

Research on "green" fashion design and development trend

Xiaorui Zhang

City University of Macau, Macau, China

Abstract: *In the process of the vigorous development of the global economy, the environmental problems faced by human beings are becoming increasingly severe. Green ideas such as "low-carbon", "green" and "environmental protection" have gradually entered people's vision and ears, and the protection of the earth environment has been paid more and more attention. With the increasing concept of environmental protection, the demand for sustainable development of all walks of life is also increasing. Industrial production should not only adapt to the lifestyle and fashion trend of today's society, but also conform to the new concept of low-carbon green environmental protection development. In this paper, the concept of "green design" as the concept of clothing design for the application of discussion, starting from the concept of "green", the concept of "green" clothing is briefly analyzed, and combined with the current international, domestic and international research on green clothing, clarified that green clothing design is in line with the current social development and ecological environmental protection requirements of the concept. This paper analyzes the development trend of green fashion design, points out the importance of "environmental protection" of clothing at present, and puts forward the requirement of sustainable development of society, which indicates that green fashion design based on nature will become the development direction of fashion design in the future.*

Keywords: *clothing design, green design, low-carbon and environmental protection, sustainable design, fabric*

1. Foreword

With global warming, ecological and environmental problems are becoming more and more serious, and clothing, as an essential item in People's Daily life, has an inseparable relationship with our life. Therefore, green clothing is gradually valued in the world, which also provides an opportunity for the development of the textile industry in various countries. Green textile and clothing not only reflects people's requirements for sustainable development, but also is an important part of the sustainable development of enterprises. China has fully launched an environmental protection clothing project, and "green" has become the focus of social attention.

2. Green design concept

Green design is a design concept for the purpose of protecting the ecological environment and sustainable development, and "green", as an important concept in clothing design, reflects people's pursuit of the quality of living environment. Green design should not only stay in the surface form, but should think deeply from three aspects: "people and nature", "people and lifestyle", and "people and clothing". Green clothing design can not only improve people's living quality level, but also is a kind of protection of human living environment. Therefore, it can be said that green clothing is to put forward new requirements for the ecological environment.

In recent years, the concept of "green" has been widely used in the fashion field, such as choosing more environmentally friendly and safe colors for fabric decoration, and making it a popular trend in the fashion industry, which is also the protection of ecological environment; improving and innovating the traditional process, adding simplicity and human body curve.

2.1 Man and nature

Clothing is the closest partner of human beings. With the continuous development of The Times,

people pay more and more attention to its comfort and wearable ability when wearing clothes. Therefore, when designing clothing, we should be people-oriented, respect the characteristics of human body structure and the natural change law of human body physiological function and human personality and needs, and try to achieve the appropriate proportion of all parts of the human body, natural stretch and harmony of the body curve. In making clothes, we should give full consideration to the shape, proportion and structure of all parts of the human body, and give full play to the advantages of the human body to the extreme so as to obtain better wearing effect. For example, in the design of cutting process should consider different parts of the different cloth and lead to different parts of the wearing effect, which can not only reduce waste, but also make the clothing more beautiful and practical. For example, "comfortable fit" is the most basic requirement for green clothing, but also the key link to reflect the concept of green design[1].

Green fashion designers should strive to make the design works harmonious with nature, so as to meet the needs of all walks of life and reflect the humanistic care. For example, green fashion designers should fully consider the contradiction between people and things: that is, there is a complex and delicate connection between clothing and the human body, and to avoid overemphasizing the contradiction between people and things and the contradiction between human and nature. Such as "nature" and "environmental protection" are one of the eternal themes of people. Therefore, in the design process, designers should fully consider the relationship between people and things; use resources; reduce pollution and reduce waste.

As a fashion designer, we should set up the scientific concept of development, the sustainable development concept, the sustainable development strategic thought, the ecological civilization thought and the environmental protection thought as the guiding ideology. Human beings are also natural creatures. Human beings live in nature, and constantly evolve and mature in the process of environmental destruction. The concept of green environmental protection should establish correct values and aesthetic values, consciousness and norms of behavior in the minds of designers. The design must take into account the relationship between the natural environment and the various parts of the human body and the harmony with the nature.

2.2 People and Lifestyle

People and lifestyle refer to the way of human adaptation to the objective world and the adaptability of human beings as an individual to the environment. People and lifestyles are different characteristics in all aspects of life. For example, human beings in clothing, food, housing, transportation and other aspects of the behavior, are based on a certain living environment. Human beings from a simple animal living in the forest and fields to now can use tools and transportation to complete the daily life, indicating that human beings began to escape from the original state, from passive adaptation to the environment to active adaptation to the environment. The human dependence on the natural environment is a dependence on all the life forms of nature, which includes not only the dependence on the interdependence between the organisms and the natural environment in the natural system and ecosystem, but also includes the dependence on solving the problems needed for social development. Therefore, the human society must establish a material security system based on the ecological environment, and form a virtuous cycle and sustainable development through the interdependent relationship with the natural system. In the survival and development, human beings cannot do without clothing, food and living lifestyle, in clothing, food and clothing also need to have the corresponding environmental quality requirements, clothing takes the body as the carrier to reflect the beauty of human body form. People divide nature into two parts: man itself and nature, so clothing is divided into two aspects: man's own needs and man's needs.

Food and food energy come from food and water, and the space of clothes determines the shape curve of human body, and clothes have influence on skin and breathing. The comfort of the body when wearing clothes is also determined by the material and the body. Human society from survival to development are inseparable from clothing and food, and clothing is indispensable in people's life. When wearing clothes, environmental problems make them unable to breathe, and they should consider whether it will affect their health. Therefore, people begin to look for a more comfortable clothing materials and design methods that can meet the needs of daily life.

As the problems of human society are becoming more and more serious, these problems should be considered in clothing design. For example, due to the shortage of resources, environmental pollution and other factors, the earth's resources are constantly reduced or exhausted; the earth has lost the last piece of pure land; the earth is overwhelmed by the increasing population and so on. Clothing is not

only the medium of material exchange and energy exchange between human body and nature, but also one of the important tools for the harmonious development of man and nature.

2.3 People and clothing

Clothing as the first major consumer goods of human beings, people's life has a close relationship with it. The green design of clothing should take the human body as the starting point, and take the people's wearing experience in work as the design idea and inspiration, so as to achieve that people can better maintain health and comfort when wearing clothes. In the theory of human aesthetics, human beings is a perceptual animal with visual effect and tactile effect, but also a rational animal with emotional color and thinking characteristics. Therefore, it is very necessary to study the green design concept from the aspects of human body aesthetics and the relationship between human and environment. Human aesthetic relationship between people and clothing is close, clothing as a special commodity, it must meet people's needs for beauty and comfort and functionality, and the human body has its own beauty and defects, so to make the perfect combination of clothing modeling and function, we must understand the relationship between "people and clothing".

People wear in the pursuit of beautiful and generous, comfortable and natural also to a certain extent to meet the needs of fashion, trend and personality, but in real life can not completely follow this point, thus affecting the quality of people's life. For example, the brand "Domus" women's clothing series designed by Chinese famous designer Chen Yujian is a good interpretation of the relationship between "people and clothing". This concept of design based on the relationship between "people and clothing" not only makes it more sustainable and innovative in the design, but also makes it meet the market demand.

Green clothing design needs to start from the relationship between "people and clothing", but at the same time, it must meet the two factors of comfort and sustainable development required by human body aesthetics.

3. The concept of green clothing design

The green design concept in clothing design mainly means that the clothing designer should first consider the environmental impact of garment production. The whole life cycle of clothing should meet the requirements of green environmental protection, minimize the harm to the natural environment, improve the utilization rate of garment materials and materials; and adhere to the people-oriented to meet people's demand for clothing comfort, safety and health[2]. The design concept of green clothing mainly includes the following three aspects: first, from the perspective of the raw materials of clothing, using renewable materials or using biological fermentation and processing. Second, from the perspective of clothing style, fashion-based, based on the principle of ergonomics, clothing environmental protection as the starting point of the design concept. Third, from the clothing in the production process do not add any chemical components, and do not use chemical agents harmful to human body. In addition, according to the International Green Development Organization (UPC), some specific regulations and requirements: prohibit the use of chemical fiber raw materials and products that pollute the environment; prohibit the production of textile products that affect the environment.

4. Research status of green clothing design at home and abroad

Foreign green clothing design started earlier and developed relatively mature. Such as the "organic cotton" clothing of the United States, the Japanese "sustainable fabric" and "ecological textiles".

From 2000 to 2004, relevant researchers carried out a lot of exploration and practice on the development and industrialization of green women's wear fabric technology, and made a great breakthrough. At present, many scholars have carried out the relevant work on the development of "organic cotton" clothing and other fabric products and have achieved good results. Organic cotton is a kind of cellulose material with high hygroscopicity and high heat absorption capacity extracted from corn, sugarcane and other plants, which has natural non-woven cloth characteristics. The "organic cotton" clothing produced with this product as the main raw material has the advantages of not polluting the environment, good air permeability, comfortable wearing, not easy to deformation and so on, which is deeply loved by consumers.

At present, the domestic "sustainable development fabric" and "ecological textile" related

technology research has also made some achievements, such as the use of plant fiber, animal fiber and other natural materials as raw materials for environmental protection clothing fabrics and clothing products to improve the performance of antibacterial, odor prevention, moisture absorption and sweat removal. In China, there are a lot of research results in the design, development and development of green fiber and textiles, such as the use of natural plant fiber, cotton fabric and other raw materials to design and produce natural green environmental protection fashion clothing products. Domestic scholars also actively combine the ecological textile with the concept of sustainable development to form the design method of environmental protection concept with Chinese characteristics. China is also constantly promoting garment enterprises to increase the development of green textile products technology. For example, in 2008, the launch ceremony of the key laboratory of the national Science and technology Major special project project "Sustainable Development Textile and Ecological Textile key Technology Research and Demonstration" was held in Beijing.

In the same year, China Textile Industry Association organized and implemented the compilation of "Green Chemical Fiber Textile Products Standard". This national standard will fill a gap in China's chemical fiber industry and lay a foundation for the future research and application of green chemical fiber products.

In addition, the Environmental Protection Law of the People's Republic of China implemented on January 1, 2011 stipulates that "the production, sale and use of various chemical synthetic detergents (including detergents and soaps) that do not meet the national pollutant emission standards", "the production and sale of products which do not meet the national requirements for the quality of textile fibers and fabric products or contain the national prohibition and other relevant laws and regulations. These laws and regulations have greatly promoted the development pace of green clothing products in China. At the same time, relevant policies and regulations will help to promote the rapid development and upgrading of China's green textile industry, accelerate the realization of energy conservation, emission reduction and sustainable development goals, promote the transformation and upgrading of China to a low-carbon economy, and promote the high-quality economic and social development.

As the garment industry continues to move in the direction of green environmental protection, green clothing design is also constantly exploring and innovating, such as using environmentally friendly materials for fabric and clothing modeling design and functional processing; using renewable new materials or natural new materials; using green printing and dyeing technology for natural fabrics and textile fabrics.

5. Selection of green clothing materials

Green material is an environmentally friendly material, and its main raw materials can come from natural fiber, natural rubber, wood and animal protein. Natural fiber is a kind of recyclable renewable resources, from the natural growth or cultivated animals and plants, can be used as textile raw materials fiber, with good biodegradable, reduce the impact on human living environment[3].

Clothing designers must pay attention to the environmental performance and degradability of the selected materials when choosing materials. The following principles should be observed: ① Natural raw materials, such as cotton and silk as accessories, to reduce the environmental pollution of synthetic chemical fiber products; ② Ecological safety principle uses natural plants as raw materials, linen is often used as textile raw materials in clothing design, and natural plants, such as cotton, soybean fiber, silk and bamboo, can also be used as the source of degradable materials in textiles; ③ Recycling principle uses recycled textiles to make garment products have the recycling function.

5.1 Clothing fabric

[Textile raw materials] Fabrics contain a lot of harmful substances, such as formaldehyde, organophosphorus pesticides and polychlorinated biphenyl.

[Fiber raw materials] Chemical fiber can have an allergic effect on the human skin, so designers often choose natural fiber as the raw material, and reduce the use of synthetic fiber.

[Fabric] adopts biodegradable and recycled fabrics to improve their renewability; degradable fabrics are mainly composed of plant fiber, straw, fruit shell, etc. They are a natural source and can degrade themselves in natural environment; recycled fabrics are mainly processed from waste fabrics.

[Textile and Garment Fabrics] Garment products made from textiles and materials are harmless or cause little harm to human body.

[Clothing accessories] Fabrics made of natural materials can make clothing more comfortable and natural, such as cotton and linen, and artificial materials are often used to make printing patterns of various shapes and patterns, but many people think that printing products are harmful to human body.

[Other excipients] In addition to natural materials, avoid the release of formaldehyde, such as elastic fiber fabrics commonly used in synthetic fiber products are the two most commonly used; plant protein products such as soy protein and milk protein; and some artificial fabrics are often used as decorative fabrics.

5.2 Clothing and accessories

The selection of clothing accessories should follow the following principles: ① choose non-toxic and harmless raw materials; ② avoid the residue and contamination of harmful chemicals; ③ reduce the use of natural fiber and rubber products; ④ choose natural biological materials to achieve sustainable development.

For example, in the environmental protection selection of fabrics, 100% pure natural green recycled fabrics can be selected, this recycled fiber raw material for primary fiber or other plant fiber extract. In terms of color, try to avoid harmful to human body and cause skin allergic reactions. In addition, the following principles shall be observed in the design process: ① Select plant ingredients that can be reused after natural or biodegradation, such as linen clothing materials made from flax or cotton; ② use plant ingredients that can be recycled after natural or biodegradation; ③ make the textiles into various animal patterns, printed patterns or prints and processed by ultraviolet irradiation.

6. The modeling design of green clothing design

Green clothing styling design includes the colors and patterns of the clothing. Color is the basis of clothing style, and the pattern is an indispensable part of clothing modeling. First of all, in terms of color, the color of green clothing is mostly low color and medium color color, this kind of color will not cause pollution to the environment, is the most basic color in environmental protection design. In terms of patterns, green clothing generally stains with plants or natural dyes. In the pattern, the green clothing usually adopts a low-saturation color system. When a certain element dominates the position, the dark color system is generally used as the ornament, which mainly include: geometric shape patterns, abstract graphics, irregular shapes, etc. Last and foremost, choose natural dye, unavoidable in plants, and sustainable in color and style.

In recent years, China's textile industry enhance environmental awareness, attaches great importance to the harmful substances in the textile harm to the environment and pollution problems, trying to reduce the textile industry to the atmospheric environment and Marine ecological damage of technical means and way, and through the policy guidance, financial support, market development measures to guide the green development of the textile industry in our country. It expresses the pursuit of beauty and attention to environmental protection. It features bright colors and friendly fabrics and green performance and strong artistic, contemporary and decorative features.

7. The development trend of green clothing design

In today's increasing awareness of environmental protection, green clothing design has not only stayed on the surface, but needs to go deep into the people's mind, so we must strengthen the functionality of the product itself. At present, most of the designs on the market are designed by-oriented, but if all the functions needed by the human body are not well taken into account, it will lead to problems such as "wearing more than one dress" in the market. With the continuous progress of science and technology, there are more and more green clothes with scientific and technological content, novel and unique design, and unique style in the market. These clothes have good functionality and comfort, and can better meet consumers' requirements for their quality of life and emotional expression. At present, with the continuous development of science and technology, many new technologies have been applied to green clothing design. For example, new materials such as nanotechnology and high-tech and environmentally friendly fibers can effectively reduce the weight and thickness of clothes,

but also make the fabric more wear-resistant and washing-resistant. In today's clothing market, environmentally friendly materials and design have become a trend, and has been widely recognized by consumers. In the future clothing production, people will pay more attention to the application of environmental protection technology.

8. Conclusion

With the increasing awareness of the world environmental protection, people pay more and more attention to the harm of clothing to the human body. Green clothing refers to the full consideration of its impact on the human body in the design. On the premise of ensuring the basic function of the human body, it can reduce the consumption of resources as far as possible and reduce the pollution to the environment.

Green clothing design is a new and healthy ecological way of life, which advocates a simple, natural, healthy and comfortable living environment, the rational use of energy and renewable energy and the pollution reduction, and the protection of natural phenomena and cultural history. Green clothing is a fashion and represents an idea. In today's increasingly fierce market competition, the development of green clothing not only provides convenience for our life, but also promotes people to better protect the environment. However, with the continuous development of the green clothing market, we should continue to innovate and actively enterprising. Through the study of green clothing design, this paper hopes to promote the rapid development of Chinese textile industry.

References

- [1] Dong Lingyan. *Discussion on green clothing design in the ecological Era [J]. Chemical fiber and Textile Technology*, 2020, 49 (09): 72-73.
- [2] Wei Peiyu. *Discussion the application of green design in clothing design [J]. Footwear process and design*, 2021 (09): 11-12 + 18.
- [3] Huang Yuwei. *Application of green fiber materials in garment design [J]. Chinese and foreign entrepreneurs*, 2019 (23): 171-172.