



Sustainable Apparel: Creating awareness towards Recycle and Reuse of Apparel

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ABSTRACT

The fashion industry is one of the largest polluters in the world, and the increasing demand for fast fashion has led to a significant environmental impact. The production and disposal of clothing items have a significant impact on the environment, including water pollution, greenhouse gas emissions, and textile waste. In response to this, the fashion industry has seen the emergence of a new trend called sustainable apparel, which aims to produce clothing that is environmentally friendly, aesthetically pleasing, and functional. This research paper aims to create awareness about sustainable apparel and its various practices such as recycle, upcycling, and reuse of apparel. The paper will discuss the current scenario of the fashion industry, its impact on the environment, and the need for sustainable apparel. It will also examine the many sustainable clothing practices, their advantages, and their effects on the environment. Through this research, we seek to inspire people and companies to adopt sustainable apparel practices and contribute to a future that is more ecologically conscious and sustainable.

Keywords: Sustainable apparel, Recycled Apparels, Upcycling and Reuse

INTRODUCTION

Globalisation, often known as the borderless world, has spread widely, which has in turn helped many countries flourish economically. However, these quick changes also cause a number of environmental issues (McDonough and Braungart, 2013). People must not just successfully reuse and recycle resources, but also work to better the planet in which we live. They advanced our understanding of our own responsibilities to safeguard the environment from the effects of reckless human behaviour. Additionally, they recommended creating activities to enhance the environment (Arasinah Kamis, 2018). The most recent figures from the European Clothing Action Plan (ECAP) show that developed nations are making great strides in the recycling of clothing. Approximately 500,000 tonnes of clothing were recycled in the UK in 2019, which is 20% of the nation's total textile waste production. In a similar vein, France recycled 212,000 tonnes of textiles in the same year, up 6% from the year before. A great amount of improvement has also been made in the Netherlands, where in 2019 almost 70% of textile waste was recycled.

The Environmental Protection Agency (EPA) in the United States announced that 2.5 million tonnes of textiles were recycled in 2019, an increase of 14% from the previous year. 1.7 million tonnes of the total recycled textiles—the majority of the textiles—were gathered by nonprofit organisations. Textile recovery facilities gathered the remaining 800,000 tonnes and sorted and processed the materials for recycling or reuse. According to Australia's National Garbage Report 2020, about 15% of garbage from garments and shoes was recycled in 2018–19. The survey also noted that the quantity of recycled textiles in the nation has steadily increased in recent years. In general, women in the West purchase and discard clothing more frequently than men, resulting in a seven-fold increase in female apparel supply (Zurga, Hladnik & Tavcer, 2015; Muthu, 2014; Claudio, 2007).

Indian women typically buy clothing for festivals and other events. Women often buy clothing for celebrations and special occasions based on how they are feeling. Due to the availability of the newest styles and the chance to take advantage of festival-specific discounts and special deals, this is the period when they may look their best during the festive seasons. Women's lives revolve heavily around clothing, which also significantly contributes to the development of feminine status and identity. Females benefit from clothes by feeling more confident and having more self-esteem (Nirbhan Singh, 2013). Additionally, some people donate their clothing out of charitable behaviour. Donating garments to charities not only lightens the burden on those in need, but also helps with environmental pollution problems and the management of space at disposal facilities.

According to reports, a number of secondhand clothing stores have opened up recently, offering a different option to used clothing that doesn't require disposal and can instead be reused and sold for a lower price (Joung & Park-Poaps, 2013). These stores are referred to as thrift and goodwill stores in the United States and as opportunity (Op) stores in Australasia. In the United States of America 90% of people buy second hand clothes (Xu, Chen, Burman, and Zhao (2014). Low-income states like Odisha in India offer ample opportunity for marketing and upgrading used clothing. Young people are becoming more and more attracted to purchasing used clothing in India's smaller cities over time (Santosh Tarai, K Shailaja, 2020). As a result, buyers are psychologically persuaded to replace their totally functional clothing. This increases the quantity of used clothing with unclear uses. However, fresh buyers can still offer these worn-out garments a second chance at life (XU, 2014). Unfortunately, not many people embrace outdated clothing.

Due to the fact that the materials used to make the clothing were comprised of potentially harmful compounds, disposing of the clothing has a significant negative influence on the environment health (Arasinah et al., 2017a; Muthu, 2014; Joung & Park-Poaps, 2013). Customers are prepared to spend money to achieve their desires by owning specific products. Additionally, some consumers choose to burning their used clothing. This not only led to waste of money, but also seriously harmed the environment (Wai Yee, Siti Hasnah & Ramayah, et al., 2016). Most of the world has adopted the zero-waste concept, and it is now exploring new approaches to putting new waste management models into practise. The goal of the zero-waste movement is to promote the idea of rethinking resource life cycles so that all goods and materials can be recycled or recovered. It also offers advice on how to change people's behaviours to promote a sustainable environment (Hogland, Kaczala, Jani, Hogland & Bhatnagar, 2017).

Excessive Usage of Apparels

Due to rapidly changing fashion trends, lower pricing, and an ongoing supply of new trends, excessive clothing utilisation occurs. The fashion tempo was geared towards what is referred to as a "quick fashion life cycle" about 20 years ago. Customers who have worn clothing until it is torn or they have become tired of it will simply throw it away without considering the right disposal procedure or where it will end up (McDonough, W., &, Braungart, M, (2013). Donations of clothing from customers' closets to welfare organisations have climbed by 67% since 2001. Recycling is one way to reduce wasteful material use in addition to fostering environmental responsibility (Bianchi and Birtwistle (2012). The emergence of fast fashion has significantly changed how Americans buy, wear, and dispose of apparel. Consuming clothing that is not necessary could be seen as morally wrong in an environment-friendly setting. Recycling abides by pro-environmental ideals, and clothes donating has become the offered way to cope with the surplus of old clothing. Donating clothes could help people feel less guilty about their excessive consumption and give them moral license to buy more new clothes (Rebecca A. Williams, 2020). The statement that "global consumption has increased to an estimated 62 million tonnes of cloth goods per year" in the introduction has been changed to read "62 million tonnes of apparel per year." 'Polyester (a synthetic) accounted for 51% (54 million tonnes) in 2017' has been changed to 'Polyester (a synthetic) accounted for 51% (54 million tonnes) in 2018' in global supply chains. The statement "post-consumer textile-waste recycling varies widely between countries" in the subsection "post-consumer textile waste" has been changed to "post-consumer textile collection rates vary widely between countries." Closing the loop has been updated to read "polyester accounts for only 14% of the global total polyester market share," instead of "polyester accounts for only 14% of the global fibre market share." (Kirsi Niinimäki, 2020).

B. Creativity

Fashion designers are aware of the pace and devastation in the industry, but they also know that consumers won't buy a particular style if recycled materials are used to manufacture it. They are more drawn to fresh goods. The creation of new clothing will appeal to consumers' senses and encourage them to buy it (Byun and Sternquist 2011). The ability to conceive, act, and generate something unique, new, and the person must be very imaginative are all components of creativity. When someone is very innovative, thinks differently, and is prepared to take risks, they have the skill. In the designing process, where it creates inspiration and ideas, creativity is a crucial element in developing an inventive idea. In studies on creativity, the creative appraisal of a product frequently comes up. Therefore, creative people must be aware of market demands (Lee and Jirousek 2015). Additionally, they must be able to transform their originality into works of art that are timely and generally regarded both today and, in the future, (Karpova, Marcketti & Barker, 2011a); Karpova, Marcketti & Barker (2011b); Mete (2006). According to a study of female respondents between the ages of 21 and 60, these women express their creativity by repurposing and mending their worn clothing. This was done to lessen the problem of textile waste (Lapolla and Sanders 2015).

In contrast, the study discovered that creative people are open-minded, risk-taking, and determined to think differently (Karpova, Marcketti and Kamm 2013). Clothing design and creative thinking strategies have been developed using the conceptual framework of creativity. This model has elements including preparation, hibernation, lighting, and evaluation (Black, Freeman and Stumpo, 2015). According to research, creativity has a crucial role in determining whether or not to buy a product, the value of creative design, and the necessity of the creative process (Valgeirsdottir, Onarheim and Gabrielsen, 2015). Future graduates must be creative in order to demonstrate their interest in professions in the fashion sector (Arasinah, Ab Rahim, Ramlah, Soaib & Norhaily, 2013; Arasinah, Ab Rahim, Ramlah & Soaib, 2014; Arasinah, Ab. Rahim, Ramlah, Soaib, Zaliza, 2015). According to studies, the most important step in the process of designing clothing is coming up with original ideas under the influence of inspirational sources (Strickfaden, Stafiniak and Terzin, 2015). The capacity to solve problems is also enhanced by creativity (Im, Hokanson & Johnson, 2015). When designing clothing, designers should consider factors like function (easily matched, comfy, usable), hedonic (interesting and able to be paired with other styles), social (polite), easy care, durability, and extended usage periods (Koo, Dunne, Bye, 2014). It was discovered that usefulness, versatility, and practicality must all be considered in the design of a textile product (Cao, Wool, Bonanno, Dan, Kramer and Lipschitz, 2014).

ROLES OF FASHION DESIGNERS AND MANUFACTURER

It is estimated that fashion designers have a significant impact on over 80% of environmentally harmful product development. They are intended to be a part of the problem-solving process, but sadly, most Asian nations do not place as much emphasis on protecting the environment. The environmental concerns in textile production are still not given much weight by Asian fashion designers and textile producers. If environmental problems are not resolved quickly, they will soon endanger ecosystems and natural resources, which will indirectly endanger human health. Therefore, cutting back on the use of chemicals during the textile production process and processing and reusing textile waste are two strategies to address. In addition, ongoing civic awareness programmes should be increased significantly (Mostafa, 2006). In order to boost demand and raise awareness for environmentally friendly products, the textile and garment industries, in particular, have begun to emphasise the importance of environmental friendliness in their production (Muthu, 2014). The significance of creating textile items that may be recycled or reused must also be understood by designers.

Few overseas studies recommended that the producers hunt for effective strategies to persuade consumers to purchase recyclable cloth products. Another study revealed that consumers are now more optimistic and want to purchase textiles and clothing that are recyclable and beneficial to the environment (Zheng and Chi, 2015; Yan and Xu, 2010). Additionally, studies show that consumers are beginning to recognise the benefits of clothing created from organic materials like bamboo, chicken feather fiber, vegetable oil and banana fibers ((Hwang, Lee & Diddi, 2015; Cao, Wool, Bonanno, Dan, Kramer & Lipschitz, 2014).

C. Textile Waste Management Method

One of the largest and most established industries is the apparel and textile sector. The massive manufacturing of textiles—which is usually accompanied by some kind of pollution and waste—is a result of technological improvement, industrialisation, and the quick evolution of fashion. Although our current way of life makes it impossible to set production limits, we can always develop new ways to recycle and lessen our impact on the environment. These environmentally responsible practices are crucial to protecting future generations as well as the environment (Prerna Jain and Charu Gupta, 2016). According to estimates, between 2 and 10% of our environmental impacts are attributable to clothing. Following food and drink, transportation, and housing, which collectively account for 70 to 80% of the environmental effect of consumption, comes clothing and footwear (Hawley, 2006). According to estimates, the amount of solid trash produced by the 217 million people who live in metropolitan areas will rise from 83.8 million tonnes in 2015 to 221 million tonnes in 2030. This sparks creative thinking about trash management (Agarwal et al., 2015).

The nomadic Bakkarwal and Gujjar tribes of Rajasthan and Jammu and Kashmir employ a variety of textile crafts that are based on recycling as a part of their heritage, culture, and effort to preserve ancient textiles. Jammu and Kashmiri tribes use handcrafted needlework embroidery and acrylic yarns to transform ancient woollen felt blankets into carpets. Similar to patchwork, embroidery, and mirror work, Rajasthani tribes use these techniques to accentuate the beauty of their textile products. Numerous accessories made of recycled textiles include hats, bags, wall hangings, mojaris (footwear), cushions, and more (Bairagi, 2014). Pre- and post-consumer waste are the main categories for textile waste. Pre-consumer waste includes fiber lint, rejected yarn during turning, defaulted fabrics during manufacturing, fabric and garment trims during the clothing sector, and rejected garments during production. It is also referred to as manufacturing waste and clean waste. Post-consumer textile waste is frequently referred to as dirty or household waste. Post-consumer textile wastes are any worn-out, harmed, and out-of-style clothing and fabrics that are thrown away after the wearer has stopped using them. They are occasionally donated to organisations, but more often than not, they are thrown out with the trash and wind up in municipal landfills (Wang, 2010).

D. Recycle

Recycling is the process of using waste materials to create new or similar items. The recycling process can reduce waste materials, the need for new raw materials, the use of energy, pollution of the air and water, and the emission of greenhouse gases. Plastics, textiles, papers, glassware, metal, and electronics are among the recyclable materials. Recycling is the practice of maximising the use of materials in any way, such as turning trash into raw materials for the environment or any other sector. (McDonough & Braungart, 2013). Currently, the majority of used clothing is sorted manually, and sorting effectiveness is generally low. Some businesses implemented an outdated clothing sorting method along with a semi-automatic sorting mode. Although this method of sorting used clothing is only semi-automatic and relatively traditional, work productivity has been significantly increased when compared to completely manual sorting. With the growth of the recycling sector for used clothing and growing recognition that these materials are equally valuable resources, it is anticipated that old clothing sorting will follow a scientific and contemporary path (Lin, C.W.R, 2018).

By converting waste materials into new resources, the recycle paradigm actively reduces waste while balancing resource output and consumption. There are two types of recycling: closed-loop and open-loop recycling. Closed-loop recycling entails repurposing waste without altering the original characteristics of the substance being recycled. Open-loop recycling entails converting recovered materials into lower-value products. (Tse et al., 2015). Traditional recycling practices and circular economy-focused recycling methods differ significantly in terms of technology, workforce, and operational procedures. In the traditional recycling process, untrained labourers in unregulated environments incinerate, disassemble, and shred materials. However, a circular economy orientation builds an emphasis on creating an end-to-end process for collecting, classifying, and separating e-waste into salvageable metal extracts. Global quality standards, skilled workers, and the greatest technologies on the market power an end-to-end integrated setup (Sandeep Goyal, 2016).

Frequently, promotional offers that enable customers to save money on new items support these recycling efforts. This could be contradictory because recycling is being utilised in this way to encourage more consumption. This essay examines how four US companies—American Eagle, H&M, Madewell, and The North Face—promote recycling initiatives (Lascity, M. & Cairns, M., 2020). There isn't many research that analyses how recycled and reused old clothing affects operational performance on cost and profit optimisation in the remanufacturing process. In other words, used clothing is seen as a multi-period CLSC (Closed-Loop Supply Chain) when it enters the recycling or remanufacturing process, which is also supported (Lin, M.H.; Hu, J.Y.; Tseng, 2016). Companies recycle a variety of old clothing categories, including winter and summer clothing. These used garments range in condition from virtually fresh to worn out. Additionally, used clothing is made from a variety of materials, including cotton, polyester, wool, leather, and blends. Secondhand undesired clothing is first categorised in order to be reused.

E. Reuse

The dynamics of clothes reuse can change the rising rates of consumption and waste with the low market value. Designers use their imagination to create unique pieces by reshaping, re-cutting, re-stitching, or paneling the clothing along with off-cuts (Fletcher & Grose, 2012). For developing economy with persistently low purchasing power, used clothes is a vital resource. The amount that can be purchased is significantly constrained by the low earnings.

According to reports, the average discount price for used clothing is 37.7% less than the price of new clothing of similar quality. Thus, despite the fact that trade frequently forbids the free flow of used clothing, there is still a high demand for it (Brooks, A., Simon, D., 2014). Another end-of-life management tactic is for businesses to buy back their products from customers after they have worn them out. However, this tactic is frequently applied to promote the purchase of fresh goods. Fashion behemoths H&M, North Face, and Nike have all started take-back policies, but it is being questioned whether these initiatives are linked to the sales of new products. The "Clothes the Loop" programme, developed by North Face, aims to increase the lifespan of clothing and footwear by turning them back into their original, basic raw components.

Nearly half of the survey participants in India expressed a desire to get rid of clothing that was no longer in use. Despite the fact that the majority of respondents were willing to contribute, there is a lack of knowledge regarding the channels accessible for used clothing donations. The majority of the donated apparel is tops. The majority of NGOs use post-consumer recycled clothing for charitable purposes or upcycle it into new items with the help of an artisanal community who depend on it for a living. Currently, only a few Indian brands recycle post-consumer apparel waste to produce designer goods (Bairagi N 2017). The trade in used garments represents a different view of the connections between the global north and south. It illustrates the relationship between the richest and poorest individuals in the globe. An environmental catastrophe is on the horizon as a result of accelerating fashion trends and rising global clothing waste without any fundamental changes to the way we create and market clothing (Anupam Kapoor, 2019). The reuse paradigm includes prolonging the product's useful life as much as feasible and using the unused or discarded material to create something that satisfies a basic need and adds economic value to another area of society. This strategy focuses on developing a "trash" economy and allows for the preservation of essential resources and commodities while generating new sources of income (Esposito et al. 2015a; Gerholdt, 2015).

Apparel Life-cycle

The stage of raw material production, distribution or selling, usage, and the direction of apparel after expiration are the beginning points of the apparel life cycle (Carneiro, Refosco, & Soares, 2016; Downer & Cassidy, 2012). According to research, environmental pollution occurs at every stage of the life cycle. Thus, it is crucial to educate consumers about the impact of the apparel life cycle on achieving fashion sustainability (Zurga, Hladnik and Tavcer, 2015). In addition, consumer behaviour in selecting equipment to buy, wearing it, maintaining it, and finally discarding it all has an impact on fashion sustainability (Carneiro et al., 2016).

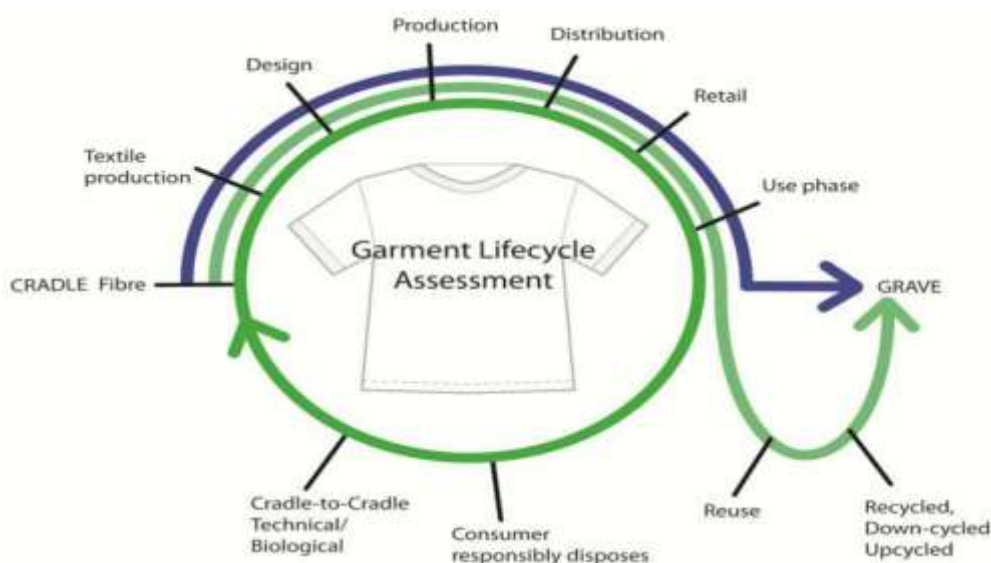


Figure 1: Apparel Life Cycle

Stated that the average lifespan of an article of clothing in the wardrobe is only for 4-5 years, and that some reasons for disposals include incompatible sizes, a lack of space for clothing storage, items that are out of style, worn-out fabrics, and items that are not functional for the wearer. There are two types of textile waste: or before-waste cloth and post-waste textile. Pre-waste textile is trash from the cotton and fibre industries, whereas post-waste fabric is textile that has already been recycled into various items and has been sold on the consumer market (Laitala 2014). Typically, the wardrobe metabolism and the life cycle of the clothing are tightly related. When clothing is acquired from a store or other source, disposed of, or removed from a consumer's clothing stock, the process of wardrobe metabolism begins (Xu, 2014).

Conclusion

Textile waste can be recycled to create a variety of multipurpose textile products. Additionally, in order to raise awareness of the value of protecting the environment among consumers, designers, and manufacturers, as well as to foster a positive attitude in these groups. The society needs to be aware of the significance of recycling for the benefit of environmental sustainability; otherwise, recycling practice will be forgotten and only destruction will take place. Consumers are made aware of this importance by purchasing products that can be recycled or that are made from recycled materials. Reusing of

cloths will reduce the need for energy and the pollution of the environment in general. Zero-waste is a philosophy that promotes reusing resources while minimising the amount of waste that is disposed of at disposal sites. Recycling initiatives are a further step in the direction of zero waste.

Therefore, the government must enforce the rules pertaining to environmental pureness. This is a crucial phase in the environmental protection process. The trash can be treated again and used once again. By using this technique, it is possible to employ fewer renewable resources in the production of raw materials for fundamental human requirements. In addition, the nation might reduce its expenditures on meeting human needs while still being able to preserve the environment. In conclusion, one strategy to combat environmental pollution is through recycling programmes and reuse of reusable materials. Since pollution affects society and the nation as a whole, it needs to be addressed right away. To address the issues of environmental pollution, all relevant stakeholders must cooperate. Environmental contamination can be handled efficiently if all relevant parties work together well.

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