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Research Article

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Urban ecological culture quality evaluation index system construction

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ABSTRACT

The current acceleration of urbanization has brought environmental resources consumption and a series of environmental pollution problems. Under the severe environment pressure, the construction of ecological culture gets more and more attention of people. This paper proposes fuzzy evaluation and analytic hierarchy process (AHP) method of the evaluation indicators, ecological culture comprehensive evaluation results are obtained. The evaluation results not only have positive and realistic effect to the comprehensive evaluation of ecological culture, also have reference for the planning of ecological culture.

Keywords: Ecological culture; Analytic hierarchy process; urbanization

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INTRODUCTION

City is the important carrier of human existing and developing. As the concept of ecological culture is widely accepted, it is of interest to set up an indicator system for it. Now, all countries have generally recognized that ecological planning is the main method of the ease environmental crisis today, the urban ecological culture construction is particularly urgent.And the changing and variation of city development under the influence the natural environment and social environment, in which many urban problems, the most important thing is to urban ecological crisis, the urban ecological system has a high material consumption, high pollution and low reserves the unique characteristics of natural resources. Hence, How to understandthe urban ecological culture quality and the status is the important problem in the study of the urban ecological crisis , several researchers proposed such as Cheng Chun-ming, Song Yong-chang proposed evaluation index system of urban ecological culture quality, In this paper, we analyze and refer the methods of city ecological security evaluation in Wuhan city, construct urban ecological culture quality evaluation index system, and through analyzing the comprehensive analysis of urban ecological culture quality, evaluate on time scales urban ecological culture quality and its trend, provide theoretical basis for city ecological security evaluation and management.

The characteristics of urban ecological culture

Due to the different geographical environment and the different of environment scale, the ecological communities of practice form is different, as one of these forms of urban ecological culture, it basically has the following several characteristics: (1) the thick population, land stress; (2) the natural resources is less per capita and per capita energy consumption is large; (3) the ecological risk is relatively large. Urban ecological culture which is a relatively independent unit cell , it is closely related to the other functional units, affected by the outside world, natural ecology and social ecology security in the culture is a greater ecological risk.

The establishment of evaluation system

Ecological culture is a relative concept. With the development of society and the development of science technology, its connotation and practice will be constantly developed and improved, there will be many new elements into the ecological culture. In the exploration of urban ecological culture in the process of the evaluation index system, we

uses the analytic hierarchy process (AHP), concluded that the three levels of evaluation index system of ecological culture, select specific indicators, identify a specific reference index.

there are many kinds of urban ecological culture evaluation models, a commonly used model is: hierarchical analysis model; Pressure-state-response model, "Social economic environment" three elements model, the hierarchical analysis model is used in this paper to integrated use of pressure-state-response model, urban ecological culture quality evaluation index system can be divided into four levels: firstly, the goal layer, namely to urban ecological culture quality as the general objective, comprehensive analysis and characterization of urban ecological culture quality present situation and development trend; The second layer is the essential factor layer, taking the ecological culture pressure, urban ecological status, social and economic as three elements, evaluating from different aspects about city ecological culture quality; The third layer is the project, in the urban ecological culture system contains some evaluation and analysis on the basic structure for the project, will refine the second of three elements, evaluation of urban ecological culture quality from different angles; The fourth layer as an index, district respectively different urban ecological culture indicators, in the form of a quantitative evaluation of urban ecological culture quality.

AHP index system

For the building index system, we can use AHP and entropy weight to determine the index weight of subjective and objective information respectively, comprehensive weights are obtained, in order to improve the accuracy and credibility of evaluation results.

When determining our security system coordinated integrated evaluation system of the index weight j, we should comprehensively consider the results of subjective and objective weights way, that electricity security system coordinated weight value j of comprehensive is concluded.

The determination method of comprehensive weight.

If we determine weight set by the AHP $A=\{a_1,a_{2,},\cdots,a_n\}$, and weight set by entropy weight method: $W=\{\omega_1,\omega_2,\cdots,\omega_n\}$, the power of ecological system coordination in the comprehensive evaluation system of the first comprehensive weights of indicators j is as follows:

$$Z_j=\frac{a_j\omega_j}{\sum_{j=1}^{n}a_j\omega_j}\left(j=1,2,\cdots,n\right)$$

Calculate comprehensive evaluation index. Through calculation results of the comprehensive evaluation index system and index weight,we use the weighted average model to calculate the comprehensive evaluation index of power ecosystem coordinate (H_{3e}), and evaluate the power coordination degree of ecosystem. Its computation formula is as follows:

$$H_{3e}\left(i\right)=\sum_{j=1}^{n}Z_j x_{ij}^{'}\left(i\right)\left(0\le H_{3e}\left(i\right)\le 1\right)$$

Index normalized processing. Since the dimension and the order of the magnitude of each indicator has certain differences, we have to eliminate the influences of different dimensions on the evaluation result, so it is necessary to standardize various indicators.

$$x_{i,j}^{'}=\begin{cases}\dfrac{x_j-x_{\min}}{x_{\max}-x_{\min}}-A\\ \dfrac{x_{\max}-x_j}{x_{\max}-x_{\min}}-B\end{cases}$$

Index after normalization treatment, the matrix proportion is as follows:

$$Y = \left\{ \frac{x'_{ij}}{\sum_{i=1}^{m} x'_{ij}} \right\} (0 \le i \le m, 0 \le j \le n)$$

Calculate index information entropy and information utility value. The first item index j of information entropy value is:

$$e_j = -k \sum_{i=1}^{m} y_{ij} \ln y_{ij} \left(k = 1/\ln m\right)$$

Information utility value depends on the difference in value between 1and the index of information entropy e_j. Its computation formula is:

$$dj = 1 - e_i$$

Calculate entropy of index. The entropy value of the j item parameter values is defined as weight:

$$\omega_j = \frac{d_j}{\sum_{i=1}^{m} d_j}$$

The index evaluation result is as shown in table 1

Tab.1 The evaluation result of the third grade index

Elements	Project	1999	2002	2005	2008
Eco-communication pressure	population structure	0.0039	0.0212	0.0473	0.0613
	Natural resources	0.0138	0.0138	0.0261	0.048
	social structure	0.0025	0.0232	0.0418	0.0958
Urban ecological status	Economic Status	0.005	0.0265	0.0531	0.175
	Environmental Status	0.0212	0.0463	0.0578	0.193
	Social Status	0.0059	0.058	0.1147	0.1701
Socio-economic response	Allocation of resources	0.0273	0.035	0.0612	0.1406
	Environmental protection	0.0018	0.0256	0.0427	0.0693

CONCLUSION

This paper elaborates on application of the method of AHP，which leads to a set of qualitative and quantitative indicators thatis in accordance with both local and nationwide situations. Withreference to other relevant studies，the detailed criteriaindicator data are given，and then the comprehensive evaluation model by means of AHP and fuzzy mathematics. From the view of ecology and scientific outlook on development, the ecological system in urban cultureis the organic unity of a dynamic balance, comprehensive, coordinated, sustainable development. Unlike natural ecological system, ecological system in urban culturetook human activity as the center, it not only has the overall relevance, ecological adaptability, coordination and basic properties of symbiosis, dynamic balance of natural ecological system, but also has the social attribution, which is different from the natural ecological system or the unique social controllability. In this sense, the ecological system in urban cultureis a human activity, which can act as the center and subject to human control in special ecological system. Therefore, with the new changing situation ,Moreover, we need to grasp the opportunities for the development, so as to meet new challenges

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REFERENCES

[1] Zhang Biao, *China Population, Resourse andEnvironment*,**2005**,15（87）:70-73.
[2] Hong Ji-hua，Song Yi-lan. *Environmental Science & Technology*,**2000**,23(1):32-36.
[3] Chang Tao. Comprehensive Evaluation Indicator System ofEcological culture [D]. Dalian：Dalian University ofTechnology，**2003**.
[4] Zhou Jian-fei, *Journal of Safety and Environment*,**2005**,5(2):24-27.
[5] Shi Chun, *Shanghai Environmental Science*,**2003**,22(8):564-572.