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## Driving Sustainable Change in the Fashion Industry

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Driving Sustainable Change in the Fashion Industry

An Honors College Thesis

by

Christina Pasqualicchio

Spring, 2021

Fashion Merchandising

## **Abstract**

Climate change is a threat to global sustainable development and the fashion industry is one of the largest polluters in the world. This thesis explores how fast fashion and consumerism have contributed to an overabundance of clothing, an increase in greenhouse gases, fibers and fabrics that don't disintegrate properly, and water pollution; all of which create negative environmental and social issues. Through detailing each of these problems, it can be seen that there needs to be internal changes within the fashion industry and external changes made by consumers. In order to create these changes, the fashion industry needs to adjust the current fashion model by reshaping how fashion is made through slowing down production and manufacturing and focusing on the lifespan of a more circular economy through methods such as rental, resale and repurposing of garments. This will pave the way for less pollution and waste, more transparency, the creation and utilization of sustainable textiles, and educating consumers to buy more mindfully. Tools and resources, such as new durable textiles and environmental impact tools, have been helpful innovations so far, but they are not yet ubiquitous. There are additional solutions that can be utilized or carried out on a larger scale in order to make a difference. Finally, there is a discussion on the future of fashion and moving forward after COVID-19, which has had a large impact on the industry. The overall goal is to bring awareness to the issues the fashion industry creates and show how the global fashion community can come together to build a more sustainable fashion industry.

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## **Introduction**

Plagued by the negative impacts of fast fashion and consumerism, the fashion industry is now one of the largest polluters in the world. Contributions to this problem include an overabundance of clothing, an increase in greenhouse gases, fibers and fabrics that don't disintegrate properly, and water pollution. It is not only important to educate consumers on these detrimental impacts that fashion has on the world's environment and people, but essential to change how fashion is made and bought. The fashion industry can catalyze change in the global community by adjusting the current fashion model which will pave the way for less pollution and waste, more transparency, the creation and utilization of sustainable textiles, and educating consumers to buy more mindfully.

The fashion industry is connected to the consumer beyond just clothing. Fashion is a uniting force across the world that engages different cultures and identities. It is something we will always need and have in our lives. Our style choices are implemented into our daily decision-making and help to communicate who we are to others. Fashion also is a reflection of what is going on around us in everyday life. Ben and Jerry's collaborated with Nike to create a sneaker while a new Oreo cookie was created in collaboration with Supreme. The video game Animal Crossing featured pieces to dress characters from designers like Marc Jacobs and Anna Sui in its own virtual fashion show (Harwood). Fashion is relevant in politics and television as well, often because of what the clothing can symbolize. Vice President-elect Kamala Harris wore a white suit, a color associated with the women's suffrage movement, when she gave her acceptance speech. When it comes to television, we are shown the zeitgeist or spirit/mood of the times based on what characters are wearing, which allows us to tap into trends. Fashion is evidently an important part of our society that is ingrained in our culture and means a lot to

people. Financially, it is a \$2.5 trillion global industry and is only projected to grow (“The State of Fashion”), although the industry is now at a point where a lot of waste has been created from production and consumption. Cultivating a more sustainable industry is vital to not only the consumer but also to the environment.

“Fast fashion, which references apparel with short product life cycles, has emerged as a potent competitive force. Fast fashion brands introduce new styles at more frequent intervals, focusing less on durable quality, and more on low costs and up to the minute designs” (Mukherjee 22). As a result of fast fashion and increased consumption, a pollution footprint has been left behind. The fashion supply chain, which includes designing, harvesting raw material, spinning, yarn production, dyeing, weaving, cutting, stitching and final garment construction, has a large environmental impact in each one of these phases. This is due to the large amount of products used and discarded throughout every phase of the product life cycle (Mukherjee 22).

Fast fashion is on a two-to-three-week delivery cycle, sending out new collections at a faster speed than ever before. This has placed the rest of the fashion world spinning on its axis, trying to deliver clothing faster and cheaper just to keep up. The desire from consumers for the industry to create new and trendy items is part of the reason why there is so much waste. Over time, there has been a shift from designers and celebrities driving the industry, to mostly consumers embracing disposable fashion and driving it based on their wants. The fashion market is now filled with an abundance of clothing that is often either really expensive or really cheap and mass-produced. Mass production enabled this “democratization of fashion,” (Idacavage) where everyone, regardless of social and economic backgrounds, could be seen wearing fast fashion and communicating through their clothing.

Today, buying affordable clothing that is easily disposable is common, but getting to this point did not happen overnight. During the Industrial Revolution, garment factories proliferated and technology expanded, so people were able to receive news faster and pay attention to what everyone was wearing around them. Women were making most of their clothing at home at the beginning of the 20th century, but an increase in mass production and ready-made apparel was becoming widely available. New textile machines and factories allowed clothing to be readily accessible in larger orders rather than being made to order (Stone 5). After World War II there was a boom in the economy and birth rates and standardized production increased, which led to middle-class consumers being more open to mass-produced clothing (Idacavage). There were also new consumer goods in homes, more people focused on family life, and casual clothing for all members of families increased with the invention of wash-and-wear fabrics such as acrylic and Orlon (Stone 15).

“More than in any other decade, the 1960s produced styles that demanded niche marketing to specific customers. More mature adults gravitated toward more tailored looks, while the fashionable youth crowd browsed trendy boutiques” (Stone 16). In other words, fashion really started to speed up in the 1960s and many young people began to buy cheap clothing and follow trends. In response, fashion brands had to keep up with this increasing demand for trendy, affordable clothing, which led to large textile mills opening across the developing world. This allowed U.S. and European companies to save millions of dollars by outsourcing labor to make clothing (Idacavage).

In the late 1990s and early 2000s, it became more acceptable and desirable to show off the love for low-cost fashion and to mix high and low fashion. Fast fashion retailers who are considered leaders in the industry today include Zara and H&M, which both started in Europe.

Zara came to New York at the beginning of 1990 and H&M arrived in the U.S. in 2000. The *New York Times* used the term "fast fashion" to describe Zara's mission and discussed how quickly the store could get a garment on the racks only a few weeks after being seen on a designer runway. It was "chic to pay less" (Idacavage) when H&M arrived.

Bridging a gap between brands and consumers, "see now, buy now" gave consumers the ability to buy a designer's clothing right after a runway show via shoppable channels such as websites and social media platforms. The first brand to adopt this model was Burberry in September 2016, giving consumers instant access to buy the collection shown (Haschka). This change is a part of the reason that companies like Zara were able to easily take designs from the runway and sell them for a much lower price in their stores. The general public was given the opportunity to purchase designs similar to those they saw on the runway in a shorter time and at a significantly lower price. Fashion retail saw this as an opportunity, and so began the race between different brands to take designs from the runway and produce them at an accelerated speed with the lowest price possible (Idacavage).

### **Issues the Industry Has Caused**

The fashion industry has left behind many environmental footprints. This includes an overabundance of clothing, an increase in greenhouse gases, fibers and fabrics that don't disintegrate properly, water consumption and pollution, a lack of transparency, and bad working conditions.

### **Overabundance of Clothing**

Fast fashion production is a linear system of "take, make, dispose," which has led to an overabundance of clothing and an increase in textile waste. Many brands have started to strive toward changing their product life cycles since this linear model is wasteful and polluting, but its



complexity has slowed down this movement toward circularity. Currently, it is estimated that by 2030, the world population will exceed 8.5 billion people, and garment production will increase by 81% globally. This means more clothing will end up in landfills, which is a problem since 73% of the world's clothing already lands there (Global Fashion Agenda). Transforming the fashion industry to a circular system has never been more important as the finite resources on our planet are in jeopardy along with the industry itself.

As a result of fast fashion, consumers have access to an increasing number of styles and collections each year at low, enticing prices. This clothing is not designed with durability or recyclability in mind, leading to an overabundance of waste when consumers decide they no longer want their items. Apparel production is almost double the amount today and the number of times consumers actually wear that apparel has dropped by a third since the start of the century. Still, clothing sales are expected to rise to 160 million tonnes in 2050 (Global Fashion Agenda).

Global consumption of this apparel has now reached around 62 million tonnes per year and is projected to reach around 102 million tonnes by 2030 (Niinimäki). In terms of fast fashion, it has been estimated that more than half of production is disposed of in under a year. This disposed of clothing is often sent to a landfill or is incinerated, which means that not only are we seeing an increase in non-biodegradable waste, but the large number of nonrenewable resources that are used to produce it are unnecessarily wasted (Ellen MacArthur Foundation 3). Less than 15% of clothing is collected for recycling and less than 1% of the material that is used for production is recycled into new clothing. That 1% of material is a loss of around 100 billion in U.S. dollars each year (Ellen MacArthur Foundation 91).

Across the industry in general, only 13% of the total material is in some way recycled after it is used in clothing (Ellen MacArthur Foundation 37), and it usually goes to other industries to be used for insulation material or mattress stuffing, which is most likely the final use. If the collection rates of textiles were tripled by 2030, it could be worth around 5 billion USD for the world economy. Additionally, if the industry could collect and recycle all fibers, the value could be around 95 billion USD. Even though an overabundance of clothing is a problem in itself, if clothing was disposed of and reused properly, a lot of money could be saved (Global Fashion Agenda).

In many countries, the already low rates of clothing utilization continue to drop. By throwing away clothing that could continue to be worn, consumers lose 460 billion USD each year. Some of these garments are estimated to be thrown out after only just seven to ten wears. Many people have admitted to knowing that they own more clothing than they actually need, but it is a part of consumer culture. Many continue to not dispose of it properly either. Rather than recycling or donating, people choose a much easier route and throw their unwanted clothing in the trash. Even if people do recycle and a country has high collection rates for reusing and recycling textiles, the textiles are not always handled properly anyway. Many western countries end up exporting their clothing to developing countries that do not have the same collection infrastructure. While this may help increase clothing utilization, it has started to become a problem (Ellen MacArthur Foundation 38). Many of the developing countries have started to ban the import of textile waste because their markets become oversaturated by second-hand clothing and they want to protect their own local production (Niinimäki).

In order to examine the entire problem, it must be traced back to the very beginning of the design and manufacturing process. Pre-consumer waste, or production waste, is created

during the manufacturing of textiles and garments (which includes fiber, yarn, and fabric waste). “One study estimated that 15% of fabric used in garment manufacturing is wasted; in other studies, the figure is ~10% for pants and jeans and >10% for blouses, jackets, and underwear, and some estimates even place textile waste during garment manufacturing at 25–30%” (Niinimäki). During production, the more accurate the cuts to the fabric are, the less that goes to waste. Unfortunately, many mistakes are made during the process, but if the accuracy between design and manufacturing is more precise, it would help. Deadstock, or old fabric that has not been able to sell or even be used as scraps, has also become a problem. Luxury brand Burberry has reported burning around £90 million (around \$124 million) worth of unsold inventory over five years as of June 2018. The brand admitted that £28.6 million (about \$39 million) worth was incinerated in 2017 alone. Although the incineration of deadstock “recovers” some energy from the products, it also generates more emissions and air pollutants than reuse or recycling (Niinimäki).

The waste that consumers throw away is called post-production waste. In 2012, almost 60% of around 150 billion garments produced globally were discarded several years after production. Also, the average life of a garment from consumption to post-production waste is very quick. Averaged between China, Germany, Italy, Japan, the UK, and the USA, three different types of garments (t-shirts, knit collared shirts, and woven pants) averaged around 3.1 to 3.5 years per garment to go from consumption to waste. Furthermore, textiles account for up to 22% of mixed waste worldwide. In the USA and UK, there is an average of 30 kg of textiles that goes to waste per person each year. In 2015, the post-consumer textile waste collected for recycling purposes was only 15%. Overall, “to close the material loop and create an effective

recycling system for all textile waste, not only must garment recycling become more widely adopted, but the production and consumption of garments must be slowed” (Niinimäki).

### **An Increase in Greenhouse Gases**

Throughout the value chain, from agriculture, manufacturing, and production to the use and disposal of textiles, greenhouse gases are released. Although there is a range of estimates, the industry has been said to produce around 8-10% of global CO<sub>2</sub> emissions annually (4-5 billion tonnes annually) and the Intergovernmental Panel on Climate Change has said that the textile industry causes 10% of global greenhouse gas emissions (Niinimäki). The fragmentation of clothing manufacturing has made it hard to accurately assess environmental impacts due to raw-material sourcing and processing happening in different places around the world.

Environmental consequences are uneven as well since developing countries, where most of the production happens, deal with more negative impacts than the developed countries who are the consumers of the products that are made. Also, most of our clothing is produced in countries mainly powered by coal, a large contributor to increased carbon emissions.

Climate change is a threat to sustainable development globally, causing wildfires, droughts, flooding, hurricanes, rising sea levels, ocean acidification, and the melting of permafrost. The fashion industry is one of the many contributors to climate change due to greenhouse gas emissions. A lack of recycling and the tons of discarded clothing that ends up in a landfill are only some of the ways the industry adds to this global problem. When organic materials decompose in landfills, they release gas naturally. Around 50% of it is methane and the other half is carbon dioxide (CO<sub>2</sub>). There is also a small amount of non-methane organic compounds released. Methane and CO<sub>2</sub> are both greenhouse gases that trap heat in the atmosphere and contribute to climate change, although, methane is 28 to 36 times more effective

than CO<sub>2</sub> at trapping heat in the atmosphere over a 100-year period, according to the latest Intergovernmental Panel on Climate Change (IPCC) assessment report (“Basic Information about Landfill Gas.”).

Cultivating cotton, which is largely used, emits CO<sub>2</sub> as well. Even though regular cotton emits 3.5 times more CO<sub>2</sub> than organic cotton cultivation, the growth of organic cotton utilizes more water, making people use it less. Negative impacts can still occur during production with these natural fibers because of high energy requirements for washing, drying, and ironing. Based on 50 washes, an estimation of the lifecycle of a cotton t-shirt shows that 35% of CO<sub>2</sub> emissions are due to textile manufacturing and 52% is produced when the product is actually used (Niinimäki).

Climate change negatively impacts the industry itself, because hurricanes and floods can affect production. Decreased biodiversity, endangered ecosystems, and destruction of oceans and forests (both important for absorbing carbon emissions) are also negative results of climate change. Natural resources and the industry are easily depleted because of this. Today, greenhouse gas emissions from apparel production are around 1.2 billion tonnes annually. This is more than international flights and maritime shipping combined (Global Fashion Agenda). Furthermore, CO<sub>2</sub> emissions and energy use are highest during initial fiber extraction, especially for synthetic fibers such as acrylic because they come from fossil fuels. High energy use, which is also influenced by the source of energy that is used, is a main reason that the fashion industry has such a large carbon footprint. China, for example, depends on coal-based energy, which results in a 40% larger carbon footprint than textiles made in Europe (Niinimäki). Experts have said that if the industry stays on the same path, emissions from production will rise by more than 60% by 2030.

Even though the industry has been trying to reduce emissions through different programs and using renewable energy sources, progress is too slow. Global emissions are still set to rise and are not going to reach the targets of the Paris Agreement. In order to keep the temperature below the Paris Agreement's goal of 1.5 degrees Celsius, greenhouse gas emissions need to be cut by 45% by 2030. Still, current models are not enough to meet goals or recognize the impacts of the fashion industry. Fashion brands and manufacturers need to work together to accelerate their efforts to reduce their impact on the planet and reverse climate change (Global Fashion Agenda).

### **Fibers and Fabrics that Don't Disintegrate Properly**

The mix of materials that a fashion brand uses in its products often causes a large environmental footprint. This mix can determine the amount of water, energy, and land that it uses up and the amount of air emissions and waste it creates. Research says that cotton production by itself is at fault for a quarter of insecticides and herbicides that are used globally. Replacing conventional cotton with organic has been estimated to save 62% of the energy needed. "For polyester, estimates suggest that substituting one metric ton of virgin polyester with its recyclable counterpart can reduce toxic substances by up to 90%, energy consumption by 60% and emissions by up to 40%" (Global Fashion Agenda).

Natural plant fibers, like cotton, are renewable and biodegradable. Even though this is good for the environment, the problem is that cotton is one of the largest water consumers in the supply chain. Natural animal fibers like wool, leather, down, and silk are biodegradable as well, but their production can lead to unethical sourcing practices such as forced feeding, live-plucking, and corrupt slaughtering practices. Land use and climate effects of animal farming also have a high environmental impact and manufacturing leather uses heavy chemicals for tanning.

When producing natural fibers like cotton, viscose, and leather, there can be a negative impact on biodiversity if it is done unsustainably, so even though these are materials that can biodegrade, there are still negative impacts associated with them. Other negative effects can include soil depletion, deforestation, and diminished wildlife populations (Global Fashion Agenda).

The fashion industry mostly relies on non-renewable resources. Measuring up to around 98 million tonnes in total per year, this includes oil to produce synthetic fibers, fertilizers to grow cotton, and chemicals to produce, dye, and finish fibers and textiles. With low levels of recycling and the current wasteful, linear system, there is a large pressure on resources (Ellen MacArthur Foundation 20). Also, man-made fibers usually require less water than natural fibers, and are highly durable. However, many of these synthetic fibers are not biodegradable and rely on chemicals and fossil fuels when they are being produced. They shed microfibers, which make up 35% of microplastic pollution in the oceans. Cellulosic fibers present an opportunity to be a useful part of a sustainable material mix as an alternative to synthetics, but only if the impact on deforestation and land degradation can be lowered (Global Fashion Agenda). Even though synthetics, like acrylic, polyester and nylon, are cheap to use, they create more pollution because they are harder to recycle and disintegrate slowly. For example, nylon takes 30 to 40 years to decompose (Mukherjee 25). In 2018, the fibers used in production for the fashion industry included polyester at 51% (54 million tonnes) followed by cotton at 25% (25 million tonnes). Since polyester is cost-efficient and performs well, it is used often and is projected to increase (Niinimäki). This is a problem because it can take 20 to 200 years to decompose (“Material Guide: How Sustainable Is Polyester?”).

Many fabrics are blended and therefore have combined properties of their component fibers. This often improves appearance, performance, comfort, and ease of care of a garment, but

can lead to difficulties in decomposition and the ability to biodegrade. More complex blends are known to be three materials or more. When these complex blends are used, cheaper fibers are often blended with more expensive ones, which lowers the cost. One example of this is a polyester and cotton blend, called polycotton. It has higher durability, crease resistance and a lower cost than pure cotton and still has the same feel. Also, acrylic is often blended with wool fibers to lower the cost. Even if clothing is labeled as 100% of a certain material, it can still have a small number of other materials, especially in the label or sewing threads (Ellen MacArthur Foundation 94). Polyester threads are usually used for stitching because of their strength and durability. When biodegradable fibers, like cotton, cellulose-based fibers, or wool are mixed with non-biodegradable fibers like polyester, acrylic, nylon, or elastane, this creates a problem--the mix is no longer biodegradable, and these blended materials are hard to recycle. The blends can be processed in mechanical fiber recycling, but it is difficult to control the separate yarns. There is also chemical polymer recycling where technology can separate blends, but this is only good for materials that are used in large portions in the input material. So, if a small amount of a material was used, it will not come out properly to be recycled. Most recycling processes do not filter out dyes and contaminants either. Therefore, even though there are ways to recycle and breakdown fibers again, different problems arise that cause the process to not be that efficient (Ellen MacArthur Foundation 94).

Cellulose-based fibers are naturally biodegradable. However, even these types of garments usually contain other materials in their stitching, labels or buttons. Dyes contained in clothing are also not particularly safe if they end up in the environment and they usually contain residue of other chemicals that are used in fiber production and textile processing. These substances can affect possible composting use as well from contamination. Garments would need



to have compostable attachments in order for it to be an easier process. A company called C&A created a t-shirt that is biodegradable and non-toxic, and a company called Freitag created jeans that can remove non-biodegradable parts easily by hand, for example. Even though companies are creating positive solutions, a large amount of value is lost when clothing is composted rather than recycled, so the industry needs to do more (Ellen MacArthur Foundation 51).

Rayon is often thought of as a synthetic, but it actually comes from trees. When trees are cut down, they are turned into pulp and are spun to form fibers. Unfortunately, “more than 150 million trees are logged every year and turned into cellulosic fabric – if placed end to end those trees would circle the earth 7 times” (Leibowitz 94). Also, the dissolving pulp used for rayon wastes around 70 percent of a tree and uses a lot of chemicals. This is leading to deforestation in Rainforests like the Amazon. Bamboo also seems like a sustainable choice to use since it does not use a lot of water or chemicals to grow, but toxic chemicals are used to break it down. Turning trees into pulp can be done in a non-toxic way with the use of better solvents or mechanical breakdown, but even mechanical breakdown can use up a lot of energy (Leibowitz 92). In reality, these processes are not as sustainable as they may seem.

### **Water Consumption and Pollution**

One cotton t-shirt takes around 2,720 liters of water to make. This is as much water as one person would drink in three years. According to the Ellen MacArthur Foundation, textile production uses about 93 billion cubic meters of water each year. This is equal to 37 million Olympic swimming pools (Chan). Not only does the industry use a lot of water but dyeing and finishing of textiles makes up 17-20% of all industrial water pollution. The industry is also a major contributor to plastic entering the ocean. Around half a million tonnes of plastic

microfibers have been estimated to end up in the ocean annually. This happens when plastic-based textiles such as polyester, nylon, and acrylic are washed (Ellen MacArthur Foundation 21).

Cotton is one of the most water-intensive crops. It takes about 347 gallons of water to grow one pound of cotton. More than half of the cotton fields in the world require irrigation and these crops are usually in regions where water is already scarce. These cotton fields produce more than 70 percent of all of the cotton grown in the world (Mukherjee 25). A lot of water use is also from bleaching, dyeing, wet processing, printing and finishing of textiles, which heavily involves chemicals as well. Many chemicals used during manufacturing are toxic and this wastewater can degrade the ecosystem when it enters local groundwater. For example, in Cambodia as of 2008, the fashion industry caused an estimated 60% of water pollution and 34% of chemical pollution. The variety of chemicals that the textile industry uses during manufacturing can enter soil where they can cause a decrease in soil biodiversity and fertility. They also can cause cancers and respiratory diseases and premature death among farmers (Niinimäki).

During the dyeing process of textiles, not all of the dye gets absorbed. When the textiles are washed, a large amount of the water, which includes toxic chemicals from the dye, gets released into bodies of water. Each year, the global textile industry releases 40,000-50,000 tons of dye into rivers and streams. In Europe, 1 million tons of salt is released in order to even out the color of the water each year. In order to make the water safe, wastewater can be treated to remove dye, salt, and other toxic chemicals, like heavy metal, but this process is expensive and does not always happen. Even if the water does end up getting treated, the temperature can be a problem. The water used for dyeing is heated, which makes the wastewater hot. When this gets

discharged into river systems, it can negatively impact and harm the fish and ecosystem (Mukherjee 27).

Over 2 billion pairs of jeans are made each year and around 1,800 gallons of water are used in the process to make one pair (Farra, “These Are the 10”). Cotton, which is used to make jeans, uses a lot of water and chemicals. When jeans are made, they require the use of synthetic dyes, which require a lot of water use from washing and rinsing cycles and more chemicals for finishing. Workers are also exploited to make as many pairs of jeans as possible. When it comes to the process of finishing each pair of jeans, they have to create holes or patches by hand and often without wearing a face covering for protection. Also, 99.9% of jeans are dyed with synthetic indigo, which includes cyanide and formaldehyde that are potentially harmful substances to human health. Washing the chemicals out makes them safer, but this wastes water and leads to chemical runoff into rivers (Fullerton). Therefore, jeans, a very popular and commonly used apparel item, present a large environmental impact all on their own.

When washed, synthetic clothing, such as polyester, acrylic, and nylon, releases tiny plastic particles into the ocean, which eventually end up in our environment and even in our food. These materials represent around 60% of clothing around the world. Also, these plastic particles, which do not biodegrade and end up in smaller pieces called microfibers, are smaller than 5mm and are not visible to the naked eye. There are a large number of microfibers entering the ocean especially because washing machine filters do not have the technology to catch a particle that small. Every time we do our laundry, about 9 million microfibers are released into wastewater treatment plants, so they end up in the ocean. This contributes to 35% of the microplastics polluting our oceans. Wearing synthetic pieces of clothing alone releases plastic fibers into the air as well. People breathe in at least 13,000 to 68,000 plastic microfibers from our

clothing, carpets, curtains and other textiles each year. Inhaling plastic microfibers can result in lung inflammation and possibly cause other health problems. Research has shown that these microplastics are also found in seafood. So not only are they polluting oceans and marine life, but they are affecting human health as well (“What Is Microfibers Pollution and Why Is It Bad?”).

Fortunately, the industry has the opportunity to use water and energy more efficiently. It has been shown that the industry can cut water use by 11% and energy use by 7% all while having a return on investment. The industry needs to enhance water and energy efficiency and reduce the use of hazardous chemicals in textile and leather processing. This will improve the health of workers and reduce the impact on the environment. Luckily, there are plans to help improve all of this by 2030 (Global Fashion Agenda).

### **Lack of Transparency**

The fashion supply chain involves millions of people and resources. The first stage of this process is designing. This is where fabrics, silhouettes, trims and finishes are set. Next is material production, which involves growing raw textile material, spinning the fibers, weaving them into fabric, dyeing and finishing. This is where a lot of pollution occurs due to the water and chemicals that are used. The next step is producing the clothing, which involves cutting, sewing and finishing a garment. After that is distribution, which involves separating the clothing to its designated location. It then gets transported to retailers where it is ready to move on to the last stage, the consumer phase. This is when consumers have access to purchasing the garment. Throughout each of these stages, there are many environmental and social impacts. There is also an increased demand for speed, volume and cheap consumption. Garments get moved around a lot as well and go through different processes in different locations all around the world.

Therefore, due to its complexity, it is very easy for there to be a lack of transparency within the fashion supply chain (Zoltkowski).

Due to the lack of transparency that occurs as a result of the complexity of the fashion supply chain, it is hard not only for consumers to understand what has happened to their apparel, but difficult for manufacturers and brands to trace the process. When textile and garment production shifted to countries where labor costs are low, there was a decline of production in developed countries. Over time, it has become increasingly harder for manufacturers to pinpoint where their raw materials come from, especially because there are a lot of steps a garment goes through, so information can easily get lost (Niinimäki). The fragmentation of the fashion supply chain makes it difficult for fashion brands to have full traceability and visibility to track their products, too.

Transparency is important in the fashion industry for many reasons, among them showing that employee health is being protected, hazardous waste is handled properly or being avoided, and measures are being taken to protect the environment. Currently, there is a lack of transparency on wage data for workers and very low transparency on the chemicals used in the fashion industry. This makes the scale of pollution difficult to measure across economic, environmental, and societal impacts. Thankfully, there are many opportunities to improve transparency as concerns continue to grow from NGOs, the public and policymakers (Ellen MacArthur Foundation 53).

### **Bad Working Conditions**

The fashion industry employs more than 300 million people globally. When it comes to producing cotton, it accounts for almost 7% of employment in some low-income countries. The unsafe methods and hazardous substances used in the production process have negative effects

on farmers and factory workers, who suffer poor working conditions, long hours, low pay, and in some instances, modern slavery and child labor. Local communities suffer from poor environmental practices such as the flow of untreated production wastewater back into their water supply. This pollutes local rivers used for fishing, drinking, or bathing (Ellen MacArthur Foundation 21).

Many factories fail to comply with minimum wage laws and even if they do, wages are still too low to meet the basic needs of workers. This often is linked to other issues such as a lack of governance or institutional support. While there have been improvements in recent years, more needs to be done. Fashion brands need to make sure that manufacturers are following laws and paying workers fair wages without any unlawful loopholes. It is necessary for brands to support manufacturers in order for there to be a safer work environment for employees. It is not only ethically important for this to be ensured, but is also expected by consumers. Ethical work environments can bring higher productivity, fewer sick days, less errors, and a shorter turnaround time. Unfortunately, many workers are still exposed to factory fires or hazardous chemicals. Each year, on average, one in twenty fashion industry workers suffers an injury. Many women are subject to these problems since two thirds of the global garment workforce are female. Human rights violations have been noted at each step of the production process, but governments and companies have been trying to get more equality in the workplace with regulations and policies (Global Fashion Agenda).

Dyeing and cutting of fabric are repetitive and dangerous tasks that workers are required to perform. Manufacturing polyester (which is made from petroleum and is the most widely used manufactured fiber) and other synthetic fabrics requires a lot of energy and the use of a large amount of crude oil. This releases many acid gases, like hydrogen chloride, which can cause or

worsen respiratory diseases (Mukherjee 25). In a study of women garment workers in Bangladesh, it was found that workers do not get enough sleep and are victims of diseases and illnesses. As a result, they end up not even working that long because the conditions are so bad. Factory buildings were found to be overcrowded and poorly ventilated. Workers were exposed to toxic substances and dust. They also had a lack of clean water and waste bins (Absar 460). In the Los Angeles garment industry, where the lowest-paid workers are women, a large percentage of Latinas could “be found in sweat shops (small investment operations that work outside of the industry's structure of regulations)” (Soldatenko 321). Contractors would pay these apparel workers less than minimum wage, would cheat them of some of their wages, and would pressure them to work long hours. The working conditions in these sweatshops are unhealthy as well. There are fire hazards, no ventilation, and an infestation of rats and cockroaches. The bathrooms are filthy, and garbage is not disposed of properly. The dyes and materials could cause allergic reactions because the workers were always exposed to them and emergencies were not always prepared for (Soldatenko 321).

Even though production in developing countries creates jobs for people in poverty, wages are still low and working conditions are still not the best. As stated previously, there are significantly more women who work in the garment industry, which makes them disproportionately affected. It has been said that they have less bargaining power, are more docile and generally hold positions of less power than men. They also often have a lack of knowledge of rights or are prevented from joining trade unions. If workers decide to go on strike or speak up, they are often punished. Women are exposed to sexual harassment, physical torture, a poor working environment, low wages and long working hours as well. These workshops have

less strict restrictions in developing countries than developed ones. The workers suffer health problems like asthma, fatigue, miscarriages or other injuries (Mukherjee 31).

Fast-fashion workers who are paid a low wage are frequently exploited by the rich who are benefitting from their work. For example, a worker in Bangladesh, where about 80% of garment workers are women, discussed how she works 12-hour days, often has to skip meals due to a lack of money, and only makes around \$900 a year to sew clothes. Meanwhile, the chairman of H&M earned around \$809 million in one year (Bain). It is possible to pay garment workers a living wage, but brands are keeping their profits high and costs low by cutting back on paying workers a sufficient wage and even safety improvements.

A few years ago, there was an incident where Zara shoppers discovered tags attached or tucked into garments with messages written from factory workers. One tag said, "I made this item you are going to buy, but I didn't get paid for it" (Peoples). The notes were meant to show shoppers how a company that makes so much money does not pay their factory workers properly. "The tags reportedly state that the workers are employed by Bravo Tekstil, one of Zara's factories based in Istanbul" (Peoples). This is not the first time Zara has been targeted by their unhappy Turkish employees and it shows that workers are not being treated fairly by large apparel companies.

Safety problems have been shown in many cases, such as the 2013 Rana Plaza factory collapse in Bangladesh that killed around 1,100 people (Bain). Even though there were cracks down the walls of the eight-story factory complex, managers hit workers with sticks to force them into the factory that day. This incident, which is one of the largest industrial accidents in history, ignited protests and attracted international attention. Workers at Rana Plaza were working for long hours, unfair wages, and in unsafe conditions. After this tragedy, a new legal



agreement, called the Accord on Fire and Building Safety in Bangladesh, was signed by more than 200 global firms. This agreement required these firms to source from factories in Bangladesh that met basic safety standards. “The accord implemented a massive safety inspection and remediation program, covering factories where more than 2.5 million workers are employed. More than 1,000 of the factories covered by the agreement have sufficiently addressed 90 percent or more of the safety issues raised in their places of work” (Jacoby). As the time to renew the commitment nears, some firms are hesitant to renew, which is a concern. Also, a law increased the minimum wage to \$65 a month after most workers earned an average of \$50, but inflation wiped out any gains. So even though there were advances in helping building safety, not everything is as good as it should be (Jacoby).

On March 25, 1911, a fire in New York’s Triangle Shirtwaist Factory killed 146 garment workers, many of them young female immigrants. So many died because doors in the factory were locked (History.com Editors) to prevent workers from leaving on unauthorized breaks. This led to the development of laws and regulations to globally protect the safety of workers. Unfortunately, these rules were not enforced globally because on November 24, 2012, a fire broke out in the Tazreen Fashions garment factory in Bangladesh. Workers were trapped inside the building since exits to the outside were locked. The only way to leave was through windows on the upper floors. Sadly, over a hundred workers were injured from jumping out of the windows and at least 112 died. Many families of those injured or killed had to fight for compensation for their loved ones for multiple years (“Tazreen Fire: Fight for Compensation.”).

Overall, fashion companies look to save production costs by manufacturing their products in locations where it is cheap. Even though fashion brands do not set the wage of a production worker, they can support the conversation between manufacturers, local governments and

employee representatives to improve wage practices. Improvements in wage systems for garment workers would help better the lives of workers and their families through health, safety and education. This would also help increase productivity and quality of employee work. It is hopeful that companies will continue to make the efforts needed for progress to be made (Global Fashion Agenda).

### **Transforming the Fashion Industry**

Leading up to today, the fashion community has started to create sustainable solutions toward eliminating the issues that are a result of the process of apparel production. It has not been uncommon in recent years for designers to move away from trends and add timeless pieces to their collections. As conscious consumption becomes more important, there has been a shift from quantity to quality. Seasonless collections increase longevity of apparel and consumers are responding by seeking these pieces that will last in their wardrobes for many seasons. This change is more sustainable than designing to keep up with trends (Klerk). Companies have also come up with other numerous tools and resources in order to ensure a more sustainable industry, such as new durable textiles and environmental impact measurement tools. While these solutions are helping, they are not yet ubiquitous. There is more that can and needs to be done to create a better system. In order for this to happen, there needs to be internal changes within the fashion industry and external changes made by consumers. Adjusting the current fashion model will help the industry pave the way for less pollution and waste, more transparency, the creation and utilization of sustainable textiles, and educating consumers to buy more mindfully.

### **Adjusting the Current Fashion Model**

Fast production and consumption are defining characteristics of today's fashion industry. A sample or sketch can be turned into a product in as little as 12 days. Exploitation of labor and

natural resources makes short lead times and cheap clothing possible. Designing a different system that still generates money, but respects workers and the environment, is important. Creating apparel with longevity, quality, fair wages, a lower carbon footprint, and zero waste can help the fashion industry create stability in clothing and a more sustainable supply chain (Fletcher).

Slow fashion is about designing, producing and consuming in a better way. It yields quality clothing and makes designers, buyers, retailers, and consumers aware and responsible for understanding the impacts that apparel has on workers, communities and ecosystems. This is not meant to take away from what fashion is now. Slow fashion is still about choice, identity, and balance, but rather than producing cheaply made, disposable products, it requires durability and long-lasting, quality products. Shifting from quantity to quality will give suppliers more time to plan orders and predict the number of workers needed for the job. It will invest in the long term and workers will not need to work overtime and can have regular hours. Quality does cost more, but the idea is to buy more mindfully. Even though workers will spend more time on each piece, everyone can work closely together for a more transparent supply chain, which in turn can create a more sustainable fashion industry (Fletcher).

The more a piece of clothing can be worn, the less pressure on the environment, people and natural resources. Each year, by throwing away clothing that could still be worn, consumers are losing 460 billion USD. If the number of times a garment is worn was doubled on average, greenhouse gas emission could be lowered by 44% (Ellen MacArthur Foundation 73). The current relationship that society has with buying clothing is complex. Other than purchasing clothing as a basic necessity, people buy to fulfill emotional and societal desires (like expressing their identity and showing their values). The experience of buying clothing can also be known as

“retail therapy.” In order for a slower fashion system to work, there needs to be a shift in the consumer point of view from seeing clothing as disposable to seeing it as something that should be high quality and long-lasting. Any model that differs from the current linear one will have to appeal to a variety of consumers as well, since different regions can have specific needs.

Circularity, otherwise known as the Cradle to Cradle approach, “is the idea that products not only cause no harm, but actually benefit people and the environment along the entire product’s life cycle. Cradle to Cradle proposes a future ‘where design is a positive, regenerative force, producing effects that we want to expand rather than shrink.’ In addition to having positive impact, products create no waste -- all materials are either infinitely recyclable or biodegradable” (Leibowitz 54). Creating a circular business model that allows for the creation of durable items that can be recycled and broken down with more ease will help the fashion industry. Leaders should be encouraged to train their design and product development teams to understand the impact of production. Increasing efforts to collect unwanted, used garments and encouraging consumers to engage in circular initiatives is important too. Leaders need to collaborate in order to understand any challenges and solutions involved in this circular system. Engaging with policymakers to ensure that circular fashion systems are widespread on a global scale is vital. Continuing to invest in innovative technologies to turn textile waste into high-quality fibers and tools at each step of the supply chain can help the industry to maximize its goals to become circular (Global Fashion Agenda). There are also possibilities for clothing to be designed as multi-purpose, adaptable and upgradable, which can lower the amount of clothing that consumers need to buy. Some options to lengthen the life of a garment would be to create apparel that can be worn inside out, has a fixed base, or has removable sections, like a collar, which can be added as a decorative attachment (Ellen MacArthur Foundation 86).

On-demand manufacturing is another model the fashion industry can utilize. It is a process where apparel is produced only when wanted and in the quantities that are needed. Traditionally, large quantities are made and then stored and sold when ready. On-demand manufacturing eliminates the need to hold this inventory. This avoids wasted product and the need for markdowns. It gives brands more time to focus on designing their products, quality control and creating long lasting items that produce less waste (Damen).

There are other current models that are becoming increasingly popular that can assist in replacing the current linear model of fashion, which is leading to lower clothing utilization rates and increased excessive shopping in many areas of the world. Clothing rental models are focused on fast-changing needs and styles. Clothing resale or repair service models help with offering high-quality items and extending a garment's life cycle. These models are thriving already, but in order to get rid of throwaway culture for clothing, there needs to be a larger shift in using these models in the industry.

Both rental and resale offer consumers many different options and the ability to make their clothing last longer. Renting helps meet short-term needs and allows consumers to access trends without having to buy and own the clothing. This is especially ideal for one-off occasions and clothing where the sizes change, such as baby and children's clothing and maternity clothing. Rather than wearing an item once or a few times and then throwing it away, consumers can just rent it. Subscription models can even be used to allow consumers to have a fixed number of garments out at once, which is cost-effective for the customer. In the U.S., subscription services have been known to use bloggers and influencers to their advantage as well, which attracts consumers (Ellen MacArthur Foundation 86).

Even though everyone is not open to these models, the U.S. currently suggests that just over 40% of customers could “imagine using fashion rental” (Ellen MacArthur Foundation 80). Brands will therefore need to continue to make this an appealing option in order for it to become more widely used. This can be done by putting the customer experience first and making both resale and rental convenient and accessible. Quality and hygiene of these products needs to be proven, as well as giving consumers the digital technology through AI to incorporate their existing wardrobe into the equation to assess their clothing needs. In other sectors, such as in hotels, focusing on quality and customer experience created a shift that could be done similarly for fashion. For example, sleeping in hotels where bed sheets are washed and reused has become acceptable (Ellen MacArthur Foundation 86) as well as, giving the hotel guest a personal experience each and every time they visit, which translates well to bespoke fashion -- a personal experience for each and every customer.

Introducing rental and resale models gives an incentive to brands to design for durability because lower rental prices and higher margins can be achieved through circularity. As the average quality and durability of clothing increases, so will its value through rental and resale. Rent the Runway is one successful model that expanded to a monthly rental subscription in 2016 (Ellen MacArthur Foundation 79). In the U.S., they rented more than 800 million USD worth of retail value in clothing in 2014 (when their model revolved just around occasion wear) (Ellen MacArthur Foundation 80). If durability of garments increases, so could rental and resale services because an increased demand for them would be an increased economic benefit. Teaching people to fix their clothing at home could help as well. Retailers could provide these services to teach or partner with other providers in order to get this information to consumers. Many brands, such as Jack Wolfskin and Patagonia already offer repair services for their

products. For example, Patagonia, which operates the largest repair facility in North America, repairs around 50,000 garments each year (Ellen MacArthur Foundation 88).

Improving durability has many advantages for brands, such as reducing the number of returned garments, improving competitiveness, and increasing customer satisfaction and brand loyalty. Patagonia, Eileen Fisher, and Levi's are all brands that have adopted a strategy for durable, high-quality clothing that have all seen a growth in market share and profitability. For example, Patagonia's sales revenue saw an annual growth with gross profits of 600 million USD in 2015 (Ellen MacArthur Foundation 84). Retailers can also make resale markets mainstream by selling used clothing along with their new clothing. This is an appealing and convenient option for consumers. Patagonia had a Worn Wear initiative where they benefited from this setup by using their platform to sell previously used clothing from their brand. They are not only making resale a norm but are increasing visibility of their brand. Luxury brand Stella McCartney has also partnered with The RealReal to encourage their consumers to sell their items once they do not need them anymore (Ellen MacArthur Foundation 87). Furthermore, in order to extend the life cycle of its products, Eileen Fisher created EILEEN FISHER Renew. The brand's consumers are able to return (in person or by shipping) their clothing that they no longer want and get \$5 in rewards no matter what condition the item is in. Once items are received, the brand's specialists sort through them. If it is in great condition, it gets resold. Everything else is recycled or created into a unique work of art. To clean each item, Eileen Fisher collaborates with Tersus Solutions. They wash the apparel in a closed-loop system that preserves water and electricity and captures microfibers. This apparel can be found online and in some select store locations (*EILEEN FISHER Renew*). Secondhand clothing is evidently a market that is increasingly growing in

revenue and is an option that is not only better for the environment, but for the fashion industry itself.

Labeling for durability allows consumers to judge the value of their purchases. Even though durable products cost more to produce and purchase, quality assurance shows the consumer the value of buying longer-lasting items. Quality labeling would need to be consistent throughout the industry to be trusted. A standard for it between brands, producers and retailers will be helpful to build that trust. While more research may be needed on the criteria for this, it could include the number of washes an item can withstand or the minimum times it can be worn without showing wear and tear. Better maintenance information on clothing labels with repair and washing instructions can help reduce water and energy use by encouraging best practices such as using lower temperatures and avoiding tumble dryers. Offering warranties to repair or replace any product can also help and can strengthen customer loyalty (Ellen MacArthur Foundation 84). Additionally, smart labeling solutions offer a way to give this information without a physical label. For example, Khongboon Activewear has a microchip in each garment that provides this information that can be accessed with a phone (Ellen MacArthur Foundation 88).

Overall, brands need to continue to create tools and strategies in order to make their clothing last longer. Using durable materials, strong seams, lasting dyes and prints that can withstand multiple-use cycles are important. Enhanced knowledge, transparency and accountability needs to be implemented throughout the supply chain to ensure better quality. Sourcing materials and fabrics, testing garment durability during washing and use phases, setting goals for clothing to last, and communicating with consumers is important too. Moving away from cheaper production that results in a loss in quality and increasing durability should be a



continued goal, which is possible at minimal costs and can be profitable (Ellen MacArthur Foundation 89). Achieving these goals for more durable, sustainable items will not only create a better fashion system, but will prepare garments to enter resale and rental markets to have an even longer life-cycle, which is better for the environment.

### **Decreasing Pollution and Waste**

Circularity is becoming popular among brands, regulators, investors, consumers and industry initiatives. In just three years, the second-hand market for fashion has grown 21 times faster than the retail apparel market and more companies have shown an interest in resale and aftercare for clothing. Collaborating across the industry through policy and more post-consumer textile recycling have been shown more recently as well (Global Fashion Agenda). The initiatives and goals that the fashion industry and its leaders have set are leading to a contribution of less pollution and waste, but more work needs to be done. Even though some tools exist, many designers do not fully understand how to design for circularity and a majority of textiles are still ending up in landfills. Many solutions can be encouraging, but more collaborations will have to be carried out in order to keep creating results.

The United Nations (UN) has a 2030 Agenda for Sustainable Development that keeps in mind peace and prosperity for people and the planet, in the present and future. There are 17 Sustainable Development Goals (SDGs) that are a call for action by all countries. Preserving our environment and improving the health of people and the environment are among the many goals of this global partnership. The UN believes that fast fashion is responsible for many of the negative social, economic and environmental impacts, so it is important that clothing gets produced responsibly and ethically. The UN Conference on Trade and Development considers the fashion industry to be the second most polluting industry in the world as well. If things

continue the way they are, greenhouse gas emissions can rise by about 50% by 2030, but the UN is hopeful that as the industry makes changes and as consumers become more conscious and aware of the amount of fashion that is consumed, the days where they buy a lot just because it is trendy may dwindle down and less waste can be created (“UN Launches Drive to Highlight Environmental...”).

REGENERATE, a sustainable fashion consultancy, partnered with the UN in 2018 for an initiative called “Partnerships for SDGs.” This commitment seeks to connect the 17 goals to the global fashion industry by providing solutions to address the environmental and social impacts of fashion production and consumption. Some of the solutions they endorse are sustainable design strategies, using sustainable technology and resource management in the textile supply chain, and engaging with consumers for better consumption habits. They engage with companies and consumers and educate organizations and students to deliver information about the SDGs and how they can be implemented (REGENERATE Fashion, LLC 10-11).

An increase in recycling is an opportunity for the fashion industry to decrease negative impacts of disposal and get back the 100 billion USD worth of materials that are lost each year. Developing new materials for production, efficient recycling processes, an increased demand for recycled materials, and more clothing collection locations where they do not exist, are all important factors. Having a more efficient production process that requires less use of fossil fuels and chemicals and can run on renewable energy could reduce pollution (Ellen MacArthur Foundation 25). Additionally, regenerative agricultural methods could be applied to the production of cotton and other renewable materials that are used in production of textiles. This could increase land productivity, return nutrients to soil and increase organic matter.

Increasing the circularity of garments would reduce the quantity of textiles that are sent to a landfill or burned, which both cause pollution. This would reduce the amount of water needed for production as well, and would benefit the environment and people, especially where water is scarce (Ellen MacArthur Foundation 47).

Green buildings are a solution that offer benefits to our climate and natural environment by using less water, energy, and natural resources. They often can even have a positive impact on the environment by creating energy or increasing biodiversity. Green buildings offer economic and financial benefits with cost savings on utility bills through energy and water efficiency. There is also a lot of potential for reducing greenhouse gas emissions. The possible emissions savings can be as much as 84 gigatonnes of CO<sub>2</sub> by 2050 through energy efficiency, fuel switching, and the use of renewable energy in buildings. The building sector can make energy savings of 50% or more in 2050 and can limit global temperature rises to 2 degrees Celsius (above pre-industrial levels) as well (Leibowitz 147).

Using low-water appliances such as low-flow toilets, washing machines, dishwashers, faucets, and any other water-using appliance in buildings can help lower the impact on the environment. Companies can get an ENERGY STAR® seal too, which means they are buying an appliance that uses 10-50% less energy and water. Using less energy by turning off lights and using natural light, turning off computers, printers, and copiers when they are not being used are among other solutions. Furthermore, switching to LED light bulbs can not only reduce an electric bill by up to 75%, but can last 25 times as long as traditional incandescent bulbs and do not have any potentially harmful toxins like mercury (Leibowitz 151).

Reducing waste by using biodegradable items, less paper by going digital, having recycling bins, and shredding paper for packing material or composting it, can reduce waste in

offices. Using real dishes, reusable water bottles (avoiding single-use plastics) and utensils rather than disposable ones make less of an impact with washing them rather than throwing disposable alternatives away. Eileen Fisher is one brand that has taken on many green initiatives. The brand has a skylight-lit office space and glassed-in meeting areas surrounded by an outdoor area with beautiful river views. This open floor plan is energy efficient, reduces lighting costs and has increased employee satisfaction. Using reclaimed wood floors, recycled rugs, kitchens with silverware to eliminate waste and Green Guard certified filing cabinets are some of the other ways the brand reduces its impact on the environment (Leibowitz 158). Stella McCartney has also taken on many green initiatives. The brand's 23 Old Bond Street location in London installed air filter technology that removes 95% of air pollutants and other harmful gases, like nitrogen dioxide. Mannequins made from a bioplastic material that is biodegradable are also in the store (Newbold).

A large amount of global pollution comes from packaging, which is usually single use. The plastic that washes up on ocean shores is a visible result of this, while airborne microplastics are not visible in our everyday lives. Most of the packaging used by fashion companies and brands does not get recycled even if it is recyclable. This is detrimental to our environment because it ends up in a landfill and therefore wastes the natural resources that were used to make it. While plastic and paper are common materials used for packaging, biodegradable bioplastic is a more environmentally friendly option. Reducing the amount of packaging used and making it more compact would help too since less money would need to be spent on packaging materials (Leibowitz 161).

A company called Botanical Paperworks makes zero-waste packaging that contains post-consumer materials and is embedded with seeds. Once planted, it can grow flowers, herbs, or

vegetables. It is ideal for light-weight packaging like wraps or box filler, but there are many ways to be creative and it is a great alternative for brands to create less waste. Additionally, rather than using Styrofoam packing peanuts for packaging that are not easy to decompose, brands can use biodegradable cornstarch packing peanuts that dissolve in water or can be thrown into compost piles. Even though they can increase shipping costs because of their weight, it is a more environmentally friendly option. Styrofoam does get accepted for recycling, but most people throw that away so choosing the cornstarch option is better (“Pros and Cons of Biodegradable Packing Peanuts”).

Some brands have started to introduce biodegradable packaging. Allbirds uses 90% of post-consumer recycled cardboard for shipping their products. The brand Rothy’s uses boxes made from 85% post-consumer recycled materials and ribbons that seal the boxes are also made from recycled material. They offer curbside pickup for their recyclable boxes or consumers can simply return them to the brand since it comes with an added adhesive so extra packaging or adhesives do not need to be used to ship it back (Cunningham). These are some of the steps forward that are being taken in order to use more sustainable packaging.

Scoby, the byproduct of the drink kombucha, can help transform the single-use plastic packaging problem. People discard a lot of plastic (especially in the fashion industry), which ends up in oceans and takes hundreds of years to disappear. It also breaks down into microplastics, which can make their way into food and our bodies. A student in Poland developed a method to turn Scoby into usable, edible packaging for dry food. The Scoby can be a replacement for plastic packaging and does not have the downsides of plastic since it can either be eaten or composted. This is a solution that can be further innovated and transformed to assist the fashion industry in reducing waste, especially when it comes to plastic (Bretan).

The Catalytic Clothing initiative plans to help neutralize pollution by embedding titanium dioxide nanoparticles into clothing fibers. Even though they are not sure of the scope of their reach or what may happen if they are absorbed by humans, it is an interesting idea. The particles released from the clothing would interact with harmful pollutants in the air and create a chemical reaction that turns those pollutants into less dangerous elements. One example that is given is that nitrogen oxide will turn into “relatively harmless” nitric acid. These abilities are meant to last on the product and are an example of an initiative for clothing to help with air pollution (Threewitt).

More than \$120 billion worth of excess fabric sits in warehouses around the world and ends up burned or buried. Queen of Raw, a marketplace to buy unused fabrics online, helps with this problem. They have kept deadstock in circulation, are saving the amount of chemicals being used by recirculating textiles rather than making new ones, measure the amount of CO2 saved compared to what could have been emitted, and identify the amount of waste saved from landfills and money saved by fabric bought and sold. They also save 700 gallons of water per yard of fabric purchased. According to their website, “of the total fiber input used for clothing, 87% is incinerated or disposed of in landfills. The World Economic Forum estimated there could be materials saving of over \$1 trillion just from material reuse, recycling, and upcycling” (“About Us.”). With the creation of this marketplace, Queen of Raw is making a large impact.

Fabscrap is a nonprofit organization created to meet NYC’s commercial textile recycling needs. They collect materials that normally would end up in a landfill and ensure that they are being properly recycled and made available for reuse. According to their website, “New York City residents throw out 200,000 tons of clothing, shoes, accessories, and linens every year. Textiles comprise 6% of the City's total waste stream. Residential waste - material that has been

used and discarded by an individual or family -- is picked up by the Department of Sanitation” (“ABOUT.”). Small scraps are shredded and can be used to create insulation, carpet padding, furniture lining, etc. When they resell these scraps for many different purposes, they help save a ton of waste from ending up in a landfill. Each pound of waste from apparel production is associated with around 2.06 pounds of CO2 emissions, which shows they are making a positive difference.

Overall, it is important that fashion brands reduce their greenhouse gas emissions in their operations and value chains. Adding more low-carbon and nature-based solutions can help move toward a net-zero emission economy. Working with manufacturers across their value chain to reduce greenhouse gas emissions by switching to renewable energy resources, promoting land restoration or investing in sustainable land management practices will help the industry improve as well. Lastly, “frontrunners will collaborate with industry peers, manufacturers, investors and policymakers to help reverse climate change and to turn their companies into climate-positive businesses” (Global Fashion Agenda).

### **Increasing Transparency**

Sustainability has become a widely used term in the fashion industry to describe ongoing projects or initiatives. Designers have started to further integrate recycled fabrics and carbon neutrality into their collections as it continues to be demanded by consumers. Brands like Stella McCartney have used recycled fabrics and plastics in their collections. Gabriela Hearst and Burberry also have begun to create what they call carbon neutral runway shows, but it is important to recognize that this does not necessarily make a brand completely sustainable. Fast fashion companies like H&M push out large quantities of clothing and still have called some collections sustainable. They are causing a lot of waste even if more sustainable materials are

being used. Representing their clothing as sustainable is therefore misleading to the consumer and is known as “greenwashing.” Deceiving consumers is wrong, especially when more transparency is expected today (Dixon, Emily. “The Problem with 'Sustainable Fashion'.”).

Traceability is important for fashion brands and manufacturers to see what challenges there are across their supply chains and how they can implement more sustainable practices. This helps brands to get the data they need to communicate with consumers, investors and manufacturers about the impact of their product. Transparency is being accountable for one’s supply chain and sharing information with consumers, who have the right to know what the supply chain looks like. Authenticity is equally as important and pertains to the ethos of the company. Free trade, identifying a company's supply chain, carbon footprint, worker’s wages, and location of production are all relevant pieces of information. Brands must also keep in mind that younger consumers are especially concerned with social and environmental causes, so they lean toward supporting brands that align with their values and avoid ones that do not (Leibowitz 76).

Sourcing ethically is not always easy. Brands and companies have to work with their suppliers to make sure there are good working conditions, so building a relationship and visiting facilities at random and by appointment in person needs to be a priority. Making sure to consult suppliers, understanding how long an order takes to complete, finding out when peak times are, and the appropriate living wage for the geographical area, are other significant factors. Companies need to keep in mind that low prices equate to low wages for the factory workers and placing orders too close to a shipping date or asking for a last-minute change can also cause workers to work overtime without fair pay. Contacting local organizations, trade unions and NGOs that deal with human rights issues is a good way to uncover the problems that are being



faced in an area, such as inequities in fair wages. Lastly, it is important to not just trust a supplier. Brands need to double check that they are not lying about their rules and regulations in order to get brands to work with them (Leibowitz 76).

Corporate Social Responsibility (CSR) is a type of business self-regulation that corporations use to show their commitment to ethical responsibility in carrying out their operations. This promotes a positive brand image and builds a relationship with consumers. CSR and transparency need to show up in every sector of a company if they want to be seen as fully responsible. This is very crucial today because there has been a rise of “cancel culture,” where people or brands can be “canceled” — in other words, culturally blocked from having a prominent public platform or career” (Romano). This often happens when a celebrity, public figure, or even brand does something deemed offensive or wrong. Getting “canceled” can easily happen since consumers, especially Gen Z consumers, are unafraid to call out brands for doing something wrong or not speaking up on important issues.

There are many measures to take to show transparency in a company. Green buildings that achieve the green building certification, LEED, “in the US and other countries have been shown to consume 25 per cent less energy and 11 percent less water, than non-green buildings” (Leibowitz 147). Becoming a certified B Corporation can show that a business has met the standards of being “verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose” (“About B Corps.”). For manufacturing, the “bluesign® system eliminates harmful substances right from the beginning of the manufacturing process and sets and controls standards for an environmentally friendly and safe production” (Leibowitz 111). This is done by tracing everything that happens to a textile during the manufacturing process and making improvements along the way. Lastly, the Global Organic

Textile Standard (GOTS) “lists all substances prohibited in Organic certification. It lists them by stage, which is helpful to understand where to watch out for toxic substances in your supply chain. It also lists what is allowed, so it can help serve as a guide for better alternatives” (Leibowitz 111).

The Sustainable Apparel Coalition is an alliance for sustainable production in the apparel, footwear, and textile industry. They developed the Higg Index, “a suite of tools that enables brands, retailers, and facilities of all sizes — at every stage in their sustainability journey — to measure and score a company or product’s sustainability performance” (Leibowitz 17). This allows businesses to make improvements that protect their factory workers, local communities and the environment.

Life Cycle Assessment (LCA) “looks at the social and environmental impact of a product over its entire life, including raw material extraction, material processing, manufacturing, packaging, distribution, retail, use, maintenance/ upgrading, and disposal or recycling” (Leibowitz 24). In 2007, Levi Strauss & Co. (LS&Co.) conducted the apparel industry’s first LCA to evaluate the lifecycle impact of a set of garments. It mainly focused on the company’s U.S. operations and revealed that the biggest water and energy impact was in cotton cultivation and consumer care. “Since then, LS&Co. has made tremendous progress addressing areas within its control, leading to more than one billion liters of water saved to date through the Levi’s® Water<Less process and implementation of the apparel industry’s first water recycle/reuse standard in its supply chain” (Levi Strauss & Co. 1). Through an initiative called “Care Tag for the Planet,” the brand has also been able to educate and encourage consumers to use less energy and water when taking care of their clothing. By joining the Better Cotton Initiative®, LS&CO.

has been able to invest in more environmentally friendly cotton and help improve farmer livelihoods as well (Levi Strauss & Co. 1).

According to Kering's website, Kering's Environmental Profit & Loss (EP&L) tool "measures carbon emissions, water consumption, air and water pollution, land use, and waste production along the entire supply chain, thereby making the various environmental impacts of the Group's activities visible, quantifiable, and comparable" ("EP&L: a Measurement..."). The impacts are converted to monetary values to measure the use of natural resources. Kering uses the EP&L to decide what its sustainability strategy will be, how to improve its supply sources and the best technologies to use. In order to move the industry forward, they have been sharing this tool with other companies.

More brands and manufacturers have implemented supply chain measurement tools as they become more available. This helps them understand where and how their products are made and the environmental and social impacts involved in the production. To increase traceability, fashion brands understand and measure their value chain impacts, increase transparency and have stakeholder engagement on sustainability. Companies serious about this will invest in new technology that gives access to supply chain data and use traceability methods to understand problems like deforestation and pollution, how they are impacting the climate, and circularity and biodiversity (Global Fashion Agenda).

When fast fashion began, retailers felt the pressure to cut down prices for consumers, which caused costs for brands to rise. As a result, companies started to move their local factories abroad for lower labor costs and to produce raw materials cheaply. This led to very complex supply chains that were difficult to trace. Now that people are demanding more transparency from fashion brands, new tools and technologies are helping people learn about how ethical and

sustainable their favorite brands are. This technology is called blockchain and has been used by companies like Walmart. As a result of using blockchain for food traceability, “Walmart can now trace the origin of over 25 products from five different suppliers using a system powered by Hyperledger Fabric (“Walmart Case Study.”). Now, this technology is able to be applied in the fashion industry. “Blockchain offers end-to-end visibility in supply chains, for example—when raw materials like cotton leave the farm, they are accompanied by paperwork (which accumulates at each stage of the supply chain) that usually remains with the producers in their internal systems. The use of blockchain would allow the information to be uploaded as a block and anyone with access to a blockchain-based network could procure the information” (Barot and Manvi). Therefore, blockchain can be helpful for tracking tags and for tracing products throughout the supply chain (from raw material to the factory and to the consumer) (“Can Blockchain Technology Make Fashion More Transparent?”). It also helps with shipment tracking, delivery timing and preventing counterfeit products from taking away profits from the actual brand (“How Is Blockchain Technology Changing the Fashion Industry?”). Blockchain shows a list from when the product was first being created without any data being manipulated. “By integrating blockchain based technology into the supply chain, brands can also protect their intellectual property by safeguarding their designs, making imitations by fast fashion brands difficult. Thus, when the origins of a garment can be traced, counterfeit garments will not possess such a chain of records and can be weeded out from authentic pieces, allowing them to retain their uniqueness” (Barot and Manvi). Overall, although it is still a developing technology, blockchain facilitates transparency by allowing consumers to view each stage of the manufacturing process and see firsthand if a brand is being sustainable and ethical. This will help consumers trust that their garment is going through a process that matches their set of values.

This is especially important today since consumers want to buy from brands that reflect their own personal beliefs.

### **Creation and Utilization of Sustainable Textiles**

Commonly used synthetic fibers like polyester, nylon, spandex and most fake leathers and furs come from crude oil, a non-renewable resource that comes from the earth. It takes a long time for nature to produce oil and the industry is using it up faster than it can be replaced. Synthetic fibers shed microplastics through washing and end up in our water, which then ends up in food and the air. It is harming both people and our oceans. There are studies being carried out to understand the problem of microfiber shedding and finding solutions to it, but further research needs to be done to develop fibers or fiber coatings that would prevent shedding or create washing machine and industrial water treatment filters to capture microfibers (Leibowitz 54).

While there are many great technologies advancing the fashion industry, more will have to be created to keep progressing forward. When fibers are blended, they are difficult to recycle. Creating products with one material makes it easier to recycle and therefore have a closed loop system. Another option is to use sustainable materials, which is becoming more important for fashion retailers. Natural fibers, such as recycled and organic cotton, organic hemp, and organic linen are great options. Organic cotton has a lower impact on the environment. It has been found that compared to conventional cotton, organic cotton is “46 percent less harmful to global warming, there’s 70 percent less acidification of land and water, the potential for soil erosion drops 26 percent, surface and groundwater use falls 91 percent and demand for energy could go down by as much as 62 percent” (Donaldson). Mylo, a synthetic leather fabric created from mushroom roots, was created by a company called Bolt Threads. They have partnered with brands like Stella McCartney and Patagonia and most recently, Adidas. As of April 2021, Adidas

revealed the Stan Smith Mylo. “Mylo is used for the outer upper material, perforated three stripes, and heel tab overlay of the Stan Smith. The midsole is constructed from natural rubber” (Spötter). This is a great way to innovate an iconic sneaker that otherwise would be made of leather or a manmade textile that is not biodegradable. Piñatex is another increasingly popular textile. “It is a natural, non-woven and patent-protected material made from pineapple leaf fibers, is praised for being durable, breathable and pliable, in addition to tensile strength that is similar to flax and greater than jute, hemp and sisal” (Meyers). It has been used by more than 500 brands since 2016, including Hugo Boss and Lancel. Lastly, Lenzing creates fibers made from cellulose, which is a renewable, natural component of their source, material wood. Cellulose is biodegradable and compostable, so this is a closed loop cycle (“Lenzing Group.”). These are some examples of the many great fibers and fabrics that have been invented for brands to utilize.

There are many other companies and programs accelerating the fashion industry toward using better textiles and systems to create them. The Textile Exchange Preferred Fiber & Materials (PFM) offers a membership that connects companies with suppliers who use sustainable fabrics (Leibowitz 101). BIONIC® is a company that specializes in material engineering. Using coastal and marine plastic, they have created textiles and polymers that can be used for manufacturing. With the use of ultrasonic technology, IndiDye® has reached “high levels of color fastness for natural dyes without the use of chemicals, at the same time reducing water consumption significantly. They utilize a new patented dyeing technology that combines natural beautiful colors and ancient dyes with an innovative new ultrasonic fiber dyeing process” (Leibowitz 118). Furthermore, NRDC Clean by Design offers a program where it has helped mills significantly reduce their environmental impact in fabric dyeing and finishing. The 33 mills

that used this program in 2013 saved “3 million tons of water, 61 thousand tons of coal, 36 million Kwh<sup>1</sup> of electricity, 400 tons of chemicals, and \$14.7 million dollars” (Leibowitz 33).

Many brands have been working toward creating technology or working with organizations to make their products more sustainable and innovative. Kloters, a loungewear brand in Italy, is hoping to make a positive environmental impact with the world’s first pollution-absorbing t-shirt. The shirt has a chest pocket insert made of a special fabric that absorbs and lowers pollutant molecules. A lab test showed that one shirt is able to offset the emissions of two cars, which could make a huge positive impact (Pinnock). In 2015, Adidas partnered with Parley for the Oceans, an environmental organization, to turn marine pollution into sportswear. The brand expected to make 11 million pairs of shoes using recycled ocean plastic in 2019, which was double what it made in 2018. Adidas has an overall goal to replace all of its virgin polyester with recycled plastic by 2024. Currently, 40% of its apparel is made using recycled polyester (Morgan).

H&M has created a piece of technology that is said to be the first to separate and recycle polyester and cotton-blended clothing at scale. Monki, the womenswear brand owned by H&M, will release products made using the recycled fibers in a small collection. The fashion industry relies heavily on polyester and also struggles with waste, so this is quite noteworthy. Although circularity is gaining momentum, The Ellen MacArthur Foundation estimates that currently less than 1 percent of materials used to produce garments are recycled into new ones. Poly-cotton blends have proven especially hard to recycle since once the fibers are twisted together, they are nearly impossible to break apart. This is a breakthrough since H&M has created a possible solution for this problem with their Green Machine that can separate these blends. It is a closed loop system, which means that all the water, heat, and chemicals are recycled, although, the

reclaimed polyester is still likely to shed synthetic microfibers in the wash and contribute to marine plastic pollution. In addition, it currently cannot recover non-polyester or non-cotton fibers from more complex blends, such as those containing acrylic and elastane. Either way, this is another step forward and provides a possible solution for the fashion industry to use more sustainable textiles (Chua).

### **Educating Consumers to Buy More Mindfully**

Educating consumers on how to buy more mindfully is extremely important to make the fashion industry more sustainable. Studies have found the greatest environmental impact occurs during consumer usage. It has been shown that around 80 to 90 percent of the total energy used by a washing machine is created by heating the water. Energy can be reduced by washing clothing in cold water and hang-drying it. Other than using less energy, air drying also increases the longevity of clothes (Leibowitz 183).

It is important to educate consumers on how to prolong the lifetime of their garments and lower their carbon footprint, which “is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions” (“What Is Your Carbon Footprint?”). “A study by WRAP found that extending a garment’s life by just three months would lower the water, carbon, and waste footprint by 5–10%” (Leibowitz 184).

It starts with the people who are designing the clothing. Making low quality products that do not last long will not have a long lifecycle even if consumers do what they can to take care of them. First brands need to create high quality products that can be repaired and then they need to inform consumers how to care for and repair them, if needed. Washing less, washing in cold water, washing only when loads are full, washing on shorter cycles, using front-loading, energy efficient machines, air drying, using non-chlorine bleach and using safe laundry detergents are



some things consumers can do. Brands can further educate the consumer by adding this information to care labels. Also, if applicable, having information about the materials, recyclability, and instructions for disassembly, along with placing this information on a brand's website would be helpful. Brand recycling, resale, and repair programs would also make it easier for consumers to care for the product (Leibowitz 185). Furthermore, tools like thredUP's Fashion Footprint Calculator give consumers the ability to calculate how their closet contributes to climate change and access to resources on how they can make changes to improve their impact.

Millennials and Gen Z have a lot of buying power. They care more about the environment, engage in thrifting, and demand transparency and textiles that are sustainable. It has even been said that nine out of ten Generation Z consumers think that companies have the obligation to speak to environmental and social issues (Amed). Therefore, this incentivizes brands to become more sustainable. In a case study from the Business of Fashion, there is a focus on Nike, Brandy Melville, Morphe, Depop and Louis Vuitton and how they have successfully attracted Gen Z, those born between 1997 and 2012. Gen Z currently makes up 40 percent of global consumers and \$150 billion in spending power in just the United States, according to McKinsey & Co. This means that attracting Gen Z will be important to many brands and retailers, especially post COVID-19. Gen Z is gradually joining the workforce and are predicted to have higher rates of consumption. There are now so many ways to reach these young consumers, who are more vocal than ever about what they want and expect from brands. They want their values and beliefs to be reflected by their favorite stores. It is important to pay attention to them, especially now that COVID-19 has changed buying habits. By utilizing creators and creating communities on different platforms, companies have had success in attracting this customer. Gen-Z looks to influencers for trends and direction. They follow

influencers in the same way that generations before them looked up to celebrities, actors, royalty and the wealthy for their cues. While there is no single strategy, campaign or message that can assure success, there are different approaches that can help brands reach consumers in order to help educate them on buying more mindfully (Nanda).

A study found that the fashion industry is not providing millennials with adequate sustainable fashion choices that meet criteria important to them when making a purchase. For 95% of millennials, this includes ease of making a purchase, as well as price and value. There needs to be more variety of fashion items to meet these expectations. Information on sustainability needs to be clear and straight to the point, since attention spans of this generation are short. Labeling any sustainability certifications on product descriptions online or the “ability to filter products by sustainable attributes like “fair trade” or “100% organic cotton” — much like they filter products based on price, brand or colour — could sync with millennials’ desire for ease of use” (Hahn-Petersen).

According to a Business Insider survey of around 1,800 people in Gen Z, the primary motivator when it comes to deciding where to shop is price. Since their focus is on social media, there is pressure to always acquire new clothing, which in turn has caused a growth in rental and resale. Platforms like Poshmark and Depop are being visited more than ever. They provide Gen Z a way to have a unique look and not have to spend as much money (Hanbury). This is why it is important for brands to create long-lasting garments. It increases a garments lifecycle and chances to be used for rental or resale.

Overall, Gen Z and millennials make up a large percent of the population and will eventually have even more buying power as time goes on. Therefore, it is important for brands to give them the attention they deserve and appeal to them to buy more mindfully. This applies to

the older generations as well, who currently have a lot of buying power. It is important that the global community comes together to assist the fashion industry in their efforts towards sustainability, decreasing its negative environmental and social impacts.

### **Conclusion: Moving Forward from COVID-19 and the Future of Fashion**

The coronavirus pandemic has served as a stopgap or pause in our normal lives; we now have time to reflect on what we have done as a community. Many fashion executives and business leaders have been focusing on crisis management. Shifts in the global economy and consumer behavior now and post-pandemic will need to be understood by leaders in the fashion industry. As these changes occur, many may wonder what changes may start to happen in the current fashion system. Throughout the pandemic, the industry struggled on both sides-- consumer demand and supply chain management. Manufacturing was halted in many places and widespread store closures were especially damaging for many retailers. The pandemic impacted the low-cost sourcing in manufacturing hubs, such as Bangladesh, by negatively affecting workers. This situation gives the fashion industry a chance to reshape its value chain and an opportunity to reassess how it measures its actions (Amed and Achim).

According to McKinsey and Co., large discounts as a result of the pandemic are going to build a new shopping culture and brands will need to find ways to regain value and rethink their broader business mission, although, “in the luxury segment, we expect consumers to return more quickly to paying full price for quality, timeless goods, as was the case after the 2008 financial crisis” (Amed and Achim). The pandemic also brought values surrounding sustainability and conversations around materialism, over-consumption and irresponsible business practices into focus. “The focus on sustainability will be especially prominent for Gen-Z and Millennial shoppers, whose concerns for the environment were already heightened pre-crisis” (Amed and

Achim). Also, keeping stores open during the pandemic and putting retail workers in danger (where there are already a lack of healthcare benefits), has directed anger toward retailers. Although the world continues to experience the negative impacts of the pandemic, it has uncovered some concerns in the fashion industry that may cause a shift to it becoming more sustainable.

Social media has shown the power the world has in coming together and connecting during a crisis. Fashion companies and leaders, such as Christian Siriano, were quick to create face masks for those in need in New York after Governor Andrew Cuomo reached out for help on Twitter. Many people continue to share ways to help each other on social media through this tough time. Everyone has been doing their part, why can't the global fashion community come together in the same way to help with climate change? One side effect of the pandemic was a decrease in carbon emissions. This was due to a compromised supply chain. Orders had to be canceled, stores shut down, and meetings were moved to online, so travel significantly decreased. If the fashion industry is to make remarkable changes as it moves toward sustainability, it is important to insist that businesses increase transparency and take action to limit their operations that contribute to the amount of greenhouse gases being released into the atmosphere. Overall, climate change needs the same unity and spotlight as the pandemic received in order for us to make a positive impact on the environment (Farra, "Now Isn't the Time").

We have also seen an increase in making masks more stylish as they have become part of our everyday attire. Not only have they been seen on the runway, but they are more noticeable in innovative technology that is now more relevant. For example, a company called Bioscarf has created scarves that have an air filter. When tested, it filtered out around 99.75% of airborne

particles. “That means it can help protect you and your family from pneumonia, strep, influenza, tuberculosis, pet dander, pollen, smoke and many other airborne contaminants that not only cause allergies but can also be harmful to your health” (*BIOSCARF*). Even though this product was created before the COVID-19 pandemic, this is something that is very relevant today.

Scough is a company that created a fashionable face covering. Their goal was to create a bandana that would have a high-quality filter in order to block air pollution and particles. They are all breathable, lightweight and can be washed. Their filters last for 90 days as well and are a more environmentally friendly option rather than using a disposable mask and throwing it away. While they have a disclaimer that it is not a medical product used to protect against germs or viruses, they mention they are working on improving their design since COVID-19 (“Learn More About Scough.”). They have also been promoting mask wearing on their website, so COVID-19 has sort of been able to bring them to the forefront of fashion as well.

Economic shutdowns as a result of the COVID-19 pandemic have created many challenges for the fashion industry, including disrupted supply chains and decreased consumer spending. COVID-19 has revealed global supply chain vulnerability and had a major influence on manufacturing. Many people and businesses were unable to get their materials and products made where they usually did, causing many to have to change how they were going to produce their products. International trade became restricted and many orders ended up being canceled. Followed by closures all around the world, production came to a halt in China first. While everyone had some sort of struggle, some brands and suppliers were hit harder than others. For example, J. Crew, Centric Brands, and Neiman Marcus are among many who filed for bankruptcy (Ricchetti). Since it was more difficult to source globally and transport goods, the low-cost sourcing countries that are dependent on textile and garment exports for money faced

especially tough times (Teodoro). Although it is possible that sustainability may not even be a primary concern since some brands need to focus on surviving, this may lead to more sustainable supply chains, which can impact the entire industry.

It is already known that the manufacturing of garments creates a large amount of textile waste throughout the supply chain. “A study by Reverse Resources shows that more than 25% of materials -- and sometimes as much as 47% -- are discarded in fabric and garment factories” (Ricchetti). Fashion brands and manufacturers have already been working toward more environmental sustainability, especially when it comes to getting rid of chemicals and reducing carbon dioxide emissions, but the pandemic may push the industry toward it faster. This leaves the question of whether or not the fashion industry will shift how it releases collections of clothing, and what this will mean for big retailers. Some stores are also now out of touch with who their customer is since there has been a shift in consumer behavior. This is a problem, especially if they want to attract young buyers, like Gen Z, one of the largest groups of consumers. The pandemic has and will continue to cause companies to reconsider what direction they should move toward in order to continue to attract the consumer they want (Farra, “We All Have A Chance”). Overall, COVID-19 is a crisis that is causing fashion companies to tailor their strategies to fit their priorities and capabilities, but we cannot forget about the goals to create a more sustainable industry.

Ultimately, the fashion industry needs to create changes for long-term stability in all areas of the supply chain. The pandemic has taught the world that so much is possible to do virtually. Flying around to buying appointments, shows, and events are no longer as relevant as they once were. As everyone adapts to this new way of coming together, there are not many reasons why we cannot. The global fashion community can easily collaborate on a variety of

online platforms. Global issues, like climate change, can only get better if the fashion industry creates resilient models that will sustain it. Being mindful of product design and whether or not a product is actually needed, is essential for brands to keep in mind. One group will not be able to fix all of the problems there are, but brands need to start somewhere within the value chain. It is hopeful that by bringing awareness to the issues the fashion industry creates, necessary changes will eventually lead to a more environmentally friendly fashion industry and sustainable future.

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