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Nature Conservation Environment Based on Public Participation of Random Forests

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Abstract: With the development of social economy, the public's awareness of participating in the natural protection of the environment has gradually increased, and a certain organizational structure and interest expression mechanism have gradually formed in the natural protection of the environment. The public's participation in natural environment protection is also increasingly concerned by government departments, social organizations and enterprises. Based on the random forest model, combined with public participation activities and management practice experience, this paper explores the problems and solutions of public participation in natural protection environment. The results show that: in the questionnaire survey of public environmental awareness, 164 people said "very important", 92.1%; Thirteen respondents thought it was "important", 7.3% of all respondents. There are 177 items in total, about 99.4% of all respondents. This shows that most people are still aware of environmental protection, but lack guidance.

1. Introduction

China is the country with the largest forest area and one of the countries with the highest forest coverage in the world. In terms of ecological environment protection, with the rapid development of economy and the increase of population, human life and consumption patterns have undergone tremendous changes. While meeting the growing material and cultural needs of the people, it has also caused damage to natural resources, ecological environment and natural environment. In this case, human beings will face severe challenges; On the other hand, with the development of science and technology and productivity, environmental problems have become increasingly prominent. Therefore, it is an important issue that China must face and solve to improve the national quality, especially to improve the ecological environment awareness of the whole society. It has become an important issue that the country must solve and strive to solve at present by carrying out various forms of activities to improve the overall social protection of the ecological environment, cope with the loss caused by the shortage of resources and energy, and meet the growing needs of the people

for a better life.

Stochastic Forest Model (RBM) is a commonly used computing model in dynamic design and model building solutions. Taiane Ritta Coelho put forward a relational perspective to examine how power is related to resource use in practice, that is, related to resource allocation [1]. In order to adapt the random forest to the dynamic characteristics of data flow, Ocean Wu discards the trained tree and grows a new tree when concept drift is detected by the most advanced technology [2]. Jonathan Aaron Cook proposed a method to adjust random forest prediction to consider non random sampling of training data. This adjustment makes the population forecast more accurate. Also caution against using inverse probability weighting when analyzing selected samples [3]. In this context, research and discussion are carried out from the aspects of natural resource utilization, ecological environment supervision, social organization management, etc. to promote the construction of natural protection capacity and promote natural protection environment.

At present, a certain model has been formed at home and abroad for the citizens' right to know and the rights of supervision and decision-making enjoyed by citizens in accordance with the law in public participation in natural protection and environmental action. The corresponding organizational structure and interest expression mechanism have been established to ensure that citizens will not be harmed in natural protection and environmental action, as well as the corresponding accountability and accountability, and promote the continuous improvement of relevant systems and mechanisms. Based on the random forest model, this paper combines the analysis and practice of public participation in natural protection environment, and puts forward the opinions and suggestions of public participation.

2. Research on Nature Conservation Environment Based on Public Participation of Random Forests

The random forest model (RBM) is a major model in the random forest system. Its main idea is to use machine learning technology to train human data, then build a tree and generate a seed at the top of the tree. When the seed is subject to external forces, it can split or embrace itself and grow on it; When encountering external interference factors, it will naturally die, and make the original plant unable to continue to grow or become better [4, 5]. Therefore, by selecting the right seeds, plants can grow normally in harsh environments and adapt to different environments. In nature conservation, the public is treated as a whole in order to make the public issues interact and influence each other, and a more effective public participation system is formed by building a feedback and interaction model between the public and public issues to achieve "public participation in the government" and "public" interactive development and mutual feedback [6].

2.1. Research on the Status Quo of Natural Protection Environment

With the economic development, China's economy and society have entered a new historical stage. The rapid development of social economy has made great contributions to material and spiritual civilization, while the impact and destruction of human activities on the ecological environment and natural resources have become increasingly serious. At present, there are a series of challenges in China's social and economic development, such as taking economic construction as the center, increasing pressure on resources and environment, and increasingly prominent ecological vulnerability. It is urgent to solve the major problem of damaging the ecological balance; At the same time, it is urgent to solve ecological problems. China's ecological compensation mechanism is still in its infancy, and has not yet been formed and improved. This system has provided good conditions for the public to participate in the construction of ecological civilization, and has also managed the natural protection environment to a certain extent [7, 8].

(1) Utilization of natural resources

Due to the geographical location and climatic characteristics of natural resources, different regions have different demands for natural protection, and the fields of natural resources utilization are also different. At present, China's natural resources utilization mainly includes agriculture, forestry, animal husbandry, fishery and tourism. This is because China's resource utilization is diversified, extensive and complex. In recent years, China's rapid economic development has seriously strained the space for land use and ecological construction. On the one hand, land resources have been overexploited, leading to the increasingly serious desertification and salinization of China's land; on the other hand, due to the impact of global climate change and other factors, China's ecological deterioration trend has intensified. How to solve the problems exposed in the utilization of natural resources has become the focus of many scholars [9, 10]. In recent years, Chinese scholars have found that the utilization of natural resources in China has many problems, such as single resource utilization mode, low resource utilization efficiency, and serious ecological environment damage.

(2) Ecological environment supervision

In terms of natural protection, the management of natural resources is mainly the supervision of natural protection. From the perspective of regulatory mechanism, there are mainly two kinds of mechanisms: government led management mechanism and land and resources department led mechanism [11]. Among them, the government led management mechanism mainly manages the natural resource utilization, planning and regulatory agencies, while the natural resource management department supervises the ecosystem and human activities; The management mechanism led by the land and resources department is that the land and resources department formulates the land space plan and supervises the implementation, while the environmental supervision is mainly that the environmental protection department supervises the pollution and destruction according to the environmental regulations and standards [12].

(3) Social organization management

The management of social organizations refers to the effective management of natural protection environment while promoting the healthy development of social organizations through laws and regulations and the management and guidance of relevant government departments to enable them to actively perform their own functions on the premise of abiding by laws and regulations. Zhang Ying, Cui Haiying, Liu Xintao, He Lijuan and other scholars elaborated on the development and growth of Chinese social organizations from the perspective of laws and regulations, and proposed that social organizations, as an important citizen of a modern civilized country, participate in the construction of China's ecological civilization [13, 14]. According to the classification standard of social organizations in China, social organizations are divided into three categories: social groups, foundations and social service institutions. At present, only a few domestic research institutions regulate social organizations and non-profit organizations through laws, regulations or administrative rules [15, 16].

(4) Public participation

In terms of ecological compensation, ecological compensation mechanism, environmental conditions and governance have also become the research focus in this field. However, there are still some deficiencies in this field, which requires a perfect mechanism and a more reasonable system. It mainly includes the following aspects: the government and non-governmental institutions should improve the ecological compensation mechanism and play a good role in the market mechanism; Give play to the role of experts and technicians; Strengthen the knowledge and ability of ecological environment protection [17, 18].

2.2. Problems and Solutions in Public Participation

With the continuous deepening of China's ecological civilization construction, people's understanding of the earth is deepening, and the ecological environment problems have also attracted the attention of the relevant national departments. According to the existing resource and environment management and education system, public participation in natural environment protection and restoration is particularly important. However, according to the survey, there are some deficiencies in people's understanding, solutions and channels of participation in the field of natural protection management. Lack of understanding of public knowledge and behavior in this regard; affecting the environment and social and economic development is one of the behaviors that lead to the deterioration of the ecological environment and cause harm or even threat to people; In this case, the public will take action to protect themselves. In Chinese laws and regulations, the public's decisions and actions on ecological environment protection are defined as follows: national interests; National interests and the safety of the people; Social public interests and people's feelings; State administrative organs administer according to law and other relevant matters. In the field of nature conservation, there are still some problems to be solved in public participation.

(1) The public does not know enough about nature conservation

There are still many deficiencies in China's nature conservation management. People do not know enough about nature conservation management, and the public lacks initiative in participating in the process of ecological environment protection. They do not know how to do it correctly. Many people will think that these natural events have a lot to do with themselves after seeing some news or photos, and will pay attention to these events. Although some of the things you do seem to be nothing, they will definitely be blamed if they happen to you. What many people do not know is that they have been punished for a wrong act. And the punishment result is a warning to people, which can make them more deeply aware of their responsibilities.

(2) Lack of public participation and supervision mechanism

The supervision mechanism of public participation mainly supervises relevant matters through the public participation platform, public platform or media established by relevant national departments. Through these monitoring platforms and media, we can learn more about the development of relevant issues in a timely manner and how the public considers before taking action. In addition, in specific work, the public will learn about the procedures and rules to be followed in their own participation through various channels. However, at present, the Chinese public's supervision mechanism for these activities is not sound, many participants have not fully understood the problems, and the effect of public participation is not ideal.

(3) Lack of effective publicity means

Publicity departments in China do not attach great importance to public participation, and the public has a low awareness of participating in nature conservation. Because public participation involves many aspects, it can not be realized simply by introducing the relevant contents of ecological environment protection to the public. The public has different publicity means for environmental protection in different departments, and lacks effective publicity means. For the public, who do not know much and have weak awareness, it is difficult to achieve the purpose of effectively using the network or other information channels to publish and publicize.

3. Research and Design Experiment of Natural Protection Environment Based on Public Participation of Random Forests

3.1. Questionnaire

In order to better understand the current situation of citizens' participation in environmental

protection, a questionnaire survey was conducted by means of random sampling to understand the actual situation of citizens' participation, their views on the current situation, find out the problems, and put forward corresponding countermeasures and suggestions. The questionnaire includes five basic personal data, including age, gender, education, income, occupation, etc., in order to understand the cognition and behavior of different groups on environmental protection. This paper is mainly composed of structural and non structural questions. The purpose is to understand the citizens' environmental knowledge level, awareness, behavior, assessment of government work, ways of participation, safeguard measures, etc; The purpose of non structural projects is to collect citizens' opinions and suggestions on participating in environmental protection.

From May 13-15, 2022, 200 questionnaires were randomly selected from the site, and 178 valid questionnaires were obtained. The sample data collected by the questionnaire were collated and analyzed using EXCEL software.

Statistical analysis of the questionnaires collected shows that 95 respondents are 21 to 35 years old, accounting for 53.4% of all respondents; There are 71 people aged 36~50, accounting for 39.9% of all respondents. There are 166 respondents to the above two items, accounting for 93.3% of the total number of questionnaires. Therefore, this time the respondents are young and middle-aged people, and the survey results are more about the views and suggestions of young and middle-aged people (see Table 1).

Table 1. Age distribution of survey samples

Age	frequency	Effective percentage
<20	1	0.6%
21-35	95	53.4%
36-50	71	39.9%
51-70	11	6.2%
>70	0	0%

The students who participated in the questionnaire were mainly college diplomas, a total of 81, accounting for 45.5% of the total number of questionnaires; Secondly, there are 47 persons with master's degrees or above, accounting for 26.4% of the total number of questionnaires. The total number of these two indicators is 128, accounting for 71.9% of the total number of questionnaires, indicating that the educational level of the respondents is generally high (see Table 2).

Table 2. Educational background distribution of survey samples

Education	Frequency	Effective percentage
Technical secondary school and below	21	11.8
Junior college	29	16.3
Undergraduate	81	45.5
Postgraduate or above	47	26.4

3.2. Weighted Random Forest Algorithm

First, assume that the initial voting weight value of the decision tree is 1, and take the average value of the data set K_m of each decision tree itself as the weight. The specific weight formula is as follows:

$$E(m) = \frac{K_m}{(\sum_1^M K_m)\Big/ M}, m = 1,2,..,M \tag{1}$$

Where: $E(m)$ is the weight of the m-th tree, and M is the number of decision trees.

Therefore, this paper can determine the weight of each tree according to its own imbalance factor, so that the election algorithm in this paper can use formula (2) to determine a group of data:

$$\sum E(m_j)\Big/\sum E(m_i) \tag{2}$$

Among them, $E(m_j)$ is the weight of the tree that divides the data into most classes, and $E(m_i)$ is the weight of the tree that divides the data into most classes.

If (2) is greater than 1, the data will be classified into most categories; if less than 1, the data will be classified into a few categories. There are few cases equal to 1, so it can be basically ignored.

4. Experimental Analysis of Natural Protection Environment Research Based on Public Participation of Random Forests

4.1. Public Awareness of Environmental Protection

In the questionnaire collected, the comprehensive analysis results show that when asked whether you think environmental protection is important ? Among the respondents to the survey, 164 respondents said "very important", accounting for 92.1% of the total survey; thirteen of the respondents said "important", accounting for 7.3% of all respondents. The total number of these two projects is 177, accounting for 99.4% of the total number of respondents (see Figure 1a). When asked, "What do you think is the relationship between economic development and environmental protection?" Among the respondents surveyed, 146 respondents answered "coordinated development of economy and environmental protection", accounting for 82.0% of the total number of questionnaires; In the survey, 29 respondents answered the question of "environmental protection first", accounting for 16.3% of the total number of questionnaires. The total number of these two projects is 175, accounting for 98.3% of the total survey (see Figure 1b).
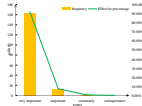
(a) Understanding of Investigation Samples on Environmental Protection
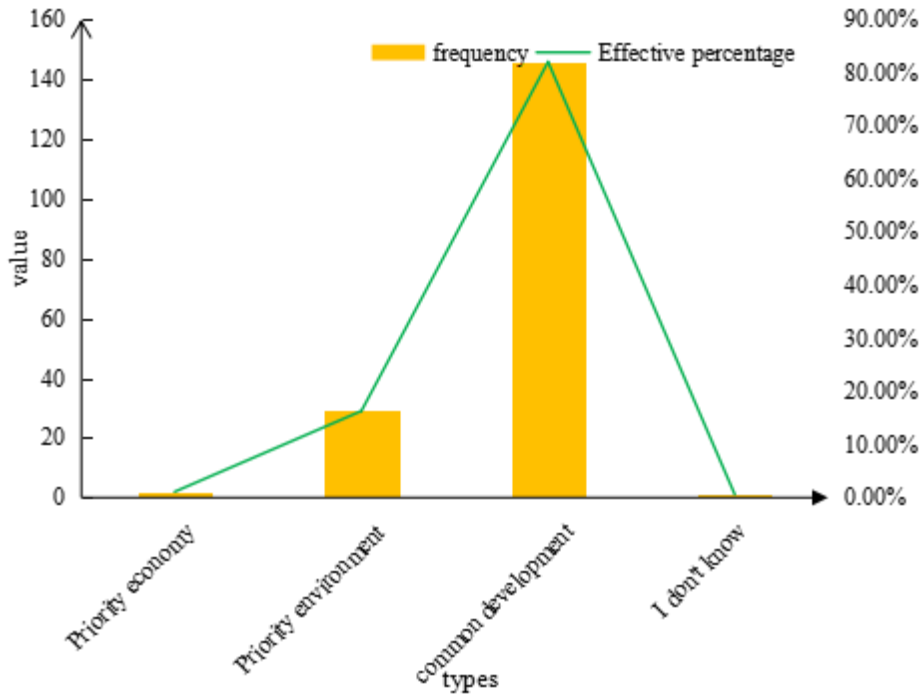
(b) Understanding of the relationship between economic development and environmental protection by survey samples

Figure 1. Statistical chart of the importance of environmental protection work generally recognized by the public

After the reform and opening up, China's social and economic development has made remarkable achievements, the people's quality of life has been greatly improved, and the average annual GDP growth rate has reached 9%. A considerable number of officials only focus on GDP and do not consider the development mode of environmental costs. With the increasing prominence of environmental protection issues, the attention of all sectors of society and the government to

environmental protection is increasing. On the one hand, the majority of people actively participate in various environmental protection activities to safeguard their environmental rights and interests. On the other hand, the report of the 18th National Congress included the construction of ecological civilization in the "five in one" plan, and environmental protection has received unprecedented attention.

4.2. Channels for Public Participation in Environmental Protection

In the questionnaire collected, the comprehensive analysis results show that when asked which of the following ways do you get the most environmental information? Among the respondents, 59 respondents said "TV", accounting for 33.1% of all respondents; Among the respondents, 51 said "Internet", accounting for 28.7% of all respondents. These two figures total 110, accounting for 61.8% of the total survey (see Figure 2). This means that people are increasingly learning about environmental protection from "TV" and "Internet". "TV" and "Internet" are more likely to be used by the public because of their convenient use and low cost. Therefore, based on the tendency analysis of the public on the media communication channels, the organizers can more effectively publish environmental information to the public.
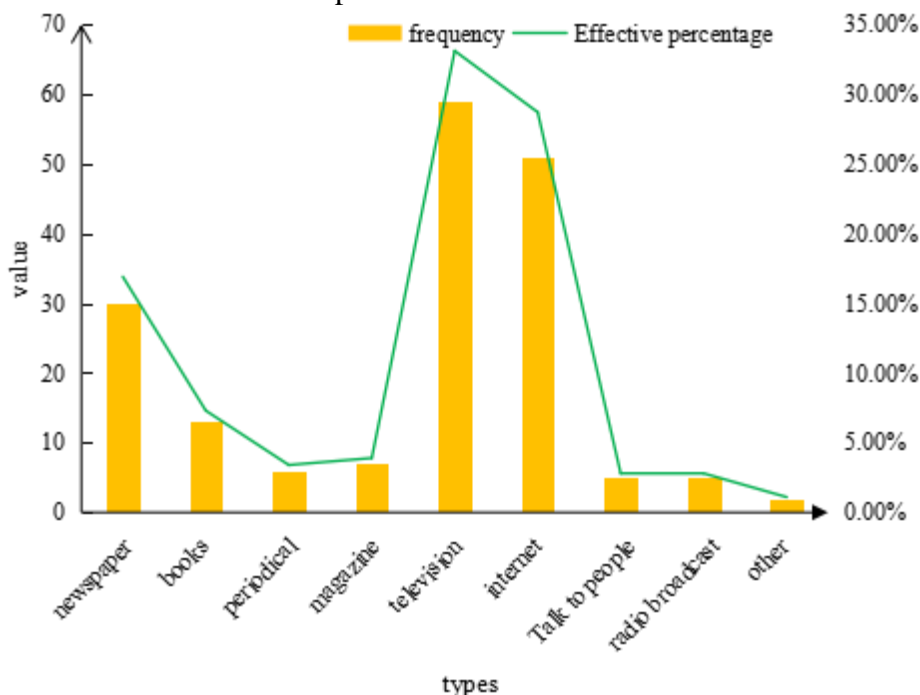

Figure 2. Access to environmental protection information for survey samples

4.3. Safeguard Measures for Public Participation in Environmental Protection

In the questionnaire collected, the comprehensive analysis results show that when asked, "Do you have any understanding of the Environmental Protection Public Prosecution Law?" Among the respondents surveyed, 75 respondents said they had "heard of", accounting for 42.1% of the total number of questionnaires; 51 of the respondents said "never heard of it", accounting for 28.7% of the total respondents. The total number of complaints on these two issues was 126, accounting for 70.8% of all investigations (see Table 3). This shows that the development of environmental public interest litigation in China is relatively lagging behind.

Table 3. Understanding of environmental public interest litigation by survey samples

option	frequency	Effective percentage
be familiar with	8	4.5
understand	44	24.7
Yes	75	42.1
Never heard of it	51	28.7

In 2014, the environmental public interest litigation was clearly defined, but the right of citizens and other social groups to file environmental public interest litigation was not defined. At present, no public interest litigation mechanism has been established. Environmental public interest litigation can effectively supervise the behavior of the government and enterprises, and is an effective supplement to environmental administrative law enforcement. In order to enable the public to better participate in environmental protection, we need to improve the public interest litigation mechanism.

5. Conclusion

The traditional environmental governance system has a strong top-down and unidirectional feature, which cannot protect the public's environmental rights. Public participation is an effective way to solve the problem of energy and resource conservation, environmental protection and protect the basic rights of the public. It is necessary to analyze the problems in the process of public participation in natural protection through the random forest model. On the one hand, the public can improve their work and life and improve their own quality by participating in natural protection activities; On the other hand, the public can obtain material and spiritual support and encouragement from the natural protection environment. In the future, we can establish various forms and channels to enable the public to participate in the activities of natural environment protection. The public can not only obtain corresponding benefits through government procurement or free donation, but also through enterprises or non-governmental organizations; On the other hand, the government can also actively use external resources to provide support and help to other interested parties.

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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.

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