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Dressed for Disaster: An Advocacy for Sustainability in a Fast Fashion World

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Abstract

It's not uncommon to hear that major steps need to be taken by 2030 before the effects of climate change become irreversible. The clothing production industry is a major contributor to these problems. This project focuses on sustainable fashion. After giving a brief background on the climate crisis, it analyzes what fast fashion is doing in terms of the harm it has on the environment, focusing on common negative practices in clothing production. The discussion then turns to the environmental impacts of sustainable fashion, examples of business strategies, various sustainable clothing brands, and methods in clothing production that can sustain the environment. The last topic is the positive aspects of building a sustainable fashion brand. The desire is to continually highlight the positives of making clothing design and production sustainable to encourage companies to follow suit.

The end goal is to provide a compelling argument as to why a company should integrate sustainability into its business. In order to make the greatest impact on various fashion companies, they may be sent the end product created in an effort to communicate a way for them to be more environmentally friendly while reducing the research that the companies would have to do as much as possible. The goal of this is to make the incorporation of sustainability easier for companies. Although it is unrealistic to expect to overhaul any company's production methods with this work, the hope is that this research can enact some positive change in the world.

The Climate Crisis

Global warming and its impacts are an occurrence that many of the world's populations are aware of and informed of. It is well understood that, since the Industrial Revolution in the 18th and 19th centuries, the climate of the earth has changed at a rapid rate. Even allowing for a natural shift in the climate over time, it has changed too much too quickly following the industrialization of the United States and Europe to disregard any concern. Since then, technology has only advanced—but so has the climate crisis. New technologies began to be utilized in higher frequencies and at greater numbers; technologies that deplete the earth of its natural resources and harm the environment. Technology that allowed products to be produced at a faster rate led to the growth of consumer capitalism in the 19th to the 21st centuries. The demand for more products in less time has greatly impacted the climate crisis. A primary contributor to the climate crisis is the production of greenhouse gases. In *The Economic Effects of Climate Change*, author Richard Tol writes, "The sources of greenhouse gas emissions are more diffuse than any other environmental problem. Every company, every farm, every household emits some greenhouse gases" (Tol, 2009, p. 29). These emissions are not a problem that can be taken lightly; they block infrared radiation from leaving the Earth's atmosphere. This traps the radiation from the sun inside the earth's atmosphere, in turn warming the climate. The warming climate causes the melting of ice caps, which means disrupting the habitat of animals who live on ice caps, floods and dams bursting—destroying forests and other habitats—disrupting the temperature in the water and the oceanic food web, and

rising sea levels—causing coastal erosion, and storm surges as a result of warming air and ocean temperatures. The impact of greenhouse gases reaches not only the environment and the animals but humans as well. Like all climate change, the impacts are inescapable for all living things.

Literature Review

Clothing Production's Impact on the Environment

The Environmental Price of Fast Fashion

Due to the massive size of the fast fashion industry, the market produces and wastes enough items to pose a key environmental threat. The pollution and waste that the fast fashion industry creates, while detrimental to the environment, are not something that the industry chooses to focus on. Fast fashion producers' and retailers' concern lies with the reduction of cost of production and speed of delivery to the market, regardless of how this harms the environment. Waste and pollution are present in many key stages of the industry, from knitting and dyeing in the production stages to distribution. Textiles made from knitting and weaving use excess amounts of water when they go through wet processes such as bleaching, dyeing, and finishing. In this process, a lot of excess waste is produced. The use of water and chemicals in textile, fiber, and yarn production impacts the environment negatively, as well as the CO2 emissions that are produced during the manufacturing, distribution, and consumption stages. Water usage has a major impact on the environment and is prevalent throughout the fast fashion industry (Niinimäki et al., 2020, p. 190-192). In 2015 it was estimated that 200 tons of water were used to produce one ton of textiles, totaling 79 billion cubic meters that year. This usage not only exacerbates water scarcity, but also produces wastewater. Wastewater is created by toxic chemicals used in the manufacturing process that aren't treated properly, leading to them entering the local groundwater in the area and harming the ecosystem. Wastewater is

very prevalent in Cambodia, where 88% of all industrial manufacturing occurred as of 2008. It is estimated that 60% of the water there is polluted (Niinimäki et al., 2020, p. 192).

The water usage prevalent in the fast fashion industry has a major impact on the environment. Most of the global water usage in the fashion industry stems from the various processes associated with cotton and the wet processes of textile manufacturing, such as bleaching, dyeing, and finishing. In fact, cotton has the highest water footprint of any other fashion fiber. Currently, textile production uses an estimated 44 trillion liters of water yearly for irrigation—about 3% of global irrigation use. In total, 95% of that 44 trillion liters is connected to cotton production (Niinimäki et al., p. 2020, 191-192). Textiles that are made to be waterproof are also harmful to the environment. The stable fluoropolymer chemicals they are made with are found as far as remote areas of the Arctic as well as in the bodies of seals and polar bears (Niinimäki et al., 2020, p. 194).

Even with the lengths production companies go to in order to mass-produce fast fashion clothing, garments are thrown out after only a few uses. Compared to 2005, the garment-use time has decreased by 36% on average, meaning clothing is being disposed of more quickly than it has in the past. This is hardly surprising, as the fashion industry encourages consistent consumption and impulse buying from its consumers. This creates a sense of urgency when shopping as a buyer (Niinimäki et al., 2020, p. 189-90).

The Business of Fast Fashion

The Global Environmental Injustice of Fast Fashion

Fast fashion encourages its consumers to view clothing as disposable (Bick, Halsey, Ekenga, 2018, p. 2). In America, the average person disposes of approximately 80 pounds of clothing on an annual basis. This results in clothing occupying almost 5% of all landfill space in America. One tactic that companies employ to encourage overconsumption is greenwashing. This is when companies market their products as "green" and environmentally friendly without following any of the criteria that are derived from Fair Trade America and the National Council of Textiles Organization (Bick et al., 2018, p. 2-3). While these certification organizations offer evaluation and auditing tools in order to promote fair trade and production standards, many companies capitalize on the emotional appeal that eco-friendly goods create instead of truly enacting change. Companies market their products as "green", but they don't actually adhere to any of the criteria that would make it so. This is simply a marketing ploy in order to increase sales of products. Increased demand for large amounts of inexpensive clothing has changed the past two decades of fast fashion. There is a continuous demand for inexpensive clothing, having become what is ordinary for big-name fashion brands. In the last 20 years, this increase in production is what has led to environmental and social degradation throughout the supply chain (Bick et al., 2018, p. 3).

Green Practices in Sustainable Fashion

Prospects of Sustainable Fashion Design Innovation

As the sustainability industry has grown and developed, it has garnered the support of many people (Kumar, 2017, p. 7). While many fashion trends have irreversibly harmed the environment and put human survival at risk due to the impacts of global warming, pollution of the air, water, and land, and energy depletion, environmentally friendly clothing is now gaining popularity. Many sustainable practices have been initiated by various clothing companies, such as the use of green natural fiber and green regenerated fiber being used to create textiles. Examples of these fibers include organic cotton, bamboo fiber, natural color silk, soybean fiber, milk fiber, and corn fiber. Another new sustainable practice in clothing production that is being explored stems from a collaboration between a famous British designer and some scientists. Together, these minds are attempting to manufacture plastic clothes that can dissolve in water using biodegradable polyvinyl alcohol and capsules that are water-soluble. The goal of this research is to find a way to reduce the amount of clothing that is sent to landfills. If clothing was able to dissolve in water it would reduce the pollution and waste resulting from discarded clothing being sent to landfills (Kumar, 2017, p. 8).

The same researchers are reported to be working on another sustainability-centric project of designing "contact reaction clothing." This technology would allow the clothing to control pollutants through the processes of neutralizing and washing. Helen Dorian, a professor at the London College of fashion working on this project,

explains that the large surface area that clothing possesses can be used to purify the air (Kumar, 2017, p. 8). Designers, manufacturers, and companies all have a responsibility to the environment through the impacts that the fashion industry has and the unsustainable consumption behavior of consumers. The products placed on the market configure consumers' needs and use patterns to derive what should be produced, hence creating consumption habits. Designers hold power in that they have the ability to create fast-changing trends that can quickly outdate other products and render them no longer popular (Kumar, 2017, p. 9). Environmentally, slow fashion cycles are much more beneficial, which designers have the power to enforce. In addition, fashion companies have power and possibilities directly correlated to their size, meaning the larger the company, the more influential it has the opportunity to be in the field of sustainability (Kumar, 2017, p. 11). Large corporations have so much responsibility to lead in sustainable fashion because climate change is shaping the future in a critical way. Because of a lag time that exists, the impacts that corporations are having on the climate crisis that will be experienced in 2025 will still be from pollution that has already occurred. With this in mind, how the climate changes in the approaching years will be critical in determining what the future looks like (Kumar, 2017, p. 8).

Marketing of Green Practices in Sustainable Fashion

Environmental Impacts in the Fashion Industry: a Life-Cycle and Stakeholder Framework

The design and developmental stages in the fashion industry have the potential to play a vital role in incorporating environmentally sustainable policies in their processes of clothing production. While having these policies developed in the first place is important, it is even more so that those policies would genuinely be integrated into the various stages of the fashion industry. The Centre for Sustainable Fashion found that, while designers are becoming more aware of sustainability and rethinking their role in environmentally-friendly fashion, they are having difficulties working within a sustainable framework. This may be more attributed to a lack of the systems' approach in the fashion than any other factor (Kozlowski et al., 2012, p. 18). Designers do, however, have a great opportunity to be influential and effect change. Through design, there is the potential to incorporate environmental, social, and stakeholder considerations that can achieve a company's social and environmental goals using strategic supply chain management. The design stage of the fashion industry has the ability to directly influence the care and maintenance requirements of their garments produced and the option to reuse materials, as well as other choices related to the clothing's end-of-life management (Kozlowski et al., 2012, p. 26).

Research has previously shown that the different characteristics of clothing create an appeal that serves as the strongest influence on purchasing behavior. Instead of the social and environmental impacts that a certain clothing company has,

the draw for consumers is located in the color and style of the clothing. For designers, this means that they must create products that appeal to the consumers who are potentially purchasing them, sometimes resulting in a disregard for the environmental impacts that a design might have. They must be conscious of reaching their financial goals in order to pursue other objectives, such as achieving environmental and social sustainability in their apparel. Although they may be more drawn toward the appeal of the clothing they're purchasing, today's consumers are also growing in attunement to the social ramifications and environmental and social impacts of the fashion industry (Kozlowski et al., 2012, p. 24). This gives leeway to companies and designers who want to pursue sustainability in their clothing brands and explore what methods are best, such as using fair-trade and organic fiber (Kozlowski et al., 2012, p. 30). This choice in fiber results in a reduction of negative environmental impacts as well as a promotion of positive social impacts. In utilizing this strategy, companies add value to both the product and the company and create positive stakeholder perceptions. This allows the company to align itself with a not-for-profit or NGO. H&M has employed this strategy by associating with the Better Cotton Initiative as well as with other buyers and product developers from other companies that use the same suppliers and factories as they do (Kozlowski et al., 2012, p. 30). Another strategy that can be employed to aid in the sustainable fashion industry is applied by analyzing the end-of-life management of clothing (Kozlowski et al., 2012, p. 29). Design considerations focused on end-of-life management include selecting materials that can be recycled, upcycled, or repurposed by avoiding blending

materials that cannot be separated, having systems and services in place to take back and recover products, and incorporating features in the products that are repairable, replaceable, or upgradable in order to maximize durability and longevity of the garment. These methods can be employed in designing jeans. They have the ability to be designed as more durable, repairable, and recyclable, which increases their garment longevity and adds value to the product and the organization. Patagonia, Levi's, and North Face are all brands that have implemented take-back programs and repair services to offer to their consumers. Recyclable jeans can reduce costs in the acquisition of raw materials and in the number of resources necessary to create new products. In addition, the environment is positively impacted by the employment of these strategies through the elimination of the future use of virgin materials (Kozlowski et al., 2012, p. 29).

The Environmental Impacts of Fast Fashion Clothing Production

The fast fashion industry has a significant impact on the deterioration of the world's environment. How clothing tends to be produced and the mass amounts in which it is made and then thrown out only harm the environment further. In his article *Slow Fashion in a Fast World: Promoting Sustainability and Responsibility*, Mark Brewer writes that fashion, in general, is one of the world's most polluting industries. Because fast fashion aims to churn out a higher volume of clothes in a short period of time—sacrificing the quality and longevity of the clothing in the process—it is especially detrimental to the environment. The low quality of clothes only makes them deteriorate and be thrown away faster, adding to the pollution caused by clothing waste. Brewer explains the main reasons why the fashion industry is so harmful to the environment, saying that "it requires enormous quantities of raw materials, creates considerable levels of pollution, leaves a significant carbon footprint, and generates alarming levels of waste" (Brewer, 2019, p. 2). Each of these impacts is caused by a multitude of reasons within the fashion industry, but Brewer highlights the largest contributors to pollution. Waste is, in part, contributed by all the clothing that is thrown away after wearing out quickly as well as extra material that is thrown away.

Brewer reports that the fashion industry is estimated to contribute to 17-20% of global industrial water pollution (Brewer, 2019, p. 2), meaning that much water pollution worldwide is caused by waste from the fashion industry. This wastewater that is produced by the textile industry "often contains high levels of dangerous dyes

and other chemicals, which may be toxic to aquatic wildlife and harmful to human health." Specifically, these dyes often contain carcinogens that have been proved to lead to various cancers. In this way, the fashion industry does cause an alarming amount of pollution, as Brewer wrote. It is not only damaging the quality of the environment and human life but animal life as well. To some aquatic creatures, the pollution that the textile industry causes in the water is deadly. Brewer writes, "According to the World Wildlife Fund, 20,000 liters of water are required to produce one kilogram of cotton" (Brewer, 2019, p. 2). This contributes to the significant carbon footprint that he mentioned prior. Water is a natural and infinite resource, so it can be confusing as to why using it in this way is harmful to the environment. Because of the chemicals that are sprayed onto the cotton, the water used to produce them becomes the wastewater that was previously discussed. When this water re-enters the water stream, it then hurts sea life as well as people. To combat this specific problem, organic cotton can be used. When organic cotton is used in clothing production, there are no harmful chemicals that put the ecosystem at risk. Energy consumption, as a whole, is negatively impactful to the environment. In *The Economic Effects of Climate Change*, Richard Tol states, "The production of CO2, the predominant gas implicated in climate change, is intrinsic to fossil fuel combustion…One cannot have cheap energy without carbon dioxide emission" (Tol, 2009, p. 29). The energy that is consumed by large corporations, such as those producing textiles and clothing, is enough to produce a harmful amount of carbon

dioxide. While effective for business, cheap energy costs sustainability and endangers the future.

In *The Environmental Price of Fast Fashion*, six authors collaborated to discuss how fast fashion harms the environment. Like Brewer, they showcase how the fast fashion industry consumes water and produces wastewater in a way that is detrimental to the ecosystem. According to their numbers, the fashion industry consumes 79 trillion liters of water per year, 20 percent of water pollution is a result of textile treatment and dyeing, and contributes 35 percent of oceanic primary microplastic pollution—190 thousand tonnes per year (Niinimäki et al., 2020, p. 189). This journal article gives more examples of how the clothing production industry is harmful to aquatic ecosystems. Brewer and Niinimäki and her colleagues both note how much water pollution results from the clothing production industry, finding the same percentage from their data collection. Their articles were published a year apart, and while Brewer's results reported that 17-20% of water pollution is from the fashion industry, Niinimäki and her colleagues found it to be a clear 20% (Brewer, 2019, p. 2; Niinimäki et al., 2020, p. 189). From this information, it can be concluded that water pollution from the fashion industry has decidedly not decreased. The problem may have stayed the same or even gotten worse, but no evidence points to it having improved. *The Environmental Price of Fast Fashion* also touches on the immense quantity of microplastics that are entering the ocean as a result of clothing production industries. As explained, the industry contributes a significant amount of microplastics—small pieces of plastic that have broken off from a larger piece of

plastic—to the ocean. Microplastics could be eaten by sea creatures and create health problems for the animal that may kill them. Sea creatures are also caught in or strangled by microplastics such as fishing lines. Microplastics enter the water system that humans use and exist in the water they drink and some foods that they eat. Due to all the negative outcomes that microplastics bring, there is no positive outcome of them entering the waterways.

Niinimäki and her colleagues do not solely focus on what the fast fashion industry does that is harmful to the sea. According to their research, the industry also produces eight to ten percent of global carbon dioxide emissions, which equals four to five billion metric tons per year (Niinimäki et al., 2020, p. 189). It is common knowledge how harmful carbon dioxide (CO_2) is to the environment, especially in such an outstanding amount. Carbon dioxide is a greenhouse gas, which is a gas that contributes to the greenhouse effect. Greenhouse gases are those that trap thermal energy in our atmosphere that would otherwise escape into space. The right amount of carbon dioxide keeps the planet at a warm and livable temperature for the life on it. With ever-increasing amounts of carbon dioxide and other greenhouse gases being released and trapped in the atmosphere, however, the planet is becoming warmer than it should be. Results of this are melting ice caps—which means a diminishing habitat for arctic animals such as polar bears and penguins, warming oceans—which causes the water to expand and the sea level to rise, and other changes in where species of animals and plants can live. All of this is a result of excess carbon dioxide being released into the atmosphere, which the fashion industry does at four to five

billion metric tons annually (Niinimäki et al., 2020, p. 189). Niinimäki and her colleagues also include the fashion industry produces over 92 million metric tons of textile waste per year—waste that is usually left in a landfill or is burnt. Burning textile waste releases carbon dioxide and other greenhouse gases into the atmosphere, the effects of which have been previously discussed. Landfills pose a similar problem. While it may seem obvious that they are harmful to the environment in that they destroy the natural wildlife of an area and unhouse the species that live there, landfills also produce greenhouse gases. Carbon dioxide is one of them, but so is methane: one of the most potent greenhouse gases, one which is much stronger than carbon dioxide. The amount of textile waste that is both burned and sent to landfills is a direct contributor to global warming and the climate crisis.

In *The Environmental Price of Fast Fashion*, Kirsi Niinimäki and her co-authors provide a diagram that shows the process of clothing production from the beginning to the end of the garment's life. What is made blatantly clear through this visual is that every single step of the clothing production process has some sort of impact on the environment, ranging from energy consumption to water use to chemical use to waste production. No step in the process doesn't have some effect on the environment. The agriculture that produced the natural fibers in clothing and the chemical manufacturers that produce the synthetics in clothing both use energy, water, and chemicals. The next step in the process, yarn manufacturing, uses all the same resources. Textile manufacturers use water, energy, and chemicals, and also produce waste. Trim manufacturers use energy and produce waste, as do garment

manufacturers, retail distribution centers, and retailers. Consumers use water and energy and produce waste. Discarding a garment at the end of its life uses energy and produces waste (Niinimäki et al., 2020, p. 191). Every step of the clothing production process has an impact on the environment, whether it is taking a resource or leaving waste. While this may not be able to be completely prevented in the clothing production industry, it is the mass amount in which it is done to produce fast fashion that is detrimentally harmful to the earth.

Anika Kozlowski and Michal Bardecki, authors of *Environmental Impact in the Fashion Industry: a Life-Style and Stakeholder Framework*, supported the information discussed in the diagram by touching on the different parts of the clothing production cycle that impact the environment. They note that, during a garment's lifespan, it is connected to wastewater emissions, solid waste production, and a depletion of resources resulting from consuming minerals, fossil fuels, energy, and water (Kozlowski et al., 2012, p. 17). As previously identified, water is wasted in the agriculture, chemical, yarn, and textile manufacturing, and consumer stages of clothing production and waste is produced in the textile, garment, and trims manufacturer, the retail distribution center, retail, and end of life stages of production (Niinimäki et al., 2020, p. 191). Simply with those two environmental impacts of wastewater and waste production, every part of the clothing production industry was listed. Yet, that wasn't even the complete list of harmful impacts the industry has on the environment that occur in each stage of production; chemical use and energy consumption were not named. Kozlowski and Bardecki's paper reinforces the

information provided in other sources by showing consistency in the facts presented. Through the production of garments and apparel, the fast fashion industry pollutes various parts of the environment in several different ways. All are harmful.

In *Environmental and Social Impact of Fast Fashion: Towards an Eco-friendly, Ethical Fashion*, Sudeshna Mukherjee explains the main environmental issues that are associated with clothing. Looking at these can be a helpful tool in understanding why the different steps of the clothing production process are so harmful. Mukherjee explains that the agriculture connected to the production of clothing uses mass amounts of land in order to sustain so many crops, which can cause land degradation from the chemical pollution of soil and groundwater due to herbicides, insecticides, fertilizers, and a loss of biodiversity (Mukherjee, 2015, p. 25). This damages the land, the plants that can grow in the land, and the animals that can live in it. Species may be driven away from their homes in waves because it is not inhabitable. Even the use of resources can be harmful to the environment. Fossil fuels and water are often used as a resource in clothing production, which are used in growing, producing, and transporting materials and clothing (Mukherjee, 2015, p. 24). It was already discussed why using water as a resource can be negative when used in such mass amounts. Using fossil fuels is not ideal, either, as they are a finite resource. In the manufacturing process, some companies use hazardous or acidic chemicals that can be released as liquid sewage and discarded into rivers or seas (Mukherjee, 2015, p. 25). The factories that are used in the manufacturing stages of clothing production also produce a massive amount of greenhouse gases, which has been discussed prior. It is

believed that polyester and cotton blend clothing has the highest greenhouse gas influence during the steaming process, almost all of which's emissions are carbon dioxide. Wool has a significant greenhouse gas impact early in the production stages because the sheep used to produce wool create so much methane (Mukherjee, 2015, p. 24). Regardless of the material being used, or the step in the production process, all have an impact on the environment. Chances are that this impact is negative. These impacts hurt both the living creatures in the environment and the ozone layer that surrounds the earth. Previously, it was mentioned that most textile waste ends up in landfills or is burnt, including unsold products. This also applies to clothes that are thrown away by the owner. This is the end of life for many articles of clothing. Because they are so bulky—especially in comparison to other typical waste products—they consume a large portion of the limited space that landfills have. Typically, about 50% of a garment is biodegradable, but that just leads to the release of more greenhouse gases through the breakdown of the material (Mukherje, 2015, p. 25). The disposal of mass amounts of garments into landfills both takes up space that previously was an ecosystem for life, leading to the creation of more landfills, and results in more greenhouse gases being released into the atmosphere. On a whole, clothing production at the mass level can be very damaging to the environment.

Niinimäki and her colleagues depicted what kinds of environmental impacts garments have at the end of their life cycle, and Mukherjee showed why those impacts can be harmful. In the article, *The Global Environmental Injustice of Fast Fashion*, Rachel Bick, Erika Halsey, and Christine Ekenga explain in depth what landfills look

like in America as a result of fast fashion and why this happens. They found that about 85% of the clothing that Americans consume—amounting to 3.8 billion pounds every year—ends up in landfills as solid waste (Bick et al., 2018, p. 1). Fast fashion is the main factor in why such a large amount of clothing is thrown away every year. Fast fashion encourages a higher turnover rate for new styles of clothing, influencing consumers to buy more and more clothes to keep up with each trend. In order to produce clothing at such a fast rate, the quality of the garments is lowered. Low quality of clothing and quick changes to new styles result in consumers cycling through more pieces quicker, meaning more garments are thrown away. This makes more room for new pieces. But the extreme excess of waste that this creates is one of the factors that is incredibly harmful to the environment. Not shockingly, Bick and her colleagues found that the United States is the number one consumer of clothing and textiles in the world (Bick et al., 2018, p. 1). The consumer mentality that fast fashion preys on is extremely prevalent in Americans. In the United States, it is estimated that discarded clothing takes up five percent of the space in landfills (Bick et al., 2018, p. 2). Mukherjee discussed how one of the reasons the consumption of clothing is so damaging to the environment is because of how much space discarded items take up at a landfill. Five percent of a landfill may not seem to be much space, but it is still a large amount that has a negative effect on the environment. This rings especially true when it is so unnecessary to have such a large amount of landfill waste be attributed to discarded clothing every year. In *The Environmental Price of Fast Fashion*, Niinimäki and her colleagues lay out what happens with all of these discarded

garments, reporting that only a small amount of clothing that has been thrown away is actually recycled, while the majority of it is either incinerated or transported to landfills in developing countries (Niinimäki et al., 2020, p. 191). The incineration of clothing, as may be suspected, is not friendly to the environment. Like other forms of fire, burning garments releases carbon dioxide and other greenhouse gases into the atmosphere. It is well known that this is harmful to the planet Because such a large amount of clothing is discarded into landfills, this incineration happens at a large scale, producing more carbon dioxide and greenhouse gases. The clothes that are transported to developing countries still only end up in landfills, which does nothing to solve the problem of land use or any other problem that accompanies the use of landfills. It only shifts the problem away from America, doing nothing to better the earth.

After Bick, Halsey, and Ekenga presented the statistics on discarding clothing, the article's focus shifted to clothes that aren't thrown out but are still discarded in some form. Specifically, they discuss garments in second-hand stores that end up not being sold and need to be sent away in some form. These clothes are compressed into bales that weigh 1,000 pounds and are then shipped overseas to be graded—sorted, categorized, then re-baled—by workers getting paid low wages in Low and Middle-Income Countries (LMICs) (Bick et al., 2018, p. 2). These clothes are then sold in second-hand markets in the Low and Middle-Income Countries (Bick et al., 2018, p. 2). This may appear to be beneficial to people in other countries at first, following the idea that it is providing clothing for them. However, that is not the

case. Because fast fashion produces cheap quality clothing, these clothes are not made to last. In the long term, they won't be beneficial because even the ones that do get sold aren't durable. Many of them, though, are not sold. These clothes become solid waste and end up clogging rivers, greenways, and parks. There are so many extra unsold clothes that they clog waterways when discarded, showing another reason as to how the fast fashion industry negatively impacts the environment. This is also a huge indication of the fact that these clothes are not beneficial to Low and Middle-Income Countries. The mass amount of clothing shipped to them is not helpful. Not only is it unnecessary, but it is also hurting Low and Middle-Income Countries. Clogging the waterways creates health hazards in places that don't have robust waste systems in their municipal (Bick et al., 2018, p. 2). The standard of fast fashion—the over-production of low-quality clothing—creates an excess of clothing that does not have a long life cycle. When these garments are dumped for newer ones, they then contribute to a waste problem. There is no way that shipping mass amounts of low-quality clothing can be disguised as beneficial to citizens of Low Middle-Income Countries. It only hurts the people there, making the problem created by fast fashion companies into the problem of another country.

Not only is how garments are made and the excess in which they are produced harmful to the planet, but so is the manner in which they are transported. In *The Environmental Price of Fast Fashion*, Niinimäki and her colleagues cover how the transportation of clothing and garments also damages the environment. In the past, clothes were typically transported overseas by container boats; now, air cargo is often

used in order for garments to reach stores at a faster rate (Niinimäki et al., 2020, p. 191). Fast fashion is a major factor that plays into the speed of transportation of clothing. It comes from a consumer culture, which is encouraged and influenced by businesses. There is a higher demand wanted at a faster pace. The quick turnover of styles that fast fashion contributes to also increases the demand for decreasing the time in between when the buyer purchases an item and when it is in their hands. Online shopping plays a role in this as well, as that is when the consumer is made to wait in between purchase and reception. In addition, the low price that is attached to clothing that has been produced without concern for the environment encourages buyers to purchase more with the idea that they are spending less. The downside of this quick transportation method is that air cargo has a much larger environmental impact than cargo ships do; specifically, transitioning one percent of garments from cargo ships to air cargo can result in a 35% increase in carbon emissions (Niinimäki et al., 2020, p. 191). Just a small amount of goods being moved from being transported by ship to by plane has a massive impact on the environment. This is all for the sake of the consumerism that fast fashion feeds. In his article *Slow Fashion in a Fast Fashion World: Promoting Sustainability and Responsibility*, Mark Brewer notes that high carbon-producing modes of transportation, such as air cargo, are a result of the public's addiction to continuously changing and new fashion (Brewer, 2019, p. 3). This addiction is fueled by corporations who ignore the harmful effects they have on the environment from producing and shipping their clothing in order to sell more products and make more money. They fuel the consumers.

The authors of *The Environmental Price of Fast Fashion* look further into the environmental impacts of textile production. They found numerous resources reporting on it, stating that textiles are next to aluminum in producing the most greenhouse gases per unit of material (Niinimäki et al., 2020, p. 192). This emphasizes the massive impact that the clothing production industry has on the environment. As reported by multiple sources, textiles are currently producing the most greenhouse gases per unit of material, only matched by the amount of greenhouse gases that aluminum produces. The clothing industry is so impactful in this because there are so many brands that are huge corporations. Brands that are in the fast fashion market and who are willing to jeopardize the stability of the environment in order to turn a better profit. Using sources such as the International Panel on Climate Change and Quantis, Niinimäki and her colleagues reported that the textile industry causes between 8.1 and 10% of global greenhouse gas emissions, equaling four or more gigatonnes annually (Niinimäki et al., 2020, p. 192). This number speaks for itself in being blatantly impactful on the Earth's environment. This is not a number that can increase or even remain constant while coinciding with the hope of keeping the planet alive as it is known today.

Sustainability in Clothing Production

Environmental Impacts of Sustainability

Now that the impacts that the fast fashion industry, specifically in clothing production, has on the environment have been discussed at length, the focus can be turned to sustainable practices in the clothing industry. Sustainability is achievable, as will be demonstrated. In the article *Prospects of Sustainable Fashion Design Innovation*, Rajeev Kumar highlights the work that researchers Helen Dorian, a professor at the London College of fashion, and Tony Ryan, a professor at Sheffield Interaction Research Center of British University, have been working on. To reduce the pollution and waste that is caused by copious amounts of clothing being sent to landfills, Dorian and Ryan have focused on designing plastic clothing made from biodegradable polyvinyl alcohol in recent years. The design behind these clothes is to have a capsule that allows them to dissolve. The environmental implications of this are clear. Garments that are able to biodegrade would not have to be discarded through the trash and sent to the landfill, a vast majority of which is taken up by discarded clothing. This would then reduce the number of garments that are shipped to undeveloped countries and end up doing more harm than good. In addition, researchers are developing a project named "contact reaction clothing", which has the goal of reducing pollution through the use of clothing (Kumar, 2017, p. 8). Titanium dioxide nanoparticles are similar to a light-activated ingredient in sunscreens, which can be embedded into the fibers of clothing and work as a catalyst when harmful pollutant particles are exposed to oxygen, and sunlight in order to turn those

dangerous particles into other elements (Threewitt, 2012, para. 4-5). The idea behind this is that, as people with titanium dioxide nanoparticles in their clothing move around outside, their clothes would be working to battle pollution in the moment and reduce harmful pollutants in exchange for non-harmful ones. Even though resources have to be used in order to create garments for people to wear, there is still an opportunity to reduce waste and pollution, both that already exist in the world and that are created through the clothing industry, when deciding what a garment is made out of. It is as if these clothes are giving back to the environment.

There are other options as to what material to make clothing from than biodegradable polyvinyl alcohol, though. Options that may not be as revolutionary, but that are simpler and potentially more accessible. In the journal article *Environmental and Social Impact of Fashion: Towards an Eco-friendly, Ethical Fashion*, Sudeshna Mukherjee from Banglaore University explains what materials can be used as well as what other parts of the clothing production process can be made environmentally ethical and sustainable. Organic raw materials are important to work from when prioritizing sustainability, which can look like using cotton that was grown without pesticides or silk that was made by worms who were fed on organic trees. These organic raw materials would not be using chemicals that are harmful to the environment in order to speed up their growth process. In the production process, chemicals and bleaches that are harmful to the environment should not be used for color or anything else. Again, abstaining from putting harmful chemicals into the environment is what is sustainable in this part of the process. Finding methods to

color or change fabrics that aren't harmful to the environment should be the primary focus of this step. Another option of how to get material is to use recycled textiles to create something new. High-quality garments can be produced from recycled materials or plastic water bottles (Mukherjee, 2015, p. 33). This method is beneficial for the environment because it doesn't involve producing more unnecessary things. Instead, it takes what has already been produced and repurposes it to be of use again. This reduces the amount of waste being produced and the energy, water, and chemical use that goes into manufacturing and harvesting what is needed for new materials. As a stark contrast to fast fashion, sustainable articles of clothing are ones that are made to last and withstand the test of time (Mukherjee, 2015, p. 33). Having this higher quality encourages people to keep them longer, as the clothes are wearable for longer periods of time. This reduces the amount of clothing going to landfills because they are not made sturdily enough to last long, and could also influence a decrease in consumption. The longer articles of clothing last, the less need there is to buy more new clothes. This cuts down on all the harmful impacts that go into mass-producing new clothing.

Marketing Techniques of Sustainable Brands

Because fast fashion relies on over-consumption, switching to a sustainable and environmentally-friendly method of production would mean shifting the focus of the corporation from a consumerism-focused market to a sufficiency-promoting one. This is something that Patagonia has practiced, which involves focusing on the needs of the consumer as opposed to their wants (Frick, Gossen, Santarius, Geiger, 2021, p.

3). Patagonia put this into practice recently by launching their "Don't buy this jacket" campaign, in which they put an ad in the *New York Times* on Black Friday of a jacket with text instructing not to buy it (Frick et al., 2021, p. 3). The point of this was not to drive away any customers and run their business to the ground; in fact, Patagonia is still operating successfully. Conversely, the point of the ad campaign was to encourage consumers to think twice before buying more things. With their slogan "we're in the business to save our home planet", Patagonia exemplifies that they are a company that prioritizes the environment over its profitability. However, simultaneous with that, they are still able to be a financially successful company. Focusing on sustainability and sufficiency over consumerism does not have to equate to being unsuccessful as a business. In fact, that focus can be used to attract business by promoting the ethics of the company. In addition, Patagonia is not spending the money to produce an excess amount of clothing. This also means that the energy consumption, water use, waste production, and chemical use needed to produce clothing are being lessened. In turn, these components will have a lesser impact on the environment. Patagonia's "Don't buy this jacket" campaign isn't the only marketing strategy that is inspired by a sufficiency-promoting market According to an article in the Journal of Environmental Psychology, *When your Shop says #lessismore: Online Communication Interventions for Clothing Sufficiency*, other marketing concepts that can actively work to reduce consumption are demarketing and social marketing (Frick et al., 2021, p. 3). These marketing strategies aren't bad for business; they're just good for the environment.

North Face, another big name brand, also has a mission of sustainability. As a result of that, they've also focused their branding and marketing strategies on promoting taking care of the environment. Anika Kozlowski, Michal Bardecki, and C. Searcy analyzed how North Face branded its focus on sustainability in the article *Environmental Impacts in the Fashion Industry: a Life-Cycle and Stakeholder Framework*. The brand collaborated with designer David Tefler to create the Zero Waste Project (Kozlowski et al., 2012, p. 30). The results of this project were an innovative product design, an enhanced brand image, less waste created in the apparel manufacturing step and therefore reduced environmental impacts, and less waste sent to landfills in the communities the clothing was made as a result of positive social impacts. The project allowed the company to focus both on its branding and business profit as well as sustainability. They spent time working on their product design and their brand image, both of which are factors that correlate to marketing and profit. They also looked to create less waste, being successful in two steps of the clothing production process. North Face demonstrated how it looks to actually focus on an environmentally-friendly mission, not only using sustainability for branding—a practice known as greenwashing. They showed successful marketing tactics relating to a genuine company value.

Other companies have run through various marketing techniques as well. A sustainable online shop ran an experiment testing out a completely online informative marketing strategy of hosting a "theme week" in which they promoted clothing sufficiency through their social media accounts and newsletters. Using the hashtag

#lessismore, the brand promoted the idea of buying less and only owning 'favorite pieces.' This encouragement to consume less positively impacts the environment through decreasing demand, eventually leading to a decrease in production. When that happens, fewer resources would then be utilized and wasted to put out the products. The data of this project did not seem to report well. Nine percent of the study group reported only seeing the newsletter, four percent had only seen the social media posts, and seven percent had seen both, which left 80 percent of the group having seen neither tactic (Frick et al., 2021, p. 4). These percentages were recorded based on cued recall, and the behaviors of the study group after were also recorded in order to give accurate results. By the end, all participants, regardless of if they recalled any intervention or not, increased their sufficiency behavior by reducing their clothing consumption. For this experiment, both the reported results from the study group and their changed behaviors as the experiment went on were important parts of analyzing the meaning. Not all of the participants may have recalled any intervention tactics, but all of them were impacted in one way or another. All of the participants changed their behaviors by the end of the experiment, yet not all of them recalled seeing newsletters or social media posts. This seems to suggest that this experiment ultimately showed that social media alone may not have as much of an impact on consumers' buying habits as some may believe. The same result was found in a similar experiment that had the goal of reducing food waste through social media awareness, in which both the control group and the group exposed to social media self-reported a significant reduction in food waste (Frick et al., 2021, p. 6). In these

experiments, it seems more likely that an outside source influenced a change in spending habits, as both the groups exposed to social media and those not exposed to it reported a behavior change. From this, it can be deduced that exclusively focusing on spreading the message of sustainability through online media does not seem to be the most effective tactic. But that is not a failure in itself; rather, it informs the reader what not to do in their own business practices and marketing strategies. The conclusion from this experiment should not be connected to the success—or lack of success—of clothing businesses that promote sustainability, but to this specific marketing strategy.

The company Nudie Jeans has also explored how to be more environmentally sustainable. Their denim jeans are made with raw denim, which eliminates the sandblasting and bleaching steps in the manufacturing process. Sandblasting is done by hand, meaning it has social impacts as a result of health and safety implications as well as the environmental impacts that result from polluting the air. This company is working to ensure that the process of how they're producing garments is sustainable for the environment. They did this by removing bleaching and sandblasting, both of which negatively impact the environment, from their production process. Eliminating those steps also helps the company to save money by cutting out those costs. Nudie Jeans doesn't stop its pursuit of sustainability after they've manufactured its jeans. On the inside pocket, there are printed instructions that challenge the wearer to avoid washing the jeans for the first six months of owning them, which creates a more personalized jean with unique wear and tear (Kozlowski et al., 2012, p. 29). This

encourages the consumer to live more sustainably by reducing their usage of water and electricity to wash their clothing. Nudie Jeans is taking steps to be more sustainable and to encourage its customers to do the same. Their tactics are marketable and easy to achieve on both their and the consumers' parts. Their tactics are even financially effective for them as a company. These positive environmental impacts are real. They aren't a result of a company greenwashing their products in order to market them as sustainable when that's not the actual truth. These are products that are both marketed as sustainable, are sustainable, and encourage the wearer to be sustainable with their own choices after purchase.

Oftentimes, a major deterrent for companies from being sustainable is concern over a shrinking profit margin. Fast fashion is so prevalent because it is cheap to produce. For many businesses, this cost outweighs the importance of sustainability and ethicality. They are concerned that having to increase the cost of their products as a result of spending more to not harm the planet during production. In order to maintain a profit margin, an increase in cost in sourcing, manufacturing, and shipping would mean an increase in the price of the product. There may be concern over if customers would still purchase the products if they were more expensive. In the article *What about Sustainability? An Empirical Analysis of Consumers' Purchasing Behavior in Fashion Context*, Maria Vincenza Ciasullo, Gennaro Maione, Carlo Torre, and Orlando Troisi surveyed 269 consumers to answer the question of how much more they'd be willing to pay for sustainable clothing. Of the group, 96% stated that they would be willing to pay more for garments that had been produced in

an environmentally-friendly fashion (Ciasullo Maione, Torre, Troisi, 2017, p. 10). In total, the data was recorded as follows:

Ten people (about 4% of the sample) pointed out that they would not be willing to pay any premium price to get a sustainable item of clothing, since they care about other features of products. Another 10 people (about 4% of the sample) declared that they pay enough attention to sustainability to be willing to support a 50% increase in price. Nineteen people (about 7% of the sample) said they would be willing to pay 40% more for apparel with a sustainable brand, while 22 (about 8% of the sample) revealed that the highest price increase they would support for a sustainable item of clothing is 30% on the base price. Forty-three people (about 16% of the sample) stated their willingness to pay a 10% increased price for a sustainable fashion product. One-hundred and sixty-five people (about 61% of the sample) pointed out that they would pay no more than 20% than the basic price to get a sustainable item of clothing. No one declared a willingness to support a premium price increase of more than 50% for buying a fashion good produced through sustainable practices (Ciasullo et al., 2017, p. 10).

As is shown, the high majority of consumers were willing to pay more for sustainable clothing. The largest willing group reported they were comfortable paying at least 20% more for sustainable fashion, which accounted for 80% of those surveyed. As the premium price increased, some consumers were less willing or able to pay more. Those who were willing to pay up to a 20% premium price were also the largest group, which made up 61% of the survey. Consumers are willing to pay more

for products that they know are better for the planet Oftentimes, they want to take action that is beneficial for the environment. They understand the state that the climate is in and want to take part in helping it improve. If this were not well-known and understood, greenwashing would not exist to take advantage of consumers who want to help the planet. By producing garments that actually are less damaging to the environment, companies would be benefiting the environment and be able, to be honest with customers about what they're actually doing. Customers are willing to pay more for products that are sustainable, which mitigates the concern that exists over sustainable clothing costing more to produce. The higher cost of production can be balanced by the premium that consumers are willing to pay.

Sustainable Fashion Brands

Now that some of the marketing techniques of sustainable movements have been discussed, it's important to emphasize that these—and other—companies focus first on producing garments that were made sustainably before they encourage their consumers to live more sustainably. If this is done in the opposite order, companies would just become hypocritical. In the article *Environmental impacts in the fashion industry: a life-cycle and stakeholder framework*, Kozlowski and her co-authors write that brands like Patagonia, North Face, and Levi's have all implemented take-back programs and repair services for consumers who purchase their clothing (Kozlowski et al., 2012, p. 29). This leaves a positive impact on the environment because it encourages waste reduction. Instead of throwing out garments that are worn or torn, customers can bring them back to a store that offers repair services and get them

fixed. With North Face, this looks like recycling previously-owned gear in order to reuse the raw materials, which launched in 2022 (The North Face, para. 3). The garment doesn't have to get put in a landfill, and can instead be remade into something without having to create more agricultural waste in the production process. In addition, North Face has set a goal to make all of its products from recycled, regenerative, or responsibly-sourced renewable fabrics—fabrics made from materials that will replenish over the course of a lifetime. The company is on track to achieve this for all of its apparel by the year 2025 and all of its footwear by the year 2030. They are shaping and refining the process of how they produce their products in order to make them more environmentally sustainable. Although they are not as fully environmentally friendly as possible currently, they have set goals to keep their company accountable to soon reach a higher level of sustainability. They continually strive to do better and encourage both their customers and suppliers to do the same. North Face partners with retailers and suppliers who have the same mission and values in order to create a more positive impact (The North Face, para. 4-5). By being aligned in values, it allows the company to better work alongside other suppliers and retailers and makes a larger impact than they could alone on the overall industry. Even in their shipping methods, North Face strives to be more environmentally conscious by eliminating single-use plastic packaging by the year 2025 and both reducing and making their packaging more recyclable currently. North Face uses recycled or certified third-party content for all of its paper materials, such as product hangtags and shipping boxes (The North Face, para. 5-6). Again, the company shows

that they have a specific goal set in order to be the most sustainable they can be by a certain year. Until they are able to reach that goal, they are still implementing steps that allow them to be more environmentally friendly by reducing the waste and energy needed to make more packaging items. Even in their in-between process, North Face is working to be more sustainable in all the ways they can be.

In addition to some major corporations that value and follow sustainability practices, many smaller apparel companies also believe in the importance of positively impacting the environment. Maison de Mode is such a company and brands itself as a luxury ethical fashion company. This includes ethicality concerning the environment, fair trade, and the treatment of animals. For this project, their environmental impact will remain the topic of discussion. On their sustainability page, the company depicts and describes icons that are used to identify what ethical and sustainable practices apply to each of their products. One icon indicated that the particular garment was produced in the USA (Maison, para. 3). This allows them to minimize their environmental impact by reducing the need for overseas shipping, cutting out sea or airfare, and the environmental impacts that are brought with that. Packaging plays a large role in shipping, and the company offers some products that exclusively use eco-packaging, which are all made from compostable, recyclable, or biodegradable materials (Maison, para. 7). The compostable and biodegradable packaging can be broken down and degraded naturally by the environment, and the recyclable packaging can be reused for other purposes. There becomes no need to have to dispose of any of their packaging through the trash, meaning the company has

reduced its waste production by achieving this. In some of their products, Maison de Mode uses recycled or reclaimed materials that have been reconditioned to give them another or a new use. This reduces the amount of waste produced in agricultural, chemical, yarn, and textile manufacturing steps of the production process. These steps can be cut out when using materials that are recycled and reclaimed. Of their garments that are made with new materials, Maison de Mode has some apparel that is made from organic materials. These are grown without harmful pesticides, herbicides, and genetically modified seeds or are raised on organic feed without hormones or antibiotic treatments, both of which are made of at least 95% cotton (Maison, para. 9). The focus on organic materials reduces the amount of chemicals that are released into soils, water, and vegetation. These chemicals can then damage ecosystems and harm animals. Maison de Mode takes a serious approach to the environmental impacts that the fashion industry has and works to be transparent about the efforts they are making to mitigate that impact.

Not all sustainable apparel companies follow the traditional company model of producing their own products. Bloom Boutique is a resale and education initiative operated by students at the University of Southern California. The boutique accepts donations of clothing from community members and then sells them at a reduced price, following the same idea as an average thrift store. On their website listing, the officers mention that the boutique was born out of a desire to offer sustainable fashion in the community and reduce the amount of waste caused by the fast fashion industry (University, para. 1). Selling old, donated clothes at a reduced price provides

both an affordable and sustainable option to college students and those in the community near USC. By providing an accessible option, the organization aids in working to reduce the amount of waste that the fast fashion industry creates. The more that consumers buy from Bloom Boutique, the less they need to turn to fast fashion in order to meet their clothing desires and necessities. By providing their consumers access to environmentally friendly shopping, Bloom Boutique is able to be sustainable.

Revtown USA is a company that focuses almost exclusively on jeans. They have shirts and hats in their inventory, but their primary garment of production is denim pants. With this, Revtown focuses on making its denim sustainable for the environment. On their story page, they remark that clean denim production is their priority: they use shrimp shells, orange peels, and nut shells to sustainably dye their denim. They write that this method uses 30% less energy, 50% less water, and 70% fewer chemicals than the traditional dying methods that are used by other corporations in the industry (Revtown, para. 16). The brand is dedicated to making sustainable products and has found methods of sustainability that work with their company. The technique of using shrimp shells, orange peels, and nut shells to dye clothing is not traditional, but it is effective and achieves the goal that Revtown has: to produce quality clothing that is sustainable for the environment. By using less energy, water, and chemicals in their dying process, the company can do less harm to the earth in their production methods. Another way Revtown reduces water usage is by only working with certified cotton. This results in efficient water usage and

regulation of the soil's health (Revtown, para. 17). By using certified cotton, Revtown is ensuring that the soil their cotton is growing in is healthy. This way, the other plants or animals populating the area the soil is in won't be negatively affected. Revtown also mentions their milling process, in which they follow the strictest environmental practices and regulations that are in the denim industry in order to maintain sustainability. This allows them to hold themselves accountable by following not standards that they have set for themselves, but standards that are set as a general by an outside source. In addition, to following environmental practices and regulations, the company recycles all of its waste into denim yarn or insulation for local housing (Revtown, para. 15). While it may not be feasible to completely eliminate waste production in the manufacturing stages of clothing production, it is feasible to repurpose the waste that is produced. This is what Revtown does in order to contribute to a healthier planet It is a potential that they can then reuse the denim yarn to make more of their products, or sell it to a store. This would either reduce the amount of cost they have to allot to paying for materials or would give them extra profit. By using some of their waste as insulation for local housing, the brand is meeting another need that is present in their community. They are not only providing clothing and making efforts to help the environment, but they are also providing a resource to help build housing. They recognized a need outside of their own business and saw a way to meet it while also benefiting the planet

Stanley/Stella is another fashion business with the aim of maintaining sustainability in its work and means of production. In the article *Barriers towards a*

systemic change in the clothing industry: How do sustainable fashion enterprises influence their sector?, authors Ingrid Molderez and Bart Van Elst write that the company is cutting-edge in the fashion industry as well as eco-friendly, sustainable, and ethical (Molderez, Van Elst, 2015, p. 104). On their website page about sustainability, Stanley/Stella breaks down the sustainable practices that they follow in their business. They use 100% cotton from India certified by the Global Organic Textile Standard, recycled polyester from China, and modal (Stanley/Stella, para. 3). These raw materials have been grown in a way that doesn't negatively impact the animals, people, or environment. They ensure that the materials that they are using to produce their apparel are sourced from materials that don't negatively impact the environment, holding themselves accountable by using materials that have been certified by a globally established standard. In their manufacturing process, Stanley/Stella encourages their dealers to implement GOTS Certified standards of sustainability by using printing techniques that don't use harmful chemicals and inks and striving for sustainable means of production (Stanley/Stella, para. 4). In the parts of the manufacturing process that Stanley/Stella is not directly involved in, they are still encouraging environmentally sustainable means of production. It is a value that they clearly hope to implement in others. By not using harmful chemicals and inks, Stanley/Stella ensures the safety of animals and other wildlife in the ecosystems surrounding their manufacturing locations. The company equips its partner factories with Effluent Treatment Plants that work to remove toxic elements from water and make sure that it is safe to reuse. This ensures that the water being used in production

is safe for wildlife to live in so that the ecosystems the water sustains are not harmed, and that the water can be reused by the manufacturers so that they can continue using the renewable resource. In addition, Stanley/Stella has developed a recycling fabric waste project (Stanley/Stella, para. 7). This allows them to reduce the amount of fabric waste produced in the clothing manufacturing process. Instead of throwing it out, it can be used to be made into something else with a different purpose. Perhaps one of the most interesting parts of Stanley/Stella's background is how they started. While it says on their website that sustainability was a motivator and core ideology of their business, *Barriers Towards a Systemic Change in the Clothing Industry* reports that the owners and major investors of the company were previously involved in B&C, a traditional fashion enterprise that does not prioritize environmental sustainability (Stanley/Stella, para. 1; Molderez, 2015, p. 104). This is not to indicate that Stanley/Stella is in any way disingenuous because some of the most influential people in the company have not always had sustainable values. Instead, it is to show how change is possible. A company that previously used common practices in the clothing production industry completely changed how it operated in recognition of the planet's needs. Change is possible, as Stanley/Stella shows. They were still able to successfully run a clothing company even after switching their means of production to be more environmentally friendly.

Orimpex is a clothing company that takes a different approach to fashion than most companies. A big part of their sustainability movement is that they are a design-to-delivery supplier (Orimpex, para. 1). By being design-to-delivery, Orimpex

practices slow fashion. As opposed to fast fashion, slow fashion takes time in producing garments in order to allow for good quality apparel that respects people, animals, and the environment. In addition to slow fashion, the company utilizes sustainable textiles in order to be environmentally friendly. While cotton is one of the most damaging textile fibers because of its water usage and environmental impact from pesticides, Orimpex uses certified organic cotton in its apparel. This eliminates the use of fertilizers and pesticides and reduces nitrogen inputs to a point where growing organic cotton produces up to 94% fewer carbon emissions than growing regular cotton and maintains clean and safe waterways (Orimpex, para. 4-7). By growing organic cotton instead of regular cotton, Orimpex reduces the number of greenhouse gases that are released into the atmosphere. It also ensures that chemicals are not getting put into the waterways where the cotton is grown, keeping the ecosystems there safe and unaffected.

Orimpex also uses cellulostic fibers as a material in their production, which are made from sustainably sourced natural raw material wood and are biodegradable (Orimpex, para. 10). This wood is already made from sustainable sources and practices. On top of that, it is biodegradable, meaning it can re-enter the ecosystem at the end of its life cycle by being broken down into the environment. The company also uses bamboo, which produces 35% more oxygen than an equivalent stand of trees, doesn't need any chemicals or pesticides to grow, doesn't often need replanting or irrigation, and is biodegradable. However, in the process of turning it into a fiber, bamboo does require some chemical use (Orimpex, para. 12-14). Orimpex is open

about how they fall short in the sustainable process in order to be transparent about their impact. Even with this shortfall, bamboo is incredibly sustainable in that it produces a lot of oxygen, uses less water, is biodegradable, and doesn't need pesticides to grow.

The last sustainable material Orimpex uses is recycled polyester. Polyester itself is the most commonly used fiber worldwide and is a synthetic petroleum-based fiber that is made from non-renewable resources through an energy-intensive process (Orimpex, para. 15). While polyester is not a sustainable material, Orimpex uses recycled polyester in order to repurpose polyester that has already been produced. Instead of just going into a landfill after being used, the company uses that material for a new purpose. This allows them to reduce energy usage, water usage, waste, and chemical usage that happens along the material production process because they don't have to start from the beginning. In *Barriers towards a systemic change in the clothing industry*, Molderez and Van Elst look at the profit of Orimpex, finding that the company doubles its turnover from its start in 2007 to 2015, and became one of the leading fashion companies with its production based on organic cotton and bamboo (Molderez, 2015, p. 104). They have been able to sustain their business since 2007 and have been profitable enough to become a leading company in their field of production. Through the conscious thought they put into what materials they use to produce their garments, Orimpex has taken steps to be more environmentally friendly.

Another fashion company that Molderez and Van Elst write about in their article *Barriers towards a systemic change in the clothing industry* is ProGarments. ProGarments is a brand that specializes in work wear, swimwear, kids wear, outdoor wear, and sportswear and focuses on the social aspects of sustainability, making sure to manufacture their apparel in ethical ways and provide living wages to their employees. Then, as a result of consumer requests, the company started including organic cotton and recycled polyester in its production. Their utilization of more sustainable materials in their manufacturing was not originally a goal of the company, but it was integrated after their consumers expressed a desire for it to be. This is a business that really cares about customer satisfaction. They may not have made a shift towards sustainability because of how they were impacting the planet, they made a shift because of how their customers were affected. Their consumers desired them to. Either way, they worked to implement sustainable materials into their production process. Now, the owner of the company reports that they continuously look to reduce water, air, and soil pollution, and the emission of sound; prevent, control, and reduce residual material and runoff; and the deliberately choose raw materials, resources, and sustainable machinery (Molderez, 2015, p. 105). ProGarment's movement toward sustainability emerged from a desire to satisfy its consumers. Now, it is an aspect of their production that they highly prioritize, looking to be environmentally conscious in many different ways, specifically focusing on being sustainable in the materials and resources that they are using and producing. The reason a company has for working towards sustainability is less important than the

act of them following through. Truly working to be sustainable is more impactful than intentions and values, and is what the planet needs.

Methods in Clothing Production to Sustain the Environment

Authors Vivian Frick, Maike Gossen, Tilman Santarius, and Sonja Geiger wrote an article in the Journal of Psychology named *When your shop says #lessismore: online communication interventions for clothing sufficiency*, which explores what individual consumption looks like and its impact on the planet According to their findings, Europe had a 40% increase in clothing purchases from 1996 to 2012 (Frick et al., 2021, p. 1-2). This increase in consumption is a major contributing factor to the environmental impacts of the fashion industry. By buying more, customers ask for more to be produced, increasing the materials that are used and waste that is made in the process. Oftentimes, this also connects to a shorter retention cycle of clothing on the consumers' end: they don't tend to keep garments as long in order to fill their closets with new pieces. While this is a pressing part of the climate crisis and it may not seem within the control of fashion companies, there have already been ways addressed to aid in this problem from the industry's side. One way was Patagonia's "don't buy this jacket" campaign, which was previously discussed. While they recognized they couldn't directly prevent consumers from buying more, Patagonia knew that they could influence others to rethink their spending habits by running ad campaigns to educate others on overconsumption and the environmental impact. Through methods like this, companies can take an active stance in dissuading consumers from buying products they don't need, won't use, and will throw away.

The marketing that is oftentimes currently displayed has the opposite impact; it encourages people to buy more, even when it's things they don't need or that won't last long. The goal of this is to turn a bigger profit, but profit can still be made through sustainable and environmentally conscious advertising. As mentioned prior, Patagonia still makes a profit and is a highly successful company. A lot of this balance comes from creating higher-quality products that will last a long time and won't get thrown away. Even when companies aren't directly responsible for their consumers' actions, they can take action to encourage sustainability in others.

In the article *Tools for sustainable fashion design: an analysis of their fitness for purpose*, Kozlowski, Bardecki, and Searcy also address the concept of slow fashion. They argue that the slow fashion movement works to increase the lifespan of clothing pieces (Kozlowski, Bardecki, Searcy, 2019, p. 5-6). This happens because slow fashion produces garments that are high quality. While fast fashion works to churn out as many clothes as they can in a short amount of time, sacrificing the quality of the product and its treatment of animals, people, and the environment in the process, slow fashion takes time in the manufacturing process to use methods that are sustainable for people, animals, and the earth, and that are good quality. Since the clothes are well-made in the slow fashion process, they won't deteriorate as quickly as fast fashion apparel. They won't rip or tear as easily, and will therefore last longer. This would cause less clothing to need to be produced, as less would need to be purchased. To counterbalance the decrease in products being sold, higher quality clothing comes with a higher price tag. This reflects the amount of time and

sustainable practices that were a part of the manufacturing process and mitigates the perceived decrease in profit. Kozlowski and her colleagues addressed this reduction in the manufacturing of clothes as well, writing that slow fashion would decrease the speed of the fashion system through the necessary cultural shift of establishing a slow culture. This change in the consumeristic cultural viewpoint established in America would lead to a decrease in the negative impact that comes from the clothing production industry. Even if sustainable practices were not implemented, simply decreasing the overproduction of clothing would have less of a negative impact on the environment. Although the more sustainable a company is the better it will be for the planet, even some improvements would be better than what the norm is now.

Positive Outcomes of Building a Sustainable Brand

Besides aiding in sustaining the environment, there are other positives to building a sustainable brand. In the journal article *Case Study: Miranda Brown Limited and the Passion to Make Fashion Sustainable*, authors Kate Kearins, Helen Tregidga, and Eva Collins look at the sustainable fashion brand Miranda Brown and its founder and designer of the same name. The journal article explains that, at one point, Miranda Brown Limited had products in 40 New Zealand stores, ranging from fashion to baby wear to home wear, as well as products in international stores (Kearins, Tregida., Collins, 2015, p. 123). Although Miranda Brown is a creator and a brand instead of a store itself in this anecdote, this still gives a clear point of achieving success while still working sustainably. Miranda Brown was able to have her products in 40 different stores in her native country, allowing her to reach more people than she would

otherwise. What's more, 40 different stores anticipated enough value in her work that they allowed her to sell her products in their stores. They believed they would be able to make enough profit off of her work that it would be worth taking space in their stores to sell it. It is often a concern that sustainable fashion isn't profitable, but Miranda Brown's business shows that to be false. Sustainability can be successful in business. By prioritizing what is good for the planet in terms of material sourcing, production standards, and marketing, businesses can still be successful and will attract consumers who value the same ideals.

A potential concern companies may have is over consumer interest and willingness to invest in a more sustainable market Companies may use the excuse that there is not enough interest or demand from consumers to buy sustainable products, making it illogical to focus on environmentally-conscious practices. While fashion industries do need to take the initiative to integrate sustainable practices in their business, the influence consumers have is powerful. Because of the continuation of support of the fast fashion industry from customers, it can be tempting to continue those unsustainable practices in order to rake in more profit. However, sustainable fashion interests consumers. This can come from the understanding that the planet is in danger, or from another reason. In the case study *Miranda Brown Limited and the Passion to Make Fashion Sustainable*, Brown talks about why she believes people buy her products. Brown stated that people want to buy her products and designs because of the experience they gain from them; when customers buy from her, they know that they're simultaneously doing some act of good—for example, buying a product that

also donates some profit to save whales (Kearins et al., 2015, p. 125). When there is a good reason to pay more money for a product, consumers will be more likely to make that purchase. It could be that the more expensive product is much higher quality and will last longer, that it will help protect and sustain the environment, or because a company has joined in order to support another project. Knowing that they are either benefiting themselves or something they care about if they purchase a more expensive product gives consumers more incentive to do so. When they are made to feel good about the product they are purchasing or the reason they are purchasing it, they are more likely to want to buy it. This works to satisfy the customer, be a successful business, and do some good actions in the world.

In the article *Ethical foundations in sustainable fashion* by Kirsi Niinimäki, Niinimäki explores other positive outcomes that result from creating a sustainable fashion business. She wrote that customers who are satisfied with a certain product will want to use that product longer, resulting in them continuing to buy from brands that they trust will provide them with customer satisfaction (Niinimäki, 2015, p. 5). This is both good for the environment and business. When more time is put into making a product, it is less likely to be a part of the fast fashion cycle and less likely to be harmful to the environment. In turn, this higher-quality product is more likely to satisfy the consumer. This satisfaction often compels them to buy again from the same business the next time it is necessary, as they are already confident that the products will be a good fit for them. Even though a company would have to spend more money in the production process of their goods in order to attain this, it

increases the likelihood of business in the future. Fast fashion clothing is not made to be high-quality. Customers who desire for their clothing to last for a longer time are less likely to be satisfied with the lifespan of low-quality clothing and are therefore less likely to return to those companies for their next purchases. Producing high-quality, sustainably-made clothing is more likely to build a good rapport with consumers and increase customer loyalty, which leads to those customers spending more at the companies they favor. This is backed by the article *What about sustainability? An empirical analysis of consumers' purchasing behavior in fashion context*, in which the authors Maria Vincenza Ciasullo, Gennaro Maione, Carlo Torre, and Orlando Trois reference studies of how a consumer's expectations influence their buying habits. They explain that consumers' expectations are facilitators in their decision-making processes and purchasing intent (Ciasullo et al., 2017, p. 6). If a consumer has high expectations about a fashion good, they are more likely to purchase it. These expectations can be built around several things, including the consumer's previous experience with the brand. If a consumer previously purchased a product that did not live up to their expectations, then their perception of the company will be impacted and they will be less likely to purchase from the company again. Brand loyalty is incredibly important in companies, not only because it ensures the return of one customer, but because they are more likely to encourage others in their social circle to also purchase from the company. Brand loyalty can be built by providing high-quality, environmentally conscious products and meeting customer

expectations. This ends up being a symbiotic relationship between the consumer and the brand itself.

Sustainability is not a concept that is going away any time soon; in fact, it is only likely to gain more attention as the planet's environmental condition becomes an increasingly pressing matter. In the *sustainability* section of MDPI's published scientific journals, the authors of *What about sustainability?* dive into this, stating that it is a widely shared belief that socio-environmental dynamics largely influence individuals' behaviors (Ciasullo et al., 2017, p. 1). With the world gaining more awareness of the environmental needs of the planet, the push for sustainability has grown. This influences people and their buying habits. Ciasullo and her co-authors state that, over time, sustainability has gained interest and support because of how it can influence consumers and their buying choices. Environmental sustainability is a variable of interest when consumers purchase products. It plays a role in the consideration people put into their decision to purchase something. This could be that knowing something is sustainable makes a consumer more likely to purchase a garment, or that knowing something is unsustainable makes them less likely to make the purchase. *What about sustainability?* states that some authors believe that, in the current competitive and ever-shifting market, sustainability in clothing production is one of the most effective methods to attract customers—both those who are active participants in environmental conservation and those who simply prefer sustainable options when they are made available. Sustainable options reach a larger market than just those who are fully invested in living environmentally-friendly lives; they also

reach more average consumers. This is not a narrow market. As stated, sustainability has a lot of influence on consumers' current understanding of the climate. When it is made available and accessible, it becomes an attraction for many people. Ciasullo and her co-authors make the point that business managers should be aware that most companies who have undergone sustainability initiatives have seen a lot of benefits in regulatory compliance, brand reputation enhancement, customer relationship betterment, improvement and/or consolidation of the market position, and more (Ciasullo et al., 2017, p. 1). This is another indication that sustainability initiatives are not isolated to being in the interest of the environment or consumers. They benefit businesses themselves as well, in a multitude of ways. The wording the article uses implies that it is the responsibility of business managers to be aware of the positive impacts of sustainability implementations. Not knowing this information robs the business of the chance to improve in areas such as its brand reputation, customer relationships, regulatory compliance, and market position. Everything reflected here has been noted previously and supported by other authors and scientific journals. Sustainability initiatives are not only a necessary action to keep the planet livable, but a prosperous action to take as a business.

Although there is support for the statement that there is an increased desire in consumers to purchase sustainable goods, and that they will buy more sustainable goods the more they are offered, there are negatives to this market as well. In the article *Brand popularity as an advertising cue affecting consumer evaluation on sustainable brands: A comparison study of Korea, China, and Russia*, authors Claire Whang, Eunju Ko, Ting

Zhang, and Pekka Mattila state that ethical markets are expanding very slowly, meaning sustainable clothing companies are something many consumers are not yet familiar with (Whang, Ko, Zhang, Mattila, 2015, p. 792). Even though there is a desire for sustainability among many consumers, there are many other consumers who are not yet familiar with the concept. Because of that, it is not one of the factors that they consider when they are making purchases. Having little knowledge and availability of the initiative prevents consumers from prioritizing it as much as they might. This is not the consumers' fault, but it does urge companies to be more proactive. By communicating more about their environmentally conscious actions and the reason behind them, brands can spread more awareness to their customers about the importance of sustainability in production. This is where large brands hold a lot of power. They have more of a platform to be able to spread awareness about the need for sustainability in the clothing production industry. In addition, Whang and her co-authors articulate that consumers tend to have a certain level of pre-established trust and confidence regarding popular brands (Whang et al., 2015, p. 792). This is why major fashion corporations need to step up to lead this movement. They have the influence, money, and raised trust and expectations Whang and Ciasullo both discussed. They have the sway and power in order to implement change and affect the market Consumers want more sustainability, and larger companies that have pre-established trust from consumers can provide that.

Closing Remarks

There is often debate over the most important measures to take in order to mitigate the effects of climate change. In his article *Climate Crisis: 11,000 Scientists Warn of 'Untold Suffering,'* Damian Carrington reports that scientists say there is no time to lose and that "'The climate crisis has arrived and is accelerating faster than most scientists expected. It is more severe than anticipated, threatening natural ecosystems and the fate of humanity"' (Carrington, 2019, p. 1-2). The consensus from 11,000 scientists across 153 nations is that the climate crisis is an urgent issue. It is advancing at a pace more rapid than even scientists believed it would. Because of this, it is all the more pressing to take action in order to stop and reduce climate change. In his article *The Economic Effects of Climate Change*, Tol spurs the reader to desire action to be taken. He writes, "Balancing these factors, cost-benefit analyses of climate change typically recommend only limited greenhouse gas emission reduction—for instance, Nordhaus...argues that the optimal rate of emission reduction is 10–15 percent (relative to the scenario without climate policy) over the course of the twenty-first century" (Tol, 2009, p. 33-34). Although this isn't a direct call to action, it brings attention to how much change must occur. Nordhaus isn't explicitly saying, in this excerpt, that action needs to be taken immediately; however, he outlines how much needs to be done this side of the century. This century is still young, as there are still almost eighty years left in it; however, that does not justify any excuse to further prolong confronting the climate crisis. Nordhaus argues that there needs to be a 10-15% reduction in emissions, which is not a small amount. The vast

majority of carbon emissions worldwide are produced by large companies. Focusing on reducing emissions in these companies is a major key in achieving that 10-15% percent reduction and even more. As Tol writes, "The missing effects further emphasize that climate change may spring nasty surprises. Such risks justify greenhouse gas emission reduction beyond that recommended by a cost-benefit analysis under quantified risk" (Tol, 2009, p. 46). While the data and numbers have been calculated and explained how much emission reduction absolutely must be achieved, that is simply the bare minimum. It accounts for no margin of error. A higher reduction of emissions would be safer and could only improve the quality of the environment. Large corporations have the power in this situation to make a change for the better.

While Tol focuses on one aspect of the economy that contributes to climate change and how it must be addressed, Carrington gives a list of measures that must urgently be taken. In *Climate Crisis: 11,000 Scientists Warn of 'Untold Suffering,'* he writes that action must be taken to "Use energy far more efficiently and apply strong carbon taxes to cut fossil fuel use….End the destruction of nature and restore forests and mangroves to absorb CO2" (Carrington, 2019, p. 3). These all need to be achieved in order to curtail the effects of climate change. With the current state of the environment, the sooner these are set in motion, the better. While clothing production corporations are not in control of applying carbon taxes, they have power over how much energy they use and how efficiently they use it. This concept has been discussed at length, from companies that use recycled materials and other

materials that are more energy-efficient to produce, to companies that use dyes and other techniques in the production process that save energy. They also have an impact on the destruction of nature, whether that be in factories that produce clothing or by using natural and animal products to make garments. These are attainable steps that the clothing production industry can feasibly make. They have the power to contribute to a better tomorrow.

Making a better tomorrow takes work, and willingness to change. Many capitalistic companies are built off of the drive to do what is most profitable in the immediate moment, but it is absolutely imperative that the unsustainability of this mindset is realized. This kind of business practice will not allow the world as we know it to survive. A multitude of possible action steps have been addressed from a variety of points in the production and distribution processes of clothing manufacturing. From the very beginning of the process, companies can practice sustainability by sourcing environmentally friendly materials to make their garments. This could be organic cotton, bamboo fiber, cellulostic fibers, or recycled materials. Any material that will reduce the amount of water, chemicals, and electricity used to produce it and reduce the amount of waste made will have a more positive impact on the environment. This same logic can be applied to the production stages of the fashion industry. Reducing factory use, emissions, water use, and chemical dyes will all be beneficial to the environment. Instead of chemical dyes, companies can use natural dyes, such as shrimp shells, orange peels, and nut shells. These will contribute

to less water and energy usage as well as not putting chemicals into the surrounding waterways.

Companies can even be more environmentally sustainable by considering where they should be located. As discussed, shipping garments by air travel is much less sustainable for the environment than using cargo ships, even though it is faster. Locating production plants in the region of the world where the company's primary consumers are reduces the need for air travel, as the distribution process can then be done by land. Using cargo ships in favor of cargo planes will also better support the environment. A necessary addition to this method is a willingness to practice slow consumption over instant gratification. Instead of receiving online orders instantaneously or getting new shipments of clothing frequently, consumers and stores have to adjust to waiting longer periods of time before new garments are made available to them. Directed toward consumers, companies can also use marketing strategies to encourage sustainable habits. This could be aimed to make the consumer think twice before purchasing a piece of clothing, or a challenge of how to care for a piece of clothing in order for it to have the least amount of impact on the environment possible and be able to have a long lifespan. Large corporations and fashion industries are responsible for a lot of the effects that the environment is facing. These impacts and practices are not sustainable for the current world and the life it sustains, and therefore action is demanded. Companies need to work to reduce their impact on the environment and create a more sustainable future, or there will be no recognizable future.

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