

Recycling and Reuse in the Chinese Textile Industry

Xinyu Du

Introduction

With the development of fashion and productivity, people are increasingly seeking ever-changing fashions and new trends. At the same time, to meet this demand, more and more textiles are being produced in the world every year. The result of this is that, according to the British newspaper *The Guardian*, the apparel and textile industry is currently the most polluting industry after the oil industry. But it has been estimated ^[16] that only 12 percent of the apparel materials worldwide are eventually recycled, which means that most textiles end up discarded. This shows that there is a great need for research on the sustainability of the textile industry. This issue is also closely related to the United Nations' Sustainable Development Goal (SDG) 12 - Ensuring sustainable consumption and production patterns, as sustainable recycling patterns in the textile industry can lead to more efficient use of existing raw materials and save further energy consumption. How to build circularity in the textiles is also an important part of the value chain of The OnePlanet Initiative.

China, as a major consumer of textiles, plays a very important role in this process. In addition, the fact that less than 1% of the clothes discarded each year ^[17] in China are currently reused or recycled also suggests the need for research on this issue.

This paper analyzes the final stage of the textile industry recycling and reuse in the fashion industry. In the context of the existing textile recycling and reuse situation in China and with reference to similar textile sustainability tools in other countries, this paper aims to shed some light on the existing textile recycling and reuse phase in China. Starting from the initiatives of apparel companies and the change of attitude of consumers. Bringing textiles back to life and recycling and reuse again to help build sustainability in the textile industry.

Background (Existing Problems)

I. Analysis of the current situation

1. Existing situation of the textile industry

Driven by the trend of fast fashion, the consumption of clothing has increased dramatically, and with it, the amount of waste clothing has also risen dramatically. According to the survey, it is known that the loss caused by consumers throwing away clothes that can continue to be worn amounts to about \$460 billion per year ^[1]. But with this trend, the increasing demand for fast fashion grows further, as well as the increased productivity, the waste caused each year will also increase. This creates an urgent need for new business models to achieve a sustainable textile value chain. Furthermore, not only the carbon footprint of the textile industry cannot be ignored, but the sustainability of the textile industry also has an impact on other SDGs, where energy savings in the textile value chain can be used more where needed, and where

reducing energy consumption will mitigate climate change and other impacts. For example, SDG7 - Ensure access to affordable, reliable, sustainable and modern energy for all and SDG13 - Take urgent action to combat climate change and its impacts.

2. Benefits of recycling and reuse in the textile industry

There is a lot of existing research on sustainability in textile production processes. Examples include how to make better use of water resources for irrigation, or how to reduce the energy consumed in the dyeing process. However, more research is needed on how to reuse textiles in the final process. If we can maximize the use of these textiles in the final process, then there is no doubt that the sustainability of the textile industry will be greatly improved.

There are also many ways of final disposal. For example, the textiles can be incinerated directly, the clothing can be sold twice, or the recycled material can be designed and made into new products. In these ways, reuse is a more efficient use of energy than direct incineration. And according to studies, recycling, redesigning, reusing clothes can extend the life of products. And clothes can reduce their carbon, water, and waste footprints by 5-10% ^[14] by simply extending their useful life by three months ^[2]. Therefore, for how clothing can be recycled in the final process can significantly reduce the carbon footprint and help achieve the purpose of sustainable textile development.

3. The current situation in China

What is the situation in China on this issue? China is the second-largest fashion market in the world ^[5], and each year consumers are consuming more and more textiles as their interest in fashion grows. However, although China generates a lot of used clothing each year, very little is actually recycled at the final stage. According to studies, about 26 million tons of used clothes are landfilled in China every year, while the recycling rate is less than 1%, and most of them are not remanufactured or harmlessly treated ^[3]. Data from the *China Association of Circular Economy* also show that this figure is expected to reach 50 million tons in 2030, and most of it will be landfilled or incinerated. This shows that new initiatives are also needed regarding the final disposal of Chinese textiles to slow down and improve the problem of this massive waste of clothes. By recycling more used clothing, not only will the final life of the textile be extended, but also a lot of resources will be saved in the process.

II. The two players involved in the textile circulation

To improve the existing problems in the textile industry, there are undoubtedly two important players to be involved: the apparel companies, as the initial producers, and the consumers, as the final purchasers. Only companies that better persuade consumers and recycle materials can better help to achieve sustainability. Only the positive actions and attitudes of consumers are the basis for all measures and tools to be implemented in the end.

1. Current situation of textile and apparel (T&A) industry in China

First of all, as the initial seller of apparel, the company should have the awareness of

sustainable development. Not only in the process of initial production to achieve green, but companies should also pay attention to the recycling and utilization of the final clothes. Companies can not only persuade consumers to reduce the waste of clothing in the process of selling, but also provide channels to recycle these fabrics to achieve the purpose of recycling.

Of course, companies must ultimately generate economic benefits in order to continue to operate. Changing the existing profit model and developing a sustainable business model is certainly a challenge for companies. For example, if clothes are recycled, how can companies make more efficient use of these materials to eventually produce economically valuable products. Clothes are made of different fabrics and are difficult to sort and dispose of. Companies may need to invest more costs in research and experimentation first. In this process, companies need to calculate costs and revenues as well as various possible risks.

Even if companies have this sense of social responsibility, how to change consumers' attitudes and persuade them to act is part of what needs to be thought about from a company's perspective.

In addition, not only consumers will have old clothes at their place. Companies will also face the problem of what to do with the remaining inventory. Inventories that are eventually unsold and destroyed each year would also contribute to the sustainability of the textile industry if they could be recycled again.

For now, in general, Chinese apparel companies do not have a high level of sustainability awareness. According to a 2019 study on the "Assessment of sustainability capability of textile and apparel corporations in China," only 22.1% of the 86 Chinese T&A companies surveyed had a high level of sustainability awareness and could be classified as truly sustainable according to the MRCS ^[4]. (MRCS is the moral responsibility theory of corporate sustainability framework.) In addition, although there is a growing interest and demand for sustainable fashion in the Chinese apparel industry, the analysis shows that most of the research on sustainable consumption is concentrated in Europe or the United States ^[5]. This shows that there is a need for Chinese companies to learn from the existing means measures of other countries or regions in terms of sustainability awareness.

2. Perceptions of Chinese consumers

The perceptions and attitudes of consumers are an important part of whether or not sustainable development can ultimately be achieved. More positive consumer attitudes can not only accelerate the process of sustainability but also drive policy and company change. Overall, the movement of consumers as a whole can bring about a dramatic shift in the marketplace.

Regarding the disposal of used clothes, most Chinese consumers currently choose to dispose of their used clothes in the garbage or donate them. However, some consumers also choose to give their clothes to clothing brands for recycling. This also depends on whether consumers have access to or are aware of the recycling channels.

Most places now have recycling bins, so consumers are more likely to choose to dispose of their clothes.

And there are about consumers' attitude towards second-hand items, according to the survey of Chinese consumers' intention to consume second-hand clothing, it is clear that Chinese consumers in general have a strong resistance to second-hand clothing consumption, with the strongest resistance among the post-70s. [2].

Different age classes have different motives for buying clothes, and they have different intentions for not recycling clothes. According to the survey, Chinese consumers do not buy second-hand clothes for several reasons: the availability of new, low-priced clothing products in the market; concerns about the hygiene of second-hand clothes; considerations of economic and status inferiority or emotional discomfort [2]. Chinese consumers' resistance to such second-hand items may be a problem that needs to be addressed and improved. Only when consumers' attitudes change will they be able to do more.

But the main consumer groups in the market are constantly changing dynamically. On the positive side, millennials are now increasingly becoming the main consumer group in China. Millennials care far more about fashion and sustainability than their predecessors. It is predictable that millennials may also contribute more to sustainability. Their attitude may drive more companies to focus on this aspect.

Evaluation of the Case

Some existing examples may give some insight into sustainability in the Chinese textile industry, especially in terms of corporate actions and changes in consumer attitudes.

There are a variety of measures that companies can take to help achieve sustainable development. They may be driven by their own value goals or by consumers' concern for environmental concepts. In short, more and more major fashion brands are taking a variety of steps to help achieve sustainability and are including the results in their corporate development reports. This not only helps other companies in the industry to learn but also gives consumers a clearer picture of the company's actions. The luxury industry is often more sustainable than other apparel brands because of its higher margins and more durable materials. So referencing some of the advanced practices of luxury brands may give Chinese apparel brands some insight.

Kering, the world's leading luxury goods group, has developed an innovative tool to measure and quantify the environmental impact of its operations - the Environmental Profit & Loss (EP&L). This tool precisely measures the sustainability value created by the company throughout the entire process, from manufacture to supply chain [6]. This tool can inspire many companies to create sustainability blueprints with a goal of a few years and to show consumers the results of their data. Moreover, Kering Group has launched the My EP&L app based on this tool. In this app, consumers can compare

different materials to see how each of them affects the environment. Such a tool not only provides better visualization of the qualities of different materials but also serves as a way to educate consumers about the ultimate impact of the products they buy.

More and more companies are aware of the need for sustainability and their responsibility for environmental development. Many brands are now recycling existing materials to redesign products for sale. For example, a brand will recycle old jeans into a new handbag or shoe. Although this practice is not new, it can give companies insight into what materials can be better reused. In addition, companies can also let consumers know what kind of recycling channels are available, as well as which fabrics will be recycled in a more finely sorted way.

What are the factors that contribute to consumer behavior and attitudes? According to various previous studies, consumers may decide whether to recycle because of convenience, knowledge of recycling channels, personal feelings about their clothing, etc. A 2019 Canadian experiment on "consumer attitudes towards fashion and their disposal methods" may shed some light on this issue ^[7]. In this trial, the concept of fashion index was introduced to analyze the attitudes of fashionable and non-fashionable people towards the disposal of used clothes. The study found that while fashionable people may own more clothes, fashionable consumers showed more interest in how to dispose of unwanted clothes. They are also more willing to do something that puts more effort into it. Perhaps it would be more effective for fashionistas to promote the recycling and reuse of clothing.

Proposed Solutions and Changes (effective coping strategies)

In general, the recycling of used clothing is limited by technology, regulations, consumer preferences, corporate policies, and so on. There are several ways to recycle, such as buying used clothing or making products from textile materials. These means are influenced by many factors, and the best outcome is that companies encourage consumers to take action and take the initiative to recycle and that more consumers' positive attitudes lead companies to take more responsibility. A dynamic cycle is created.

It is important to offer different strategies depending on the consumer. Although Chinese consumers are currently more resistant to second-hand clothes, the issue can be dealt with separately in different situations. Firstly, a survey indicated that for the post-60s and post-70s consumers show strong more resistance to second-hand clothing consumption, so consumers should be guided to choose to rent second-hand clothes instead of owning new ones ^[2]. And millennial attitudes have the greatest impact on purchase intentions. The focus should thus be on building the formation of positive attitudes among millennial consumers ^[5]. Companies can target different policies to different age groups of consumers. Such as encouraging millennials to recycle more clothing, while guiding post-60s and post-70s consumers. Different

strategies can also be tailored to consumers' level of fashion preference. Those consumers who care more about fashion will also be more willing to try new products made from recycled materials because these consumers are more willing to put in the money and effort. Promotion to these consumers is also expected to be more effective.

The most important way to change consumer attitudes is to "educate" consumers. This approach has been used in many service products. For example, not all consumers know how to use a restaurant kiosk the first time they see one. It takes a gradual transition to educate consumers before they can use a kiosk on a large scale. The same is true for educating consumers about sustainability. According to a study of Chinese consumers, the higher the level of human-natural knowledge and environmental knowledge, the higher the level of goodwill toward sustainable fashion, and the more positive the impact on sustainable fashion attitudes^[5] Then apparel companies can expect good results from sustainable and friendly consumer education. Companies can educate consumers through a variety of channels. For example, with the Kering Group's My EP&L app, companies can design different tools to allow consumers to see how the products they buy will affect the environment. Especially for China, a big market for luxury consumption, Kering has launched a special WeChat app to help consumers to use it better. It can help Chinese consumers to build a better awareness of sustainable consumption.



Figure 1: My EP&L app

For many consumers, they do not have access to the source and destination of the products they buy. However, this software allows consumers to see the source of raw materials for different material garments, especially from other countries. More visually, consumers will also have a better understanding. This is a new way for consumers to learn information that they would not have otherwise. While some

Chinese apparel companies don't have the profits or technology to make such a thoughtful app, these companies could certainly take a cue from this idea and show consumers their consumption or things more visually in a digital way to give consumers a platform to learn and explore more.

Also, the My EP&L app is limited to seeing the source of the product and the different energy consumed as well as comparing the different energy consumption caused by the different materials. But if it could be expanded even further to allow consumers to visualize how clothing is ultimately recycled, it might not only allow consumers to see how much effort companies put into the process, but also give them some insight into how clothing is ultimately recycled. Many Chinese consumers choose to throw their used clothes in the recycling bins because they don't know what recycling channels are available, but if companies are responsible for educating consumers at the source and reminding them that there are more channels for recycling their clothes, they will certainly try something other than just throwing their clothes away.

For Chinese clothing companies, they can do more than that. They can also attract more consumers by promoting their social responsibility programs on social media. For example, companies can advertise their buy-back programs and rewards for consumers on social media platforms. Starting with millennials, they can slowly draw consumers' attention to the company's recycling program and make it more visible to a wider age group. While consumers may not be very engaged at first, they will slowly become aware of the issues and change their attitudes over time as they learn more. In addition, apparel companies can go a step further by collecting consumer reactions and attitudes on social media to maintain good interaction with consumers and a long-lasting dynamic relationship with them.

Companies competing in the fashion industry though they have to constantly launch new products to gain a competitive advantage. Fashion needs to be constantly changing according to seasons and styles, while sustainability needs to be recycled for as long as possible, which may seem a paradox. But companies can also choose to promote a slow fashion concept. Such as using organic, recycled, or more durable materials to promote sustainability^[8]. Although they may lose some of the head starts in keeping up with trends compared to fast fashion companies, the ideas promoted by slow fashion will also gain an advantage in terms of distinctive style. They will be especially appreciated by consumers who care about sustainability. If companies adopt this strategy and consider the materials used to produce their apparel from the beginning, such as considering recycling techniques or how to reuse materials, it also relieves a lot of effort for the final product to be recycled.

An example is the famous clothing brand Levi's. They have put a lot of thought into the choice of fabric for their jeans. They will test different materials and select the more durable ones to make the clothes.^[15] Naturally, these garments will withstand wear and tear, and consumers will be able to use them for longer. Many Chinese fashion

brands have a fast fashion strategy of constantly launching new clothes, and while it is difficult to get these companies to change their strategy all at once, the companies could indeed choose more durable materials or, for example, introduce a durable slow fashion collection to consumers once a year.

Recommendations for the Future (future recommendations)

First of all, it is expected that all initiatives will achieve better results with a dynamic cycle of mutual benefits between consumers and companies. Companies will offer different targeted strategies to consumers and educate them in a way that will slowly change consumers from those with a high interest in sustainability to those with a low interest in sustainability. The change in consumer attitudes will also lead more companies to choose to produce slow fashion products to extend the life of textiles. Such a dynamic cycle will contribute to the sustainability of the final stage of the textile industry and will thus improve energy consumption and waste in the textile industry as a whole. Sustainability in the textile industry is certainly an important part of achieving SDG12.

But in reality, there may be some problems that lead to these methods not achieving the desired results. For example, companies are financially oriented and the prerequisite for sustainable development is that they have a sustainable profit. In the process of sustainable development, companies need to invest a lot of money, such as studying how to recycle fabrics or conducting surveys on different consumer groups. Some luxury brands have sophisticated sustainability tools, but these companies launch products that have high profits, so they can create more sustainability. However, the average apparel company will not be able to achieve this because of cost constraints.

In addition, the reality of the practice may involve relevant government regulations and technology among other reasons shown. Companies may be more likely to choose a subsidized or technologically mature approach.

References:

- [1] United Nations Environment Programme. (2020). Sustainability and Circularity in the Textile Value Chain Global Stocktaking.
- [2] Liang, J., & Xu, Y. (2017). Second-hand clothing consumption: A generational cohort analysis of the Chinese market. *International Journal of Consumer Studies*, 42(1), 120–130. <https://doi.org/10.1111/ijcs.12393>
- [3] Chenfadmin. (2013, November 20). Textile recycling industry started encounter difficulties. features china. Retrieved February 2022, from <https://www.featureschina.com/blog/textile-recycling-industry-started-encounter-difficulties/>
- [4] Yang, N., & Ha-Brookshire, J. E. (2019). Truly sustainable or not? an exploratory assessment of sustainability capability of textile and apparel corporations in China

from the Moral Responsibility Perspective. *Fashion and Textiles*, 6(1).
<https://doi.org/10.1186/s40691-019-0172-6>

[5] XINYU, H. U., Jeong, S. W., Kim, E., & Lee, J.-H. (2021). Determinants of sustainable fashion consumption in China : Based on the theory of planned behavior. *Fashion & Textile Research Journal*, 23(4), 458–468.
<https://doi.org/10.5805/sfti.2021.23.4.458>

[6] Disko. (n.d.). EP&L: A measurement tool for sustainable luxury. Kering. Retrieved February 2022, from <https://www.kering.com/en/sustainability/measuring-our-impact/our-ep-l/>.

[7] Weber, S., Lynes, J., & Young, S. B. (2016). Fashion interest as a driver for consumer textile waste management: Reuse, recycle or Disposal. *International Journal of Consumer Studies*, 41(2), 207–215. <https://doi.org/10.1111/ijcs.12328>

[8] Brewer, M. K. (2019). Slow fashion in a fast fashion world: Promoting sustainability and responsibility. *Laws*, 8(4), 24. <https://doi.org/10.3390/laws8040024>

[9] Xie, X., Hong, Y., Zeng, X., Dai, X., & Wagner, M. (2021). A systematic literature review for the recycling and reuse of Wasted Clothing. *Sustainability*, 13(24), 13732. <https://doi.org/10.3390/su132413732>

[10] Suraci, O. (2021). The Best-Dressed Polluter Regulation and Sustainability in the Fashion Industry. *Hastings Environmental Law Journal*, 27(2), 225-242.

[11] @SiennaPan, Y. P., Flora, L., Yuan, R. Z. and Z., Toczauer, C., & Bina, J. (2017, October 19). Will Chinese luxury consumers embrace sustainability? *Jing Daily*. Retrieved February 2022, from <https://jingdaily.com/sustainability-push-kering-chinese-luxury-consumers/>

[12] A very serious marketing is the launch of Kering's environmental profit and loss statement: Shanghai Fashion Week. (n.d.), from <https://baijiahao.baidu.com/s?id=1581374057112827955&wfr=spider&for=pc>

[13] Pac-Kering 2019-09-06 web - parisactionclimat.paris.fr. (n.d.). Retrieved February 2022, from https://parisactionclimat.paris.fr/sites/default/files/2019-09/pac-kering_2019-09-06_web.pdf

[14] Abingdon, M. D. (2016). Recycled textile associations unite to combat media misconceptions of secondhand clothing industry. Retrieved from <http://www.prweb.com/releases/2016/10/prweb13799691.htm>

[15] Levi.com. (n.d.). Retrieved February 2022, from https://www.levi.com/US/en_US/blog/article/how-were-changing-for-good

[16] BBC. (n.d.). Why clothes are so hard to recycle. *BBC Future*. Retrieved February 2022, from <https://www.bbc.com/future/article/20200710-why-clothes-are-so-hard-to-recycle>

[17] Bloomberg. (n.d.). *Bloomberg.com*. Retrieved February 2022, from <https://www.bloomberg.com/news/features/2020-10-18/china-s-big-fashion-problem-is-recycling-26-million-tons-of-used-clothes>