

Application of Zero Waste Management System in Daniel New York Fashion Brand

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ABSTRACT

This study focuses on the impact of fast fashion on environmental sustainability, particularly in terms of textile waste and the use of synthetic dyes in the fashion industry. The research problem addresses the negative consequences of the fast fashion phenomenon, such as short product lifetimes leading to increased waste generation. The aim is to explore sustainable fashion practices, specifically zero waste design (ZWD) techniques, to mitigate the fashion industry's environmental impact. The methodology involves a literature review on fast fashion, textile waste, and sustainable fashion practices, with a focus on the work of Mukherjee. The study considers the environmental implications of synthetic dyes and textile waste, emphasizing the need for sustainable alternatives. The findings highlight the significant environmental harm caused by the fast fashion industry and the importance of transitioning towards sustainable fashion practices. Sustainable fashion, particularly ZWD techniques like upcycling and patchwork waste utilisation, can reduce waste and empower ethical production methods. The implications of this research suggest that a shift towards sustainable fashion practices, including ZWD techniques, can help mitigate the fashion industry's environmental impact. Keywords: fast fashion, textile waste, synthetic dyes, sustainable fashion, zero waste design, upcycling, ecological sustainability.

Keywords: carbon emission, customer behaviours, sustainable fashion

1. INTRODUCTION

Fast fashion is a term used to represent the phenomenon of today's fashion industry. The fashion industry is a very dynamic, creative industry sector. The phenomenon of fast fashion harms environmental sustainability. One of the consequences of the fast fashion phenomenon is the lifetime of clothing products. Changes in trends and product quality in the mass product industry are one of the reasons why consumers wear clothes for a short period. The problem is that clothes that are no longer used end up as waste. The fast fashion industry is one of the biggest polluters of the environment (Mukherjee, 2015). The environmental damage will

continue as long as there is a large market demand for the fast fashion industry. Fast fashion is the most widely used concept by the fashion industry. This concept offers a speedy model change, which requires the fashion industry to produce a lot of clothes in mass quantities in a short time.

Textile waste contains hazardous materials when discharged into the environment, especially regional waters. Most of the materials contained in textile waste are dyestuffs, especially synthetic dyes. Synthetic dyes are molecules with a delocalised electron system and contain two groups, namely chromophores and auxochromes. Chromophores work as electron acceptors, while auxochromes act as electron donors that regulate solubility and color. Currently, there are various synthetic dyes whose use is adjusted to the type of fibre to be dyed, the desired colour resistance, and other technical and economic factors. In the dyeing process, the dyes that are commonly used generally do not enter all textile materials, so the resulting effluent still contains dye residues. This causes textile effluents to be colorful and easy to announce if they are not immediately discharged into public waters. The textile industry's main environmental problem is the dyeing process's waste. Air pollutants include dyes, heavy metals, and high salt concentrations (Mukherjee, 2015). One of the environmental problems is the contamination by textile dyes from the textile industries, which are increasingly emerging due to market demand or the fashion market, where fashion trends continue to change with the times. The textile industry does not produce many solid waste. Waste that is generated more by volume is liquid in the form of dyes in large volumes (Wang, 2010).

Sustainable fashion is also part of slow fashion, this is also interpreted as part of green fashion or environmentally friendly fashion (Rosadi, 2021). What is meant by green fashion or eco-friendly fashion is the use of recycled materials that can be biodegraded. The main focus of the sustainable fashion concept is to minimize the negative impact on the environment from business operations and to increase the capacity and welfare of business people and their supporting communities. Sustainable fashion is often associated with the concept of slow fashion (Carey & Cervellon, 2014).

2. RESEARCH METHODS

The research design involves a qualitative case study approach, focusing on secondary data for social science. These include censuses, information collected by government departments, organisational records, and data that was originally collected for other research purposes. The context of the study will be Daniel New York Fashion Brand.

3. RESULTS AND DISCUSSION

Slow fashion is a concept that promotes sustainability and ethical values in producing or consuming fashion products. The slow fashion movement includes: buying used clothes, redesigning, recycling or upcycling, buying products from small

and medium manufacturers, minimising consumptive culture, respecting the environment, and upholding ethical values. One of the principles offered in the slow fashion concept is redesign or recycling, so that the sustainability of the clothing life cycle becomes longer. The clothing life cycle consists of pre- production, production, distribution, consumption, and post-consumption processes. The main waste from the fast fashion industry is textile waste, which is most commonly found in the production phase in the form of patchwork and used clothing waste that ends up in landfills(Cox et al., 2010).

Zero waste fashion can be defined as a method of designing clothing that only produces a small amount of textile waste or suppresses the waste of material disposal and does not even produce waste at all, which is considered to be part of a larger sustainable movement (Miinimäki, 2013). Zero waste fashion design is a method used to eliminate the disposal of textile waste from clothing production through design. Various techniques aim to remove patchwork waste from the garment production process through its design. In a broader sense, zero waste fashion is a system where waste is eliminated at all stages of the production chain (Rissanen, 2015). Several ways to implement zero waste management are reduce, reuse, recycle, and upcycle. Zero waste is one of the main principles of slow fashion (Antanavičiūtė & Dobilaitė, 2015). Zero waste is a fashion design concept that eliminates or at least minimises clothing production waste. Zero waste techniques are generally carried out by designing patterns and cutting clothes in such a way as to be able to utilise the material as much as possible and minimise/eliminate waste material. The concept of zero waste can also be applied by utilising the leftover scraps from the mass production industry that are not used.

Some of the goals to be achieved from zero waste fashion are to create fashion products that can be an alternative and solution to the problem of fashion waste that can cause environmental pollution and change the norms of the fashion industry by changing the mindset to create the latest environmentally friendly fashion. Furthermore, to produce product designs without waste, and to make consumers more sensitive in choosing fashion products that are in accordance with the concept of sustainable fashion. Then to create public awareness of the environment (Myers, 2014).

Zero waste management means the holistic concept of waste management which recognizes waste as a resource produced during the interim phase of the process of resource consumption. Zero waste strategies may be applied to companies, to communities, industrial sectors, to schools, and homes since they include many stakeholders, not only those of the environment, but also technological aspects. Sustainability is also strongly supported by environmental protection, cost reduction, and additional jobs regarding waste management and handling back into the industrial cycle. Lowering global resource requirements forces us to consider resource management and product management. Therefore, the management of zero waste is a holistic view of the sustainable avoidance and management of waste and resources. Although there are many null practice approaches and null waste approaches in the modern world, zero waste is a very complex system, and in the future, there are still

many works (Cox et al., 2010). Reduce or reduce waste, namely efforts to reduce waste in the environment even before waste arises, every source can make efforts to reduce waste by changing consumptive lifestyles, namely changing habits from wasteful and producing a lot of waste to being economical and efficient and reducing waste (Darmawan, 2013). Some of the actions that can be taken with the reduce action are by reducing the purchase of fashion products in large quantities, simply buying clothes according to their needs.

Reuse means reusing materials or materials so they don't become waste without going through a management process such as using paper back and forth, reusing used beverage bottles for water containers, filling milk cans with refilled milk and so on. The principle of reuse is carried out by choosing items that can be reused as much as possible. Avoid using items that are only disposable. This can extend the time the item is used before it becomes trash. If it is associated with fashion products, what can be done with the act of reuse is to continue to use clothes that are still fit for use (Darmawan, 2013).

Recycling is a process which recycles a material or item that is no longer useful (trash) into other materials after going through a processing process such as processing the remaining patchwork into blankets, patchwork, footwear, and so on or processing bottles/ used plastic into plastic pellets to be reprinted into buckets, hangers, pots, etc. or processing waste paper into pulp and reprinting it into lower quality paper and so on. The principle of Recycle is carried out as best as possible, items that are no longer useful can be recycled. Not all goods can be recycled, but nowadays many non-formal industries and home industries use waste into other goods. If it is associated with the clothing industry, then what can be done is to process textile waste into usable goods, as well as recycle clothes that are no longer used so that they can be used as disposable goods (Darmawan, 2013).

The upcycle concept is also one of the efforts to create new products with a higher value than before through the use of materials that have been wasted or post-use materials (Myers, 2014). Furthermore, this concept is reaffirmed that basically upcycle is the reuse of recycled products or discarded products by reducing new materials and giving them more value, not less (Sung, 2015). The term then spread at a slow but exponential pace to other industrial sectors like fashion, plastic recycling, organic waste, fashion, furniture etc. The product is described as a product design journey chain that starts from material selection, production process, use by the end consumer until the product is damaged and ends up in a landfill. Some of the product components that can still be used are redesigned back into other products. so on and on until the product undergoes its own destruction or is processed into other energi (Myers, 2014).

The principle of increasing Product value. The core goal of upcycle products is to promote the values of recycled waste materials and turn them into products of new economic and ecological value. Then the principle of maximum utilization of recycled waste. Redesigning product waste as raw material is carried out as much as possible to reduce residual materials generated from the production process and avoid secondary

waste. Designers need extensive knowledge and good environmental awareness in making logical and structured programs to control, direct, classify waste materials and components to be used. Furthermore, the principle of durability and the environment. Even though the raw material for product redesign comes from used goods, it does not mean that the product is of poor quality. Instead, the designers must treat the used materials equally without discrimination, and develop them with the same regular product status to ensure their long-lasting quality thereby extending their service life. Next is the principle of cost control. This principle relates to controlling the sources of costs that come out of the design process. The design process, starting with the choice of materials, up to the final production process, is a public aesthetic principle. The public's aesthetic taste is a reference that should be in the design principles of this upcycle product.

Through this principle, designers are required to have good visual quality, sharp insight and be familiar with market demand conditions, and be sensitive to fashionable elements and trends that are popular with the public (Mukherjee, 2015).

Daniel Silverstein is a New York-based fashion designer who applies zero waste techniques to his designs. Daniel is a pioneer in designing clothing designs with a zero-waste concept. Initially, Daniel designed zero waste couture clothing that is often used by celebrities and world public figures. In 2016, Daniel created a new brand called Zero Waste Daniel. The background behind the launch of the Zero Waste Daniel brand is the concern about fashion waste pollutants, especially textiles that end up in landfills and can threaten environmental sustainability (Zero Waste Daniel, 2016).



Figure 1. Zero Waste Daniel New York Product
Source: (Zero Waste Daniel, 2016)

Zero Waste Daniel (ZWD) is a genderless or unisex fashion brand that utilises pre-consumption patchwork waste. Pre-consumption patchwork waste is the remaining unused pieces of clothing production collected from the remaining pieces of the main

pattern material. ZWD's real activity in collaborating with Google Pixelbook in 2018 was by launching an interactive design showroom concept that carries the concept of sustainability and technology together. Activities include daily production that pays attention to ethical issues, educational activities, and curation activities for upcycle products that can be used as problem solvers in the real world (Zero Waste Daniel, 2016).

The purpose of Zero Waste Daniel's product is to create fashion products that can be an alternative solution to the problem of fashion waste polluting the environment. The main mission of Zero Waste Daniel's product is to change the norms of the fashion industry by changing the mindset of being creative to create fashion design products without waste (Zero Waste Daniel, 2016).



Figure 2. Zero Waste Daniel New York Product

Source: (Zero Waste Daniel, 2016)

Daniel's Zero Waste Product (ZWD) is designed using a zero-waste technique by utilizing the remaining waste from production scraps. Daniel's Zero Waste product design is a couture-zero waste product. The term couture refers to sewing products with excellent quality, often known as easy-to-wear, deluxe. In contrast to mass production, couture prioritizes details with manufacturing techniques that pay attention to details. As previously explained, zero waste is a fashion product made using production techniques that eliminate or minimize production waste. Product ZWD David Bowie is a unisex (genderless) clothing that both men and women can use. The Genderless concept was created to reach a wider market, not only specific to certain genders. The design is obtained from how to process patchwork waste into products with good use and aesthetic values.

ZWD products were created with the concept of sustainable zero waste. The concept is applied to the production process from using raw materials to applying ethical work concepts. The socio-cultural impact to be achieved is the creation of an awareness for the community regarding the issue of fashion industry waste and its negative effects, so that people are more sensitive to participating in preserving the environment. Based on the ecological context between artefacts, the concept of sustainable ZWD products is an artefact that has a complementary (cooperative) relationship with other products. This can be observed from the relationship between the

use of patchwork waste left over from the production of other products used as new products. Implementing zero waste is not only about cutting materials that don't leave a lot of waste cloth, but also by utilising other waste products for upcycling (Zero Waste Daniel, 2016).

The results of the visual observation analysis indicate that David Bowie's ZWD product is designed by adjusting the patchwork waste through the application of zero waste techniques. The design is obtained from the idea of how to process patchwork waste into products that have use value and good aesthetic value. In contrast to the general design method, which is to design the design first and then determine the material, in the context of the ZWD sweater product, the availability of patchwork waste is collected first from the source/supplier and then sorted by color and type of material, which is then determined by the design. The elements of creativity and innovation in design concepts and production techniques are needed in processing waste raw materials into trendy fashion products (Zero Waste Daniel, 2016).

4. CONCLUSION

The concept of sustainable fashion is a mindset responsible for environmental, economic and social aspects in the fashion industry. Efficient use of resources is one of the points highlighted to preserve the environment and improve the welfare of mankind. To be able to achieve this goal, it is necessary to first change the mindset and perspective of the community as consumers in choosing sustainable fashion products. Consumers who are sensitive and understand when choosing fashion products will change the behavior patterns of producers in providing the right products. The application of zero waste techniques to ZWD products is one design approach that can minimize the negative impact of the fashion industry on the environment. Utilisation of scrap using the upcycling technique is an example of an effort to minimise and slow down the rate at which waste ends up in landfills. ZWD's uniquely designed products require production skills and techniques that can empower workers ethically. The use of patchwork waste gives ZWD its uniqueness, namely that each piece has a different design model. Zero Waste Daniel is an ideal sample of sustainable, slow fashion products.

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