

Research on Promoting Sustainable Development of Textile and Garment Industry from the Perspective of Design

Qingfeng Ma

Zhengzhou University of Light Industry, Zhengzhou 450000, China.

1105355219@qq.com

Abstract

Clothing is an indispensable product for people's daily life. With the rapid development of social economy, people's demand for clothing is no longer limited to wearing warm clothes. Fashionability has become an important factor in clothing selection. As a result, clothing is produced and consumed rapidly, and then abandoned. However, in the garment production process, it will cause serious environmental pollution, and the contradiction between textile and garment industry and the environment is becoming increasingly prominent. Design is an important commercial means to stimulate consumption and increase product production for a long time. Design provides consumers with more new choices and makes old products abandoned quickly. This phenomenon is particularly prominent in the textile and apparel industry. Fast fashion and other clothing brands are rapidly introducing new clothes to stimulate consumers' desire for consumption, resulting in a large amount of waste of clothing. In the contradiction between clothing and environment, people realize the importance of sustainable development, and consumption concept is changing quietly. The purpose of this study is to reduce the waste and pollution of textile and garment industry and improve the utilization rate of textiles by using fashion design techniques. Starting from the existing methods of garment sustainable development, the operability of the main implementation methods is analyzed with examples, and suggestions are put forward. From the design point of view to solve the existing problems, comprehensive environment, corporate interests, consumers, designers and other factors, put forward the design method of clothing parts replaceable design, in order to reduce the damage of textile and garment industry to the environment from the design point of view.

Keywords

Environmental Pollution, Textile and Garment Industry, Sustainable Design Method.

1. Introduction

Since the 21st century, with the rapid development of modern social economy, industrialization and urbanization have accelerated the development process, people's living standards and quality of life continue to improve, and the consumption of clothing has been increasing along with this trend, which also leads to the increasing number of waste clothing. All kinds of fashion clothing brands are competing to introduce fashion clothes with many new styles. Most of the fast fashion clothes will be discarded of soon after they are sold. Every year, more than 150 billion clothes are discarded around the world, enough for everyone to change 20 clothes a year.

The garment industry also poses a great threat when it provides people with various styles of cloths. The environmental pollution problem in the life cycle of garments is becoming increasingly prominent. The textile and garment industry is the second largest serious pollution industry on the earth after the oil industry. Each kilogram of cotton thread needs to consume 20,000 liters of water, while 1 kilogram of cotton can only make one ordinary T-shirt and one simple pair of jeans. Textile industry (including cotton planting) consume about 93 billion cubic meters of water every year, which causes water shortage in some areas. In addition, 20% of the world's industrial water pollution is caused by dyeing and treatment of textiles. The garment textile industry produces 1.2 billion tons of

waste gas pollution every year, and it is still increasing every year. According to the objective forecast of the United Nations, if the population of the earth increases to 8.5 billion by 2030, the consumption of clothing will surge to 160 million tons. These data show the huge labor input, energy, resource consumption and environmental pollution emissions in the garment industry chain.

Due to the lack of environmental awareness, excessive pursuit of profits, wrong consumption concept and other reasons, people's awareness of sustainable environmental protection in the production and consumption of textile and garment industry is very weak. With the dramatic increase in the number of garments and the increasing environmental burden, it is urgent to study the sustainable development of garments.

2. Current Situation of Sustainable Clothing Design

Aware of the serious "unfriendliness" of the textile and apparel industry to the environment, people's consumption concepts are also changing quietly, and the concept of thrifty life has gradually become the consensus of the public. People need a higher level of experience in consumer life. They are no longer satisfied with simple material life. They begin to consider the coexistence of human and environment. They gradually recognize and practice the concept of sustainable development in Fashion. Fashion designers and garment enterprises also recognize the importance of sustainable development and begin to form environmental awareness.

2.1 Multi-dress¹ to Reduce Waste

Osman Yousefzada's "Great Depression Dress" and Donna Karen's "Infinite Dress" are constantly bringing forth new ideas in a multi-dress scheme. Osman Yousefzada has launched a two-ways of wearing clothing he designed. The first way is to obliquely cross the scapula with a hanging structure; the other is to cover the lower abdomen. Osman Yousefzada has successively designed three kinds of clothes and more kinds of clothes. Variable clothing has become a design method to meet the needs of consumers in pursuit of new styles. Donna Karan also unveiled her "multi-dress" style—"unlimited dress," he claiming millions of different ways of wearing it. Another type of sweater can be worn as a sweater, as well as a pullover or scarf. This kind of multi-dress design to a certain extent meets the consumer's pursuit of new styles. A variety of wearing effects can be achieved when the overall clothing is unchanged, this can satisfy the consumer's psychology and reduce the waste of the textile and garment industry to a certain extent.

2.2 Recycling of Used Textiles

Sustainable design has become an irreversible trend in the textile and garment industry. Low carbon and environmental protection are the vane of textile and garment enterprises. At the present, the phenomenon of textile and garment waste has also been paid attention to, and recycling of used textiles has become a solution to this problem. The textile recycling program is gradually developing, and the recycled clothes will be handled in a variety of ways. Clothes of less polluted or damaged quality will be re-cleaned and donated to charities or poor areas for reuse after wearability is guaranteed. Textiles that are no longer suitable for wear will be reprocessed into other products, such as building materials, cleaning appliances, etc. Textiles that cannot be reused can also be processed to obtain their fibers for use in other products that require the fiber. Even the stringently processed fibers can be re-textured and processed into new textiles. Through these methods, waste textiles can be regenerated to the maximum extent.

2.3 Fashion Companies Pay Attention to Sustainable Development

H&M is the first fashion company to use Denimite fabric. Denimite fabric is a composite denim fabric made from recycled denim fabric, chopped, and mixed with organic resin. H&M also expects to use sustainable design and recyclable fabrics in all of its products in 2030 to achieve a perfect combination of fashion and sustainable development.

¹ "Multi-dress" means that there are many ways to wear a dress.

ZARA has also launched JOIN LIFE Series in recent years. On the basis of sustainable development and green design, this series of garments are made of Tencel, regenerated wool, organic cotton and so on. The cellulose of Tencel is pure plant fiber, and the raw material is purified refined wood pulp. The raw material of the wood pulp is the forest approved by the Forest Standards Committee. The cellulose of Tencel is easier to decompose naturally than other fibers. Compared with the traditional cotton planting, the water consumption of Tencel in the process of planting and growth will be reduced by 90%, and the planting of Tencel will greatly reduce the burden of the environment.

Fashion industry is developing towards sustainable design. Fashion designers are gradually aware of their responsibilities. More enterprises begin to pay attention to their ability to be reused from the selection of raw materials. The focus of today's society is turning to green economy. Textile and garment industry is also turning to green economy. The concept of sustainable development is gradually evolving from fragmentary plan to a complete action system. The fashion design industry is also imperative.

3. Sustainable Fashion Design Method and Operability Analysis

Traditional textile and garment industry has caused serious pollution to the environment. As a fashion designer, we should do our best to reduce the environmental pollution and resource waste caused by the garment industry from the perspective of design. Under the conflict between people's demand for personalized and diversified clothing and environmental pollution and waste of resources, it is the important social responsibility of fashion designers to seek a sustainable fashion design way and lifestyle, and guide consumers to practice sustainable consumption through design. It is the responsibility of fashion designers to solve the "environment unfriendly" development caused by the garment industry through design. Fashion design methods need to be constantly innovated to better meet sustainability requirements. The following is a summary and hypothesis of sustainable garment design methods.

3.1 Multi-dress

Multi-dress means that a piece of clothing is converted into other styles by one or more ways, such as "Infinite Dress", "Great Depression Dress" mentioned above. After investigation and practice, multi-dress can only meet the simple change of basic style, can not achieve the essential style change, and limited by the transformation method, temporarily unable to meet the needs of consumers for many complex styles at this stage. Multi-dress can reduce garment waste on a small scale, but the strength of ready-made clothes is insufficient to achieve a particularly rich series of design results, which is not in line with the current market rules.

3.2 Structural Design

Is it possible to use the garment's own structure design to minimize the use of fabrics? Is it possible to change a certain structure of clothing and increase the fabric interest rate? Is it possible to increase the interest rate of fabrics by combining structural design with typesetting? After design and testing, under a specific style, structural design can achieve "zero waste" of fabrics, but it can not form a variety of styles, and can not reduce the waste of clothing. At present, the feasibility of using structural design to achieve sustainable design is weak.

3.3 Retrofit of Old Clothes

People have gradually realized the phenomenon of waste and environmental pollution in the garment industry, and their awareness of environmental protection has gradually increased, resulting in a lot of old clothing retrofit techniques or projects in society. The retrofit of old clothes requires professional designers to achieve wearable ready-to-wear effect according to specific styles through special design. It takes a long time, can't be achieved standardized design, unable to achieve rapid industrialization, and can't satisfy consumers' pursuit of more styles.

3.4 Multifunction

Multifunctional clothing can solve a certain of demand for clothing to a certain extent, and can reduce waste and pollution in some specific links. For example, multi-functional outdoor clothes can reduce the production of a small amount of blindfolds by increasing the part of the blindfold, and increase the design of multiple pockets can reduce the utilization and production of bags to a certain extent. Multifunctional design can reduce waste in some areas and parts of fashion design, but it is not universal.

3.5 Replaceable Part

The clothing parts replaceable design can make the clothing similar to the principle of machine replacement parts by invisible zippers, buttons or other connecting ways, and change one part of the clothing to achieve the change of the whole fashion style. While retaining part of the clothing structure, the change of style, fabric and color can be achieved, and the utilization rate of clothing can be improved. It has the characteristics of universality, richness and simplicity. It can not only meet the needs of consumers for the latest styles, but also reduce the use of fabrics as much as possible through this way, thus reducing pollution and waste.

In summary, multi-dress, structural design, retrofit of old clothes and multi-functional clothing can reduce waste and pollution to a certain extent or in a certain specific environment, it can not have the possibility of extensive and standardized production because of its limitations. The clothing part replaceable design is relatively popular and universal, and industrial production is easy to implement. It can make garment parts replaced parts like machines.

4. Feasibility and Value of Clothing Part Replaceable Design

4.1 Environment: Sustainable Design to Minimize Waste

The purpose of clothing part replaceable design is to change the garment elements such as style, fabric and color on the basis style by using the characteristics of immutability (keep basic style, key structure cannot be changed) and flexibility (non-critical parts can be designed according to requirements). The possible method of prototype, draping, basic pattern, dart and innovative structure, etc. Thereby reduce the waste of the garment industry and improve the utilization rate of garment. This design can minimize the waste of textiles and achieve sustainable garment design while satisfying people's pursuit of various styles.

4.2 Consumers: to A Certain Extent, to Meet the Diversified Needs of Consumers

With the diversified development of garment environment, consumers have put forward new requirements for the function, culture, aesthetics and personality of garments. The concept of experiential consumption of "designer—ready-to-wear—consumer—redesign" is embodied in clothing part replaceable design, which also reflects the correlation between the diversification of garment demand and fashion designer's choice of career direction. The wearing style of clothing part replaceable design can also reflect the visual effect of "multi-style clothes". It has the form characteristics of a sense of change. It can not only reflect the designer's subjective design concept, but also enable the wearer to express his subjective creativity to a certain extent. The subjective consciousness of designers and consumers is conveyed and exchanged through clothing, which changes the traditional fashion design route with designers as the main part, and emphasizes the guiding role of consumers in the fashion design process. Clothing part replaceable design can deeply explore all the basic and advanced needs of customers, and then give a certain degree of satisfaction, in order to stimulate consumer's desire to buy.

4.3 Enterprises: Improving the Competitiveness of Products Effectively

Clothing part replaceable design creates a brand-new pattern of apparel experience consumption economy, which can effectively increase the market share of enterprises. In the traditional mode, fast-selling clothing brands ZARA and H&M rapidly launch a large number of cheap and up-to-date fashions at the expense of environmental resources and cost to stimulate customer's desire for fashion.

According to the survey, no more than 18% of the clothing categories in ZARA stores do not meet the needs of consumers, so we can see that diversified styles can greatly increase the share of enterprises in the clothing market.

In the replaceable design of the clothing part, the diversification of the style of a part can directly produce diversified whole style changes, which are not limited to simple part changes, but in all-round changes of style, fabric and color. Diversified categories increase the probability of matching customer's styles and preferences, thus expanding the scope of potential consumers, bringing customers a sense of freshness and satisfaction, while increasing the profits of enterprises.

In addition to the basic wearing function of clothing, clothing part replaceable design also has the replacement function that traditional clothing design does not have, such as: customer participation in the design, increasing the added value of clothing, giving consumers different shopping experience from traditional ones, so as to reduce consumer's attention to the price, raise the price slightly, and effects on changes in market demand are also negligible. Novel design points and design methods can often attract consumers, and clothing part replaceable design provides a variety of secondary design methods, creating a new fashion experience consumption, but also can give consumers a deeper impression, improve consumer satisfaction, while the customer's recognition of the enterprise brand continues to increase.

4.4 Designers: Broaden the Space of Designers in the Design Process

Clothing part replaceable design has two meanings: one is that the designer's design concept is embodied in the traditional design concept in clothing works; the other is that the wearer's design idea is embodied in the concept of secondary design in clothing works. Designers only need to redesigned on the basis of the basic style in the design, so that a certain part of the design has greater design space. At the same time, designers also need to consider the needs of consumer's collocation and part replacement, not only in the design of style, but also in the design of different basic styles, structures, part, fabrics and colors.

5. Conclusion

Textile and garment industry has caused tremendous damage to the environment, and garment practitioners began to think about environmental behavior. Although the garment industry recognizes the pollution caused by itself, it has not been able to take effective action to restrain it. The public and some designers are also solving this problem to a certain extent, such as recycling, multi-dress, structural design, retrofit of old clothes and multi-functional clothing and so on. Such methods are still palliative and cannot be promoted on a large scale. Statistics show that only 13% of textile raw materials can be recycled in some form.

The clothing part replaceable design proposed in this paper can change the whole style by replacing a certain part of the garment, which has the characteristics of universality, richness and simplicity. This design method achieves a balance in four aspects: environment, consumers, enterprises and designers. It can not only satisfy consumer's demand for fresh styles, engage consumers and designers in fashion design together, thus enhancing the efficiency of enterprises, but also reduce the use of fabrics and waste as much as possible through this way, so as to reduce pollution, balance the interests of all parties, and achieving sustainable development of textile and garment industry.

References

- [1] Banks, Libby: How to Tell the Fashion Future?, New York Times, August 26, 2013.
- [2] Esben Rahbek Gjerdrum Pedersen, Wencke Gwozdz, Kerli Kant Hvass: Exploring the Relationship Between Business Model Innovation, Corporate Sustainability, and Organisational Values within the Fashion Industry, Journal of Business Ethics, Vol.149(2018) No.2, p.267–284.
- [3] Information on <http://www.indiaretailing.com/2017/04/04/fashion/fast-fashion-new-favourite-shoppers-retailers-malls/>.
- [4] shoppers-retailers-malls/.

-
- [5] Laili Wang: *Research and demonstration of carbon footprint and water footprint of textiles and clothing* (Ph.D., Donghua University, China 2013),p.21.
- [6] Payne, Alice: *Inspiration sources for Australian fast fashion design: tapping into consumer desire*”, (MS., Queensland University of Technology, Australia 2016),p.12.
- [7] Rudrajeet Pal, Jonathan Gander: Modelling environmental value: An examination of sustainable business models within the fashion industry, *Journal of Cleaner Production*, Vol.184(2018), No.5, p.251-263.
- [8] Veronica Gabrielli; Ilaria Baghi; Vanni Codeluppi: Consumption practices of fast fashion products: a consumer-based approach”, *Journal of Fashion Marketing & Management*, Vol.17(2013), No.2,p.206-224.
- [9] Yi Li: *Decoupling Water Consumption and Environmental Impact on China's Textile Industrial Economic Growth*, (Ph.D., Zhejiang Sci-Tech University, China 2018),p.17.