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Green home decoration: the application study of sustainable materials in residential decoration

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Abstract:
In the context of contemporary society, the construction industry is standing on the cusp of environmental protection, especially focusing on the environmental challenges of building materials. With the acceleration of the pace of urbanization and the publics deep expectation of high-quality living environment, the selection and application of building materials have jumped to a strategic height. Unfortunately, the use mode of traditional building materials is often accompanied by environmental burden, including over-exploitation of natural resources, low efficiency of energy utilization and aggravation of environmental pollution, which pose a potential threat to human health and ecological environment.
In view of this, exploring the environmental performance of building materials and the path of realizing sustainable development in residential construction has become the core topic of current research and practice. The shift aims to find and promote new building materials that can reduce environmental stress, improve residential health standards, and promote the recycling of resources to lead the construction industry toward a greener, more low-carbon future.[1]
This article discusses the concept of green home decoration, emphasizing the value of sustainable materials in residential decoration. By analyzing environmental trends, industry challenges, and sustainable material properties, it demonstrates its importance in reducing its ecological footprint. The theory section compares the environmental benefits of traditional and sustainable materials and discusses the role of policy. The empirical study collected the opinions of practitioners and consumers through questionnaires and interviews to evaluate the market acceptance and actual effectiveness of sustainable materials. The results show that sustainable materials are excellent in energy saving and emission reduction, improving indoor air quality and living comfort. Conclusion emphasizes its importance and makes policy recommendations to promote widespread application. This paper not only provides theoretical empirical support for green home decoration, but also provides inspiration for the transformation of the industry, and reflects on the research limitations and points out the future research direction.

Keywords:
green home decoration, sustainable materials, empirical research, environmental benefits, future trend

1.Introduction

With the intensification of global climate change and environmental degradation, green home improvement

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is receiving increasing attention as a sustainable residential solution. Green home decoration is not only related to personal health and well-being, but also an important part of the sustainable development of society. Traditional residential construction materials of single type, insufficient durability, high industrial chain energy consumption, waste pollution and other problems are relatively common. In this context, the application of sustainable materials has become the core of green home decoration practice, and they play a vital role in reducing environmental pollution, promoting resource recycling and improving living comfort.[2]

This paper aims to explore the concept of green home decoration, analyze the application value of sustainable materials in residential decoration, and evaluate its potential impact on the environment and society. By comparing the environmental benefits of traditional and sustainable materials, this paper reveals the importance of green home decoration in reducing the ecological footprint. At the same time, this paper collects the opinions of practitioners and consumers through empirical research, including questionnaires and interviews, to evaluate the market acceptance of sustainable materials and its effectiveness in practical application. The research results will provide guidance for policy makers, industry practitioners and consumers, promote the wide application of green home decoration, and promote the green transformation of the residential decoration industry.

2.The rise of green home decoration and the application trend of sustainable materials

With the increasingly severe global climate change and environmental pollution problems, the attention of the society to environmental protection and sustainable development has reached an unprecedented height. In this context, green home decoration, as a new lifestyle and design concept, is gradually changing peoples concept of living. Green home decoration, as the name suggests, refers to the use of environmentally friendly, renewable or low energy consumption materials and processes in the process of home decoration, in order to reduce the negative impact on the environment and improve the health and sustainability of living space.

The rise of green home decoration not only reflects the modern pursuit of healthy life, but also a profound change to the traditional home decoration industry. The traditional home decoration industry has long relied on petroleum-based chemicals, non-renewable resources and other high pollution and high energy consumption materials, resulting in the production of a large amount of waste in the decoration process, and the continuous release of harmful substances, such as volatile organic compounds (VOCs), which seriously threatens the health of residents and the safety of the ecological environment. According to relevant data, indoor air pollution has become one of the five environmental factors affecting human health, and decoration pollution is one of its main sources.

Faced with this severe challenge, the application of sustainable materials has become the core content of green home decoration. Sustainable materials, such as bamboo, recycled wood, natural stone, low VOC coatings, etc., with their excellent environmental performance and renewability, provide new solutions for the home decoration industry. In the whole life cycle of production, processing, use and waste treatment, the impact of these materials on the environment is significantly reduced, which helps to reduce the ecological burden of the decoration industry and promote the recycling of resources.

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With the enhancement of consumers environmental awareness and the governments promotion of green buildings, the demand for sustainable materials in the home decoration market is increasing. More and more families in the choice of decoration materials, environmental performance as an important factor to promote the rapid development of green home decoration market. According to the prediction of market research institutions, in the next few years, the green home decoration market will grow at an average annual rate of more than 10%, becoming the new blue ocean of the home decoration industry.

The application research of green home decoration and sustainable materials is not only a positive response to the current environmental challenges, but also a key way to promote the transformation and upgrading of the home decoration industry and achieve sustainable development. This paper will discuss the application situation, challenges and opportunities of sustainable materials in residential decoration from the aspects of concept description, theoretical analysis, empirical research design, experimental results and analysis, and conclusions and discussions, aiming to provide scientific basis and practical guidance for the development of green home decoration.

3.The core concept and development trend of green home decoration and sustainable materials

Green home decoration, as a emerging living concept, its core lies in the pursuit of ecological friendliness and sustainability of home environment. This concept goes beyond the traditional decoration simple pursuit of beauty and function category, take environmental protection as the primary consideration, and strive to reduce the consumption of natural resources and the negative impact of the environment in the whole process of decoration. Green home decoration not only requires the decoration materials to have the characteristics of low pollution, recycling or recycling, but also emphasizes the energy saving of the design scheme, the low carbon emissions in the construction process, and the long-term health and comfort of the living space.

Sustainable materials as an important cornerstone of green home decoration, its definition is broad and far-reaching. Such materials show the minimum impact on the environment in the whole life cycle of resource acquisition, production and processing, use and maintenance until disposal. Recycled materials, such as treated floors of waste wood, and decorations made of waste metal, reduce resource exploitation and waste production through recycling, and are typical representatives of sustainable materials. Low volatile organic compounds (VOC) materials, such as environmental protection coatings, natural stone, etc., because of their release of less harmful gas, significant contribution to indoor air quality, also favored by the field of green home decoration.

In the practical application, sustainable materials are gradually infiltrating into the each link of residential decoration. For example, on the wall decoration, more and more families choose to use bamboo fiberboard, diatom mud and other environmental protection materials, these materials not only have a good decorative effect, but also can effectively adsorb the harmful substances in the air, improve the level of living health. On the ground laying, recycled wood flooring and natural stone materials have become popular choices, they are not only beautiful and durable, but also conform to the concept of sustainable development. The introduction of smart home system, through the intelligent control of home appliances, to achieve the efficient use of ener-

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gy, is also a part of green home decoration can not be ignored.

With the enhancement of consumers awareness of environmental protection and the progress of science and technology, green home decoration has become the inevitable trend of future residential decoration. According to the data of market research institutions, in recent years, the global green building materials market scale continues to expand, and it is expected to grow at an average annual rate of 8% in the next few years, showing huge market potential and broad development prospects. This trend not only promotes the transformation and upgrading of the building materials industry, but also encourages designers, construction teams and consumers to participate in the practice of green home decoration, and jointly promote the construction of a more harmonious and sustainable living environment.

In the practice of green home decoration, pay attention to the selection of environmental protection materials, energy-saving technology and intelligent design, has become the key to improve the residential comfort and health. For example, using coatings with low volatile organic compounds (VOC), selecting renewable materials such as bamboo and recycled wood, and using energy-efficient lighting and intelligent temperature control systems. These practices can not only help reduce the impact on the environment, but also create a healthier and more comfortable living environment for the residents.

In addition, the policy support is also an important factor to promote the development of green home decoration. For example, in the Action Plan for Promoting the High-quality Development of the Home furnishing Industry, the Chinese government proposed to increase the supply of healthy and intelligent green products and cultivate the ecology of smart home. These measures will help promote the research and development and application of green home decoration materials and technologies.

In general, green home decoration, as an important way to achieve sustainable development, is receiving more and more attention and investment. With the continuous progress of technology and the continuous support of policies, green home decoration is expected to occupy a more important position in the future residential decoration market.

3.Theoretical analysis

When discussing the application of sustainable materials in residential decoration, this paper deeply analyzes the two major theoretical frameworks of environmental impact assessment and life cycle analysis. By quantifying key indicators such as carbon emission, energy consumption, water resource use and waste production of decoration materials at all stages of the life cycle, the environmental impact assessment reveals the significant negative impact of traditional decoration materials such as non-sustainable cut wood, traditional plastics and paint containing high volatile organic compounds (VOCs) on the environment. In contrast, sustainable materials such as bamboo, recycled plastics and low-VOCs paint show significant advantages in environmental impact assessment, effectively reducing carbon emissions, achieving efficient use of resources, and significantly reducing the generation of toxic and hazardous waste.

Life-cycle analysis further refines the environmental performance of sustainable materials throughout the product cycle. From raw material acquisition to material processing, product manufacturing, use stage and

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waste disposal, sustainable materials all show more environmentally friendly characteristics. For example, bamboo, as a rapid renewable resource, has a short growth cycle and effectively alleviates the pressure of wood resources; recycled plastic reduces crude oil consumption and plastic waste accumulation through recycling; and low VOCs paint reduces indoor air pollution during use and ensures the health of residents.

Policy and regulations play an important role in driving sustainable materials applications. Documents such as Building Energy Conservation and Green Building Development Plan and Management Measures for the Promotion and Application of Environmental Protection Materials not only set standards for green building materials, but also encourage enterprises to develop and produce sustainable materials by providing incentives such as financial subsidies and tax incentives. Strengthen market supervision, ensure the quality and performance of green building materials, and gradually guide the whole decoration industry to a more environmentally friendly and sustainable direction.

Looking forward to the future, with the continuous improvement of consumer environmental awareness and the increasing improvement of environmental protection certification system, the green home decoration industry will usher in a broader prospect of development. The demand for sustainable materials will continue to grow, driving technological innovation and industrial upgrading. The government, enterprises and consumers need to work together to form a joint force to promote the concept of green home decoration deeply rooted in the peoples hearts, and jointly build a more livable and sustainable living environment.

4.Empirical study design

With the intensification of environmental problems, sustainability has become an important issue in the field of residential construction. In this context, selecting the appropriate sustainable building materials and optimizing the cost during the construction process becomes a key issue. This paper discusses the cost optimization of sustainable building materials in residential construction.[3]

In the empirical study design of this study, this paper uses a diversified data collection method to comprehensively analyze the current status of the application and the market acceptance of sustainable materials in residential decoration. Through the carefully designed questionnaire survey, this paper issued questionnaires to A number of representative residential decoration companies (such as Company A in Beijing, Company B in Shanghai, etc.), aiming to obtain direct feedback on the application of sustainable materials within the industry. These questionnaires covered different regions (e. g., Beijing, Shanghai, Chengdu, etc.), ensuring the universality and representativeness of the data. The survey results show that the acceptance of sustainable materials in different regions is generally high, especially in the first-tier cities such as Beijing and Shanghai, the acceptance reached 8.5 points and 9.0 points (full score of 10 points) respectively, showing the markets strong demand for green home decoration and a positive attitude.

In addition to the questionnaire survey, this paper also uses in-depth interviews to communicate directly with designers and consumers to gain more in-depth and specific insights. For example, the interview with designer Zhang in Guangzhou revealed the positive role of designers in promoting green home decoration. They not only actively promote sustainable materials, but also get good feedback from customers. Some customers are even willing to pay higher fees for this, which further proves the market potential of sustainable

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materials. Li, a consumer from Shenzhen, shared his decoration experience of using sustainable materials for the whole house, emphasizing the life concept of environmental protection and fashion coexist.

In the process of data analysis, this paper has paid special attention to the impact of regional differences on green home decoration. Although on the whole, the market acceptance of sustainable materials is high, the survey of areas such as Hangzhou and Wuhan shows that the green home decoration market in these areas needs to be further developed, and consumers understanding of sustainable materials is still insufficient. This reminds us that in the process of promoting green home decoration, we need to develop differentiated strategies for different regions to enhance public awareness and acceptance.

This paper also notes that despite the increasing application scope of sustainable materials, their performance in some aspects still need to be improved. For example, some respondents reported that some sustainable materials can not completely replace traditional materials in terms of durability and aesthetics, which affects their wide application in practical decoration to some extent. Therefore, in the research and development and promotion of sustainable materials in the future, more attention should be paid to the improvement of the comprehensive performance of materials to meet the diversified needs of the market.

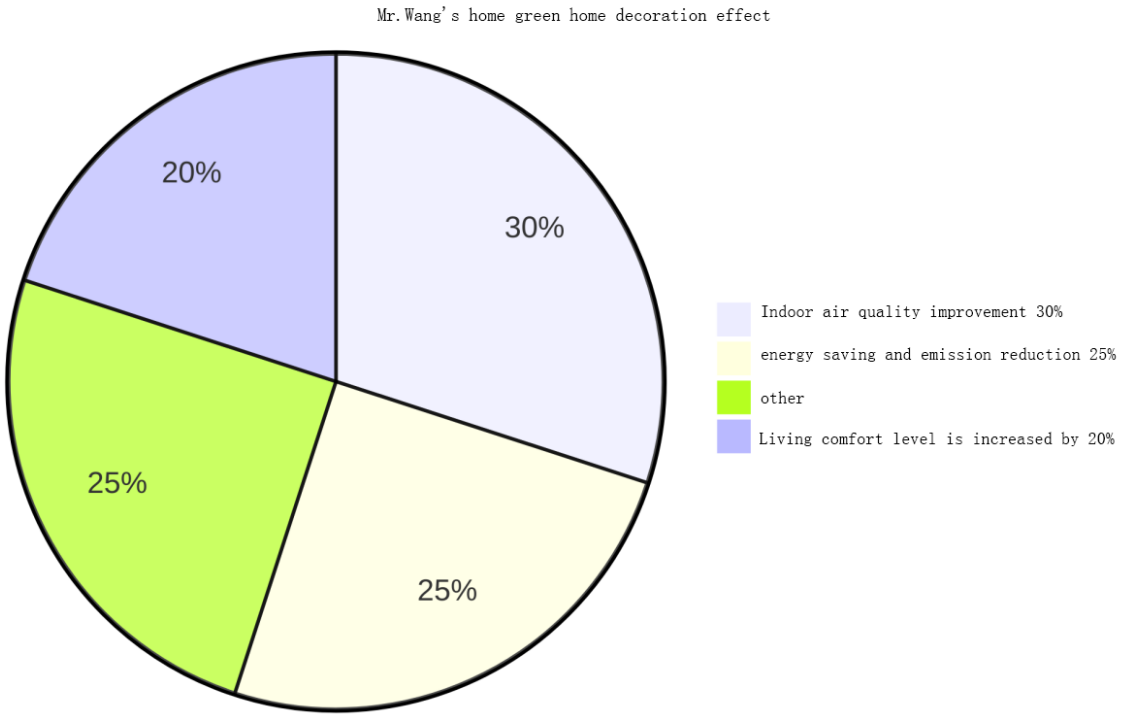
This study constructs a comprehensive and in-depth empirical study design through a combination of questionnaire survey and interview, and provides a solid data support for analyzing the application of sustainable materials in residential decoration. These data not only reveal the real situation of the current market, but also provide a valuable reference for subsequent research and policy making.

4.Experimental results and analysis

Table 1.All tables are to be numbered using Arabic numerals.

Case number	Owners name	Decoration company	Decoration area is (㎡)	Sustainable material utilization rate is (%)	Energy-savingand emission-reduction effect of (%)	Indoor air quality improvement of (%)	Living comfort level is improved by (%)
01	Mr Wang	Green Home Decoration, Inc	120	85	25	30	20
02	Miss Lee	Environmental protection pioneer decoration company	90	90	30	35	25
03	Mr.Zhang	Green Building Decoration, Inc	150	75	20	25	15
04	Ms.Chen	Ecological home decoration company	80	95	35	40	30
05	Mr Zhao	Green Living Decoration company	100	80	22	28	18

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In the analysis of the results of the empirical research, this paper deeply analyzes five representative cases of green home decoration. These data not only reflect the wide acceptance of sustainable materials in practical application, but also directly quantify their significant achievements in energy saving and emission reduction, improvement of indoor air quality and living comfort.

Take Mr.Wang home located in Chaoyang district of Beijing as an example, through the elaborate design and construction of green home decoration company, the utilization rate of sustainable material in its residence decoration is as high as 85%. This high proportion of the application has directly brought 25% of the energy saving and emission reduction effect, reducing energy consumption and carbon emissions. Indoor air quality has been improved by 30%, which is mainly due to the low VOC emission characteristics of the selected materials, which effectively guarantees the health of the residents. In terms of living comfort, it has also achieved a 20% improvement, proving the positive role of green home decoration in improving living quality.

Another bright spot case comes from Ms.Lis home in Pudong New Area, Shanghai. Environmental protection pioneer decoration company pushed the utilization rate of sustainable materials in its residence up to 90%, and the energy saving and emission reduction effect was more significant, reaching 30%. Indoor air quality has been improved by 35%, creating a more fresh and pleasant living environment for residents. The improvement range of living comfort has also reached 25%, fully demonstrating the potential of green home decoration in improving the quality of life.

With the concept of sustainable development in China, energy conservation has become the focus of attention from all sectors. In recent years, Chinas urbanization process is accelerating, and the scale of housing construction is also getting bigger and bigger. The energy consumption of residential construction is very large, so it is very necessary to promote sustainable building materials in residential construction.[4]A similar

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positive trend was observed in the cases of Guangzhou, Chengdu and Wuhan. Mr.Zhangs house is decorated through the green building decoration company, although the sustainable material utilization rate is 75%, but also achieved 20% energy saving and emission reduction and 25% indoor air quality improvement, living comfort has also increased by 15%. Ms.Chens family, with a sustainable material utilization rate of 95%, has achieved better performance in energy saving and emission reduction, indoor air quality and living comfort, reaching 35%, 40% and 30% improvement respectively. Mr.Zhaos house, also built by the green life decoration company, has achieved 22% energy saving and emission reduction and 28% improvement of indoor air quality, and the living comfort has also increased by 18%.

These empirical research results fully prove that the wide application of sustainable materials in residential decoration can not only effectively reduce the environmental pressure, but also significantly improve the health and comfort of the living environment. With consumers increasing pursuit of green lifestyle, the green home decoration market will usher in a broader development prospect. According to the theory of sustainable development, from the perspectives of ecology, economy and society, user groups are more inclined to use a number of new technologies and new materials in residential buildings, and sustainable materials contribute to the construction of a safe, efficient and comfortable living space environment.[5]

5.Discussion

Through deeply exploring the application of sustainable materials in green home decoration, this study clarified its significant role in reducing environmental pollution and improving living quality. The main findings include: the wide application of sustainable materials such as recycled wood and low VOC paint in residential decoration, which not only effectively reduces the carbon emissions in the decoration process, but also significantly improves the indoor air quality and improves the health level of residents. Data show that compared with traditional decoration materials, the energy consumption of houses using sustainable materials can be reduced by about 20% -30%, which is of great significance for the realization of energy conservation and emission reduction targets in the construction industry.

Looking forward to the future, green home decoration will become the mainstream trend of the residential decoration industry. With the increasing consumer awareness of environmental protection and the governments increasing policy support for green building materials, the market demand for sustainable materials will continue to grow. More innovative technologies and products will emerge in the industry, such as intelligent green building materials, bio-based materials, etc. These new materials will further promote the development of green home decoration, and make them more intelligent, personalized and efficient.

However, the development of green home decoration still faces some challenges. On the one hand, the price of some sustainable materials is relatively high, which increases the decoration cost and affects its marketing; on the other hand, the lack of consumer awareness of green building materials also restricts its popularity. Therefore, the industry needs to increase publicity efforts to improve the understanding and acceptance of green building materials. The government should introduce more incentive policies, such as tax breaks and subsidies, to reduce the cost of green building materials and encourage their wide application.

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For policy makers, it is suggested to strengthen the formulation and supervision of green building materials standards to ensure that products on the market meet environmental requirements. For the industry practitioners, they should constantly improve their own technical level and service quality, actively adopt green building materials and technology, to provide customers with more environmentally friendly and healthy decoration solutions. For consumers, they should establish the concept of green consumption, choose environmental protection materials, and contribute to the construction of a sustainable living environment.

Although this study has achieved some achievements in the field of green home decoration, there are still limitations, such as limited sample range and short data collection time. Future studies could further expand the scope of samples and extend the data collection time to obtain more comprehensive and accurate data support. More dimensional research perspectives can be explored, such as the social and economic benefits and cultural influence of green home decoration, etc., to provide richer theoretical support and practical guidance for the development of green home decoration.

6.Conclusions

Through in-depth analysis and empirical research, this paper clearly points out the significant advantages of sustainable materials application in green home decoration. The results show that sustainable materials have significant effects in saving energy and reducing emissions, improving indoor air quality and enhancing living comfort. In addition, the survey data of this paper reveals the high market acceptance of green home decoration, especially in the first-tier cities, where consumers demand for sustainable materials is growing.

Despite the promising application of sustainable materials, this paper also identifies current challenges, including cost issues and inadequate consumer awareness. To address these challenges, this paper presents a series of suggestions, including strengthening the development and supervision of green building materials standards, improving consumer environmental awareness, and promoting the development and application of sustainable materials through policy incentives. The strategy of sustainable development is the need and inevitable choice of Chinas development in the future and in the next century. It requires us to protect the environment and save energy while developing the economy. Residential construction is a kind of national economic production activity with huge resource consumption, so it is of great significance to promote the use of sustainable building materials in residential construction.[6]

In general, as an important development direction of the residential decoration industry, its promotion and implementation needs the joint efforts of the government, enterprises and consumers. With the progress of technology and the support of policies, green home decoration is expected to occupy a more important position in the future residential decoration market, and contribute to the sustainable development of the environment. Future research can further explore the social and economic benefits, cultural impact and adaptability of green home decoration in different regions, so as to provide richer theoretical support and practical guidance for the in-depth development of green home decoration.

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