

# FROM CATWALK TO LANDFILLS - Investigating the Environmental Lifecycle of Fast Fashion

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**Abstract**—This paradigm shift toward sustainable fashion challenges the industry's norms, emphasizing quality, longevity, and mindful consumption. Companies are embracing eco-friendly materials and ethical labor practices, aiming for stylish yet sustainable fashion. However, the effectiveness of these sustainability efforts remains uncertain. Hence, our research "From Catwalk to Landfill: Investigating the Environmental Lifecycle of Fast Fashion" aims to address this gap. This can be done through lifecycle assessments of fashion products and shifts in consumer behavior. It seeks to evaluate the impact of sustainability initiatives. Additionally, it examines the role of policy and regulation in promoting sustainability within the industry. Using an approach of mixed methods, the study endeavors to uncover the actual effectiveness and scalability of sustainability initiatives. By offering a detailed analysis, it aims to highlight the tangible impacts of these practices in reducing environmental degradation. Moreover, it seeks to provide insights into how adjustments in consumer behavior and regulatory policies can steer the industry toward a more sustainable trajectory. In summary, fast fashion's rise has brought both convenience and consequence. While it revolutionized consumer access to trendy clothing, its environmental and social costs are profound. The research strives to shed light on the efficacy of sustainability efforts within the industry, offering practical strategies for stakeholders to navigate toward a more responsible and resilient fashion ecosystem.

**Index Terms**—Fast fashion, Sustainability, Environmental impact, Consumer behaviour, Ethical fashion.

## I. INTRODUCTION

Today, in the apparel industry, fast fashion, which is a dominant force, has transformed the behavior of consumers with its rapid output of production yet affordable prices, yet it conceals a host of social, environmental, and ethical challenges. This phenomenon, characterized by quick turnover and inspired by runway trends, fosters a culture of disposability, where garments are swiftly discarded after brief wear. Consequently, it generates significant environmental harm, from excessive water and energy usage to the emission of greenhouse gases. Synthetic fibers like polyester exacerbate these issues by shedding microplastics into ecosystems. Companies that are into fast fashion strive to cut down costs, which leads to exploitative labor and workplace conditions. There was also a tragic incident like the collapse of the Rana Plaza, which underscored the human toll in the industry. A lot of movements towards sustainability and ethical sourcing have been spurred due to the detrimental effects of fast fashion. Consumers who are conscious users of fast fashion products demand prioritizing transparency and environmental stewardship.

## II. PROCEDURE REVIEW OF LITERATURE(ROL)

1) The paper studies the literature review of diverse research papers published in this sector. It builds on the fact that through environmental values, one can assess products in a fresh perspective. This approach allows for the evaluation of redesigned objects based on their environmental impact. Eco-materials, recycled products, and classic designs can increase a product's environmental and sustainable value. In the global fashion industry, adherence to corporate social responsibility (CSR) principles is crucial. Open communication and a genuine commitment to sustainability are essential for earning consumers' trust. "Made by" holds more significance than "Made in" today. Publishing all information from the supply chain, the names and locations of the suppliers and subcontracting partners, sends a positive message, and transparency can build trust. An encouraging example of this practice is the company Patagonia. Patagonia's commitment to sustainability is evident in their transparent supply chain throughout the years. Concluding, values and ethics are fundamental in sustainable fashion, guiding discussions comprehensively. Firstly, one has to consider the system-level change, what is right for the ecosystem, societies, and community as a whole. Secondly, we should consider the human health issues in production. Finally, we have to take into account the sustainable use of resources. (Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment*, 1(4), 189-200.)

2) This study brings to light the environmental and social costs associated with textile production, ranging from water-intensive cotton cultivation to the discharge of unprocessed dyes into local water sources. Furthermore, even when clothing is gracefully displayed in retail stores, it leaves a negative impact through consumer use and disposal, often ending up in landfills rather than being reused or recycled. The main environmental issues associated with fast fashion include resource consumption, greenhouse

gas emissions, landfill overflow, land degradation, and deforestation. Various measures can be taken to address these issues, including enforcing trade policy, promoting corporate sustainability through regulatory and certification bodies, and educating consumers to be critical of greenwashing practices. Ultimately, a system-wide transition to sustainable fashion requires collaboration between designers, manufacturers, stakeholders, and consumers, as well as the development of effective textile recycling systems. (Rukhaya, S., Yadav, S., Rose, N. M., Grover, A., & Bisht, D. (2021). Sustainable approach to counter the environmental impact of fast fashion. *The Pharma Innovation Journal*, 10(8), 517-523.)

3) This study focuses on the globalization of the textile and fashion industries, which has led to an unequal distribution of environmental impacts and burdens to developing countries, while developed countries import these impacts along with clothing. The high cost pressures and intense competition in the fashion industry make it tougher to shift business ideologies. It is even tougher to accurately assess environmental impact. Minimizing this impact requires change and investments in pollution prevention technologies and creating business models that are proactive for implementing environmentally friendly practices, which are critical to the long-term stability of the fashion industry. There has to be a shift in the system from linear to circular systems, and the introduction of alternative business practices such as renting and repairing can extend the lifespan of products and encourage a slower lifestyle for consumers. To make it successful, consumer behavior change requires collateral measures that address consumption patterns at different levels of society. Ultimately, the long-term stability of the fashion industry relies on the abandonment of the fast fashion model, linked to a decline of overproduction and wastage. (Niinimäki, K. (2015). Ethical foundations in sustainable fashion. *Textiles and Clothing Sustainability*, 1(1), 1-11.)

### III. DISCUSSION

The impact of fast fashion on the environment is a pressing issue as it has dire consequences on the environment. Fast fashion is defined as low-priced but stylish clothing with quick production cycles and rapidly changing clothing styles.

There are a few considerations we need to keep in mind while discussing the impact of fast fashion on the environment. The fashion industry is the second-largest consumer of water globally, with the production of a single cotton shirt requiring about 2650 liters of water. Fast fashion also results in the contamination of water due to color dyeing, as the discharge of untreated dyes is disposed of into water bodies. This industry also uses synthetic fibers such as polyester, nylon, and acrylic, which take centuries to biodegrade. This, in turn, poses a threat to the environment and various ecosystems. The production of these microplastics is also very energy-intensive and relies on fossil fuels for their energy needs. The burning of fossil fuels results in greenhouse gas emissions that contribute to global warming. As fashion trends keep changing very frequently, this industry produces a lot of waste, as there are a lot of textiles being disposed of into landfills, leading to environmental pollution and contributing to the depletion of natural resources. Beyond these issues, it also has social repercussions in developing and underdeveloped countries where laborers are overworked in the garment industry and often face poor working conditions and low wages.

In order to bring about systemic change in the fashion business, industry initiatives, government laws, and partnerships are crucial. To create a more sustainable fashion sector, rules that encourage sustainability should be put into place, eco-friendly inventions should be supported, and fashion firms should be held responsible for their environmental impact. There are many implications and actions needed to be taken by policymakers. In order to reduce the fashion industry's adverse environmental impacts, governments must play a major role in regulating the fast fashion sector. Limiting overproduction, cutting waste, and upholding sustainability standards in the clothing industry are some possible policy areas. For example, the Eco-design for Sustainable Products Regulation (ESPR) of the European Union establishes criteria for product circularity, facilitating the recycling of clothing and encouraging sustainability in the fashion industry. With startups like Carbios SA that are working towards creating the most effective recycling processes, it is a recycling leader that encourages circularity. Transparency is evident in their environmental reports, and their intentions to establish a PET recycling factory in France reflect their commitment to large-scale recycling. In the fashion business, Carbios SA is a leading provider of sustainable recycling activities.

### IV. IMPLICATIONS

The issue of fast fashion's impact on the environment is important because it has severe consequences for the environment. Fast fashion refers to low-priced, trendy clothing with rapid production cycles and frequent changes in styles.

We need to consider some things when we talk about how fast fashion affects the environment. The second-largest water consumer worldwide is the textile industry, with 2,650 liters used to produce one cotton t-shirt. On the other hand, fast fashion leads to water contamination via dyeing due to untreated colors that are discarded into aquatic environments. Moreover, this sector employs synthetics like polyester (PES), nylon (PA), and acrylic, which take hundreds of years to degrade, thereby threatening not only nature but also various ecosystems. Furthermore, their production involves a lot of energy, which mostly comes from fossil fuels. Burning fossil fuels releases greenhouse gases that cause global warming. This industry, as it tosses numerous textiles in landfills due to the constant change of fashion trends, creates a lot of waste that causes environmental pollution and exhausts natural resources. In addition to these concerns, there are also social implications in developing and underdeveloped countries where laborers are overburdened with work in the garment industry, which is known for often offering them substandard working conditions and low pay.

For the fashion business to change as a system, industry initiatives are essential, as are government laws and partnerships. To make fashion more sustainable, there should be rules that promote sustainability, wholesome inventions supported by eco-friendly principles, and holding those corporations accountable for their environmental responsibility. There is an array of impacts and measures that policymakers will have to take. The fast fashion sector can only be regulated by governments if they want to minimize its adverse effects on the environment through the fashion industry. Some possible policy areas include limiting overproduction, minimizing waste, and upholding sustainability standards in the clothing sector, among others. For instance, the Eco-design for Sustainable Products Regulation (ESPR) of the European Union contains criteria for product circularity that facilitate the recycling of clothes, thereby encouraging sustainability in the fashion sector. It is one recycling leader that encourages circularity, having companies like Carbios SA, which are working towards creating the most effective recycling processes. These companies have transparency in their environmental reports, thus further supporting this move, while setting up a PET recycling plant in France demonstrates their dedication to large-scale recycling efforts.

## V. SUGGESTIONS

Unconventional materials in the fashion industry are on the rise as they are extracted from sources that make the whole process of producing fashion goods more sustainable. Here are the materials being used to make new fashion accessories:

### Sustainable Material Alternatives in Fashion

The fashion industry is increasingly seeking eco-friendly materials to reduce its environmental impact. This has led to the development of several innovative alternatives to traditional leather and fabrics.

**Apple Leather:** Made from leftover apple parts (cores, peels) from juice production, this material is high in cellulose, making it suitable for fabric creation. It's often combined with a synthetic material (polyurethane) to create a leather-like alternative.

**Mushroom Leather (Mycelium):** Derived from the root network of fungi, this material offers a leather-like texture and biodegrades naturally. Brands like Bolt Threads are using it for sustainable clothing and accessories.

**Cactus Leather (Nopal):** Made from the leaves of the prickly pear cactus, this durable and water-resistant material is a cruelty-free alternative. Brands like Allégorie are utilizing it for stylish bags and accessories.

**Piñatex:** This innovative material comes from pineapple leaves and offers a similar texture to traditional leather. Sustainable fashion brands are incorporating it into footwear, bags, and clothing.

**Orange Fiber:** By utilizing leftover orange peels from the citrus industry, this process creates silky and lightweight fabrics. It is gaining traction in luxury fashion, promoting the principles of a circular economy.

**ECONYL®:** This regenerated nylon is made from recycled materials like discarded fishing nets and fabric scraps. It provides a sustainable option for swimwear, activewear, and accessories, while reducing plastic waste and aiding ocean conservation.

**Parblex®:** Made from algae, this bio-based plastic alternative offers a sustainable solution for accessories and packaging materials.

**Leaf Leather:** Crafted from sustainably sourced leaves, this material provides a unique texture and visual appeal. It is used in bags, wallets, and other accessories.

**Vegea:** This leather-like material is derived from grape waste generated during winemaking, such as skins, seeds, and stalks. It offers an animal-free alternative for fashion and accessories.

**Woocoa:** This plant-based alternative to wool is created from tree bark fibers, providing warmth and comfort in colder climates.

These innovative fabrics demonstrate that sustainable fashion can be both stylish and eco-conscious. By supporting brands that use these materials, we contribute to a more responsible and planet-friendly industry.

### Zero-Waste Fashion Design

Traditional garment production generates a lot of fabric waste. Zero-waste pattern cutting solves this by strategically designing interlocking patterns that maximize fabric usage and eliminate waste. Designers thoroughly plan garments, using techniques like nesting and innovative folding to minimize remnants. 3D draping and origami folding further unlock intricate designs within a zero-waste framework. This approach reduces fashion's environmental footprint, aligning with circular economy principles. While initial challenges exist in design complexity, the long-term benefits of reduced waste, enhanced sustainability, and consumer appeal outweigh them. Gaining traction in the industry, zero-waste pattern cutting allows brands to differentiate themselves and contribute to a more sustainable future. Collaborative knowledge sharing can further encourage its adoption as a standard practice. Incorporating zero-waste principles into garment production drives innovation and minimizes environmental impact, paving the way for a more sustainable fashion industry.

## Product-Service Systems (PSS) in the Fashion Industry

### What is a Product-Service System (PSS)?

A PSS is a new way of doing business that combines offering both physical products and services to satisfy customer needs. Instead of just selling items, a PSS takes the entire life cycle of a product into account, from when it's made to how it's used, maintained, and eventually disposed of. The goal is to create a system that's better for the environment and uses resources more efficiently by focusing on services alongside traditional products.

### Fashion Renting: A PSS in Action

A perfect example of a PSS in the fashion industry is clothing rental services. Here's how it works: instead of buying clothes outright, customers can rent them for a set amount of time. This service often includes not just the clothing itself, but also extras like cleaning, tailoring, and delivery. Once someone is finished with the clothing, they return it, and the cycle starts again.

### Benefits of Fashion Renting:

**Resource Efficiency:** Renting clothes reduces the need to constantly produce and buy new items, which means fewer resources are used overall.

**Extended Product Life:** Clothes get used by multiple people, which extends how long they last.

**Circular Economy:** Fashion renting aligns with the idea of a circular economy, which encourages reusing things and reducing waste.

## VI. CONCLUSION

The journey from catwalk to landfills sheds light on the intricate relationship between the fast fashion industry and the environment. The fast fashion industry continues to grow and thrive on rapid production cycles and market trends, at the cost of society and the environment. Our research, "From Catwalk to Landfill: Investigating the Environmental Lifecycle of Fast Fashion," delves into this complex ecosystem, aiming to uncover the true impact of sustainability initiatives and consumer behavior shifts.

After a thorough study of literature and discussions, it's evident that the environmental footprint extends far beyond its stylish facade. There are a variety of issues ranging from high water consumption and energy usage to landfill overflow; the fast fashion industry's practices contribute significantly to environmental pollution and resource depletion. Fast fashion also affects society through human toll, exploitative labor, and inadequate wages.

Amidst these challenges, huge opportunities lie for transformation. Many initiatives, such as zero-waste fashion designs and product service systems, promise avenues for a sustainable fashion ecosystem. By embracing these innovations and fostering more collaborative efforts between companies and the government, we can pave the way for a fashion industry that is both stylish and environmentally responsible. Governments should also implement policies that govern the functioning of fast fashion brands, which will benefit both the environment and society.

In conclusion, our research underscores the imperative for collective action to address the lifecycle of fast fashion. Through transparency, ethical sourcing, and eco-friendly conscious practices, we can navigate towards a fashion landscape that is sustainable and stylish.

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