

Artistic Concept and Aesthetic Expression of Environmental Design in Green Ecological Restoration

Xueting Qin

*Faculty of Construction, Guangdong Technology College, Zhaoqing, 526000, Guangdong, China
1308490018@qq.com*

Keywords: Art Concept of Environmental Design, Aesthetic Expression of Environmental Design, Green Ecological Restoration, Environmental Management, Agricultural Waste Biomass Measurement

Abstract: The rapid development of economy is directly related to the huge consumption of environmental resources. Urbanization has created a huge modern machine. Although providing services for urban ecosystems can help improve the efficiency of urban mobility, logistics and livelihood, its service functions are deteriorating. Especially with the rapid development of the real estate industry, the pollution problem of the construction industry has become more and more serious. Some countries waste too much resources and cause serious damage to the environment. At the same time, while building a green ecological space, efforts should be made to reduce energy conservation in low-carbon cities to reduce urban heat effects. The introduction of green design concept into modern ecological art design plays an important role in easing the consumption of natural environment and human resources. Based on this, this paper combed the overview and principles of green design concept, analyzed and discussed the application of green design concept in modern environmental art design, analyzed the application of green design concept in modern environmental art design, and put forward more achievable improvement strategies and plans, and then summarized and discussed the experiment. Through research and investigation, bringing the concept of green ecological restoration into the actual construction of environmental design can reduce the pollution and waste rate by 71%.

1. Introduction

Environmental art design includes three concepts: environment, art and design. It is a design activity based on the natural environment of a specific region. It widely applies artistic design, organizational social factors, natural factors, etc., to meet the needs of human beings in space, and ultimately achieve harmony between man and nature, adn man and society, creating conditions for people's affluent life. Therefore, the real purpose of environmental art design is to create an artificial environment. At the macro level, environmental art design is a series of activities. Through these activities, people interact with nature. The essential purpose of design activities should be how to create a self regulating artificial environment system.

There is a dialectical relationship between design philosophy and artistic characteristics. Design concept plays a leading role in environmental design. Good design can help people understand

design better. Guneroglu Nilgun suggested that the principles and methods of green design should be used to effectively express and disseminate information. The application of green design concept with humanistic care in information art design was proposed [1]. Gharaveis Arsalan reviewed and discussed the literature on the impact of architectural environment on team cooperation and communication in detail, and summarized it briefly as the final result of this review [2]. Wu Xing believed that the continuous development of modern high-tech design technology is an effective driving force to promote the development of all sectors of society [3]. Yuan Gao analyzed the basic application elements of the ocean design concept, and guided by the ocean design concept, built an optimization design model for the indoor environment of green ecological residence [4]. Oligbinde S R discussed plastic sculpture, whose concept is to convert plastic waste into aesthetic objects made of waste plastics, and purposefully select these plastics for form and background analysis [5]. Ghomeishi Mohammad investigated the differences in aesthetic preferences of non architects for external facades, and the results showed that originality, clarity and simplicity were the most commonly used attributes of non architects [6]. Meltzer Nathan W thought that the environmental crisis is a design crisis, and tried to design teaching methods to solve ecological and social problems. Environmental problems have become mainstream public discourse and government policies [7].

Ecological restoration refers to the restoration of natural ecosystems according to natural laws through artificial methods. It is an attempt to recreate, guide or accelerate the process of natural evolution. Mansuy Nicolas believed that by investing in ecological restoration, the government does not have to choose between economic priorities and environmental issues [8]. Levesque Ann proposed possible ways to integrate social dimensions through the interdisciplinary perspective of social science and natural science, which shaped the future of these communities towards the post mining era and promoted consensus and cohesion [9]. Liu Hao analyzed the changes of soil ciliate communities in four plots used for environmental assessment, and studied the impacts of vegetation communities, physical and chemical variables and GFG changes on soil ciliates [10]. Perring Michael P suggested that scaling up needs to address the challenges of governance, law and ethics, invest in technology and education capacity-building, support the restoration of the required practical science, encourage the packages that can be used to ensure the livelihood of local stakeholders, and provide investment opportunities for local actors and industries [11]. Yadav Swati discussed in detail the morphology, physiology and antioxidant reaction of plants growing on garbage dumps. In general, different comprehensive methods for the recovery of garbage dump were summarized, and methods for transforming barren garbage dump into useful place were compiled to obtain the bioeconomic benefits of plant products [12]. Zhao Meng's research found that large-scale ecological restoration has achieved success in curbing land degradation and improving ecosystem services. The research results showed that sustainable strategies require optimizing ecosystem water use to balance land restoration and water resources protection [13]. Xian Jinhong studied the current situation of urban ecological restoration along the Yangtze River, and introduced the research of engineering building information model landscape design into environmental design [14]. The interpretation of the above research on green ecological restoration is more specific, but it is not related to the artistic concept and aesthetic expression of environmental design.

All developing countries in the world pursue industrial and economic development at the expense of energy. The concept of green design is the product of modern civilization and is of great significance to the healthy development of society. On the basis of relevant ecological aesthetics, human and natural factors are integrated into ecological art design to form green design principles, and ensure the integration, coordination and interaction of human and environment in different directions and multiple elements, and create harmonious ecological art.

2. Overview and Principles of Green Design Concept

(1) Overview of green design concept

The current sustainable development strategy is based on a reassessment of economic development, ignoring the importance of environmental protection. The concept of "green" began to develop in this era, and gradually transformed into the concept of "green design" [15]. In the framework of modern environmental art design, people put forward the concept of weeding out the old to bring forth the new, as well as the concept of new areas. These ideas come from the effective use of urban planning and design, architectural landscape and interior design, and run through all aspects of work and life, and guide people's thinking. The contradiction between man and nature also reflects the destruction and transformation of human production activities into nature. How to use the concept of green has become the current task, as shown in Figure 1. In general, with the intensification of the tension between environment and resources, the concept of green design has become more and more practical in life, which undoubtedly opens up new opportunities for people and nature to coexist harmoniously.

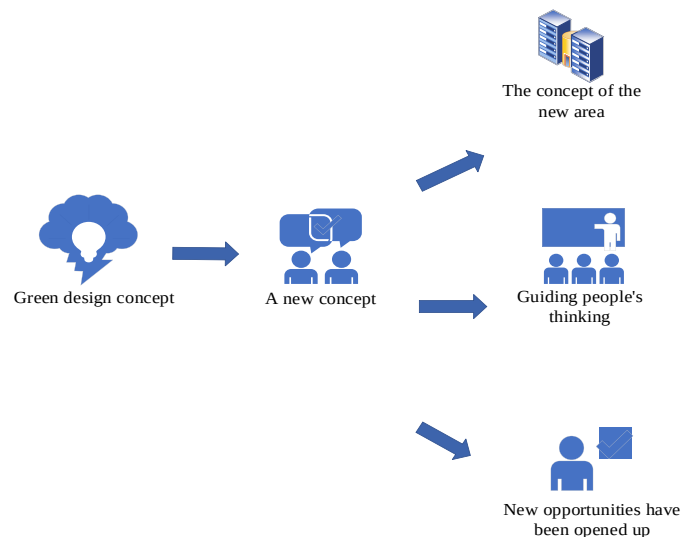


Figure 1 Overview of the green design concept

(2) Naturalness, safety and economy

The concept of green design concept is a complete system guided by the laws of nature [16]. In order to make green design concept become the core concept of realistic design, natural selection must be respected. Only by harmonizing with nature can people better combine green design with modern ecological art design. With the help of advanced scientific and technological means, people would combine the natural beauty with the environment, so that the majority of people can feel the vitality of the natural environment, and realize the design and integration with the nature. The concept of green design includes an important design principle, namely security. Safety is the most basic requirement of mankind. With the improvement of the national economic level and material welfare level, more and more people care about the quality of life and quality, pursue high-quality comfortable life, create a healthy and comfortable living environment for most people, improve air quality, and reduce environmental pollution. The overexploitation of resources has brought many environmental problems to the environment. In modern art design, according to the nature of design, people should reduce the consumption of ecological resources by reducing design. People must strive to simplify design and reveal its nature. In order to live in harmony with nature, people can make better use of this recycling form, and choose decorative materials, and use more environment-friendly materials. From the perspective of development, sustainable development

itself is to save resources. Only in this way can people truly promote the development of green design concepts.

3. Application of Green Design Concept in Modern Environmental Art Design

(1) Ensuring the core position of designers

Every design of a designer is the use of many resources. If the concept of green design cannot be put into practice at all stages of design, it would have a significant impact on the idea of a harmonious relationship between man and nature. These projects now pay more attention to the effective implementation of sustainable development, so as to draw lessons, achieve measurable results, reduce the urban heat effect, strengthen the city's data collection and management capabilities, and achieve the relative balance between "growth" and "ecology". Especially in the actual planning, designers should rely on their own knowledge, coordinate the construction and internal and external space, make full use of natural resources, and build the designed building as a whole.

(2) Paying attention to energy utilization efficiency and use of green materials

The emergence of the energy crisis is closely related to the destruction of the natural environment at ordinary times. How to improve the utilization rate of resources and reduce the energy consumption is a problem people are all concerned about [17]. In the art environment design, the focus is to maintain and control the indoor temperature, and save water and energy, such as indoor lighting. The green design concept is energy-saving and environmental protection, aiming at saving resources and reducing excessive waste of resources. Green environmental protection is the biggest challenge today, which provides rare conditions for the practical application of green design concepts. In contrast, these environment-friendly materials are closely related to energy conservation, reducing consumption, improving resource efficiency and reducing the impact on the environment. The use of environmental materials ensures human health and reduces many negative factors related to pollution. Therefore, the most environment-friendly and energy-saving materials shall be adopted for material design.

(3) The role of environmental management in environmental art design

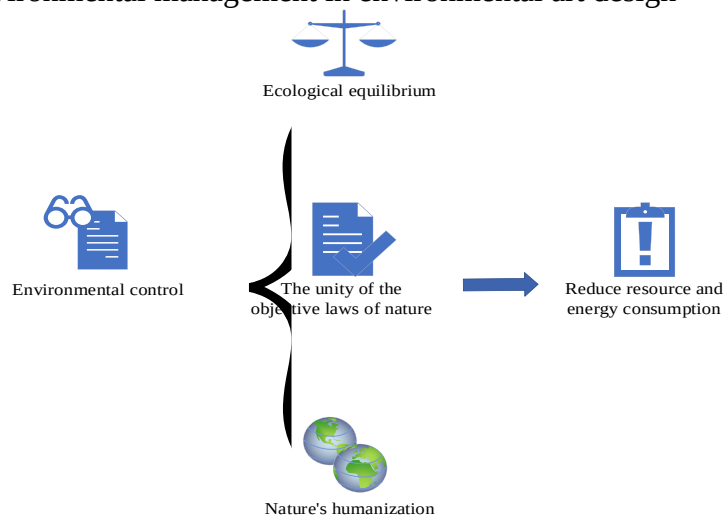


Figure 2 The role of environmental management in environmental art design

The principle of ecological aesthetics is to study the aesthetic form and content of the reflection form of ecological aesthetics in the practice of ecological environment, so as to achieve the ultimate goal of ecological balance. The essence of beauty lies in the unity of human practice and objective

natural laws, and in the humanization of nature. Ecological balance creates vitality and brings good mood to people in the environment. At present, the whole society is pursuing sensual "luxury" and "fashion", resulting in blind consumption and design. A large amount of construction waste and synthetic materials have become pollutants that affect human health. The use of large amounts of glass and metal materials may cause radiation, glare and other interference. The original design aims to avoid the use of expensive, costly and flashy landscape forms. The natural color of materials is used to minimize the consumption of resources and energy, and realize the secondary utilization of materials, as shown in Figure 2.

4. Art Concept and Aesthetic Expression of Green Ecology in Environmental Art Design

(1) The embodiment of art concept in space form design

Reasonable environmental design can enable people to enjoy unexpected beauty in environmental design [18]. Good design is the basic requirement of designers, but as designers, people should not only adhere to the established design methods, but also constantly develop and learn new technologies and methods. The goal of environmental design is to let people enjoy a better life and work as much as possible. It is of special significance to meet the needs of people's life and work, which is the artistic concept of modern environmental design.

(2) The embodiment of art concept in the color selection and collocation of environmental design

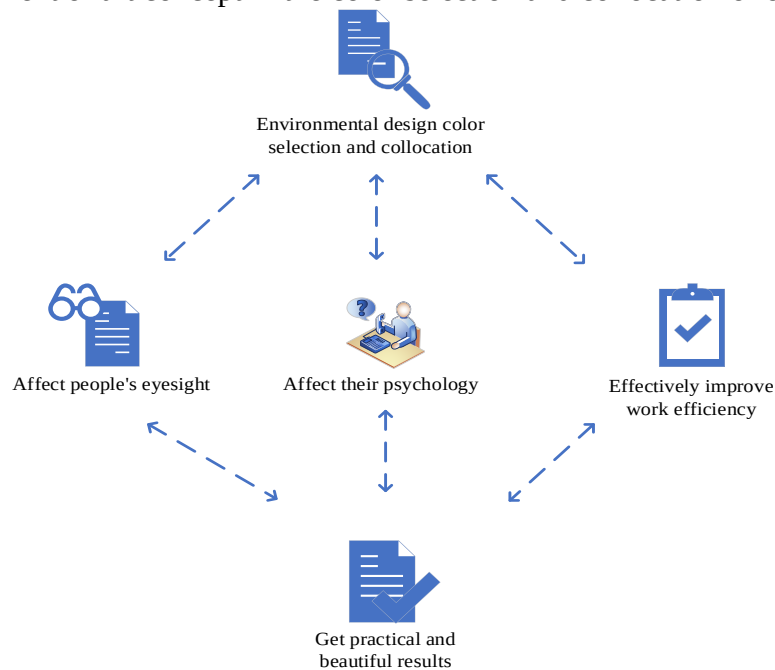


Figure 3 The embodiment of the art concept in the color selection and collocation of the environmental design

Color is also very important in environmental design. The color in environmental design not only directly affects people's vision, but also directly or indirectly affects their psychology. The reasonable combination of colors not only contributes to people's health, effectively improves work efficiency, but also can obtain practical and beautiful effects. The color environment design should not only conform to the general color laws, but also change people's vision and the actual use place with the development of the times. If the object combination of environmental design is skeleton, the color combination of environmental design is soul environmental design [19]. Generally speaking, a good environmental design must combine cold and warm colors to enable people to

adapt to the color of cold and warm life to achieve a harmonious and perfect effect, as shown in Figure 3.

(3) Perfect combination of scientific and natural design

Environmental design is an organic link between science and nature. The scientific results show that in the design process, it is necessary to ensure the good comfort, safety and efficiency of space design. The combination of different elements has a fundamental relationship with modern science and technology. Therefore, environmental design and science are inseparable. At the same time, the nature of ecological design can not be ignored. If the standardization of environmental design is only to improve its scientificity and tradition, then the design effect must be the same, without natural protection. In this regard, its importance is naturally emphasized. The challenge of environmental design is how to develop design on the basis of safety and science so that the design can not only meet people's basic needs, but also enjoy a comfortable, free and beautiful living environment when designing the environment. Under the aesthetic background of modern society, it is particularly important to ensure the scientific and natural balance of natural utilization. With the improvement of people's living standards and the enrichment of their inner life, more and more people begin to pay attention to and question their artistic effects, as shown in Figure 4. Therefore, modern environmental design and environmental art design should consider modern aesthetic concepts, and fully integrate science and nature, material and spiritual elements, and physiological and psychological needs with material means. The beautiful environment is designed to create a satisfactory and comfortable environment for people to get spiritual satisfaction of life [20].

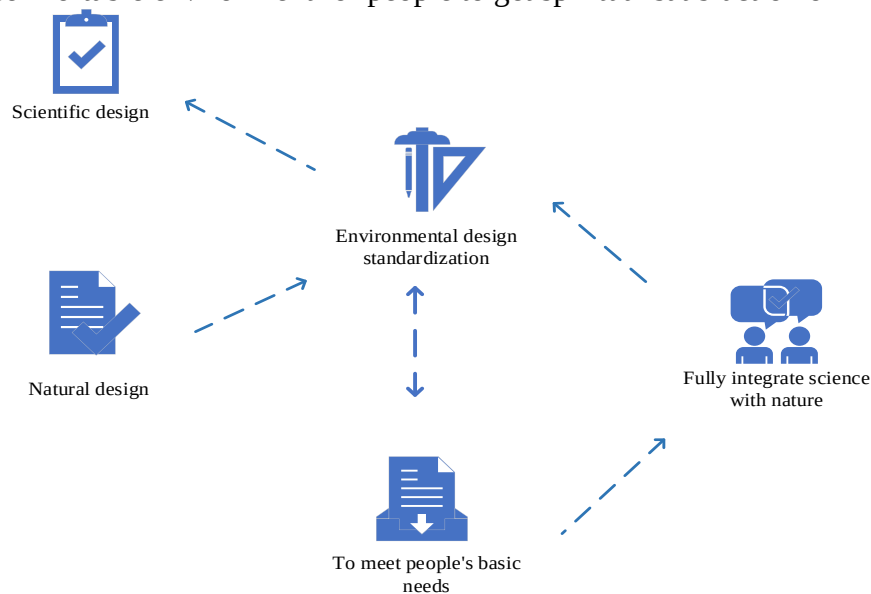


Figure 4 The perfect combination of scientific design and natural design

5. Carrying out Specific Investigation in Combination with Experiments of Green Ecological Restoration and Environmental Design

In order to further investigate the status quo of the art concept and aesthetic expression of environmental design under the concept of green ecological restoration, the design status from 2017 to 2021 was investigated, and 100 design projects of four design companies were investigated, and the degree of expression of the art concept and aesthetic expression in the design projects was investigated. The survey mainly summarized four points, namely, rational use of space, reasonable color matching, scientific design, and natural design. This paper investigates the expression of art concepts and aesthetic expressions in current environmental design projects from these four points.

The four companies are set as A, B, C and D. The survey is shown in Table 1.

Table 1 The development of the art concept and aesthetic expression in the current environmental design project

	A	B	C	D
Make reasonable use of space	71%	69%	73%	79%
Colour reasonable collocation	82%	83%	79%	78%
Scientific design	76%	79%	82%	75%
Natural design	85%	80%	84%	78%

It can be seen from Table 1 that in the current environmental design project, the four aspects of art concept and aesthetic expression, namely, reasonable use of space, reasonable color matching, scientific design and natural design, are in a relatively stable state, and there is no high performance. Specifically, the performance of company A, company B, company C and company D in reasonable use of space is 71%, 69%, 73% and 79% respectively. In the reasonable color matching, the performance of company A is 82%, company B is 83%, company C is 79%, and company D is 78%. In terms of scientific design, the performance of company A is 76%, that of company B is 79%, that of company C is 82%, and that of company D is 75%. In the nature of design, the performance of company A is 85%, that of company B is 80%, that of company C is 84%, and that of company D is 78%.

In order to strengthen the artistic concept and aesthetic expression in environmental design, the concept of green ecological restoration is brought into environmental design. In order to test the effect of the concept of green ecological restoration in environmental design, this paper investigated four environmental design companies, A, B, C and D, and investigated the impact and effect of the concept of green ecological restoration on the artistic concept and aesthetic expression in the design. The number of interviewers was 400, and the designers rated it as very satisfied, average and dissatisfied. The specific results are shown in Figure 5.

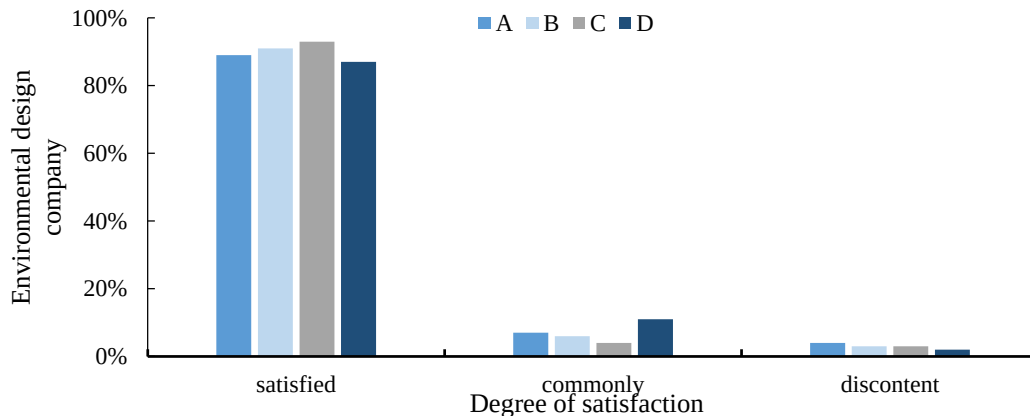


Figure 5 The influence and effect of the green ecological restoration concept on the art concept and aesthetic expression in the design

It can be seen from the histogram in Figure 5 that the employees of the four environmental design companies are relatively satisfied with the concept of green ecological restoration in the design process, and satisfaction accounts for the majority. Specifically, company A is 89% satisfied, company B is 91% satisfied, company C is 93% satisfied, and company D is 87% satisfied. Company A is generally satisfied with 7%, company B is generally satisfied with 6%, company C is generally satisfied with 4%, and company D is generally satisfied with 11%. Company A's dissatisfaction is 4%, company B's dissatisfaction is 3%, company C's dissatisfaction is 3%, and company D's dissatisfaction is 2%. In general, the environmental art that brings the concept of green

ecological restoration into the design is still recognized by designers, and has played a great role in improving the art concept and aesthetic expression in design.

In order to investigate the environmental degradation and resource waste caused by the current environmental design companies in the design projects and actual construction, 20 design projects of four design companies were investigated, including natural resource waste rate, environmental pollution rate, energy utilization efficiency and material utilization rate. The four companies were set as A, B, C and D, and the specific changes are shown in Figure 6.

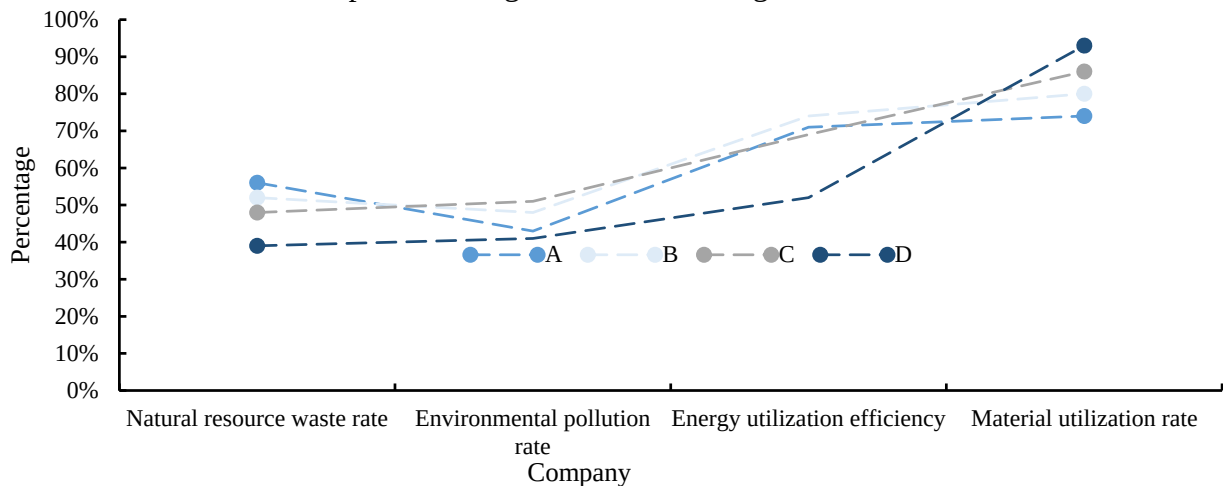


Figure 6 Environmental destruction and resource waste problems caused by environmental design companies in the design of projects and actual construction

According to Figure 6, the current environmental design company has a high waste rate of natural resources, environmental pollution rate, energy utilization efficiency and material utilization rate in the design project and actual construction. Specifically, company A accounts for 56% of the waste rate of natural resources, company B accounts for 52%, company C accounts for 48%, and company D accounts for 39%. In the environmental pollution rate, company A accounts for 43%, company B accounts for 48%, company C accounts for 51% and company D accounts for 41%. In the energy utilization efficiency, company A accounts for 71%, company B accounts for 74%, company C accounts for 69% and company D accounts for 52%. In the material utilization rate, company A accounts for 74%, company B accounts for 80%, company C accounts for 86% and company D accounts for 93%.

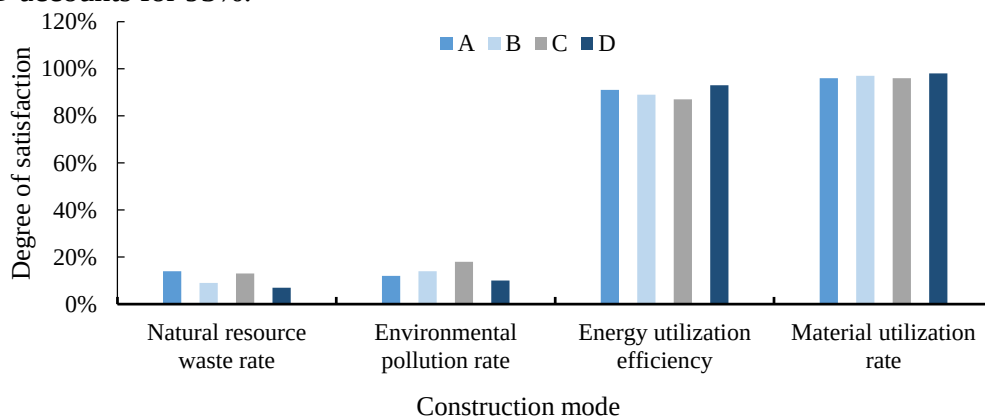


Figure 7 Influence of green ecological restoration concept on the actual construction of environmental design

The concept of green ecological restoration has been introduced into the environmental design

work, and great changes have taken place in the planning process and implementation process of the design. In order to further test the impact of the concept of green ecological restoration on the actual construction of environmental design, 10 design projects of four design companies were investigated, specifically investigating the waste rate of natural resources, environmental pollution rate, energy utilization efficiency and material utilization rate of environmental design companies in the design projects and actual construction. The results are shown in Figure 7.

It can be seen from Figure 7 that the introduction of the concept of green ecological restoration into the actual construction of environmental design has effectively improved the utilization rate of materials and strengthened the protection of the environment. Specifically, company A accounts for 14% of the waste rate of natural resources, company B accounts for 9%, company C accounts for 13%, and company D accounts for 7%. In the environmental pollution rate, company A accounts for 12%, company B accounts for 14%, company C accounts for 18% and company D accounts for 10%. In terms of energy utilization efficiency, company A accounts for 91%, company B accounts for 89%, company C accounts for 87% and company D accounts for 93%. In the material utilization rate, company A accounts for 96%, company B accounts for 97%, company C accounts for 96% and company D accounts for 98%. Through research and investigation, bringing the concept of green ecological restoration into the actual construction of environmental design can reduce the pollution and waste rate by 71%.

6. Conclusions

In short, environmental design is closely related to human life. Environmental design should consider aesthetic needs and public awareness, environmental protection, reuse of natural materials, and future development and planning, so that the use of environmental design becomes more mature and perfect with the development of culture. It is designed to meet people's needs. From this perspective, it must adapt to people's different life needs and reflect the customs and life characteristics of different groups. The environmental design is static and cannot actively communicate with people. However, people's lives are changing. People's aesthetic style would change with the passage of time. Therefore, the same person has different views on the same design, which is the art concept and aesthetic expression of environmental art design.

References

- [1] Guneroglu, Nilgun, and Makbulenur Bekar. "A Methodology of Transformation from Concept to form in Landscape Design." *Journal of History Culture and Art Research* 8.1 (2019): 243-253.
- [2] Gharaveis, Arsalan, D. Kirk Hamilton, and Debajyoti Pati. "The impact of environmental design on teamwork and communication in healthcare facilities: a systematic literature review." *HERD: Health Environments Research & Design Journal* 11.1 (2018): 119-137.
- [3] Wu, Xing. "Virtual Spectacle-Concept Design Concept of Film in The Era of Digital Media." *International Journal of Education and Humanities* 4.3 (2022): 35-37.
- [4] Yuan, Gao. "Investigation of the effective application of marine design concept in green ecological residential indoor environment design." *International Journal of Low-Carbon Technologies* 16.4 (2021): 1371-1376.
- [5] Oligbinde, S. R., C. O. Adesanya, and O. Oyeniyi E. "AESTHETIC VALUE OF RE-USE WASTE MATERIALS AS A PANACEA FOR ENVIRONMENTAL PROTECTION (An Appraisal of Oligbinde's Creative Works)." *EPRA International Journal of Research and Development (IJRD)* 7.8 (2022): 55-61.
- [6] Ghomeishi, Mohammad. "Aesthetic preferences of laypersons and its relationship with the conceptual properties on building façade design." *Journal of Asian Architecture and Building Engineering* 20.1 (2021): 12-28.
- [7] Meltzer, Nathan W. "The effect of an outdoor orientation program on participants' biophilic expressions." *Journal of Outdoor and Environmental Education* 21.2 (2018): 187-205.
- [8] Mansuy, Nicolas. "Stimulating post-COVID-19 green recovery by investing in ecological restoration." *Restoration Ecology* 28.6 (2020): 1343-1347.
- [9] Levesque, Ann. "From white to green gold: Digging into public expectations and preferences for ecological

- restoration of asbestos mines in southeastern Quebec, Canada." *The Extractive Industries and Society* 7.4 (2020): 1411-1423.
- [10] Liu, Hao. "Use of ciliate communities for monitoring ecological restoration of grain for the green in north-western China." *Soil Ecology Letters* 4.3 (2022): 264-275.
- [11] Perring, Michael P., Todd E. Erickson, and Pedro HS Brancalion. "Rocketing restoration: enabling the upscaling of ecological restoration in the Anthropocene." *Restoration Ecology* 26.6 (2018): 1017-1023.
- [12] Yadav, Swati, Vimal Chandra Pandey, and Lal Singh. "Ecological restoration of fly-ash disposal areas: Challenges and opportunities." *Land Degradation & Development* 32.16 (2021): 4453-4471.
- [13] Zhao, Meng. "Ecological restoration impact on total terrestrial water storage." *Nature Sustainability* 4.1 (2021): 56-62.
- [14] Xian, Jinhong. "Research on Landscape Design of Building Information Model in Ecological Restoration Projects of Cities along the Yangtze River." *Tehnicki vjesnik* 28.6 (2021): 1849-1856.
- [15] Muller, Samantha, Steve Hemming, and Daryle Rigney. "Indigenous sovereignties: relational ontologies and environmental management." *Geographical Research* 57.4 (2019): 399-410.
- [16] Areola, A. A., and C. O. Ikporukpo. "Social ecology and urban green spaces in Ibadan, Nigeria." *Journal of Applied Sciences and Environmental Management* 22.7 (2018): 1111-1120.
- [17] Olivier Boiral. "Environmental management certification and environmental performance: Greening or greenwashing?." *Business Strategy and the Environment* 29.6 (2020): 2829-2841.
- [18] Arulkumar, R., H. Kanagasabapathy, and I. Neethi Manickam. "Combination of agricultural waste and saw dust into biomass material for briquette." *Indian Journal of Ecology* 46.1 (2019): 188-191.
- [19] Mund, Nitesh K. "Cellulose solvent-based pretreatment and enzymatic hydrolysis of pineapple leaf waste biomass for efficient release of glucose towards biofuel production." *Biomass Conversion and Biorefinery* 12.9 (2022): 4117-4126.
- [20] Volpe, Roberto, Anastasia A. Zabaniotou, and Vasiliki Skoulou. "Synergistic effects between lignin and cellulose during pyrolysis of agricultural waste." *Energy & fuels* 32.8 (2018): 8420-8430.