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Application and Practice of Neural Networks in the Natural Protection Environment

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Abstract: With the development of social economy and the over-exploitation of resources, the environmental problems caused by wastewater and exhaust emissions are increasingly serious, which has a significant impact on the sustainable development of human society. Therefore, environmental protection has received more and more attention in recent years. At the same time, under the influence of various capabilities and objective factors, the existing environmental strategy still has some gaps, so it has not played its due role. Therefore, this paper studies the problems in environmental protection by analyzing the management requirements and contents in the natural protection environment. Finally, this paper analyzes the adaptability of natural environment monitoring by using neural network algorithm. Through comparison, the monitoring adaptability after the optimization of the natural protection strategy is 19.8% higher than that before the optimization of the natural protection strategy, and the environmental protection planning is 23.2% higher than that before the optimization of the natural protection strategy. In short, environmental protection is of great significance to the sustainable development of ecology.

1. Introduction

With the steady progress of the construction of natural environment and the large-scale development of landscape areas, the research of natural environment protection is relatively lagging behind. It is necessary to further improve the research of natural environment protection. To effectively develop environmental resources, it must take the path of sustainable development and fully consider environmental protection. Environmental managers must continue to keep pace with the times, independently understand and learn the relevant concepts of environmental protection, low carbon, ecological balance, and promote the coordinated development of ecological resources.

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Therefore, environmental protection is crucial to the sustainable development of ecology.

Environmental protection is of great significance for sustainable development. Li Yang believes that the practice of government policies must implement the concept of environmental education in the school system, provide complete and comprehensive resources, information and channels for environmental education, and actively promote the practice and legislative revision of environmental protection law [1]. Bekezhanov Dauren has carried out a comprehensive study of environmental digitalization in the management of the systematic method of the utilization of digital environmental resources, and considered the basis of improving the regulatory laws and regulations in the field of environmental safety management within the implementation framework of the digital plan [2]. Dallyono Ruswan uses a multimodal perspective to focus on the interactive meaning of symbol resources in environmental sports posters. It examines the contribution of visual and text resources to raising people's awareness of the importance of protecting the environment for future generations [3]. Mickiewicz Pawel aims to determine the extent to which the local space development plan in Poland takes into account environmental issues, and to what extent these methods can be linked with the concept of comprehensive development planning [4]. Henderson Kent E examined the impact of energy assistance on national carbon dioxide emissions in the context of conflicting norms. The aid is related to the increase of carbon monoxide emissions, but the embeddedness of the environmental system mitigates this impact [5]. Killick Evan questioned the common link between the indigenous concept of "living well" and environmental protection. The earlier criticism of extractiveism was used to show the recent emergence of environmentalist discourse, and emphasized the issues related to ontological differences [6]. Yildirim Julide tried to investigate the impact of Türkiye's social capital and the central government's expenditure on environmental protection on environmental quality. At the same time, considering the spatial dimension, he used the dynamic spatial Durbin model to check the spatial changes in the relationship [7]. The above studies have described the relationship between environmental protection and sustainable development, but have not combined technology to carry out environmental monitoring.

Many technologies need to be used in environmental monitoring to improve and protect the environment. Liu Bin demonstrated and discussed the preparation of several sensor platforms based on functional nanomaterials. Instrument-based colorimetric sensors and advanced colorimetric sensor products for high-performance environmental monitoring are also introduced. Finally, the advantages and disadvantages of various colorimetric sensors in environmental monitoring are analyzed and compared [8]. Tyagi Deepika focused on the electrochemical sensor based on nano-materials, which can be used to check the pollution of heavy metals, organic/inorganic compounds, toxic gases, pesticides, bacteria, antibiotics, etc. in water or air, which pose a serious risk to human health and the environment [9]. Goldstein Jenny E studied environmental monitoring through China and globalization infrastructure, which aims to make digital environmental data open and transparent, and how to play a role in Myanmar's forestry sector [10]. Hino Miyuki has limited resources for the public institutions that aim to implement environmental regulations to achieve their objectives. It shows how machine learning methods can effectively use these limited resources to provide information, while taking into account real-world problems [11]. Li Yanwei discussed the cooperation mechanism between different national government agencies engaged in national environmental protection, and enriched the current governance and policy literature by adding building blocks for the development of collaborative networks and network partners [12]. The above studies have described the importance of environmental monitoring, but there are still some deficiencies in the optimization of protection strategies.

In order to study the specific effects of natural environment protection, this paper analyzes the adaptability of natural environment protection monitoring through neural network algorithm, and

then analyzes the degree of perfection of laws and regulations and the rate of capital investment through experiments. Finally, it uses comparative experiments to study the adaptability, environmental protection effects and environmental planning effects before and after the optimization of natural environment protection strategies. Through experimental analysis, it is found that the adaptability and environmental protection effect have been significantly improved after the strategy optimization. Compared with other literatures, this paper focuses on the use of comparative experiments to analyze the effects of environmental planning.

2. Analysis of Problems and Objectives in Natural Environment Protection

2.1. Protection Requirements in Natural Environment Protection

The following requirements need to be observed in the natural protection environment, as shown in Figure 1. First, it should clarify the management objectives of natural resources management. The structure and management objectives, requirements and contents vary according to the spatial scale. The planning should control the overall appearance of natural resources protection, formulate control principles, and improve the policy framework. At the regional planning level, according to the overall model of natural environment protection, specific construction plans for different types of natural environment protection in different regions are formulated, and population protection and recovery projects are implemented. Formulate environmental protection planning and management objectives in all levels of planning, and effectively coordinate and integrate planning work. Second, develop legal and regulatory frameworks, develop a coordinated regulatory framework for environmental protection at the planning level, promote effective coordination with other plans while meeting regulatory requirements for environmental protection, determine and clarify priorities and management responsibilities of different projects, and reduce conflicts between projects [13].

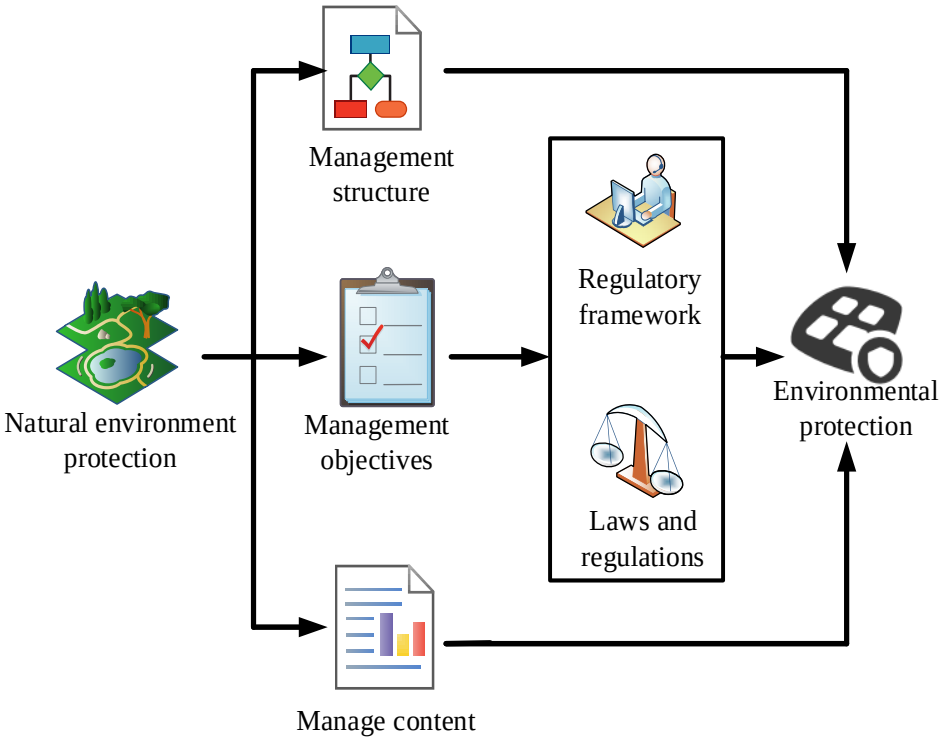


Figure 1. Protection requirements in natural environment protection

2.2. Management Content in Natural Environment Protection

The main management contents in natural environment protection are as follows, as shown in Figure 2.

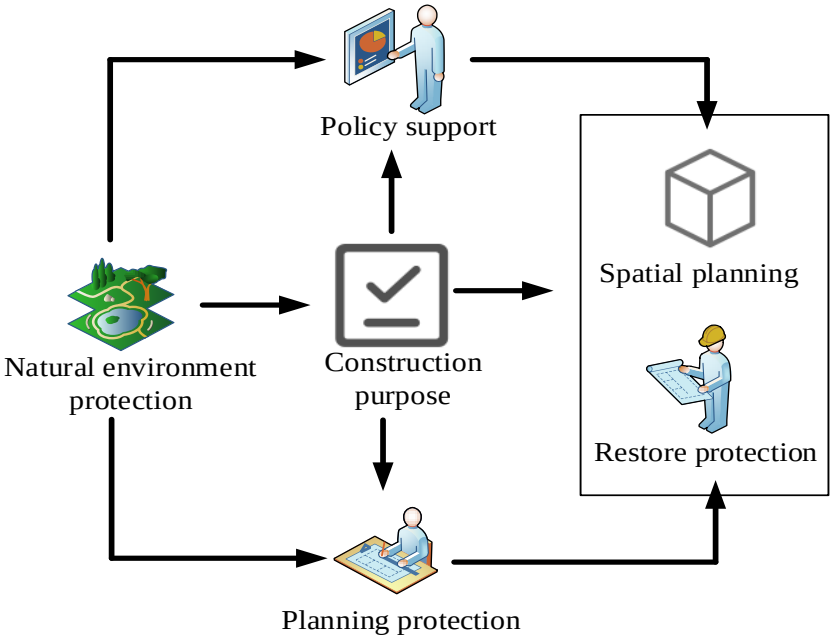


Figure 2. Analysis of management content in natural environment protection

First, construction purpose. The construction objectives of natural environment protection mainly include quantity, proportion growth and land use planning and layout. Planning and management should be implemented through environmental planning, ecological civilization construction planning, land use planning and new urbanization planning, and a safe landscape and park system should be established to determine the important hub for the development and protection of the region.

Second, plan protection and recovery management. Natural environment protection and recovery management are mainly implemented in the context of space planning and ecological civilization construction planning, including the actual engineering and management measures that need to be carried out. The spatial planning focuses on the implementation of environmental projects, such as the ecological restoration and water resources management of rivers and lakes, the restoration of wetland ecosystems, the restoration of forest cover in the region and the comprehensive management of ecological restoration. In combination with the priority space area and the focus of the ecological civilization program, specific management measures such as the establishment and improvement of species and genetic resources protection and monitoring system should be taken to protect biodiversity in the natural environment.

Third, space control. The spatial control of the natural environment is mainly achieved by planning the main functional areas. All nature reserves at the legal level should be included in the prohibited development areas, and the principle of compulsory protection, classification and control should be applied, and the regional policy of prohibiting public investment in the field of development should be formulated and improved.

Fourth, support measures. Political support mainly focuses on resources and environmental policies and specific legislative planning of protected areas. The focus of land use planning is to establish a natural protection system focusing on national parks and a diversified and

commercialized ecological compensation mechanism, improve the environmental impact assessment system, and strictly implement the environmental responsibility target system. The ecological civilization construction plan should pay attention to the deep institutional reform of the ecological protection system, ecological compensation system and other systems, and clarify the legislative plan of the protection zone [14].

2.3. Main Factors Affecting Natural Environment Protection

The main factors affecting natural environment protection are as follows, as shown in Figure 3.

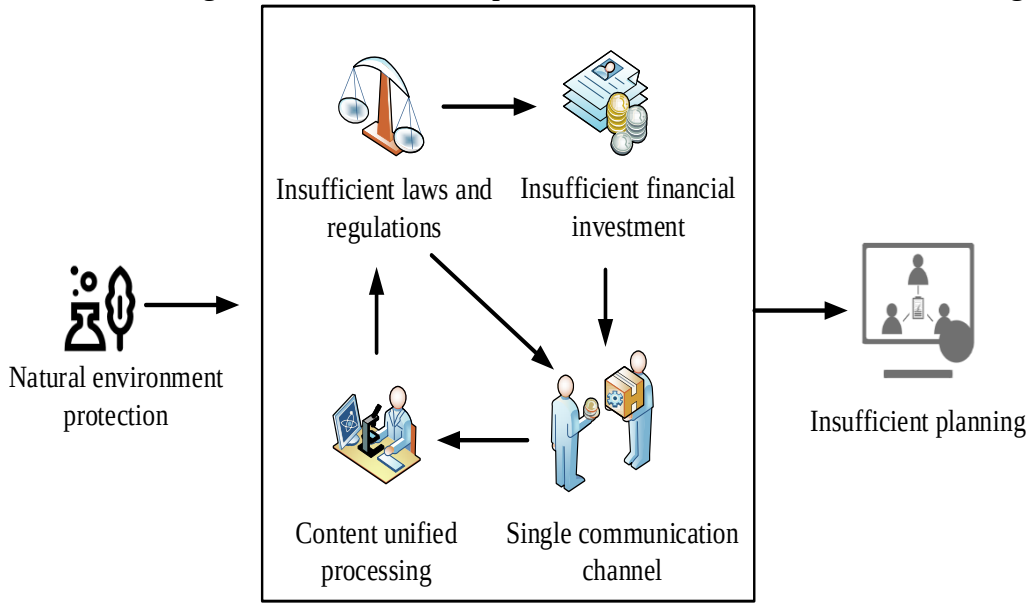


Figure 3. Main factors affecting natural environment protection

First, there is a lack of unified treatment of ecological methods and protection issues. With the development of society, the natural environment problems have become more and more serious. In order to promote the healthy and sustainable development of human society, the government has taken the initiative to formulate a strategy to support the protection of the natural environment. The deepening of the strategy has gradually exposed many problems. Government implementers lack the concept and awareness of environmental protection in the process of environmental protection, and are difficult to play a leading role in the implementation of natural environmental protection strategies.

Second, there is insufficient financial investment and laws and regulations on environmental protection. A large amount of financial investment is necessary to ensure the proper implementation of environmental protection, but in practice, the conservative strategy has not been implemented with sufficient resources and financial support. In this case, the nature conservation strategy cannot be implemented as a systematic development model, nor can it be linked with the formulation of the nature conservation strategy.

Third, a single communication channel ignores biotechnology. In the process of formulating the protection strategy, there is a problem of communication channels. The advertising methods mainly include slogans, banners, politics, etc. This unique advertising method has changed people's view on environmental protection to a certain extent, but due to the lack of comprehensive advertising channels, it failed to achieve the expected advertising effect, and undermined the implementation of the natural and biological protection strategy. Biotechnology is a new technology in recent years. Biotechnology has innovated the function of environmental strategy and can improve the efficiency

of environmental protection.

3. Optimization Strategy for Natural Environment Protection

In view of the above environmental problems and contents, this paper proposes the following environmental protection optimization strategies to promote the development of the environment.

3.1. Strengthen Environmental Protection Planning

Before developing scenic spots, it must carry out detailed research and planning, expand the scope of protection, unify the development planning around the scenic spots, make the scenic spots develop within the scope of ecological capacity, and prohibit random development and predatory development. In order to provide fresh air and comfortable environment for gei, it is necessary to effectively control sewage discharge and wastewater discharge [15]. The treatment of the equipment should meet the national standards, be far away from the scenic spots, and would not pollute the soil, rivers and vegetation. Establish a sound environmental protection system, strengthen the environmental protection management of scenic spots, improve the capacity and recovery level of wastewater, waste and other facilities, improve infrastructure, establish ecological facilities and public facilities system, establish multiple ecological demonstration areas, and strengthen on-site planning and organization management.

3.2. Improve Laws and Regulations

First, access to funding must be improved. Environmental protection is an important society. In view of its economic value, governments and enterprises should increase investment in environmental protection strategies and promote the reform of environmental protection strategies. At the same time, when reforming the natural environment protection strategy, it should fully consider the actual situation of the natural environment and improve laws and regulations. When formulating relevant laws and regulations, it is also necessary to incorporate biotechnology elements to ensure its legitimacy and accelerate the formulation of environmental protection strategies.

3.3. Expand Publicity Channels and Innovate Protection

In the process of integrating advanced technology into the environmental protection strategy and promoting the innovation of environmental protection strategy, it is necessary to broaden the advertising channels, establish an advertising platform that appropriately uses information technology and protects the natural environment, and publish the contents of environmental protection strategy. People implement environmental strategies through online platforms, understand and guide people to establish correct environmental protection concepts, and then put forward suggestions to support natural environmental protection strategies and promote strategic innovation in the field of natural environment.

3.4. Develop Long-Term Environmental Planning

Protecting the environment of a region cannot be a temporary policy. It is a long-term and effective protection behavior formed by the local government through scientific research planning. At the same time, it focuses on the long-term, determines the direction and speed of future development through planning, and ensures that sustainable development is not empty talk. The

establishment of the environmental protection system would clarify the conceptual importance of the nature protection system and the types of protected areas, and incorporate them into the temporary unified regulatory framework. In the planning process, in order to coordinate the requirements and contents of environmental management, first of all, the overall structure of the environmental protection area must be standardized at the planning stage, and the management principles and requirements must be clearly defined. After determination, it is necessary to clarify the management structure of the planning stage, determine the management content at the planning level, divide the priorities of planning management into different types of planning, extract all elements of the natural environment involved in the planning, and form a comprehensive management document.

4. Application of Neural Network Algorithm in Natural Environment Protection Monitoring

In order to study the specific effect of natural environmental protection, this paper uses neural network algorithm to monitor the effect of environmental protection, analyzes the objective function of environmental protection, and then analyzes the adaptability of natural environmental protection. First of all, this paper investigates the objective function of environmental protection as follows:

$$A = \frac{1}{2}\sum_{i}^{m}\sum_{i}^{n}\left(x_k - y_k\right)^2 \tag{1}$$

y_k is the environmental output value under monitoring. x_k is the target value in the monitoring environment. M is the number of samples monitored. N is the monitoring output value. Next, it would analyze the cross variation value in environmental protection as follows:

$$G_{ij} = x_{ij} + \delta_{ij}\left(x_{ij} - y_{ij}\right) \tag{2}$$

δ_{ij} is the cross factor in environmental protection. Finally, the adaptability under natural environment protection is analyzed as follows:

$$P = \frac{G_{ij}}{\sum_{i=1}^{n} G_{ij} \bullet A} \tag{3}$$

5. Experimental Analysis under Natural Environment Protection Strategy

In order to study the specific effects of natural environmental protection, this paper analyzes the adaptability of natural environmental protection through neural network algorithm, and then investigates the degree of perfection of laws and regulations and the rate of capital investment after the implementation of the optimization strategy, and finally compares and analyzes the effects of environmental protection planning before and after the implementation of the optimization strategy. First of all, this paper investigated the perfection of laws and regulations and the investment rate of funds in three regions before and after the optimization of natural environment protection strategies. The specific results are shown in Table 1.

Table 1. The perfection of laws and regulations and the investment rate of funds in the three regions before and after the implementation of the natural environment protection strategy

	Perfection of laws and regulations		Capital investment rate	
	Before optimization	After optimization	Before optimization	After optimization
Region 1	48%	87%	74%	83%
Region 2	52%	81%	65%	81%
Region 3	61%	85%	69%	88%

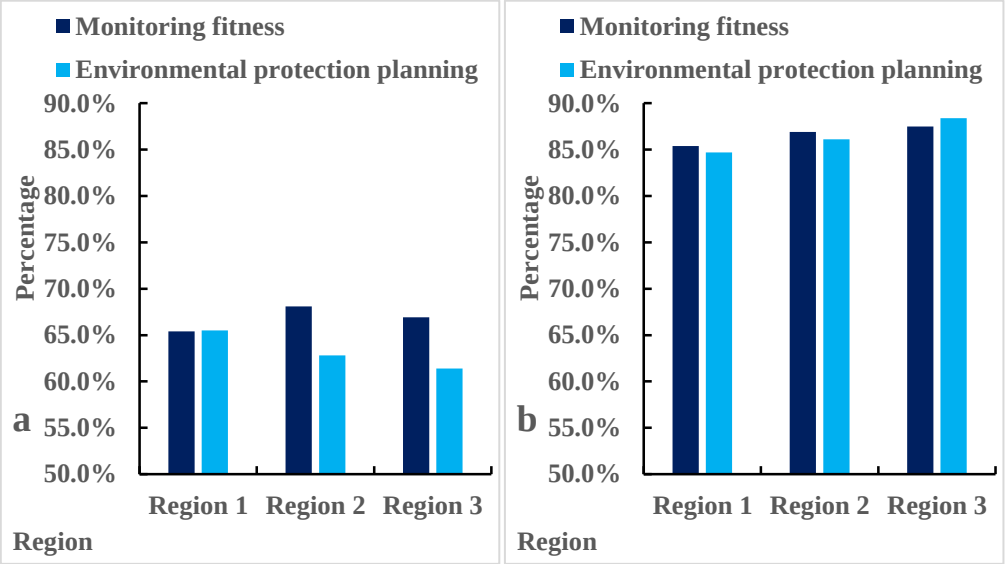
According to the data described in Table 1, before the optimization of the natural environment protection strategy, the perfection of regulations in Region 1 is 48%, and the capital investment rate is 74%; The perfection of regulations in Region 2 is 52%, and the capital investment rate is 65%; The perfection of regulations in Region 3 is 61%, and the capital investment rate is 69%. After the optimization of the natural environment protection strategy, the perfection degree of regulations in Region 1 is 87%, and the capital investment rate is 83%; The perfection of laws and regulations in Region 2 is 81%, and the capital investment rate is 81%; The perfection of regulations in Region 3 is 85%, and the capital investment rate is 88%.

On the whole, the perfection of laws and regulations before the optimization of natural environment protection strategy is 54%, and the capital investment rate is 69%; After the optimization of the natural environment protection strategy, the perfection degree of laws and regulations is 84%, and the capital investment rate is 84%. It can be seen from the comparison that the perfection of laws and regulations after the optimization of the natural environment protection strategy is 30% higher than that before the optimization of the natural environment protection strategy, and the capital investment rate is 15% higher than that before the optimization of the natural environment protection strategy. After the optimization of natural environment protection, there are certain norms for the rules and regulations of environmental protection and long-term planning, and the environmental protection effect and planning effect have been significantly improved.

Finally, the neural network is used to analyze the monitoring adaptability and environmental protection planning effect before and after the optimization of the natural protection strategy. The specific investigation results are shown in Figure 4.

Figure 4a shows the natural conservation strategy before optimization, and Figure 4b shows the natural conservation strategy after optimization. It can be seen from Figure 4a that before the optimization of the natural protection strategy, the monitoring adaptability of area 1 is 65.4%, and the environmental protection planning is 65.5%; The monitoring adaptability of area 2 is 68.1%, and the environmental protection planning is 62.8%; The monitoring adaptability of area 3 is 66.9%, and the environmental protection planning is 61.4%. It can be seen from Figure 4b that after the optimization of the natural protection strategy, the monitoring adaptability of area 1 is 85.4%, and the environmental protection planning is 84.7%; The monitoring adaptability of area 2 is 86.9%, and the environmental protection planning is 86.1%; The monitoring adaptability of area 3 is 87.5%, and the environmental protection planning is 88.4%. On the whole, the monitoring adaptability before the optimization of the natural protection strategy is 66.8%, and the environmental protection planning is 63.2%; The monitoring adaptability after the optimization of the natural protection strategy is 86.6%, and the environmental protection planning is 86.4%.

Through comparison, the monitoring adaptability after the optimization of the natural protection strategy is 19.8% higher than that before the optimization of the natural protection strategy, and the environmental protection planning is 23.2% higher than that before the optimization of the natural protection strategy.



a: Before the optimization of natural conservation strategy

b: After the optimization of natural conservation strategy

Figure 4. Monitoring adaptability and environmental protection planning effect before and after optimization of natural protection strategy

6. Conclusion

As the core of the global national environmental strategy, the natural environment protection system is considered to be the most effective means of natural protection in the world today, and is crucial to the maintenance of biodiversity and environmental safety. In the process of implementing the natural environment strategy, it should carry out the corresponding reform work in combination with advanced technology, management concepts, change the regulatory structure and other methods to solve the problem of backward natural environment strategy, achieve the goal of reform and protection strategy, and improve its operation. In addition, the formulation of relevant laws and regulations and long-term planning for the protection of the natural environment in combination with advanced technology would help to regulate the public's behavior, improve their ideological awareness, and promote the public and the government to work together to maintain the natural environment.

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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.

References

[1] Li, Yang. "Study of the effect of environmental education on environmental awareness and environmental attitude based on environmental protection law of the People's Republic of China." Eurasia Journal of Mathematics, Science and Technology Education 14.6 (2018): 2277-2285.

[2] Bekezhanov, Dauren, et al. "Environmental and legal regulation of digitalization of environmental protection." Journal of Environmental Management and Tourism 12.7 (2021): 1941-1950.

[3] Dallyono, Ruswan, and Didi Sukyadi. "An analysis of multimodal resources in environmental protection posters." Indonesian journal of applied linguistics 9.2 (2019): 472-479.

[4] Mickiewicz, Pawel. "Environmental protection and integrated development planning in local spatial policy on the example of Poland." Annales Universitatis Apulensis: Series Oeconomica 22.1 (2020): 11-17.

[5] Henderson, Kent E. "Contradictory governance norms within world society: energy development strategies, environmental protection, and carbon dioxide emissions." Environmental Sociology 5.4 (2019): 393-404.

[6] Killick, Evan. "Extractive relations: natural resource use, indigenous peoples and environmental protection in Peru." Bulletin of Latin American Research 39.3 (2020): 290-304.

[7] Yildirim, Julide, Baris Alpaslan, and Erdener Emin Eker. "The role of social capital in environmental protection efforts: evidence from Turkey." Journal of Applied Statistics 48.13-15 (2021): 2626-2642.

[8] Liu, Bin, Jinyin Zhuang, and Gang Wei. "Recent advances in the design of colorimetric sensors for environmental monitoring." Environmental Science: Nano 7.8 (2020): 2195-2213.

[9] Tyagi, Deepika. "Recent advances in two-dimensional-material-based sensing technology toward health and environmental monitoring applications." Nanoscale 12.6 (2020): 3535-3559.

[10] Goldstein, Jenny E., and Hilary Oliva Faxon. "New data infrastructures for environmental monitoring in Myanmar: Is digital transparency good for governance?." Environment and Planning E: Nature and Space 5.1 (2021): 39-59.

[11] Hino, Miyuki, Elinor Benami, and Nina Brooks. "Machine learning for environmental monitoring." Nature Sustainability 1.10 (2018): 583-588.

[12] Li, Yanwei, and Jing Huang. "The evolution of collaborative networks: A social network analysis of Chinese environmental protection policy." Public policy and Administration 38.1 (2021): 34-57.

[13] Ahamed, Tofael. "Sustainable agricultural development: a micro-level GIS-based study on women's perceptions of environmental protection and entrepreneurship in Japan and Bangladesh." GeoJournal 86.5 (2021): 2071-2103.

[14] Ford, Alex T. "The role of behavioral ecotoxicology in environmental protection." Environmental science & technology 55.9 (2021): 5620-5628.

[15] Galecka-Drozda, Anna. "Land cover changes in Natura 2000 areas located in suburban zones: planning problems in the context of environmental protection." Polish Journal of Environmental Studies 28.2 (2018): 587-595.