

The use of Sustainable Fashion to Reduce Textile Waste

Anista Farih

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ABSTRACT

Unsustainable fashion presents an escalating quandary as the industry's magnitude expands unabated. The exponential growth of the fashion sector corresponds with a surge in fashion-related waste, contributing to an array of ecological predicaments. This waste emanates toxins and pesticides, jeopardizing riparian ecosystems, aggravating global water scarcity, and amplifying carbon emissions. A statistical retrospective reveals a disconcerting trajectory: even as early as 1997, 15% of fabric allocated for garment production met a wasteful demise. The interval from 2012 to 2017 witnessed a 5.46% augmentation in the apparel market, further accentuating the squandered textile count. To address this conundrum, our proposition advances the efficacy of reuse and recycling as the quintessential panacea for textile waste predicaments. This approach, despite harboring inherent drawbacks and environmental repercussions, augments both ecological equilibrium and socio-economic vitality. Our investigation is poised to delve into nuanced strategies for curtailing textile waste and its attendant complications, as well as scrutinizing extant methodologies for ameliorating this quandary. Embarking upon an extensive review of scholarly literature, we traverse the landscape of sustainable disposal methodologies, exploring the interplay between diverse production techniques and resultant wastage. Ultimately, our exposition elucidates the affirmative ramifications of the reuse and recycling paradigm, embracing benefits spanning environmental conservation to the genesis of novel employment opportunities.

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Introduction

Over the years, textile waste has been produced in every phase and aspect of the production of clothing. Clothing symbolizes an essential human need. Its critical relevance was emphasized by Maslow (1943), who positioned it at the base of the hierarchy of necessities for survival, alongside food and shelter. Sustainable fashion is part of the slow fashion movement, developed over the past decades, and used interchangeably with eco-, green-, and ethical-fashion (Henninger 2016). Usually, textile waste can be produced by each stage of the production development of clothing from spinning until it's fully finished. There are two different types of textile waste, which are soft waste and hard waste. Typically, soft waste is usually generated from the actions of spinning and combing, while hard waste is usually generated from actions such as

twisting, weaving and knitting. Apart from production processes, some other causes that lead to textile waste are fast fashion, frequency of shopping, consumer waste and attitude towards textile (e.g. throwing out unused and old clothing and useless pieces of fabric), industrialization and also lack of knowledge of sustainability. Fast fashion, being one of them, the fast fashion cycle in the textile industry has led to a high level of consumption and waste generation. This can cause a negative environmental impact since the textile and clothing industry is one of the most polluting industries. (Pensupa, N., Leu, S et al). When it comes to sustainability, at the cause of textile waste, both the fashion industry, businesses and the population all have agreed to make sustainability for clothing in order to reduce textile waste, by doing things such as recycling. According to an article, recycling is considered a large component of the bigger environmental movement, and has grown rapidly in recent years. This interest is a result of many factors including green consumerism, rising waste disposal costs, an explosion of legislative initiatives and mandates, and the evolution of waste recycling into a smoothly running commodity industry (The Textile Waste Lifecycle - Tanya Domina, Kathy Koch, 1997). Apart from that, consumers need information on types of textile products conducive to recycling, benefits of recycling certain apparel items, and potential outlets for disposing of textile products. Consumer demand for greater textile recycling options will pressure communities, that actually leads to the community to have a lack of knowledge about textile recycling, and also on how to recycle clothing.

Sustainability is significantly important for fashion businesses due to consumers' increasing awareness of the environment. When a fashion company aims to promote sustainability, the main linkage is to develop a sustainable supply chain. According to the journal from Kwandhual and Pradan, several high-end fashion brands such as Patagonia, People Tree, H&M, Thought, Indigenous, Rent the Runway and Stella McCartney have become more focused to approach fashion in an ethical and transparent manner as possible considering both environment and customers. For example Uniqlo, they have launched sustainable clothing collections in response to these changing consumption patterns, targeting the generation of consumers that value ethical consumption (Kim 2020). The gradual shift from fast fashion to a sustainable and socially responsible fashion is clearly visible around the globe. The growing interest in sustainable fashion has been stimulating fashion houses and retailers to take action and in the early 2000s the movement started to take off (Lundblad 2016). Both new and old fashion brands are undergoing transformation day by day with new business models, new age fashion labels and supply chain practices to address the awareness and demand for sustainable clothing. This whole issue, especially these statements are all specified as important because according to these statements taken from various journals, fashion companies have been doing this for years in order to reduce textile waste. This means that the fashion industry has taken several steps to prevent textile waste, especially during the production of clothing. The aim for this research is to find several ways on how to reduce textile waste and also, be more aware of textile waste issues, especially when it comes to major brands of the fashion industry. Since the main topic in this research is about sustainability, we are going to discuss about:

- the importance of sustainability in fashion
- how production methods affect textile waste

Unsustainability in fashion is known to directly cause harmful effects in the environment, in freshwater ecosystems, a recent study suggests that unsustainable

textile waste releases toxins and pesticide into freshwater ecosystems (Stone et al., 2020). Another study suggests that mass wastage of textiles may also contribute to an overall larger carbon footprint (Zhou et al., 2022), and this is in part because textile waste is often burned, and burning of waste is known to be responsible for at least 2-10% of the world's global carbon emissions (Reyna-Bensusan et al., 2019). It is generally agreed upon that reuse and recycling is more sustainable than other forms of waste management due to causing less environmental impacts than incineration or disposal to a natural environment (Sandin & Peters, 2018). Some sportswear companies are pushing forward with cutting-edge methods to finish the production cycle. Since 2010, more than 3 billion plastic bottles have been diverted from landfill to make Nike products (Moorhouse, 2017). Besides ecological benefits, it has also been suggested that textile recycling may have a socio-economic benefit (Leal Filho et al., 2019), although the socio-economic benefits remain poorly studied. Nonetheless, there are several advantages behind reuse and recycling of textile waste, as the world plunges into a climate crisis, sustainability in the fashion industry is increasingly important. But there are also challenges in making a sustainable fashion. The complexity of the material sourcing and textile manufacturing processes make it a challenge to distinguish what is considered sustainable material (Hur 2019). The greatest obstacle to sustainable fashion is still that "fashion shoppers are... A rise in purchasing is resulting from affordable costs, high-quality stylish clothes, and exciting bargain-hunting experiences. (Han et al., 2017).

Method

This study was conducted by doing literature review across papers. This research type is a paper review, we synthesize and collect previous data collected by other authors to reach a conclusion to our research. We decided to use a literature review as it is a systematic and now relevant method of collecting data (Snyder, 2019). Data for this research was collected by examining the sustainability of various disposal methods, as well as how different production methods affect waste. We review scientific papers published by 2013 and onwards, we did not consider any paper published prior to 2013 for our review. We use a combination of high profile journals such as Sci-Hub, Jstor, and Scencedirect along with other sites publishing research papers such as ResearchGate to conduct our literature review, we also use lower profile journals as the validity of higher profile journals has been questioned (Brembs, 2018), thus, we conduct literature reviews in other less prestigious journals to get the data needed. We narrowed down our paper to only focus on reviewing peer reviewed material based on empirical research to support our findings, as such, we did not use news sites, anecdotal evidence, youtube videos, and non-journal websites for our literature review. For our paper, we limit our literature review to encompass anything related to textiles, textile waste, production of textiles, and the impacts surrounding textile waste to support our findings. We show that, despite the disadvantages, reuse and recycling will have a positive impact, ranging from environmental conservation to the creation of new jobs.

Result and Discussion

According to the Guardian, about 87% of textiles are dumped into landfills (The Guardian, 2019). These landfills are often incinerated and these incinerations emit carbon, just in Europe, Zero Waste Europe reported that millions of tons of Carbon are emitted in landfill incinerations (Zero Waste Europe, 2020). In addition to carbon, textiles dumped on landfills were also known to leak material known as nanotextiles into nearby environments (Mazari et al., 2021). Mazari and colleagues reported that nanotextiles posed a public health concern upon inhalation, noting that they caused several illnesses

upon entering the body. He also argued that these nanotextiles may also degrade soil quality and may be toxic to plants. Another study indicates that textile wastage may also pollute and degrade water quality (Bailey et al., 2022). Textile waste may also come in the form of wastewater, textile wastewater may contain toxic chemicals such as sulfur, mercury, among several other chemicals reported to have come from wastewater (Khan & Malik, 2013), waterways are thus polluted by these chemicals (Khan & Malik, 2013), moreover, such wastewater may also seep into soil which degrades the quality of the soil (Khan & Malik, 2013), exacerbating problems caused by nanotextiles. In studies focusing on recycling, Sandin and Peters (2018) noted that environmental impacts caused by textile recycling are less harmful due to less primary resources being needed, as recycling means reuse of such items, recycling circumvents the environmental impacts caused by waste and incineration with some 4 million tons of carbon emissions projected to be averted upon use of textile recycling (Hedrich, 2022). Socio-economic effects were also reported, as recycling creates a circular economy which opens up opportunities for new business and new jobs (Leal Filho et al., 2019), it is predicted that 15,000 jobs may be created from textile recycling (Hedrich, 2022).

Discussion

Sustainability is a hazy and broad concept, and the discussion over whether to sustain resources or lifestyles continues. Designers, manufacturers, and companies are accountable not only for the environmental impacts of the fashion industry, but also for consumers' unsustainable consumption habits and the growth of waste streams. The concept of sustainable fashion encompasses a variety of terms such as organic, green, fair trade, sustainable, eco, etc (Cervellon et al., 2010, as cited in Lundblad et al., 2016). 'Sustainability' in fashion has become the major focus for long-term growth and environmental impact (Khandual and Pradhan, 2019). Being the second most ecologically harmful industry with 1.5 million tons of waste, the fashion industry puts into landfills every year (Mahajan 2012, as cited in Khandual and Pradhan, 2019). Sustainable fashion has emerged as a broad term for clothing and behaviors that are less harmful to people and/or the environment. SF – and related practices of ethical fashion, eco-fashion, and slow fashion – highlights alternative approaches to fashion and presents a challenge to the rest of the industry by suggesting that 'fast fashion needs to slow down' (Dory, 2018, as cited in Mukendi et al., 2020). Switching to more ethical fashion takes planning; the health of the planet and the safety of workers in developing countries are taken seriously. For a secure, healthy, and sustainable future, ethical fashion must be promoted.

Conclusion

In conclusion, sustainability may be hard to maintain, but still a good way to reduce textile waste and its problems. The research that has been done with various methods such as recycling to avoid disposal of textile and clothing is what we have, the fast fashion method to switch into more ethical fashion, launching sustainable collections like what Uniqlo has done, and also the socio-economic effects that happen to the economy with sustainability such as how recycling creates a circular economy that opens up a lot of opportunities. From the point of view of designing clothes, even more attention is now being paid to whether they are sustainably produced and fashionable—they must be something that people want to wear while also being socially responsible. Fashion is a language used to express one's individuality. Customers want to feel good about their clothes, and that includes feeling good about how they were made with social responsibility in mind. Overall, there are several ways to reduce textile waste and methods that were presented in this research says it all.

References

1. The Textile Waste Lifecycle - Tanya Domina, Kathy Koch, 1997. (n.d.) from <https://journals.sagepub.com/doi/10.1177/0887302X9701500204>
2. Fashion brands and Consumers Approach towards Sustainable Fashion. (n.d.). Retrieved September 16, 2022, from https://www.researchgate.net/publication/325931724_Fashion_Brands_and_Consumers_Approach_Towards_Sustainable_Fashion
3. Aakko, Maarit, and Ritva Koskennurmi-Sivonen. Designing Sustainable Fashion: Possibilities and Challenges. 8 Mar. 2016, https://www.academia.edu/22782582/Designing_Sustainable_Fashion_Possibilities_and_Challenges?auto=citations&from=cover_page
4. Stone, C., Windsor, F. M., Munday, M., & Durance, I. (2020). Natural or synthetic – how global trends in textile usage threaten freshwater environments. *Science of The Total Environment*, 718, 134689. <https://doi.org/10.1016/j.scitotenv.2019.134689>
5. Shen, B. (n.d.). Sustainable Fashion Supply Chain: Lessons from H&M. MDPI. Retrieved September 17, 2022, from <https://www.mdpi.com/2071-1050/6/9/6236>
6. Pensupa, N., Leu, S., Hu, Y., Du, C., Liu, H., Jing, H., Wang, H., & Lin, C. S. K. (2017). Recent Trends in Sustainable Textile Waste Recycling Methods: Current Situation and Future Prospects. SpringerLink. Retrieved September 17, 2022, from https://link.springer.com/chapter/10.1007/978-3-319-90653-9_7?error=cookies_not_supported&code=852bfe3a-9feb-45ab-859e-a49bd0d0e771
7. Zhou, Q., Le, Q. V., Meng, L., Yang, H., Gu, H., Yang, Y., Chen, X., Lam, S. S., Sonne, C., & Peng, W. (2022). Environmental perspectives of textile waste, environmental pollution and recycling. *Environmental Technology Reviews*, 11(1), 62–71. <https://doi.org/10.1080/21622515.2021.2017000>
8. Reyna-Bensusan, N., Wilson, D. C., Davy, P. M., Fuller, G. W., Fowler, G. D., & Smith, S. R. (2019). Experimental measurements of black carbon emission factors to estimate the global impact of uncontrolled burning of waste. *Atmospheric Environment*, 213, 629–639. <https://doi.org/10.1016/j.atmosenv.2019.06.047>
9. Sandin, G., & Peters, G. M. (2018). Environmental impact of textile reuse and recycling – A Review. *Journal of Cleaner Production*, 184, 353–365. <https://doi.org/10.1016/j.jclepro.2018.02.266>
10. Leal Filho, W., Ellams, D., Han, S., Tyler, D., Boiten, V. J., Paço, A., Moora, H., & Balogun, A.-L. (2019). A review of the socio-economic advantages of textile recycling. *Journal of Cleaner Production*, 218, 10–20. <https://doi.org/10.1016/j.jclepro.2019.01.210>
11. Moorhouse, D., & Moorhouse, D. (2017). Sustainable design: circular economy in fashion and textiles. *The Design Journal*, 20(sup1), S1948-S1959.
12. Khandual, A., & Pradhan, S. (2019). Fashion brands and consumers approach towards sustainable fashion. In *Fast fashion, fashion brands and sustainable consumption* (pp. 37-54). Springer, Singapore.
13. Maslow, A. H. (1958). *A Dynamic Theory of Human Motivation*.
13. Henninger, C. E., Alevizou, P. J., & Oates, C. J. (2016). What is sustainable fashion?. *Journal of Fashion Marketing and Management: An International Journal*, 20(4), 400-416.
14. Lundblad, L., & Davies, I. A. (2016). The values and motivations behind sustainable fashion consumption. *Journal of Consumer Behaviour*, 15(2), 149-162.

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15. Hur, E., & Cassidy, T. (2019). Perceptions and attitudes towards sustainable fashion design: challenges and opportunities for implementing sustainability in fashion. *International Journal of Fashion Design, Technology and Education*.
 16. Han, J., Seo, Y., & Ko, E. (2017). Staging luxury experiences for understanding sustainable fashion consumption: A balance theory application. *Journal of Business Research*, 74, 162-167.
 17. Kim, Y., & Oh, K. W. (2020). Which consumer associations can build a sustainable fashion brand image? Evidence from fast fashion brands. *Sustainability*, 12(5), 1703.
 18. Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339.
<https://doi.org/10.1016/j.jbusres.2019.07.039>
 19. Brembs, B. (2018). Prestigious science journals struggle to reach even average reliability. *Frontiers in Human Neuroscience*, 12.
<https://doi.org/10.3389/fnhum.2018.00037>
 20. 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. <https://doi.org/10.1038/s43017-020-0039-9>
 21. Smith, P. (2022, July 27). Apparel: Annual market growth worldwide 2012-2020. Statista. Retrieved October 31, 2022, from
<https://www.statista.com/statistics/727541/apparel-market-growth-global/>
 22. Hayes, S., McLoughlin, J., & Fairclough, D. (1997). *Cooklin's garment technology for Fashion Designers*. Wiley.
 23. Vähk, J. (2020, March 6). The impact of waste-to-energy incineration on climate. Zero Waste Europe. Retrieved November 1, 2022, from
<https://zerowasteurope.eu/library/the-impact-of-waste-to-energy-incineration-on-climate/>
 24. Bailey, K., Basu, A., & Sharma, S. (2022). The environmental impacts of fast fashion on water quality: A systematic review. *Water*, 14(7), 1073.
<https://doi.org/10.3390/w14071073>
 25. Mahajan, S. (2012). Sustainability of green fashion. In *International conference: Textiles and fashion* (pp. 1-11).
 26. Khan, S., & Malik, A. (2013). Environmental and health effects of textile industry wastewater. *Environmental Deterioration and Human Health*, 55–71.
https://doi.org/10.1007/978-94-007-7890-0_4
 27. Mukendi, A., Davies, I., Glozer, S., & McDonagh, P. (2020). Sustainable fashion: current and future research directions. *European Journal of Marketing*.
 28. Hedrich, S. (2022, July 15). Scaling textile recycling in Europe--turning waste into value. McKinsey & Company. Retrieved November 1, 2022, from
<https://www.mckinsey.com/industries/retail/our-insights/scaling-textile-recycling-in-europe-turning-waste-into-value>