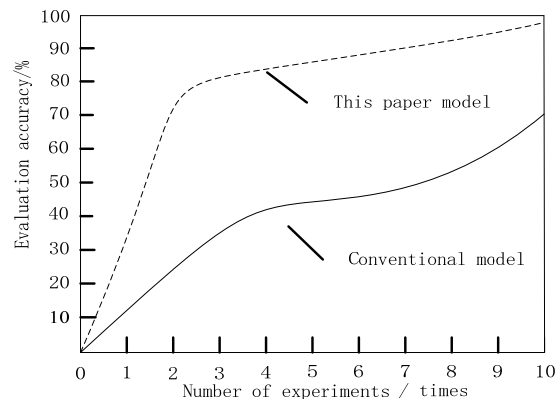


Fig. 1 Comparison of evaluation accuracy

As can be seen from the analysis of Fig.1, in the evaluation of ecological resources diversity, the accuracy of the two models increases rapidly with the increase of the number of experiments. The evaluation accuracy of the model in this paper is 99%, while that of the traditional model is about 70%. The model in this paper is obviously higher than that of the traditional model. It can be clearly seen that this model has good performance and can accurately evaluate the diversity of ecological resources.

4 CONCLUSION

Through the effective integration of natural and ecological resources, making full use of modern scientific and technological means, guiding the industrial layout scientifically and rationally laying out the urban spatial form, the carrying capacity of natural and ecological resources can achieve a new type of urban intensive development mode, which can improve the efficiency of economic and social production, protect the ecological environment and save resources. In addition to the innovation of planning concept, natural ecological resources should constantly improve the mechanism of urban development, reduce energy consumption and lifestyle, and create a set of urban planning system for ecological urban development.

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