

Study on Green Audit Innovation of Ecological Protection and Restoration Project of Mountains, Rivers, Forests, Fields, Lakes, Grasses and Sands in Wuliangsu Hai Watershed

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Abstract: The source of pollution damage of mountains, rivers, forests, fields, lakes, grass and sand lies in the upper reaches of the Yellow River, which has caused great pressure on Wuliangsu Hai. From the perspective of ecological security and protection in the upper reaches of the Yellow River, it is urgent to take protection as the prerequisite for governance and compensation. Wuliangsu Hai Lake is one of the important lake basins in the upper reaches of the Yellow River. It is known as one of the "Four Black Seas in Northwest China" because it has not undergone large-scale ecological restoration for many years. The ecological and environmental problems in the Wuliangsu Hai basin are serious, and the fragile pattern of the "three plates" has not been fundamentally reversed. Its governance and protection need to be analyzed in depth, and it is necessary to explore a road of green audit innovation.

1. Introduction

Since 2004, the state has given strong support and assistance in policy, funds, projects, science and technology, and other aspects after the construction of the "Three North" shelter, forest project and has achieved phased achievements and major breakthroughs. The central and local governments at all levels attach great importance to the construction of ecological civilization and the conservation and utilization of resources, and strictly implement the water-saving requirements in the construction of the "Three North" shelter forest project.

Green IT and sustainability reporting have received considerable attention. Internal auditors are regarded as control experts and ensure that the control measures have been designed and operate normally. However, there are differences in the role of internal auditors in sustainability activities. Based on the theoretical relationship between environmental regulation and the role of internal auditors in sustainable development activities, Kyunghee Yoon examined whether there are differences in the green ROLES of internal auditors in Australia, Canada and the United States [1]. Zhang L proposed a new assessment framework, which combines the importance assessment of

ecosystem services and landscape connectivity analysis with the importance assessment of human ecological needs to identify ecological sources [2]. Theoretically, this method proposed by Higgins Desbiolles F includes a way to realize the "socialization" of tourism by re-focusing on the public interest. This is crucial for the tourism industry to be responsible for the social and ecological limits of the earth [3]. The ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass and sand is of great significance to the ecological security and human health of the watershed.

We have increased investment in key ecological projects, in national macroeconomic policies and construction of major projects. This paper makes a brief review and summary of the green audit innovation research on the implementation of the ecological protection and restoration project of mountains, forests, fields, lakes, grass, and sand, and puts forward the basic principles to be followed in the green audit innovation research on the ecological protection and restoration project of mountains, forests, fields, lakes, grass and sand.

2. Research on Green Audit Innovation of Ecological Protection and Restoration Project of Mountains, Rivers, Forests, Fields, Lakes, Grasses and Sands in Wuliangshuai Watershed

Ecological audit refers to an audit method that thoroughly evaluates and reveals the scientificity, feasibility, and rationality of relevant institutional arrangements in ecological environment protection in an objective and fair way [4]. The so-called ecological audit refers to the process of finding problems such as the lack of effective mechanisms in the implementation of relevant policies or systems and putting forward suggestions for improvement through objective analysis, demonstration, and other activities of problems and their causes during the implementation of the project. At present, the construction of the ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass, and sand carried out nationwide is very uneven, and most of them are concentrated in the Yellow River basin and inland river basin, which are also important ecological functional areas, ecological environment sensitive areas and vulnerable areas of the country. It is of great significance to analyze and summarize the problems and causes in the implementation of the ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass, and sand in these areas after supervision, audit, analysis and research on the implementation of the project [5-6].

2.1. Ecological Audit Status of Wuliangshuai Basin

In October 2002, the National Audit Office carried out a special audit on the Wuliangshuai basin. The results showed that: first, the national audit did not find serious environmental pollution in the Wuliangshuai basin. Second, the relevant departments have unclear responsibilities and inadequate performance of duties in management. Third, the implementation of policies related to ecological environment protection is not in place, especially the laws, regulations, and relevant systems are not effectively implemented, especially the investment in ecological protection is not enough, and the project management is not standardized. Fourth, some violations of laws and regulations have not been effectively curbed. In some places, there is still the phenomenon of "fighting against corruption" for environmental protection. Fifthly, the construction of the monitoring and early warning system is not perfect, and the monitoring data is not standardized and timely, which has a certain impact on the ecological environment of Wuliangshuai. Sixthly, grassland ecological degradation is serious in some watersheds. Seventh, the economic activities along the coast of Wuliangshuai are serious and there are many polluting enterprises. Eighth, there are contradictions between regional social and economic development and environmental protection. Ninth, there are certain hidden dangers in the ecological protection of Wuliangshuai basin [7-8].

2.2. Difficulties in the Supervision and Audit of the Central Financial Ecological Protection and Restoration Funds in the Wuliangsu Hai Basin

There are mainly the following problems in the supervision and audit of the funds for ecological protection and restoration in Wuliangsu Hai: First, the audit scope is not wide enough. For the Wuliangsu Hai basin, although the relevant departments have set up the Wuliangsu Hai basin audit bureau, for the specific audit situation, there are only 11 auditors, which is far from meeting the requirements of environmental audit in the field of national audit supervision. The audit means are single and the audit scope is not wide enough. Second, the scope of the audit is too narrow. As the ecological environment construction in this area involves many fields and covers a wide range of areas, and the project has a long time span, the audit content is relatively complex. Only four provincial, municipal, district, and county audit departments audit, and no representative department in other fields is responsible for this business, so it is difficult to carry out an environmental audit. Third, the audit subject is too single. Due to the narrow field of ecological audit in this region. Only a single department is mainly responsible for the audit project planning, audit content selection, organization, and implementation. The audit methods and procedures are single, which leads to increased audit difficulty. Fourth, the audit objects are too centralized, the auditors are relatively limited, and the audit time is not sufficient.

2.3. Existing Problems and Cause Analysis

After studying the problems and causes in the construction of the ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass, and sand in the Wuliangsu Hai basin, it is believed that the current problems and causes are as follows: First, the project planning is not scientific enough [9-10]. The lack of scientific calculation results for indicators such as the total area of construction land for the Wuliangsu Hai Conservation and Restoration Project does not fully reflect and guarantee the demand conditions for reasonable land use during the implementation of the project. Second, the preliminary design of the project is not scientific enough, and the construction conditions in the early stage of the project are simply and one-sided designed, or even directly enter the construction stage without scientific demonstration, leading to the lack of assurance of the construction quality in the later stage of the project. Third, the design content was not reasonably implemented and configured in strict accordance with the planning and design requirements during the project implementation, resulting in many unreasonable phenomena in the later project implementation. Fourth, there is a lack of professionals, weak management ability, lax supervision, and insufficient investment; insufficient scientific and technological support; difficulty in financing; inadequate design capacity makes it difficult for the project construction to reach the standard; weak project management. Fifthly, the fund supervision is not enough, and the project application materials are not standardized. Sixth, the implementation was not strict. Some projects do not strictly implement the investment subsidy policy for ecological protection and restoration, which leads to insufficient funds and affects project implementation; in addition, some projects did not fully consider the particularity of ecological protection and restoration, and did not effectively supervise some local ecological protection and restoration work, resulting in ecological damage or poor restoration effect after the implementation of individual projects [11].

2.4. Innovate and Propose the Ecological Audit Model of Wuliangsu Hai Basin

Wuliangsu Hai plays an important role in ecological protection and construction in arid areas of northwest China. However, due to many reasons such as history, geography, natural environment, and differences in national governance concepts, there are various problems affecting ecological

security in the Wuliangshuai basin. At present, there is a large amount of industrial wastewater and domestic sewage discharged directly into the Wuliangshuai basin. Some residents in the basin lack awareness of environmental protection and exploit groundwater resources wantonly, resulting in a decrease in the amount of seawater in Wuliangsu year by year. With the development of modern science and technology, the discharge of industrial wastewater is increasing year by year. Wuliangshuai watershed has become an important ecological functional area in the north of Yinchuan, Ningxia [12]. The ecological audit of Wuliangshuai basin should start from the implementation of project approval and combine the characteristics of ecological audit to build a new audit mode as the starting point. Establish a full coverage mechanism of ecological audit, innovate audit methods, and comprehensively promote the integration of supervision and audit. The expert evaluation mode is adopted to ensure the maximum audit effect. Adopt full coverage and regular audit to determine the problems, implement the full coverage audit, and determine that the rectification of problems is not in place or the rebound is not complete, to ensure the full coverage effect of ecological audit.

3. Innovative Experimental Design of Green Audit for the Ecological Protection and Restoration Project of Mountains, Rivers, Forests, Fields, Lakes, Grasses and Sands in Wuliang Suhai Basin

3.1. System Design

Based on TRIZ toolset, a green innovative design process model based on TRIZ is established and studied. However, whether this process model can improve innovation and efficiency remains to be further tested. Therefore, this paper uses a novel design process of garbage collection equipment to test its effectiveness.

Since the 1990s, with the impact of population growth, economic growth, overgrazing, and other factors, the area of sandy land in the Wuliangshuai basin has increased rapidly, and the area of local sandy land has expanded. In order to solve the above problems, this paper proposes a new type of efficient and environment-friendly garbage collection equipment. The detailed design process is as follows:

(1) Design of the preliminary scheme

The analysis of customer needs is mainly achieved by consulting relevant literature and on-site investigation. According to the domestic and foreign literature on waste recycling equipment, it can be seen that: easy to put in, large capacity, good sealing, automatic opening, automatic compression, anticorrosion, reserve detection, etc. Through field investigation, it is learned that the requirements of garbage collection equipment are: to store garbage, seal it well, put it conveniently, have large capacity, not be easy to dump, and be easy to collect.

(2) Determine the main functions of the product

After analyzing the equipment required by users, it is believed that the greatest need of users is garbage storage, which is well sealed and has a large capacity. Therefore, the main function of the garbage detection collector in this paper is to store garbage and seal the opening.

(3) Comparative analysis

Based on the ideal measurement of modern TRIZ engineering system, the optimized function benchmark identifies the MPV of each main function and determines the weight coefficient of MPV according to the review results of the product development team, as shown in Table 1.

The leading MPV system is selected as the performance benchmark. From Figure 1, select the systems to compete according to the characteristics of different competitive systems, and determine

the functional benchmark by calculation according to the MPV of each function listed in Figure 1, their weights, and their weights.

Table 1: MPV and its weighting factors of main functions

function	MPV	Weighting factor
Garbage storage	Relative capacity	5
	Storage capacity	4
	Convenience	4
	life	3
	cost	3
Opening seal	Convenience	4
	Leakage rate	5
	life	3
	cost	3

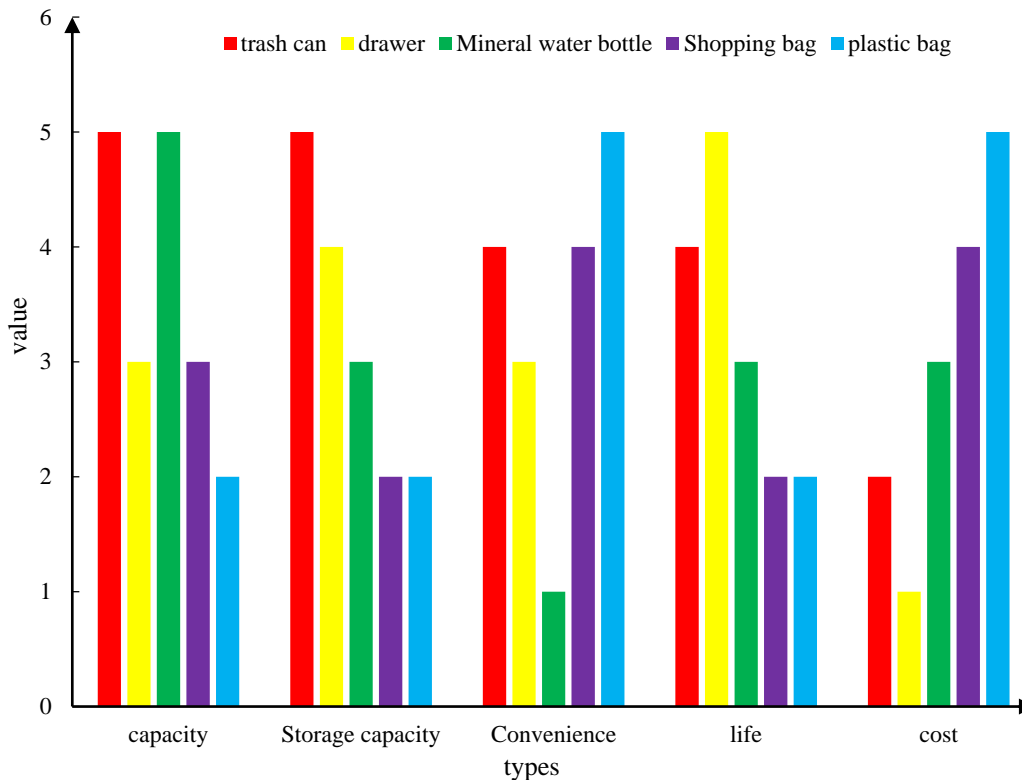


Figure 1: Functional benchmarking table for storing mixtures.

3.2. Evaluation Method of Green Design Scheme Based On Ideality

The degree of idealization can be compared by evaluating the degree of idealization of the technical system. At the same time, using the ideal degree to evaluate the green design scheme of the product can also compare its ideal degree. The most ideal solution of the technical system is not realistic, while the technical system tends to achieve the optimal solution by adding useful functions and reducing unfavorable factors. From the perspective of green design, the ultimate goal of green products is to achieve all their functions without any impact on the environment. However, the ideal evaluation plan does not take it as an evaluation index, which violates the current environmental protection concept. On this basis, the composition of the evaluation index of the green design

scheme is proposed, which takes into account both the functional quality of the product and the impact of the entire life cycle on the environment. The function of the green design scheme of the product is comprehensively evaluated. In Formula 1, calculate the ideal degree J_G of the function:

$$J_G = \sum_{j=1}^m \left(\varphi_j \sum_{i=1}^{r_j} \beta_{ji} w_{ji} \right) \quad (1)$$

Where: m is the number of functions of the product, and φ_j is the weight factor of the j th function of the product.

Similarly, on this basis, this paper calls the ecological evaluation of green design schemes of products as "ecological ideal". Take the ecological benefit evaluation as the evaluation index, and use the evaluation method similar to the functional ideal J_C . See Formula 2 for the calculation formula of the ecological ideal degree

$$J_C = \alpha \sum_{j=1}^4 (\lambda_j w_j) + (1 - \alpha) \sum_{j=5}^7 (\lambda_j w_j) \quad (2)$$

Among them, α is the weight factor of the inverse index classification of the product ecological efficiency parameter, and λ_j is the weight factor of the j th ecological efficiency parameter index of the product.

4. Experimental Analysis on Green Audit Innovation of the Ecological Protection and Restoration Project of Mountains, Rivers, Forests, Fields, Lakes, Grass and Sand in the Wuliangshuai Basin

The evaluation method of green design scheme based on ideality is adopted to evaluate each scheme, as shown in Table 2.

Table 2: Evaluation of the functional ideality of the scheme

Function	Function weight	Mpv	Weighting factor	Score
Garbage storage	0.5	Relative capacity	5	5
		Storage capacity	4	5
		Convenience	4	3
		Life	3	4
		Cost	3	5
		Ideality	/	84
Opening seal	0.3	Convenience	4	5
		Leakage rate	5	5
		Life	3	4
		Cost	3	5
		Ideality	/	72

Based on TRIZ toolset and green innovative design process of products, this paper carries out the green innovative design for TRIZ. On this basis, the green innovative design was carried out for 8 garbage recycling equipment, and the scheme evaluation was carried out. Finally, the three best schemes were determined. Through the green innovation design process of the new generation of waste recycling equipment, it is proved that the "green innovation" design process model proposed

in this paper has a significant impact on improving the "green" design innovation and innovation efficiency.

5. Conclusions

This paper takes the typical cases of the ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass, and sand in the Wuliangshuhai basin as the starting point, and analyzes and studies the main problems in the implementation of the project from the macro and micro perspectives. In this paper, we propose more targeted green audit countermeasures and suggestions: first, strengthen planning and design; second, increase capital investment; third, strict supervision and management; fourth, establish mechanisms and innovative models; fifth, establish a monitoring platform. The audit risk control system during the construction of the ecological protection and restoration project of mountains, rivers, forests, fields, lakes, grass, and sand has been improved through the establishment of technical support system for environmental impact assessment, environmental risk prevention measures, risk identification and early warning, environmental damage compensation and governance mechanism, and the establishment of an accountability system.

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