Scholar Publishing Group
Nature Environmental Protection
https://doi.org/10.38007/NEP.2021.020206
ISSN 2790-2684 Vol. 2, Issue 2: 51-60

Natural Environment Protection Technology and Improvement Relying on Artificial Intelligence

Gachuno Onesmus*

Department of Civil Engineering, National Institute of Technology Patna, Bihar 800005, India

**corresponding author*

Keywords: Artificial Intelligence, Environmental Protection Technology, Logical Regression Algorithm, Waste Classification Efficiency

Abstract: In the world, environmental protection has become the most concerned issue of all countries. Today, with the rapid development of society, how to realize the stable development of society without damaging the ecology is a topic worthy of discussion. The environmental protection work is relatively backward. Through several years of efforts, the current environmental protection technology has made great progress, but still faces many problems. Therefore, it is necessary to conduct a comprehensive research on environmental protection technology. This paper first analyzed the development of environmental protection technology and the problems it faces, and put forward relevant countermeasures in order to bring some help to the environmental protection work. After that, it analyzed the importance of energy conservation, and expounded the specific measures of energy conservation and environmental protection resources based on the actual situation to realize the concept of sustainable development, so as to create a green ecological living environment. Through the analysis of experimental data, this paper compared the technology of garbage quantity and garbage disposal efficiency, and found that the efficiency of artificial intelligence (AI) algorithm in garbage disposal was 26.25% higher than that of traditional artificial garbage disposal.

1. Introduction

Environmental protection technology is a process measure taken to reduce the impact of human factors on the natural environment. Environmental protection technology includes hardware technology for environmental pollution detection and treatment, software technology for environmental pollution management, operation and management, and expansion technology for clean technology. A series of standardized design has been carried out for the relevant management

activities of equipment, operation and management, technology selection, products and systems, which points out the direction for the operator's technology selection, and helps the enterprise to select environmentally friendly technology methods in the manufacturing process. Moreover, noise, light, heat and electromagnetic radiation pollution have also attracted more and more attention. In addition to the rich scientific research results on noise pollution, other material pollution control technologies are still in the early stage of exploration. In recent years, relevant experts have carried out a lot of research and development work in environmental pollution monitoring technology. The development and capacity of monitoring equipment and systems for air pollution and water pollution have been greatly improved. Some of these technologies have also achieved industrialization and made significant contributions to environmental protection.

With the rapid development of the economy, many problems have become increasingly prominent. The environmental protection technology also has the following problems: relatively backward environmental protection technology, lack of innovative technology and equipment, and lack of sufficient support for the research and development of environmental technology. Environmental protection technology is an effective way to combine economic development and ecological construction. Industrial low energy is a major means to reduce energy consumption and product costs. It uses technological innovation to promote the company's development towards low consumption, low pollution, high efficiency and high output, and provides necessary technical support for economic development and ecological protection. Therefore, it is necessary to accelerate the development of environmental protection technology and continuously improve environmental protection technology.

The prerequisite for the implementation of environmental protection technology is to have a sound environmental protection technology management system. Only in this way can environmental protection technology be realized. Only in environmental technology policy, evaluation and demonstration of environmental protection work in the standardization of environmental protection can promote the work of environmental protection. The construction of scientific systems for environmental technology management should be based on innovative points to highlight the practicality and effectiveness of technology, and all related technical systems still need to be sound by the state.

At present, the investment in environmental protection infrastructure in all countries is increasing, and the total emissions of pollution sources and pollutants are closely monitored and controlled. A basic scientific and technological support system for ecological protection has been gradually established, and relevant technologies and measures have been continuously improved and implemented. Without the support of emerging environmental technologies, the innovation of environmental technologies cannot be realized. The technological innovation of environmental protection technology should start from itself and reduce the investment in industries with high energy consumption and high pollution; relevant policies need to be strictly implemented and relevant technologies need to be innovated, tested and promoted. By using high-tech environmental protection technology, the greening of products can be promoted in terms of equipment and processes.

Many experts have studied the nature protection environment. Li Chunmei analyzed the pollution of the natural environment and discussed the measures for environmental protection. A method of natural protection is proposed to implement the innovation of environmental protection technology, so as to promote the development of natural protection environmental technology [1]. According to the planning of natural protection and the demand of circular economy, Sun Hang analyzed the prevention and control measures of environmental pollution, and established and developed a natural environment protection model to promote the development of environmental protection [2]. By assessing the risks of the natural environment and combining the actual

environmental protection situation, Espinoza Tom analyzed the relationship between the environmental protection measures and the assessment of environmental risks, and proposed a new planning method [3]. By adopting diversified resource management strategies, Zhe Li made qualitative and quantitative analysis of natural environment protection and formed natural environment protection strategies [4]. Bidone Francisco analyzed the current situation of environmental governance, and established multi-level governance measures. He discussed with relevant knowledge and established many feasible plans to support the policies of the environmental protection department [5]. Through the analysis of big data, Shi Daqian studied environmental governance with the method of control variables, and found that continuous environmental protection can effectively improve the quality and governance of the environment [6].

Based on the investigation of the impact of local social entities on the natural environment, and combined with the evaluation rules of ideology and culture, Molinario Erica finally obtained the internal relationship between the local environment and the ideology and culture of various social entities, thus providing practical guidance for the formulation of local natural environment protection plans [7]. Stelmasiak Jerzy discussed various kinds of pollution problems caused by local natural environment in the process of urbanization, and linked them with local natural environment protection strategies. The decision-making effectiveness of local natural environment protection strategies on pollution problems in the environment was studied. Finally, the formulation of effective natural environment protection policies was made clear, which is beneficial to improve the effect of environmental protection [8]. Seddon Nathalie was looking for a natural-based approach that can handle the problems caused by global warming and promote sustainable development [9]. Ponitka Jens carried out in-depth analysis of local weather change and evolution, and linked it with the atmospheric management strategy in local natural environment protection. Finally, an effective theoretical framework of natural environment protection policy was formed, which opened up a new path for the development of local natural protection [10]. Hironaka Ann summarized the local utility in the natural environment impact assessment, and integrated it with the assessment data of local natural environment protection degree. Finally, it was concluded that the digital natural environment protection scheme is the direction of environmental protection development [11].

The above studies have only studied AI and natural protection technology separately, without combining the two. Although these studies have some reference, they are more or less insufficient to prove the conclusion, and there is room for improvement. In order to solve the research of natural protection environment technology integrating AI, this paper analyzed the natural protection environment technology and experimental data, and compare AI algorithms. The advantages of AI algorithm in environmental protection were obtained, which has reference significance for future research in other fields.

2. Integration of AI and Environmental Protection Technology

2.1. AI Theory

At present, AI is divided into two categories: strong AI and weak AI. Weak AI does not have the ability of self-reflection, self-reasoning and problem-solving. Speech is not independent consciousness, so it cannot be called intellectual reality. On the contrary, strong AI has theoretical self-consciousness, independent thinking and ability to act independently if it can match the appropriate programming language.

The main application fields of AI are intelligent perception, intelligent reasoning, intelligent learning and intelligent action. By studying the development of AI technology, analyzing its development content, classification, application fields and impact on social existence, it provides a basis for the development of AI. The principle process of AI is shown in Figure 1.

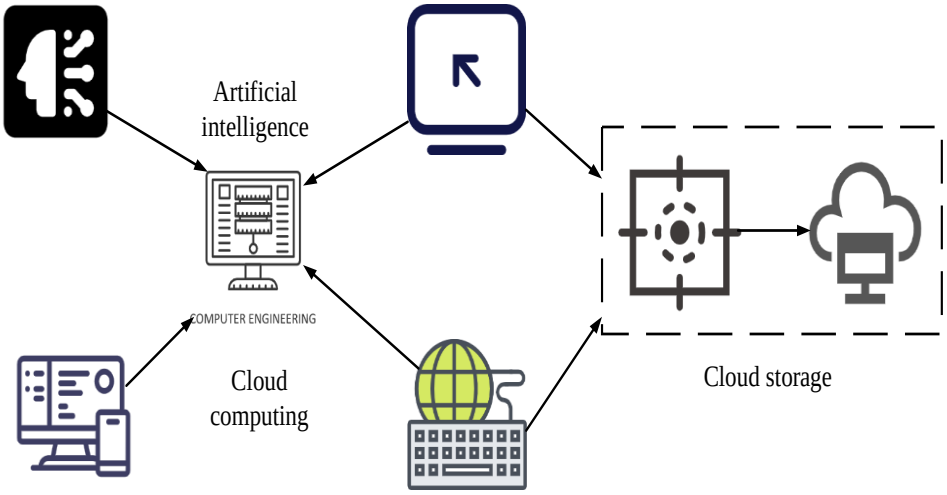


Figure 1. Principle and process of AI

2.2. Current Situation of Natural Protection Technology

With the continuous development of society and economy, it has promoted the development and upgrading of industrialization and agriculture and animal husbandry, but also brought a large amount of industrial sewage, which has a great impact on the ecological environment. With the development of social economy, human awareness and awareness of environmental protection are also gradually improving, and promoting the progress of environmental protection technology. Therefore, if a better ecological environment is to be improved, it is necessary to adopt effective treatment methods and take the initiative to carry out a series of comprehensive work such as monitoring, analysis and supervision of the ecological environment. Environmental monitoring technology can effectively solve these practical problems. It is the most important method and way to protect and solve the ecological environment problems. Therefore, it is very important to actively explore the monitoring technology of the ecological environment.

Relevant personnel put forward the concept of "environmental protection" by combining "brand" with "environment", and systematically analyzed the characteristics of environmental protection from the aspects of "environmental policy", "energy consumption", "environmental tax", "urbanization", "economic development", etc. The study found that the use of trademark rights and environmental protection technologies can reduce CO_2 emissions. Among them, energy consumption, urbanization and economic development are the major causes of environmental pollution in the region [12]. Relevant experts have put forward many solutions to serious environmental problems. The plan approved the concept itself and the three-year road map for its implementation, and for the first time required the National Environmental Protection Commission to prepare a draft road map for the next stage and submit it to the Cabinet for approval. Environmental protection requires in-depth research by managers and experts, scientists and practitioners, teachers and students [13]. Professionals should formulate more effective environmental regulation and improve the level of green technology innovation,so as to achieve a win-win situation of economic growth and environmental protection. Environmental regulation can be quantified from the perspective of green technology innovation [14].

With the rapid development of industrialization and agriculture, some toxic chemical gases and industrial waste water have been produced. These gases have polluted the ecological environment in a wide range and posed a great threat to people's health. At the same time, human protection of the ecological environment is only limited to the understanding of the degree of pollution, not fully

aware of the damage caused to the ecological environment, and not to efficiently deal with these accumulated pollution sources. Therefore, the material elements would be destroyed in a sense. This shows that the environmental monitoring technology and ecological management system are not sound enough, and are still lagging behind and in the process of exploration and development, which has resulted in the poor protection and management of the ecological environment, thus causing a serious impact on the good development of people and society.

In recent years, the ecological environment has been seriously damaged. In a sense, it has caused serious water and soil loss, and haze weather has gradually increased. This has posed a serious threat to the quality of life and the normal development of the people. Environmental monitoring technology can play a positive role in improving the quality of the ecological environment. Therefore, to improve the quality of the ecological environment and its ability to monitor the environment, it is necessary to study it proactively. With the rapid development of science and technology, the traditional means of environmental monitoring can no longer meet the current social needs. Therefore, it is necessary to increase the investment in advanced technology, and constantly improve and develop the environmental protection monitoring system. In addition, it is necessary to continuously research and develop monitoring and early warning systems for the ecological environment, so that problems can be detected and solved in a timely manner, and alerts can be issued in a timely manner when the ecological environment is damaged. Automatic monitoring system is a key link for a pollution source. The focus of this software is a database for monitoring pollution sources. It can use the methods of data collection, integration and automatic analysis to meet the needs of pollution early warning, management and other work in pollution source control, thus ensuring the full implementation of dynamic supervision. At this stage, it can be seen from the provisions of current pollution standards that using an automatic monitoring application software can better display the management results of pollution sources and effectively store them.

At present, there are serious ecological problems in the natural environment, which have a great impact on social development. In serious cases, it would seriously affect the health of the people, and is not conducive to the implementation of sustainable development. At present, local governments have increased their attention to environmental protection, and made the development of automatic monitoring technology of pollution sources more complete, thus highlighting the characteristics of the monitoring system and enhancing its monitoring effect. The technical principle of natural protection is shown in Figure 2.

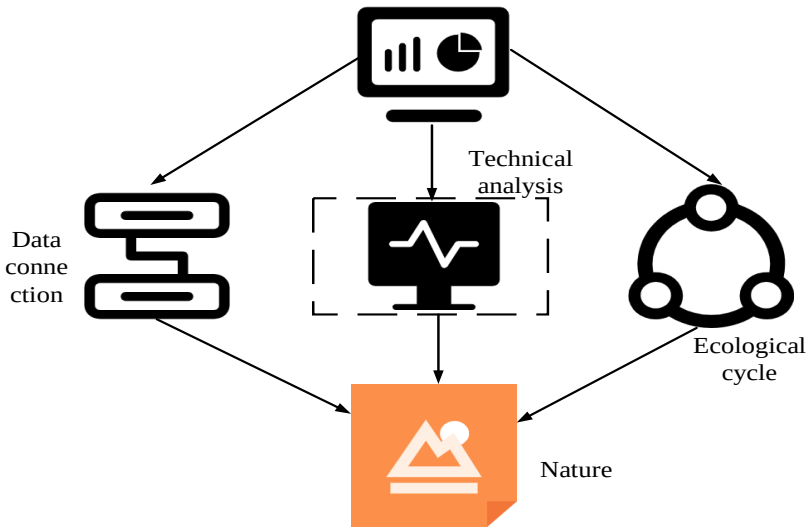


Figure 2. Technical principles of natural protection environment

2.3. Prospect of AI and Environmental Protection Technology

At present, the problem of environmental protection is becoming more and more serious. Therefore, the importance of environmental protection is increasing. With the rapid development of the industrial industry, the environmental problems caused by it show obvious commonality, which puts forward higher demands for our environmental protection work. Applying automatic monitoring technology to environmental management can solve some problems existing in the current environmental protection work, such as shortage of manpower, poor supervision, etc. This has prompted the research and use of anti-pollution devices and made greater efforts for environmental protection. At present, pollution prevention technology has achieved the goal of pollution prevention to a large extent.

By using the automatic monitoring technology of pollution sources, people can clearly know the status of pollutant discharge of enterprises. It shows the waste that does not meet the discharge standard and carries out supervision, so that more people realize the importance of environmental protection. From the perspective of the application of automatic monitoring technology of pollution sources in reality, it is mainly to comprehensively control the total amount of pollution sources and provide technical support for pollution emissions. In general, the use of automatic monitoring technology of pollution sources can lay a solid theoretical and practical foundation for the smooth progress of project construction.

Relevant experts analyzed the impact of environmental regulation and import trade on green technology innovation and the transmission effect of import trade, and also analyzed the impact of environmental regulation on green technology innovation, making up for the deficiencies of existing research. This also lays the foundation for the future government regulatory capacity and the research on the relationship between environmental regulation and green technology innovation in the industry [15]. In the context of increasingly stringent environmental protection policies and the fact that enterprises are starting their own businesses, the system would automatically examine the mechanism of environmental protection policies and enterprises' independent businesses, and give corresponding empirical conclusions [16].

The use of the automatic monitoring system for environmental pollution sources can enable enterprises to have a comprehensive understanding of the status of pollution emissions. When a pollution source is found, the monitoring signal would be sent to the monitoring center, which can prompt the staff to carry out the work of treatment, and then the pollution source would be located through the monitoring center. After the problem of pollutants exceeding the standard occurs, the relevant departments should investigate the company according to the requirements of the law and impose severe punishment. In addition, when using the sewage control system, it can also monitor and view multiple pollution sources. When developing the requirements for collection, it is also important to take into account realistic conditions and to achieve positive reporting of data. In addition, the goal setting of the urban monitoring system is to collect relevant data automatically. At this time, the data collection company is the main company to collect the pollution samples of each monitoring station automatically. Through the use of special testing technology, the toxic components and their quantities in the samples are determined. After that, the obtained results are transmitted to the monitoring center through the transmission channel. Among them, the data collection function in the monitoring system is of great significance for judging the pollutant content of each monitoring station. The integration process of AI and environmental protection technology is shown in Figure 3.

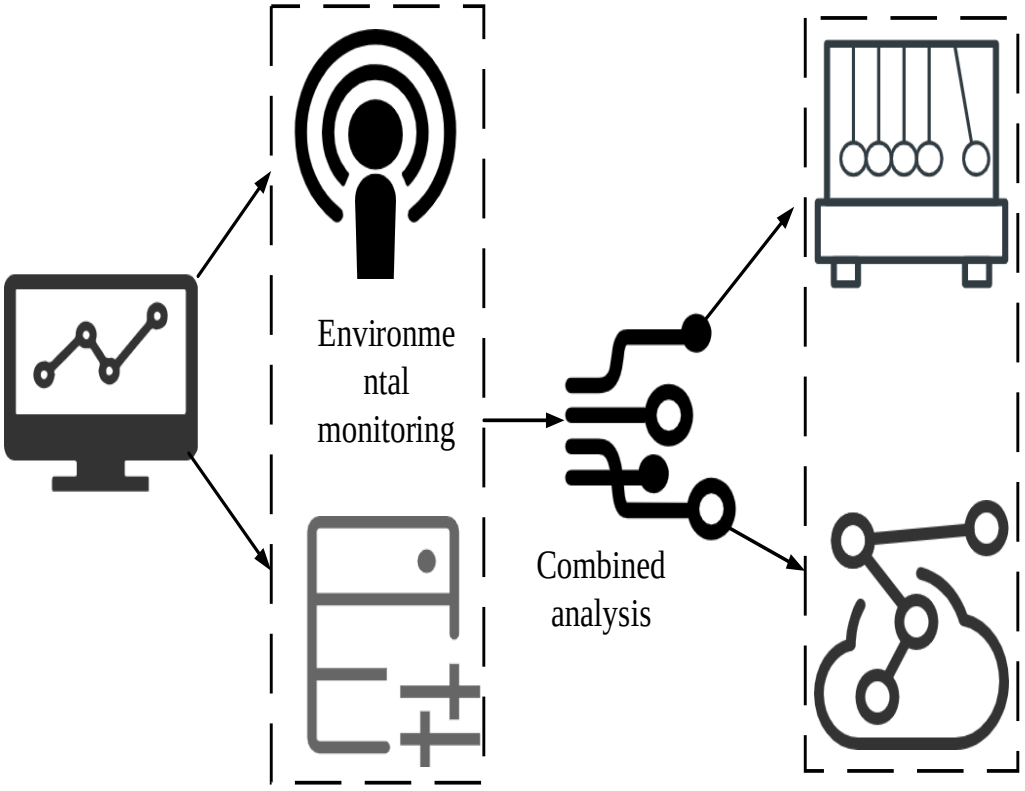


Figure 3. Integration process of AI and environmental protection technology

3. AI Algorithm

There are many kinds of AI algorithms, among which the algorithm used for classification is the logical regression algorithm, which can better classify in environmental protection technology.

The prediction function of the logical regression algorithm is:

$$h(x) = \frac{1}{1+e^{i\theta x}} \tag{1}$$

Among them, θ is the parameter, and x is the input value.

The decision boundary of prediction Function (1) is:

$$\theta^T x = 0 \tag{2}$$

After regularizing the loss function of the logistic regression model, it can be obtained:

$$g(x) = -\frac{1}{m}(\sum_{i=1}^{m} \log h(x) + \sum_{i=1}^{m} \theta_i^{\ 2}) \tag{3}$$

It is very convenient to apply the logical regression algorithm to the classification problem.

4. AI Algorithm Experiment

4.1. Experimental Method

Data from five cities were selected. By analyzing the quantity of recyclable garbage, non-recyclable garbage and compost garbage, the efficiency of using AI algorithm and traditional manual garbage treatment was compared, and the experimental data were recorded and compared.

4.2. Data Analysis

4.2.1. Quantity of Garbage

Waste treatment stations in 5 cities were selected. By analyzing the quantity of various types of garbage, the comparative analysis of the quantity of various types of garbage is shown in Table 1.

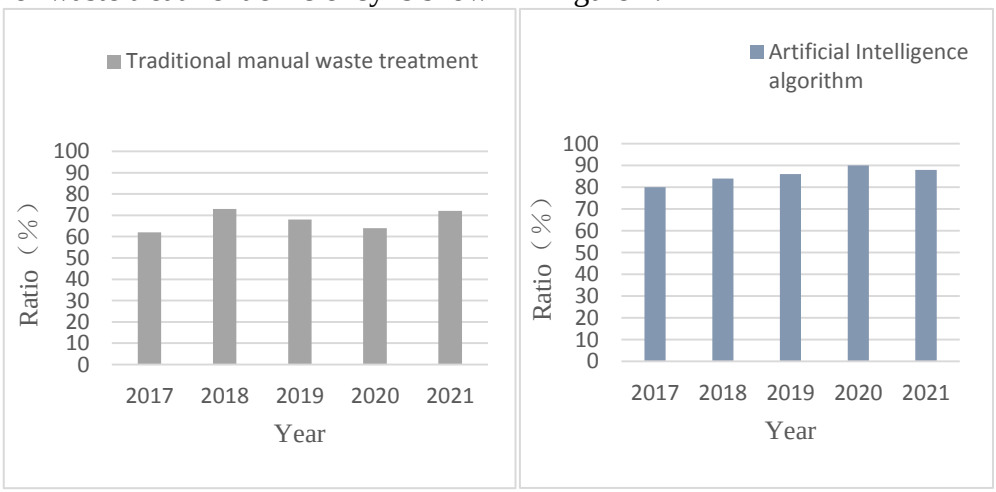
Table 1. Comparison and analysis of various types of garbage

Category	Data				
	1	2	3	4	5
Recyclable garbage	46ton	37ton	52ton	45ton	55ton
Non-recyclable garbage	67ton	73ton	65ton	70ton	60ton
Compostable	23ton	29ton	32ton	42ton	36ton

By analyzing the data in Table 1, it was found that the maximum amount of recyclable garbage was 55 tons, and the minimum amount was 37 tons; the average amount was 47 tons. The quantity of non-recyclable garbage was 60~73 tons, and the quantity range of composting garbage was 23~42 tons. It can be seen that in the process of urban garbage treatment, garbage needs to be classified. However, garbage classification requires energy and time, so it needs to be optimized.

4.2.2. Garbage Treatment Efficiency

By selecting the data of garbage stations in a region and comparing the data from 2017 to 2021, the efficiency of using AI algorithm and traditional manual processing of garbage was analyzed and compared. The higher the score, the higher the waste treatment efficiency. The analysis and comparison of waste treatment efficiency is shown in Figure 4.



(a) Traditional manual waste treatment *(b) AI algorithm*

Figure 4. Analysis and comparison of waste treatment efficiency

It can be seen from Figure 4 that the lowest value of traditional artificial waste treatment

efficiency was 62% in 2017, and the highest value was 73% in 2018; the average waste treatment efficiency was 67.8%. The highest efficiency of AI algorithm for garbage disposal was 90%, and the lowest value was 80%; the average garbage disposal efficiency was 85.6%. The efficiency of AI algorithm for garbage disposal was 26.25% higher than that of traditional artificial garbage disposal.

5. Conclusion

By analyzing the current situation of environmental protection technology, this paper found out the system and application principle of environmental protection technology. According to the principle of AI, this paper proposed a natural protection environment technology integrating AI, and analyzed the logical regression algorithm in AI. Through classification technology to protect the environment, the efficiency of the AI algorithm proposed in this paper was 26.25% higher than that of the traditional technology classification. The integration of AI and natural protection environment technology proposed in this paper has reference significance for future research in other fields.

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] Li, Chunmei, Abbas Ali Chandio, and Ge He. "Dual performance of environmental regulation on economic and environmental development: evidence from China." Environmental Science and Pollution Research 29.2 (2021): 3116-3130.

[2] Sun, Hang, and Shengxian Tang. "Planning of agricultural ecological scenery based on the concept of traditional rural culture." Acta Agriculturae Scandinavica, Section B—Soil & Plant Science 72.1 (2021): 333-343.

[3] Espinoza, Tom. "Adaptive management to reduce nest inundation of a critically endangered freshwater turtle: confirming the win-win." Environmental Management 69.5 (2021): 972-981.

[4] Zhe, Li. "Digital Analysis of the Water Layout Ecological Wisdom in Traditional Chinese Rural Settlements: A Case Study of Liukeng Village in Jiangxi Province." Journal of Resources and Ecology 13.3 (2021): 371-381.

[5] Bidone, Francisco. "Driving governance beyond ecological modernization: REDD+ and the Amazon Fund." Environmental Policy and Governance 32.2 (2021): 110-121.

[6] Shi, Daqian, Guangqin Xiong, and Caiqi Bu. "The effect of stringent environmental regulation on firms' TFP—new evidence from a quasi-natural experiment in Chongqing's daily penalty policy." Environmental Science and Pollution Research 29.21 (2021): 32065-32081.

[7] Molinario, Erica. "Motivations to act for the protection of nature biodiversity and the environment: a matter of "Significance"." Environment and Behavior 52.10 (2020): 1133-1163.

[8] Stelmasiak, Jerzy. "Nature Reserve as a Legal Form of Nature Protection." Studia Iuridica Lublinensia 29.2 (2020): 163-172.

[9] Seddon, Nathalie. "Getting the message right on nature‐based solutions to climate change." Global change biology 27.8 (2021): 1518-1546.

[10] Ponitka, Jens, and Sarah Boettner. "Challenges of future energy landscapes in Germany—a nature conservation perspective." Energy, Sustainability and Society 10.1 (2020): 1-11.

[11] Hironaka, Ann. "The globalization of environmental protection: The case of environmental impact assessment." International Journal of Comparative Sociology 43.1 (2020): 65-78.

[12] Khurshid, A. "Technological innovations for environmental protection: role of intellectual property rights in the carbon mitigation efforts. Evidence from western and southern Europe." International Journal of Environmental Science and Technology 19.5 (2021): 3919-3934.

[13] Kurbonova, Umida Sayotbekovna. "On the concept of environmental protection in the Republic of Uzbekistan." ISJ Theoretical & Applied Science 7.111 (2021): 33-35.

[14] Fan, Min, Ping Yang, and Qing Li. "Impact of environmental regulation on green total factor productivity: a new perspective of green technological innovation." Environmental Science and Pollution Research 29.35 (2021): 53785-53800.

[15] Shang, Lina. "Environmental regulation, import trade, and green technology innovation." Environmental Science and Pollution Research 29.9 (2021): 12864-12874.

[16] Lee, Chien-Chiang, Mingli Zeng, and Changsong Wang. "Environmental regulation, innovation capability, and green total factor productivity: New evidence from China." Environmental Science and Pollution Research 29.26 (2021): 39384-39399.