



## The Role of Circular Economy in Transforming the Fashion Industry

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### Abstract

The fashion industry is undergoing a significant transformation as it embraces the circular economy, a concept gaining increasing attention for its potential to address environmental concerns. Traditionally characterized by a linear model of production and consumption, the industry faces mounting challenges related to resource depletion, waste management, and environmental degradation. The circular economy offers a compelling alternative by promoting a closed-loop system where clothing is repurposed, recycled, and reused, minimizing waste and maximizing resource efficiency. This paper delves into the transformative potential of the circular economy in reshaping the fashion industry towards sustainability. We examine the environmental and economic impacts of the industry's linear practices and showcase, through detailed case studies, how companies are adopting circular strategies—recycling, up cycling, and closed-loop systems—to mitigate their ecological footprint. While benefits like resource conservation, cost savings, and enhanced brand reputation are evident, the transition to a circular economy presents challenges, including technological limitations, financial constraints, and the need for systemic change. Finally, we explore emerging trends and innovations poised to further advance the circular economy in the fashion industry, paving the way for a more sustainable and resilient future.

**Keywords:** Fashion industry; Circular Economy; Transformative; Sustainability; Recycling; landfill.

### 1. Introduction

A circular economy for fashion creates better products and services for customers, contributes to a resilient and thriving fashion industry, and regenerates the environment. Circular fashion refers to an approach within the fashion industry that aims to create a closed – loop system, reducing waste and maximizing the lifespan of clothing and textiles. It aligns with the principles of the circular economy by rethinking how garments are designed, produced, used and disposed of. The current fashion model operates linearly, prioritizing the mass production and consumption of clothing and footwear, mostly made

from fossil fuel-based synthetics that aren't designed to be reused or recycled. The linear model significantly contributes to textile waste by encouraging the disposal of clothing and footwear after minimal use or when trends shift. Consequently these items often end up in landfills, get incinerated, or sent to developing nations, resulting in numerous environmental and social complications. Recognizing the pressing threat of limited resources and growing consumer concerns about environmental and social impacts, the fashion industry is shifting towards a circular economy.



### 1.1 Objectives

- 1) To examine the environmental and economic impacts of the fashion industries linear practice through case studies.
- 2) To know about the companies circular strategies to mitigate the ecological foot prints.
- 3) To explore the emerging trends and innovations paving the way for a more sustainable and resilient future.

### 1.2 Literature Review

In 2016, H&M Group publicly shared its ambition to transform into a circular business and become climate positive by 2040. H&M Group has recognized that the traditional fashion model of the last few decades is a major component of a wasteful and polluting linear economic system that needs to change. Currently, around 50-60% of the textiles deposited are reused – either sold via resale partners or given to charity. The majority of items that remain are recycled into lower value material such as insulation or cleaning cloths.[1] Street fashion brand Weekday is working to become fully circular. More than a third of its jeans collection already meets The Jeans Redesign guidelines; while their AW23 collection is due to reach 60% [2]. In African countries, Projects like Fiber shed provide a blueprint for developing regional fiber systems that build soil and protect the health of the biosphere [3]. Recent estimates indicate that almost 70% of garments that are donated globally end up on the African continent [4] as an eco-friendly substitute for conventional screen-printing techniques, digital printing is becoming more and more popular. Because digital printing allows for exact ink application, it consumes less ink and uses less water [5]. Alternative textile: Alternatives are being made available via the development of sustainable technologies for clothing and textiles that are reusable, regenerable, recyclable, and sourced ethically. Designers like Stella McCartney have pioneered closed-loop and sustainable business models using innovative materials such as bio-based fur. [6]

### 2. Research Methodology

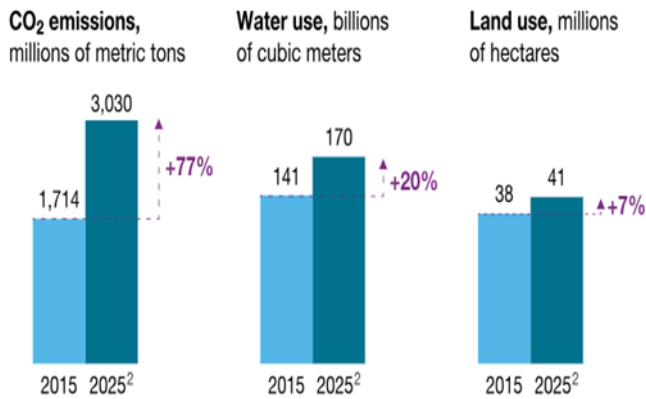
This paper delves into the transformative potential of the circular economy in reshaping the fashion industry towards sustainability. The study

encompasses a comprehensive analysis of peer-reviewed articles, books, reports from Ellen Mac Arthur foundation and case studies published within the last decade, with a focus on empirical research and theoretical frameworks that contribute to understanding the challenges, opportunities and the implementation of innovation in circular economy practices in the fashion industry. The traditional linear model of fashion ("take-make-dispose") relies heavily on the extraction of raw materials, leading to significant resource depletion, particularly of water, land, and fossil fuels. The aim is to create awareness about the environmental impacts of fast fashion and the benefits of a circular economy, leading to limited demand for sustainable products. [1]

### 3. Case Study Analysis

#### 3.1 Environment and Economic Implications of Linear Fashion

According to the Condé Nast a recent study depicts that the release of carbon dioxide (CO<sub>2</sub>) into the atmosphere is referred to as CO<sub>2</sub> emissions. The burning of biomass and fossil fuels, the use of land, and industrial production are all related to CO<sub>2</sub> emissions. CO<sub>2</sub> is the main greenhouse gas (GHG) and has a major impact on Earth's radiation balance as well as global warming and climate change [7]. The fashion industry is a major source of CO<sub>2</sub> emissions. These are linked especially to the production of synthetic materials and also the extremely high volumes of prematurely discarded items that are sent for incineration or end up in landfill. In the last 20 years, global fiber production has almost doubled from 58 million tonnes in 2000 to 116 million tonnes in 2022, and is expected to continue to grow to 147 million tonnes in 2030 if business as usual continues. While people bought 60% more garments in 2014 than in 2000, they only kept the clothes for half as long [8]. While the fashion sector is booming, increasing attention has been brought to the impressive range of negative environmental impacts that the industry is responsible for. The fashion industry is the second-biggest consumer of water and is responsible for 2-8 % of global carbon emissions. Figure 1 shows the sources of world bank, McKinsey analysis.



**Figure 1 Source: World Bank; McKinsey Analysis**

From this above figure it was proved that the overall clothing sales could rise significantly if developing-country consumers choose to buy more clothing as their purchasing power increases. We estimate that if 80 percent of the population of emerging economies was to achieve the same clothing-consumption levels as the Western world by 2025, and the apparel industry does not become more environmentally efficient, then the environmental footprint of the apparel industry will become much larger. According to the Ellen McArthur Foundation, This linear fashion model of buying, wearing and quickly discarding clothes negatively impacts people and the planet's resources. The clothing production has approximately doubled in the last 15 years, driven by a growing middle-class population across the globe and increased per capita sales in developed economies. An expected 400 percent increase in world GDP by 2050 will mean even greater demand for clothing [9]. This could be an opportunity to do better. A report found that addressing environmental and social problems created by the fashion industry would provide a \$192 billion overall benefit to the global economy by 2030. The annual value of clothing discarded prematurely is more than \$400 billion.

### 3.2 Ecological Footprint for Fast Fashion

Fast fashion relies on recurring consumption and impulse buying, instilling a sense of urgency when purchasing. It is intimidating to calculate the carbon footprint of fast fashion. According to the study by Kirsi Niinimäki, the high carbon footprint of the fast

fashion industry may be due to the industry's high energy consumption, which is often influenced by the energy source that is used. In China, for instance, textile production is dependent on coal-based energy, resulting in a 40% greater carbon footprint than textiles produced in Turkey or Europe (10). Thus, to lessen the fashion industry's effect on greenhouse gases, production volumes and non-renewable energy use must be lowered; polyester manufacture should be replaced with renewable plant-based textiles; and sustainable shipping and garment usage must be considered. Today, when environmental issues are at the top of the news, major industry players, such as Zara, H&M, and Primark have played significant roles in increasing the industry's carbon footprint by accelerating fashion cycles. In this fashion industry, previously we practiced for 2 major seasons (Spring/Summer and Autumn/Winter) but now there are 52 micro-seasons, one for each week. To put it another way, fast fashion firms need to use a lot of resources and produce large amounts of apparel in order to stay viable. These actions also cause environmental pollution (11). In order to overcome the problem, here some strategies were discussed were as follows: Demco is a Jeanswear, sportswear, and knitwear manufacturer works with European, African, and Asian suppliers and hires 3,500 workers across multiple factories located in Tunisia. It has a strong sustainability policy roadmap and is driven by a belief that environmental waste equals financial waste. All the process waste is sorted, collected, and sold to certified recycling partners. The demand for organic cotton fabric has increased by 1000% and the demand for recycled fabrics increased by 400% (12). It has ambitious expansion plans, intending to collect locally as well as to import unsold garments and recycle them in Tunisia in order to meet the growing demand for recycled fabric. In a recent project delivered with the British Council, Karingana Wa Karingana reclaims the storytelling tradition in African textiles, making sure that people know that there is more to African textiles than imported wax fabric. In their work, Wacy Zacarias and Djamila de Sousa champion the use of cotton fabrics, banana leaf textiles, recycled plastic, plant leather, and straw, as well as using different plants for natural dyes (12).



### 3.3 Emerging Trends of Innovation

FARFETCH's online platform provides convenient ways for users to filter and find 'vintage' pieces, donate to resell through a third party platform (FARFETCH Donate x Thrift+), prolong the use of their shoes & handbags ('Farfetch Fix') and also resell them ('Farfetch Second Life'). Ralph Lauren has introduced a rental subscription service, 'Lauren Look'. The subscription service starts at USD 125 a month and includes delivery, cleaning and suggestions from expert stylists. US online consignment thrift store thredUP offers users services to make resale a convenient option. Sellers get a 'clean-out' kit and their items are sorted, listed, and delivered for them. Such a user experience has increased the number of repeat users on the platform with thredUp reporting that 80% of orders come from repeat buyers. Vestiaire Collective, a resale platform that encourages local peer-to-peer sales, has aimed to create a user experience on par with prominent e-commerce brands while controlling and authenticating all items once sold. Resale platform Depop highlights carefully curated product assortments by their users and points users to specific profiles based on their style to encourage more peer-to-peer transactions. Eon Group has developed a way to give items of clothing a digital ID known as Circular ID. This digital passport enables brands to sell and resell their garments any number of times. It holds essential information - fabric makeup, which can help recyclers process the garment at the end of its life. German company "Re-Fresh Global" uses 'Smart Textile Waste Up-cycling Micro factories' to transform old clothes into fragrances, pharmaceuticals, shoes, fabrics, vehicle upholstery and more. To encourage a culture of sustainable consumption, in July 2020 Primark asked customers to bring their unwanted clothing, textiles, footwear, and bags into any store in the UK to be re-used or recycled. With 190 stores nationwide, take-back bins were introduced to help reduce textiles waste and to tackle one of Primark's key sustainability goals. By having customers donate unwanted garments to be re-used and recycled, the lifetime of clothing and other textiles can be prolonged.

### Conclusion

Evolving away from the conventional linear model of "take, make, dispose" and toward a more sustainable, regenerative system, the fashion industry is undergoing a fundamental shift to a circular economy. In recent years, the fashion industry has been trying to meet circular principles like reducing waste, reusing materials, and recycling products, which contribute to the global sustainability goals. This paper explores into the transformative potential of the circular economy in reshaping the fashion industry towards sustainability. Furthermore, this paper reveals how a range of ecological and economic issues within the fashion business have an impact on the growth of fast fashion and carbon footprint consumption. Fast fashion as a growing threat to the current state of affairs. Especially, the recycling of second-hand clothing, dumped in vast quantities in developing countries. Adopting circular strategies not only addresses the pressing ecological concerns associated with fashion but also opens new avenues for innovation and economic growth. Through collaboration across the supply chain, investment in new technologies, and a commitment to responsible business practices, the industry can foster a more resilient and sustainable future. However, the transformation is not without its challenges. To meet tomorrow's demand for clothing in innovative ways; companies will need to do what they have never done before: design, test and invest in business models that reuse clothes and maximize their useful life. For apparel companies, it's time to disrupt or be disrupted.

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### References

- [1]. Ellen MacArthur Foundation (2021). Designing products for circularity: H&M Group. Research article Published on 14 December 2021, <https://www.ellenmacarthurf>



- oundation.org/circular-examples/hm-group
- [2]. Ellen MacArthur Foundation (2023). Week Day – A Street fashion brand. Article Published on 18 July 2023, <https://www.ellenmacarthurfoundation.org/circular-examples/weekday>.
- [3]. Dr Amelia Kuch, (2024). Circular Economy In Africa: Examples And Opportunities Fashion And Textiles. Article published in Ellen MacArthur Foundation.
- [4]. Priya A (2022). Impact of second-hand clothing waste in Ghana. International Journal of Law Management & Humanities. 2022; 5:1679-1680. DOI: 10.10000/IJLMH.11298
- [5]. Green fashion technology: 7 exciting sustainable fashion innovations reducing fashion's environmental impact. Available online: <https://3dlook.ai/content-hub/7-sustainable-fashion-technologies/>
- [6]. Ellen MacArthur Foundation (2017). A New Textiles Economy: Redesigning Fashion's Future.
- [7]. Geneva Environment Network (2024). The Environmental Cost of Fashion. Article published in Environmental Sustainability in the Fashion Industry. <https://www.genevaenvironmentnetwork.org/resources/updates/sustainable-fashion/>
- [8]. Elizabeth Reichart and Deborah Drew (2019). The Economic, Social and Environmental Impacts of Fast Fashion. World research institute.
- [9]. Niinimäki K (2020). The Environment Price of Fast Fashion. Nature review earth & environment 4 (1); 189 – 190. DOI: 10.1038/s43017-020-0039-9
- [10]. Mukherjee S (2020). How Zara became the undisputed king of fast fashion?. Available from: <https://thestrategy.com/2020/11/09/zara-fast-fashion-case-study/>.
- [11]. Dr Amelia Kuch (2024). Circular Economy in Africa: Examples and Opportunities Fashion and Textiles. Ellen MacArthur Foundation.