Scholar Publishing Group
Nature Environmental Protection
https://doi.org/10.38007/NEP.2021.020402
ISSN 2790-2684 Vol. 2, Issue 4: 10-18

Ecological Value of Natural Protection Environment Considering Data Mining

Saurabh Kumar*

Department of Marine Sciences, School of Environment, University of the Aegean, 81100 Lesvos, Greece

**corresponding author*

Keywords: Ecological Value, Data Mining, Nature Protection Environment, Ecosystem

Abstract: In order to make the construction of ecological civilization conform to the objective laws and the world trend, adapt to the requirements of social development, build a new pattern of harmonious coexistence between man and nature, and accelerate the process of ecological civilization construction. Promoting the construction of ecological civilization is an irreplaceable fundamental guarantee for the sustainable development of the Chinese nation and a strategic decision made by China to meet the requirements of future development. Realizing sustainable development through ecological environment protection is one of the important principles of socialism with Chinese characteristics, and is also the essential requirement of the socialist system with Chinese characteristics. Effective measures are taken to solve the outstanding difficulties and problems facing mankind. Therefore, we must scientifically and correctly recognize the important and realistic objective existence of ecological value.

1. Introduction

The balance of energy transmission in the ecosystem is the basis for human survival and development, and the earth ecosystem is of great significance to human survival. For a long time, human life style has led to the degradation of the ecosystem, which is caused by nature itself and the ecological responsibility that human should bear. However, human beings have experienced environmental damage before entering the industrialized society, and the ecological environment has been damaged. People have realized that the environment is one of the biggest problems facing the earth, and the balance of the ecosystem can no longer meet the needs of human growth and future development goals. We should not blindly continue the resource consuming economic development model.

Ecological risk assessment is a new research field, which is rising and developing with the change of environmental management objectives and environmental concepts. Mengwei Zhao

regards ecological risk assessment as a classic multi-attribute group decision-making problem [1]. Sheng Xu Shi applies IVIFHPWA operator to deal with multi-attribute decision making with interval valued intuitionistic fuzzy information. Finally, an example of urban ecological environment construction performance evaluation is used to illustrate the developed program [2]. Bokolo Anthony Jr has developed a green information system (IS) interpretation model based on the technology organization environment (TOE) framework to determine the factors that affect the refraction of the green information system, and further studied the extent to which these factors affect the green information refraction of ICT based enterprises to reflect the ecological responsibility of enterprises [3]. Protecting the ecological environment has become an irresistible trend of social development. In order to protect and sustain development, the construction of ecological civilization will be included in China's future development plan.

Ecological value research is the foundation and core of social economy. In theory, ecological value is a comprehensive compensation, restoration and maintenance function for natural ecosystems and the biodiversity it carries. In a certain sense, ecological value is a means and way to realize the effective use of resources and environment.

2. Discussion on Ecological Value of Natural Protection Environment Considering Data Mining

2.1. Concept of Ecological Value

Ecological value refers to the value of common economic value, social value and ecological effect between organisms, resources and environment related to material production activities in an ecosystem [4, 5]. It includes material form and physical form, such as animals and plants and their products, soil, air, water, light and other material components; The value of biological structure and its metabolic activities on chemical and physical processes such as biochemical processes, life processes and action mechanisms of substances. The comprehensive consideration of these material forms will constitute the basic model and structural model of the material wealth circular economy in the ecological sense [6]. Ecological value is a new concept involving multidisciplinary cross fields. It refers to the comprehensive service function value generated by multi-level and multi type biological communities with good economic basis formed through the development and utilization of biological resources and biodiversity of the earth, with human beings as the main body. These values constitute the source of the most attractive, potential, competitive, sustainable development and vitality of the ecosystem [7]. It is measured by its economic relationship with biology and its economic value. That is, it has value and sustainable development significance to measure. It is not only an economic problem, but also a social and political problem. It not only has value and universal significance, but also has special forms and specific functions. That is to say, it gives reasonable and effective evaluation or expectation to the sum of all the material elements and processes that the natural environment has and exists, as well as their internal relations or such relations. It does not transfer with human will and is irreversible; Therefore, it must have some value to have its unique and irreplaceable meaning or attribute Or it is a value that has been recognized by human beings but cannot be explained or discovered. That is to say, this value is a kind of non-material production value, which contains a special form of objective and inevitable connection between the state of material existence and the material elements. It can also be said that it is just a concept [8, 9]. Specifically, it is not limited to the simple process of what it owns to nature or how much it carries. Because it contains the value formed by various elements in the whole process of natural generation, maintenance and regeneration.

2.2. Sustainable Development Concept

According to the concept of sustainable development, ecological environment protection must be based on full understanding and respect for the natural environment. That is, we must establish the concept of "green water and green mountains are golden mountains and silver mountains" [10, 11]. Sustainable development should reflect the harmonious coexistence and coordinated development of human and nature, rather than blind development. After the ecological environment is damaged, it should be developed and utilized. At present, China's research on these aspects is still very immature. At present, China has formed a relatively complete theoretical system [12]. The birth of the ecological value evaluation theory also provides a new idea for ecological environment protection. It can determine the environmental problems faced by ecosystems in different countries or regions and the achievable ecological value and social benefits attribution through calculation. For example, China aims to overexploit wildlife resources, resulting in environmental pollution and the destruction of species habitats, which is becoming more and more serious; In the process of agricultural modernization, these problems have also been transformed into the phenomenon of ecosystem deterioration and some preventive work has been carried out. Therefore, it can be seen that the state attaches great importance to the protection of the ecological environment. This ecological production mode is fundamentally different from the traditional industrialization, and attaches great importance to economic and social benefits as well as the concept of sustainable development to adapt to the current China's promotion of green and environment-friendly social construction [13, 14].

Due to the blank of ecological value in theory, the immaturity of the development stage, the limitations in practice and other factors, the current understanding and interpretation of ecological value in academia is still not comprehensive. Ecological value is closely related to economic development, environmental protection, ecological construction, and livelihood security. Although China has made some achievements in ecological environmental protection, there are still many problems. From the current situation of China's ecological construction, the foundation of ecological construction is still very weak, and China is a large agricultural country and a large population country, so the construction of ecological civilization has a long way to go [15, 16]. Therefore, only by applying China's ecological value theory to practice can China's construction of ecological civilization conform to the objective laws and world trends. Only in this way can the Chinese people truly live a happy life, and China's economy, politics and culture achieve prosperity and progress, making due contributions to the great rejuvenation of the Chinese nation! In today's society, the concept of harmonious coexistence between man and nature has been paid more and more attention. At the same time, it is also the core idea of the future world harmonious society construction and development strategy, and has become the common spiritual home of the Chinese nation. Protecting the ecological environment has become a common responsibility and obligation of the whole society. Through the study of environmental value theory, it is found that the earth surface resources play a very important role in human survival [17, 18]. Therefore, the government should play the role of macro-control and market mechanism in protecting the ecological environment, and the market mechanism should play a full role in protecting the ecological environment and developing the economy. We will accelerate the transformation of the pattern of economic development and achieve coordinated and sustainable development of the economy and the environment. Taking the construction of ecological civilization as the theme, we should promote human survival and development, build a well-off society in an all-round way, and constantly meet the people's growing needs for a better life; We will vigorously develop a low-carbon economy, control carbon dioxide emissions, and strive to achieve peak carbon dioxide emissions and achieve carbon neutrality at an early date. Make due contributions to China's sustainable development!

2.3. Understanding of the Relationship between Man and Nature in Ecological Protection

Ecosystem includes two levels of meaning: a stable system and an unbalanced system; Ecosystem is a dynamic system. The ecosystem will change with human activities and be constantly changed by human beings; It itself is a complex ecosystem, which is the basic element in the ecosystem, and this element determines the operation mode and structure of the ecosystem. If the ecological process of one or more natural elements from the growth period of an organism to its degradation is called the process of ecosystem, this process is constantly evolving. Because of the mutual connection and interaction between man and nature, nature also contains various relationships between human and society that are closely related and interacted with each other. There are other relationships between human and nature in addition to those at the economic level. There are contradictions and conflicts between the use of nature and the transformation of nature. This is the relationship between the contradiction and conflict between man and nature, which restricts and affects each other. It is in this contradictory struggle that human civilization has achieved continuous progress and improvement. Therefore, there is no absolute relationship between man and nature, but a complex network of interactions. Man is just constantly adapting to different forms of nature, changing rules and development directions according to different situations, and endowing human society with the material and energy necessary for its own development to meet the survival and development requirements of human material under natural conditions. Therefore, people are needed to create a better life and enjoy a better people! In a harmonious and developing society, no one can arbitrarily damage nature and all the benefits it produces. Therefore, there is a certain relationship between people and nature as nature. People use nature to protect themselves and achieve harmonious coexistence between people and nature. Therefore, rational use of nature has become a choice and pursuit for people to pursue a better way of life. This is the relationship between man and nature. In the ecosystem, the material wealth provided by nature to human beings is a crucial factor that affects the harmonious coexistence between human and nature. These roles affect the relationship between human beings and other creatures on the earth in different aspects. Without the existence of these elements of nature, there would be no human existence, and human beings could be full of hope and vitality in this world. So we should take good care of the environment

3. Experimental Design for Ecological Value Discussion of Natural Protection Environment Considering Data Mining

3.1. Conditions of the Study Area

As shown in Table 1, tree forest is 6456252 m3, coniferous forest is 651515 m3, broad-leaved forest is 4932906 m3, and coniferous mixed forest is 871830 m3; The sparse forest area is 0.03%, 2198 cubic meters; The remaining forest land is 3041 cubic meters, 0.05%, including 2175 cubic meters of secondary forest.

Origin structure: As shown in Table 2, there are 80,659 hectares of arbor forest, sparse forest and shrub forest in the nature reserve, about 91.02%. The total area of arbor forest, sparse forest and uncultivated forest is 2895 hectares, accounting for 3.27% of the total forest area. Among arbor forests, natural forest is 75735 hm2, 96.41%; Among the sparse forests, there are 39 hm2 natural forests and 11 hm2 artificial forests, accounting for 23.15%. Shrub forest covers an area of 4884 hectares, belonging to natural forest. The uncultivated forests are all artificial forests, covering an area of 60 hectares.

Table 1. Forest stock structure of daba mountain nature reserve

Forest type		Area (hm^2)	Living log savings (m^3)
Arbor forest	broad-leaved forest	58605	4932906
	coniferous forest	9587	651515
	Coniferous broadleaved mixed forest	10365	871830
Open woodland	Open woodland	5079	2198
Shrubbery	Other shrubbery	4884	0
Undeveloped forest land	Unforested forest land	60	0
	Auxiliary production forest land	31	2175

Table 2. Forest origin structure of nature reserves (hm2)

Forest type		natural	artificial
Arbor forest	broad-leaved forest	57583	1022
	coniferous forest	7946	1641
	Coniferous broadleaved mixed forest	10205	160
Open woodland	Open woodland	39	11
Shrubbery	Other shrubbery	4884	0
Undeveloped forest land	Unforested forest land	0	60

Age group structure: as shown in Table 3, the tree forests and sparse forests in the Nature Reserve were investigated and their age composition was analyzed. Among them, the total young forest is about 12811hm2, accounting for about 16.30%; The middle aged forest area is 57342hm2, about 72.94%; The area of near mature forest is 7707hm2, about 9.80%; Mature forest 727hm2, about 0.93%; In arbor forest and sparse forest land, there are 20 hectares, about 0.03%. The age group structure of Daba Mountain Nature Reserve is mainly characterized by young and middle aged forests.

Table 3. Age group structure of forests in nature reserves (hm2)

Forest type		Young forest	Middle aged forest	Near mature forest	Mature forest	Overripe forest
Arbor forest	broad-leaved forest	5290	47939	4903	452	19
	coniferous forest	4197	3645	1492	251	1
	Coniferous broadleaved mixed forest	3322	5714	1304	24	0
Open woodland	Open woodland	0	43	7	0	0

3.2. Evaluation Index of Forest Ecosystem Service Value

(1) Direct use value

The trees in the forest use solar energy to conduct photosynthesis, convert inorganic substances such as H2O, CO2, etc. into organic substances, then convert them into chemical energy, and solidify them in organisms. This is also the foundation and important function of the forest ecosystem. Solar energy generated through photosynthesis provides people and other living creatures with necessary necessities and products.

The calculation formula of forest resource value is:

$$V_a = U_b MDE \tag{1}$$

Where: V_a is the value of standing trees, U_b is the saving amount of standing trees, M is the annual net growth rate of forests, D is the average timber yield, and E is the market price of standing trees.

(2) Indirect use value

The role of forest in water conservation can be divided into broad sense and narrow sense. In a narrow sense, it refers to the role of forest canopy, litter layer and soil layer in intercepting, storing and regulating river runoff. In a broad sense, the concept refers to the comprehensive representation of multiple hydrological functions in the forest ecosystem.

The formula for calculating the value of regulated water volume is:

$$V_z = 10E_s X(Q-C) \tag{2}$$

In formula 2, "" represents the adjusted water volume of the forest, represents the unit storage capacity investment of the reservoir construction, X represents the land area of the forest, Q represents the precipitation, and C represents the evaporation of the forest.

4. Experimental Analysis on Ecological Value of Natural Protection Environment Considering Data Mining

4.1. Analysis of Direct Use Value Results

According to the statistics of the Price Monitoring Center of the National Development and Reform Commission, the average price of domestic pine timber in 2021 will be 1805 yuan/m3, while that of logs will be 1403 yuan/m3. As shown in Figure 1, broad-leaved forest is the most valuable, accounting for 73.20%, followed by coniferous and broad-leaved mixed forest (424.8 million yuan)>coniferous and broad-leaved mixed forest (84.64 million yuan)>coniferous forest (70.65 million yuan)>sparse forest land (217800 yuan)>shrubbery (210000 yuan)>shrubbery (0 million yuan).

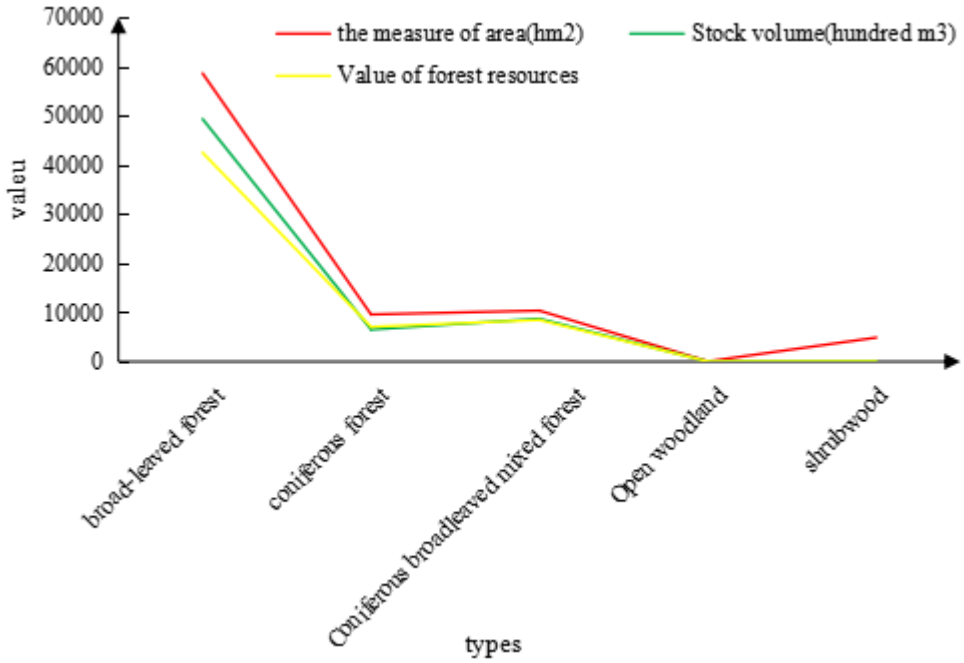

Figure 1. Forest resource value of different vegetation types in the Mountain Nature Reserve

The forest resource value of each age group of arbor forest and sparse forest is shown in Figure 2. The total assets of arbor forest and sparse forest are 58031 yuan and 7400 yuan respectively. According to the pattern of medium aged forest (428.92 million yuan)>near mature forest (82.76 million yuan)>young forest (60.32 million yuan)>mature forest (8.06 million yuan)>over mature forest (220000 yuan). It shows that the larger the age group is, the greater its value per unit area is. This is because the larger the age group is, the more luxuriant the branches are, the greater the canopy density is, the healthier the forest is, the stronger the trunk is, and the greater the volume per unit area is.

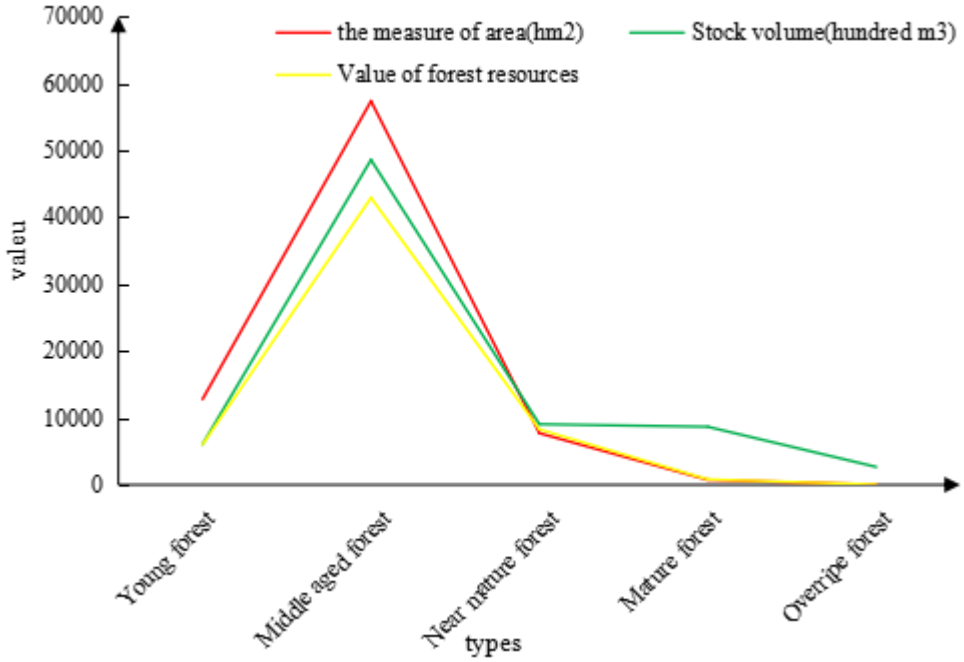

Figure 2. Value of forest resources of different age groups in nature reserves

5. Conclusion

Through the above discussion, we can draw the following conclusions: China has made great progress in ecological protection, but there are also some problems and problems to be solved! For example, China still has some shortcomings such as unsatisfactory environment, shortage of resources, serious pollution, etc; Of course, there is a big gap in the existing resources! To solve these problems, we must let people know that they have this problem before we can protect ourselves to a certain extent, that is, to protect the beautiful earth on which people live! Finally, I would like to appeal to friends from other countries in China to be active in protecting the ecological environment and a better living environment! Only in this way can the country's economy, politics, culture and other aspects make progress, and at the same time, the dream of the great rejuvenation of the Chinese nation can be realized at an early date! Contribute to human life! At the same time, more people should know how to do themselves! Let the Chinese nation have a better future!

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

References

[1] *Mengwei Zhao, Guiwu Wei, Cun Wei, Jiang Wu, Yu Wei. Extended CPT-TODIM Method for Interval-Valued Intuitionistic Fuzzy MAGDM and Its Application to Urban Ecological Risk Assessment. J. Intell. Fuzzy Syst. (2021) 40(3): 4091-4106. https://doi.org/10.3233/JIFS-200534*

[2] *Sheng-Xu Shi. Performance Evaluation of Urban Ecological Environment Construction with Interval-Valued Intuitionistic Fuzzy Information. J. Intell. Fuzzy Syst. (2017) 32(1): 1119-1127. https://doi.org/10.3233/JIFS-16475*

[3] *Bokolo Anthony Jr. Green Information Systems Refraction for Corporate Ecological Responsibility Reflection in ICT Based Firms: Explicating Technology Organization Environment Framework. J. Cases Inf. Technol. (2020) 22(1): 14-37. https://doi.org/10.4018/JCIT.2020010102*

[4] *Irani Hazarika, Anjana Kakoti Mahanta. Mining Maximal Frequent Rectangles. Adv. Data Anal. Classif. (2021) 16(3): 593-616.*

[5] *Ali Hamdi, Khaled B Shaban, Abdelkarim Erradi, Amr Mohamed, Shakila Khan Rumi, Flora D Salim. Spatiotemporal Data Mining: A Survey on Challenges and Open Problems. Artif. Intell. Rev. (2021) 55(2): 1441-1488.*

[6] *Clarisse Dhaenens, Laetitia Jourdan. Metaheuristics for Data Mining: Survey and Opportunities for Big Data. Ann. Oper. Res. (2021) 314(1): 117-140.*

[7] *Yi-Kuei Lin, Shin-Guang Chen. Reliability Evaluation in Terms of Flow Data Mining for Multistate Networks. Ann. Oper. Res. (2021) 311(1): 225-237. https://doi.org/10.1007/s10479-*

020-03774-7

[8] Tin C Truong, Hai V Duong, Bac Le, Philippe Fournier-Viger, Unil Yun. Frequent High Minimum Average Utility Sequence Mining with Constraints in Dynamic Databases Using Efficient Pruning Strategies. Appl. Intell. (2021) 52(6): 6106-6128. https://doi.org/10.1007/s10489-021-0 2520-1

[9] Tamil Selvi M, Jaison B. Lemuria: A Novel Future Crop Prediction Algorithm Using Data Mining. Comput. J. (2021) 65(3): 655-666. https://doi.org/10.1093/comjnl/bxaa093

[10] Jialin Ma, Zhaojun Wang, Hai Guo, Qian Xie, Tao Wang, Bolun Chen. Mining Syndrome Differentiating Principles from Traditional Chinese Medicine Clinical Data. Comput. Syst. Sci. Eng. (2021) 40(3): 979-993. https://doi.org/10.32604/csse.2021.016759

[11] Durgesh Samariya, Jiangang Ma. A New Dimensionality-Unbiased Score for Efficient and Effective Outlying Aspect Mining. Data Sci. Eng. (2021) 7(2): 120-135.

[12] Esther Galbrun. The Minimum Description Length Principle for Pattern Mining: A Survey. Data Min. Knowl. Discov. (2021) 36(5): 1679-1727.

[13] Steedman Jenkins, Stefan Walzer-Goldfeld, Matteo Riondato. SPEck: Mining Statistically-Significant Sequential Patterns Efficiently with Exact Sampling. Data Min. Knowl. Discov. (2021) 36(4): 1575-1599.

[14] Antonio Longa, Giulia Cencetti, Bruno Lepri, Andrea Passerini. An Efficient Procedure for Mining Egocentric Temporal Motifs. Data Min. Knowl. Discov. (2021) 36(1): 355-378. https:// doi.org/10.1007/s10618-021-00803-2

[15] Tatiana Makhalova, Sergei O Kuznetsov, Amedeo Napoli. Mint: MDL-Based Approach for Mining INTeresting Numerical Pattern Sets. Data Min. Knowl. Discov. (2021) 36(1): 108-145. https://doi.org/10.1007/s10618-021-00799-9

[16] Chitta Ranjan, Samaneh Ebrahimi, Kamran Paynabar. Sequence Graph Transform (SGT): A Feature Embedding Function for Sequence Data Mining. Data Min. Knowl. Discov. (2021) 36(2): 668-708. https://doi.org/10.1007/s10618-021-00813-0

[17] P Revanth Rathan, P Krishna Reddy, Anirban Mondal. A Framework for Discovering Popular Paths Using Transactional Modeling and Pattern Mining. Distributed Parallel Databases. (2021) 40(1): 109-133. https://doi.org/10.1007/s10619-021-07366-7

[18] Mohammad Arfaee, Arman Bahari, Mohammad Khalilzadeh. A Novel Prediction Model for Educational Planning of Human Resources with Data Mining Approach: A National Tax Administration Case Study. Educ. Inf. Technol. (2021) 27(2): 2209-2239. https://doi.org/10. 1007/s10639-021-10699-6