

The Impact of Fast Fashion on Marine Plastic Pollution

HELENA NARISU

PEAK Program Student, University of Tokyo, Tokyo, Japan.

Abstract

While widespread internet use has increased the convenience of shopping, it has also changed the shopping behavior of the public. Fast fashion is a term used to describe the mass production of cheap, trendy clothing that is designed to be worn for a short time and then disposed of. A fashion trend cycle is the period during which a trend circulates and retains popularity. In this paper, we aim to provide an overview of the phenomenon of fast fashion and its negative effect on waterways. We describe the issue in today's society and how it contributes to the pollution of waterways during its production and daily wear. This is a global issue, but it is especially prevalent in Asia where large quantities of cheap clothing are produced. Next, we highlight how this issue has been perceived by different groups, including business communities, policy makers, and consumers. Finally, we offer two potential solutions to the issue, proposing a policy to regulate the manufacturing processes of fast fashion brands and lowering the demand for fast fashion by encouraging the public to engage in sustainable fashion.



Article History

Received: 16 January 2023
Accepted: 27 February 2023

Keywords

Clothing;
Environment;
Fast Fashion;
Microplastic;
Pollution;
Social Behavior;
Trend;
Water Pollution.

Introduction


While it is well known that social behavior intervention helps to alleviate environmental problems,¹ the negative effect of poor behaviors on pollution is less studied. Due to the rise of internet use and online shopping over the past few years, it has become more convenient to buy merchandise. Especially due to mandatory stay-at-home confinement during the COVID-19 pandemic,² many people turned to pastimes such as online shopping to fill their free time and cope with the difficulties of being isolated from the outside world. According to an estimate of the United Nations Conference

on Trade and Development,³ COVID-19 induced movement restrictions increased online retail sales from 16% to 19% in 2020, making it a multi-trillion-dollar industry.³ However, a by-product of such an industry is the shortened duration of fashion trend cycles when compared to those of previous decades. A fashion trend cycle is the period during which a trend circulates and retains popularity. In the past, trend cycles were traditionally longer because it took longer for trends to circulate and gain popularity. Without relying on social media, it was more difficult to know what people were wearing in other regions of the world, so most

CONTACT Helena Narisu ✉ helena3122@gmail.com 📍 PEAK Program Student, University of Tokyo, Tokyo, Japan



© 2023 The Author(s). Published by Enviro Research Publishers.

This is an  Open Access article licensed under a Creative Commons license: Attribution 4.0 International (CC-BY).

Doi: <http://dx.doi.org/10.12944/CWE.18.1.9>

people looked to celebrities to set fashion trends. However, in the present day, with the aid of social media, it no longer takes months, but rather days for a trend to gain traction over a large physical area, causing people to constantly be exposed to new trends. This shortened trend cycle has caused fashion companies to adapt their businesses to produce clothing as quickly and cheaply as they can.⁴ Compared to the pre-2000's, brands are now producing nearly twice the number of clothing collections.⁵ As companies boast unbelievably low prices, people are convinced to buy large amounts of clothing. This phenomenon is known as the fast fashion industry. It has even become a social media trend to film and post videos spending hundreds of dollars on fast fashion websites. However, while it is ideal to buy extremely trendy clothes for low prices in high quantities, fast fashion comes at a price, as the industry is also incredibly detrimental for the environment. These harmful processes include the use of toxic chemicals in order to manufacture the clothing cheaply, the emission of greenhouse gases in transportation and shipping of the fast fashion pieces, and the disposal of the pieces, usually only after a few years of wear. Among these various issues, a large concern is that of water pollution, which includes issues such as water scarcity, the production of wastewater, and the spread of microplastics in waterways. While both water scarcity and wastewater production are mostly associated with the manufacturing of these clothing articles, the fast fashion microplastics issue is associated with both the manufacturing of the clothing and the daily wear of the clothing once it has been purchased by the consumer. In this paper, we aim to provide an overview of microplastics resulting from the fast fashion trend and their negative effect on waterways. We describe the issue of fast fashion and how fast fashion contributes to the pollution of waterways during both its production and its daily wear. We highlight how this issue has been perceived by different groups and propose two potential solutions to the issue.

Microplastic Waste Due to Fast Fashion is an Increased Source of Pollution

There are many by-products of fast fashion which contribute to environmental pollution. One such element is microplastic. Microplastics are known to pollute water, land, and air, while also impacting

human health.⁶ Based on the US National Ocean Service, microplastics are small pieces of plastic which are less than five millimeters in length.⁷ One such source of pollution comes from clothing pieces, especially those which are products of fast fashion. This is due to the fact that clothing made of fossil fuel-based synthetic materials such as polyester are cheaper and more widely available than natural materials such as cotton or wool.⁴ Currently, polyester is the number one synthetic fiber and accounts for more than half of all global fiber production.⁴ While microplastics are emitted into wastewater during the manufacturing stage of clothing products, they are also emitted during the post manufacturing stage as a result of the product's lifetime of wear and tear. Regarding the manufacturing stage of producing fast fashion, clothing materials are processed using over 8,000 synthetic chemicals.⁸ The wastewater that results from this process is often dumped into waterways untreated, seeping various chemicals and microplastics into the ocean. After the manufacturing stage, consumers purchase fast fashion clothing items that are also prone to shedding plastic microfibers during laundry cycles, when clothes are tossed around and rubbed against one another in the washer and dryer.⁹ These microplastics seep into laundry water, getting flushed into the sewage wastewater of homes. As it is still not fully possible to filter the microplastics from sewage wastewater, much of these microplastics travel into waterways, adding to marine plastic pollution.⁹ According to a United Nations study conducted in October 2019, US and Canadian households release over 878 tons of plastic microfibers into the ocean every year from laundry alone.¹⁰ In addition, these microplastics have been known to travel and contaminate long distances in the ocean. In 2021, polyester fiber, a plastic material often used to make clothes, made up approximately 75% of the microplastics found in the Arctic Ocean.¹¹ This is an alarming realization, as it suggests that microplastics stemming from the fast fashion industry have had profound impacts on marine environments all over the world.⁶ Since these microplastics are small and often colorful, various marine organisms mistake them for food and ingest them, passing these microplastics to higher trophic levels in a process called trophic transfer.¹² This may lead to harmful health effects such as the blockage of the digestive tract or the leaching of chemicals

from plastic into the bloodstream of marine organisms.¹³ Furthermore, trophic transfer not only impacts the health of marine organisms, but also human health, as humans consume seafood which contains large amounts of microplastics.¹⁴ Currently, further research is necessary to determine the long-term consequences of human consumption of microplastics.¹⁴ In addition, microplastics can attract and absorb various surrounding harmful hydrophobic pollutants from the environment, multiplying the toxicity of these microplastics further.¹² Therefore, it is evident that the irresponsible production of cheap clothing in the fast fashion industry has significantly contributed to the marine microplastics issue, yet the consequences of microplastics on both the marine environment and human health are not yet fully understood.

Public Awareness of Microplastic Pollution Driven by Fast Fashion

It is also necessary to understand how the issue of fast fashion driven microplastics is viewed by different groups such as business communities, policy makers, and civil society. While clothing companies are aware of the environmental impacts of the clothing industry and are encouraged to make sustainable changes to their business practices such as better regulating wastewater or using fabric materials that are not made of plastics, fast fashion companies choose to prioritize their economic prospects over the environment.⁴ However, while the production of environmentally unethical fast fashion may still be profitable in the short term without immediate consequence, it will not be sustainable in the long term. In the meantime, fast fashion companies such as Shein and Zara continue to contribute heavily to the marine microplastics issue.¹⁵ There are also fashion businesses which acknowledge the fashion microplastics issue and adjust their business practices accordingly. Most of these sustainable businesses, such as Pact, operate on a smaller scale and use environmentally friendly clothing materials such as organically produced non-toxic cotton.¹⁶ As the types of fabrics used are not comprised of plastics, they contribute far less to the issue of microplastics in waterways. However, this is a small percentage of fashion businesses, and there are many fast fashion businesses that are dishonest about their plastic footprint, using greenwashing to fake

sustainable business practices.¹⁷ From the viewpoint of policymakers, it is often difficult to address the fast fashion issue because the manufacturing processes of large well established fast fashion companies consist of complex supply chains which are scattered throughout various countries, especially in developing countries. This fragmentation is not only for the sake of seeking cheap materials and labor, but also to intentionally convolute the manufacturing process and make it difficult for governments to regulate business.¹⁸ In addition, as fast fashion companies are often dishonest regarding their clothing manufacturing processes, governments can only do so much to regulate these businesses. From the perspective of civil society, while people have recently become more aware of fast fashion's contribution to marine plastics, there is still a lack of accountability towards the actions of these fast fashion brands. While people generally believe that this is a concerning environmental issue, as a consumer, it is difficult to prioritize the environment over cheap and trendy clothing. Especially because a large proportion of these fast fashion clothes are made in developing countries and microplastics in the laundry are small and seemingly insignificant, consumers feel like they are removed from the issue. Therefore, it is easy to condemn microplastics pollution from a distance while still purchasing fast fashion. However, there is also an added layer of socioeconomic privilege that surrounds the issue of fast fashion. While people of lower socioeconomic status may know that they are contributing to marine plastics in purchasing fast fashion, they may not be able to afford anything other than fast fashion clothing items.¹⁹ Rather, the issue of overconsumption of fast fashion stems from people of higher socioeconomic status who buy unethical clothing pieces from fast fashion companies in large quantities even though they can afford to buy sustainably made clothing instead.¹⁹ Therefore, there is a social dilemma of choice between the cheaper and easier option of fast fashion and the more expensive but environmentally sustainable option of slow fashion.

Recommended Solutions to the Pollution Due to the Fast Fashion Trend

As microplastics stemming from the fast fashion industry are currently rapidly deteriorating the ocean, there is an urgent need to combat this

issue. This requires efforts from various groups, including policy makers, manufacturers, and general consumers themselves. First, it is necessary for policymakers to develop additional regulatory measures enforcing fast fashion brands to make their raw materials and manufacturing processes more environmentally friendly. Fashion brands should be required to comply with environmental laws filtering wastewater leaving facilities to limit the amount of harmful chemicals and plastic used in fabrics. As fast fashion brands may be hesitant to abide by these regulations, governments should implement appropriate fines and punishments on fashion companies breaching upper limits on marine plastic pollution. One proposed regulation is the 2022 Fashion Act, which would require fashion brands operating in New York with a revenue over \$100 million to take measures such as tracking the supply chains of their clothing products and disclosing their water and chemical use.¹⁵ If companies fail to comply with requirements, they will be fined 2% of their global revenue. Thus far, the proposed Fashion Act is the most comprehensive legislation to address fast fashion sustainability to date in the US.¹⁵ Second, as fast fashion companies may still be dishonest about their practices, it is also necessary to lower the demand for fast fashion by encouraging people to hold companies accountable and buy sustainable fashion. Although those of lower socioeconomic status may not be able to abstain from buying cheap fast fashion, educating those who can afford to buy sustainable fashion would help curb demand and hold the fast fashion industry accountable for its marine microplastics pollution. While there has recently been a significant push towards sustainable fashion on social media, continued education on the issue is necessary. This can include circulating statistics or exposing images and videos related to marine plastic waste that directly stem from fast fashion to younger audiences, building readily

available tools to assess the environmental effects of fast fashion brands, and broadening access to sustainable brands as alternatives of fast fashion.

Conclusions and Discussion

While fast fashion is contributing to the global economy, it is also evident that it is a heavy contributor to the marine plastic issue. We need to acknowledge the pros and cons of the industry and hold the fast fashion industry accountable. If fast fashion companies are forced by law to make their manufacturing practices more sustainable and consumers are educated on the environmental consequences of buying fast fashion, then there is hope that the scale of this issue can be decreased. Without implementing these measures simultaneously, it will be challenging to make significant change to the state of the industry. As we still do not know the long-term consequences of microplastics on wildlife and even on ourselves as humans, we are at a pivotal point in time and our actions now will greatly impact our quality of life in the future. In addition, fast fashion microplastic pollution is only one facet of a larger issue. Therefore, in order to improve the overall state of the environment, we need to work to simultaneously address these concerns as comprehensively as possible.

Acknowledgements

My sincere gratitude to Dr. Daiju Narita for his guidance on this work.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

No conflict of interest.

References

1. Zhu Y, Wang Y, Liu Z. How does social interaction affect pro-environmental behaviors in China? The mediation role of conformity. *Frontiers in Environmental Science*. 2021;9. doi:10.3389/fenvs.2021.690361
2. Hennekam S, Ladge JJ, Powell GN. Confinement during the COVID-19 pandemic: How multi-domain work-life shock events may result in positive identity change. *Journal of Vocational Behavior*. 2021;130. doi:10.1016/j.jvb.2021.103621
3. UNCTAD Technical Notes on ICT for Development No18. United Nations Conference on Trade and Development.

- https://unctad.org/system/files/official-document/tn_unctad_ict4d18_en.pdf. Published 2020. Accessed January 22, 2023.
4. Pucker KP. The myth of sustainable fashion. *Harvard Business Review*. <https://hbr.org/2022/01/the-myth-of-sustainable-fashion>. January 13, 2022. January 15, 2023. Published January 13, 2022. Accessed January 22, 2023.
 5. Niinimäki K, Peters G, Dahlbo H, Perry P, Rissanen T, Gwilt A. The environmental price of fast fashion. *Nature Reviews Earth and Environment*. 2020;1(4):189-200. doi:10.1038/s43017-020-0039-9
 6. Amelia TS, Khalik WM, Ong MC, Shao YT, Pan H-J, Bhubalan K. Marine microplastics as vectors of major ocean pollutants and its hazards to the marine ecosystem and humans. *Progress in Earth and Planetary Science*. 2021;8(1). doi:10.1186/s40645-020-00405-4
 7. What are microplastics? NOAA's National Ocean Service. <https://oceanservice.noaa.gov/facts/microplastics.html>. Published April 13, 2016. Accessed February 12, 2023.
 8. Nabeerasool A. How is fast fashion polluting our water? Open Access Government. <https://www.openaccessgovernment.org/how-is-fast-fashion-polluting-our-water/77704/>. Published November 14, 2019. Accessed January 22, 2023.
 9. Windridge M. Sustainable fabrics reducing the impact of microplastics on the planet. *Forbes*. <https://www.forbes.com/sites/melaniewindridge/2021/01/27/sustainable-fabrics-reducing-the-impact-of-microplastics-on-the-planet/?sh=3bdc98894e74>. +January +27%2C+2021. Published January 27, 2021. Accessed January 22, 2023.
 10. Vassilenko K, Watkins M, Chastain S, Posacka A, Ross PS.; 2019. https://assets.ctfassets.net/fsquhe7zbn68/4MQ9y89yx4KeyHv9Svy nyq/8434de64585e9d2cfbcd3c46627c7a4a/Research_MicrofibersReport_191004-e.pdf. Accessed January 22, 2023.
 11. Ross PS, Chastain S, Vassilenko E, et al. Pervasive distribution of polyester fibres in the Arctic Ocean is driven by Atlantic inputs. *Nature Communications*. 2021;12(1). doi:10.1038/s41467-020-20347-1
 12. Chatterjee S, Sharma S. Microplastics in our oceans and marine health. *Field Actions Science Reports*. 2019;19:54-61.
 13. Li Y, Sun Y, Li J, Tang R, Miu Y, Ma X. Research on the influence of microplastics on marine life. *IOP Conference Series: Earth and Environmental Science*. 2021;631(1). doi:10.1088/1755-1315/631/1/012006
 14. Carbery M, O'Connor W, Palanisami T. Trophic transfer of microplastics and mixed contaminants in the marine food web and implications for human health. *Environment International*. 2018;115:400-409. doi:10.1016/j.envint.2018.03.007
 15. Paton E. The new laws trying to take the anxiety out of shopping. *The New York Times*. <https://www.nytimes.com/2022/09/30/fashion/fashion-laws-regulations.html#:~:text=The%20bill%20requires%20fashion%20companies,greenhouse%20gases%20and%20chemical%20use>. Published September 30, 2022. Accessed February 12, 2023.
 16. Sustainability certified. Pact. <https://wearpact.com/sustainability>. Published 2023. Accessed February 12, 2023.
 17. Butler S. Dirty greenwashing: Watchdog targets fashion brands over misleading claims. *The Guardian*. <https://www.theguardian.com/business/2022/jan/14/dirty-greenwashing-watchdog-targets-fashion-brands-over-misleading-claims>. Published January 14, 2022. Accessed January 22, 2023.
 18. Segran E. Governments should regulate the fashion industry. *Fast Company*. <https://www.fastcompany.com/90453905/its-time-to-regulate-fashion-the-way-we-regulate-the-oil-industry>. Published January 22, 2020. Accessed January 22, 2023.
 19. Gee TJ. Is fast fashion a class issue? *Refinery29*. <https://www.refinery29.com/en-gb/2017/04/149877/fast-fashion-social-issue>. Published May 28, 2019. Accessed January 22, 2023.