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The True Cost of Clothes: Sustainability Issues in the Fashion Industry

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Abstract

Fashion is one of the most environmentally harmful industries on the planet. From greenhouse gas emissions to toxic chemicals in water supplies, the price that the planet, and vulnerable populations, must pay in the production of the clothing we wear each day is not cheap. This paper discusses the role that the fashion industry plays in environmental degradation today, as well as strategies that can be employed within the industry to make it more sustainable. Chapter 1 provides an overview of and through quantitative data on why and how the manufacturing and sale of clothing is environmentally harmful. Chapter 2 delves into the history of the fashion industry, with emphasis on the last three centuries and how garment manufacturing has evolved to the current state it is in. Chapter 3 utilizes environmental economics to assess how the industry currently functions, why it is largely environmentally unsustainable, and what it will take change. Chapter 4 explores the various ethical issues associated with producing modern-day clothing, such as animal welfare, workers' rights, and the implications of climate change in terms of environmental justice. Finally, Chapter 5 draws on the previously discussed subjects and discussions to provide recommendations for how to construct a more sustainable fashion industry that resists participating in the acceleration of climate change, environmental degradation, and overall unethical and unsustainable practices.

Keywords: fashion, climate change, pollution, sustainability, environmental history, environmental economics, environmental ethics

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Introduction: What Is (Un)Sustainable Fashion?

There are two categories of goods that we consume: goods that we need, and goods that we want. We need food, water, shelter, and clothing. While clothing certainly belongs in that list, how we consume it today is by far more in a way which appears to be a want. We all have more clothes than we need to survive, yet if we see a shirt, pair of jeans, shoes, or anything else we like in a store, we often do not hesitate to buy it. Buying clothes is both insanely easy and affordable now. You can go to a centralized location that houses dozens of clothing stores to either buy what you “need” or simply shop around leisurely, purchasing whatever catches your eye. We can even do these things from the comfort of our own bed now if we please. And what is even more amazing is that there are endless affordable options as well. A new jacket or sweater does not have to break the bank (although they could if you choose to buy from a luxury brand, but most of us are not doing that). We can also easily keep up with the latest trends and styles because they are so accessible.

Though this way of consuming clothing may be easy and fun, it also means that someone or something else is taking a hit in order to maintain this status quo. In reality, both someone and something suffers under the status quo of fashion. In order for clothing to be so mass produced and affordable, unsustainable practices are employed. Large amounts of greenhouse gases are emitted, climate change is worsened, natural resources and ecosystem services are exacerbated, and people’s health and safety are threatened. While this is the somber truth of the matter, it does not have to continue on this way. Research and action have already begun to make environmentally sustainable changes to the industry, though there is a very long way to go. However, the tools necessary are here, they just need to be picked up and used.

This paper discusses not only the problems of the fashion industry in terms of environmental sustainability, but also the role and power of fashion as a massive global industry. Its influence impacts the wellbeing of the earth's resources, ecosystem services, and climate, as well as economic systems and the lives of people around the world. Chapter 1 provides quantitative data on the fashion industry and its environmentally unsustainable practices. It discusses the state and importance of ecosystem services, the threat of climate change, and how fashion has and continues to impact them negatively. This chapter also clarifies what is meant by the term "sustainability" because it can often be vague and have various interpretations. Chapter 2 explores the history of the fashion industry in order to understand how it came to be the industry it is today. The chapter pays special attention to the past three centuries and how the production of clothing has evolved dramatically throughout them. Beginning in the eighteenth century and concluding with the contemporary state of fashion, this chapter provides background on the technological innovations that ultimately have led to many of the unsustainable practices commonly found used in fashion today. Chapter 3 analyzes the industry through an economic lens, discussing the role of consumers and firms, and exploring the viability of accelerated abatement of emissions. Chapter 4 assesses the various ethical dilemmas associated with the fashion industry, including animal welfare, workers' rights, and the disproportionate environmental impact fashion and its consequences have on the poor and people of color. In the final chapter, Chapter 5, I provide suggestions for how brands, policy-makers, and consumers can use their power to enact change that is economically viable, ethical, and environmentally sustainable.

Chapter 1. The Environmental Impact of Contemporary Fashion

According to the Millennium Ecosystem Assessment, in order to meet growing demands for resources to increase human well-being and economic expansion, humans have widely and quickly altered ecosystems and degraded ecosystem services throughout roughly the last half of a century (2005, 2). Ecosystem services are the benefits that humans acquire from ecosystems. There are four main categories of ecosystem services. Provisioning services include resources such as food, water, timber, fuel, and fiber. Regulating services include processes such as climate and air quality regulation, pollination, disease, pest, and flood regulation, water purification, and waste management. Cultural services consist of recreational, aesthetic, educational, and spiritual benefits. Lastly, supporting services are comprised of benefits such as nutrient cycling, soil formation, and photosynthesis. All of these services are linked to the overall well-being of human life, including aspects of health, security, and freedom (Millennium Ecosystem Assessment 2005, vi). The efforts to increase human wellbeing and economic development globally have led to approximately 60% of the ecosystem services examined by the Millennium Ecosystem Assessment to be degraded or deemed used unsustainably (2005, 6). If humans continue on the current path, not only will more services become degraded, but many could run out or cease to exist. The economic consequences and consequences to human wellbeing from the degradation of ecosystem services is substantial. Not only is capital lost, but more specifically many food sources and raw materials become more scarce, public health risks, such as the spread of diseases, increase, poverty is exacerbated, and aesthetic and recreational enjoyment is decreased, in addition to many more implications.

As with virtually every industry, the fashion industry relies heavily on ecosystem services in order to operate. The process of creating the clothing we purchase and wear each day is certainly a large contributor to the degradation of ecosystem services seen in the last 50 years. Provisioning services such as natural fibers are necessary for the production of clothing. Water and fuel are also needed to both grow the fibers for textiles and to manufacture garments. Regulating services deal with fashion as well. For instance, pollination and pest regulation are needed for producing the raw materials necessary for clothing. Regulating services such as climate and air quality regulation help to offset the emissions and pollution that the fashion industry creates. Aesthetic inspiration is a prime example of a cultural service that the fashion industry and consumers experience. The beauty of ecosystems around us often contribute to developments in culture, of which fashion is a part of. Finally, supporting services are also essential to allowing earth to sustain the natural processes that combine to create and maintain industries that require such large use of natural resources and materials, such as fashion.

Essential to the discussion of ecosystem services, human wellbeing, and fashion is climate change. According to the United Nations Intergovernmental Panel on Climate Change (IPCC) “Climate Change 2014 Synthesis Report Summary for Policymakers,” since the mid 20th century, warming of the atmosphere and oceans is a result of anthropogenic greenhouse gas emissions reaching unprecedented levels (Pachuri and Meyer 2014, 2). In fact, between the years 1951 and 2010, the global average temperature increased 1.2 degrees Fahrenheit, and in the years since then temperatures have continued to rise (Fourth National Climate Assessment 2018, Chapter 2). With this rapid warming comes the potential for irreversible damage globally, unless significant mitigation takes place. This damage includes but is not limited to droughts, floods, species extinction, and more intense and destructive storms and wildfires (Miller and Spoolman

2011, 515). As a large emitter of greenhouse gases and a contributor to climate change, the fashion industry is part of the problem. As noted in the 2020 report “Fashion on Climate: How the Fashion Industry Can Urgently Act to Reduce Its Greenhouse Gas Emissions,” the industry “accounts for around 4% of emissions globally” (3). This percentage is equal to the annual greenhouse gas emissions of Germany, France, and the United Kingdom combined.

Additionally, that 4% is equivalent to roughly 2.1 billion tonnes of greenhouse gas emissions. If no additional mitigation or abatement efforts take place beyond current ones, that number is expected to rise to around 2.7 billion tonnes by the year 2030 due to “shifting population and consumption patterns” (“Fashion on Climate” 2020, 3). If efforts continue to expand at the rate they are now, the 2.1 billion tonne level of emissions can be maintained in 2030. However, to stay on track to remain below a 1.5 degree warming, the fashion industry would need to cut its greenhouse gas emissions in half, to about 1.1 billion tonnes, by 2030 (“Fashion on Climate” 2020, 3). Methods for this will be discussed in later chapters, and while many options are feasible, it is nevertheless a large and difficult task to reduce emissions by this much. In order for the fashion industry to limit its contribution to the climate emergency and to become more sustainable overall, though, there is no question that this task must be pursued vehemently.

Before moving forward to further discuss the damaging impact fashion has on the planet and its resources, it is important to establish what exactly the term “sustainability” means. It is actually a very difficult word and concept to define simply. Its definition is debated among scientists, government leaders, and environmentalists, among others. That being said, the United States Environmental Protection Agency states that pursuing sustainability means “to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations” (“Learn About Sustainability” 2021). Another commonly

accepted definition describes sustainability as an “ecological system that is designed to maintain balance, meaning that no more should be taken from the environment than can be renewed” (Farley Gordon and Hill 2015, 14). In terms of fashion, sustainability generally refers to a design and production system that is environmentally and/or ethically conscious, however the term is interpreted somewhat differently by people within the industry because there are no core environmental standards in it (Farley Gordon and Hill 2015, 14). An important note to consider is that sustainability is often just thought of in terms of environmental impact, but a key element of it can be issues such as animal and human rights – specifically labor/workers’ rights. Due to the ambiguity of sustainable fashion, it can be confusing and difficult to understand what practices and goals should even exist or be implemented. Furthermore, the concept of “sustainable fashion” is somewhat befuddling and paradoxical in and of itself. Going along with the definitions of sustainability just cited, a 100 percent sustainable fashion industry is virtually impossible, especially at the same scale and magnitude the industry is at today. Given the increasing global demand for clothing and the fact that garment production relies on resource extraction, as well as an abundance of energy, the industry likely will never be truly sustainable unfortunately. Despite this, there is a massive amount of room for improvement in terms of making fashion more sustainable. The opportunities for this are extensive and by and large available right now. In order to take advantage of these opportunities though, we must understand the hurdles ahead.

One hurdle that exists is the emissions that come from creating clothing. In fashion, greenhouse gases are emitted throughout all stages of a garment’s life cycle. From producing the materials for the textiles to the actual use of the garment after it has been purchased, energy is constantly being used at every point in a garment's lifecycle. Once a garment is purchased by a

consumer, most of the energy used to maintain its life cycle comes from washing and drying the garment, yet, with that said, approximately 71% of fashion's emissions come from upstream activities, specifically production and processing of raw materials to manufacture textiles ("Fashion on Climate" 2020, 5). Today there are many types of fabrics used to make clothes, and each one varies in terms of how much emissions it creates. Unsurprisingly, the most energy intensive fibers are the synthetic ones, such as nylon, polyester, and acrylic. These materials are used frequently, including in fabrics such as jeans, knits, and lace, as well as in garments like pajamas, underwear, and silk-like party dresses that have been trendy in recent years (Siegle 2011, 107). They require oil to be manufactured, thus contributing to the "high ecological and social cost of oil exploration and extraction" (Fletcher 2014, 17). Fashion requires so much oil, in fact, that in the United Kingdom, "research suggests that each one of us is indirectly responsible for generating 0.6 kilograms of oil [...] per kilogram of fashion that we buy. With our yearly average of fifty-five kilograms of textiles, that makes thirty-three kilograms of oil" (Siegle 2011, 106). That is equivalent to nearly 73 pounds of oil per person annually. Ultimately the burning of this oil contributes to the release of greenhouse gases, exacerbating global temperature rises and contributing to climate change.

In addition to energy and oil, fashion also consumes large amounts of water which, as previously mentioned, is a provisioning service. Each year, the industry uses between six and nine trillion liters of water, which equates to 3.2 percent of the total available water on earth for humans (Siegle 2011, 105-106). Much of this comes from producing and processing the fibers for the textiles used in garments. Again, each type of fiber differs in the amount of water needed to produce it. Cotton, which accounts for about a quarter of the world's total fiber production, is the most water intensive fiber (Fletcher 2014, 10-21). Roughly 60 billion pounds of cotton are

produced every year, with the majority of it being produced in India, followed by China and the United States (Thomas 2019, 78). While there are different methods to growing cotton, including rain-fed and irrigated, irrigated cotton is the most common and can use up to 3,800 liters of water per kilogram of cotton (Fletcher 2014, 13). Rain-fed cotton does not demand the same intense supply of water as irrigated cotton which is a positive, however, it usually is not as good of quality as irrigated cotton because it does not always receive a consistent supply of water (Fletcher 2014, 31-32). Though this amount of water is massive, it does not even include the water necessary to, for example, manufacture and dye the t-shirt being made out of the fiber, or the water required to launder the t-shirt after each and every time it is worn by its consumer.

The process of dyeing fabric has environmental implications beyond just requiring immense amounts of water. Before a fabric is even dyed, it may have to go through steps such as bleaching or cleaning which require large amounts of chemicals (Farley Gordon and Hill 2015, 179). The actual dyeing is similar; contaminated waste frequently makes its way into soil and bodies of water including lakes, rivers, and oceans. Prior to the 1970s when the environmentalist movement took off, in the United States there were not standards yet for waste disposal. The Environmental Protection Agency came to understand this and worked with the textile industry to establish regulatory measures in the United States, yet many countries that are major textile producers do not have standards or enforcement (Farley Gordon and Hill 2015, 181). Therefore, there is still a good chance that clothing that is sold in the United States was dyed in an unsustainable way.

Dyeing fabric also has a history of being harmful to textile workers and consumers. In 1904 the US Department of Agriculture's Bureau of Chemistry published a study revealing that "11 percent of the fabrics they tested contained a significant amount of the poison," referring to

arsenic (Farley Gordon and Hill 2015, 176-177). The Labor Department also confirmed the threats of the dyeing process by stating that many commonly used chemicals can be toxic on the skin, to the nervous system, and on the blood (Farley Gordon and Hill 2015, 177). While many chemicals used in dyes are now regulated, this one part of the production process is a prime example of just how harmful the fashion systems can be.

It is evident that the contemporary fashion industry has an immensely destructive impact on the environment. It can also be concluded that the industry is a significant contributor to the degradation of ecosystem services, despite the fact that the industry also relies on them to function. If left unchecked, not only will ecosystem services continue to degrade, but some face the possibility of becoming scarce or obsolete. Additionally, the fashion industry will continue to fuel climate change and its consequences if it continues to operate so unsustainably. Finally, the industry itself faces possible demise due to its reliance on the ecosystem services it abuses. This all sounds very urgent, which it is, however, in order to achieve a more sustainable future, one must first understand how exactly the industry got to the point it is at today.

Chapter 2. How We Got Here: Industry History

The fashion industry today is characterized largely by the fact that there is a constant outpouring of styles, trends, and clothing in general. While high-end and luxury brands hold a significant amount of status and power both in fashion and our culture today, it is “fast fashion” that has come to dominate. Fast fashion essentially refers to clothing that is over abundantly mass-produced and is cheap to make and buy, causing it to easily and frequently be disposed of and replaced (Farley Gordon and Hill 2015, 78). Furthermore, fast fashion is a business model

that relies on trends and imitating designer pieces at a significantly more affordable price point. Since most consumers cannot afford the high fashion pieces that come down the runway each season, fast fashion companies will take those styles, designs, and trends and mass produce their own version at a much lower price point. Then, season after season we can all keep up with what is in style and what is trendy. This is indicative of why the industry is so unsustainable today; fast fashion makes it incredibly easy, and even fun, to overconsume. Yet, the flip side of that means that fast fashion is also making it easy and fun to support unsustainable and unethical systems and practices.

This system and culture of fashion is relatively new, but fashion has existed in varying capacities for thousands of years. For instance, “cotton has been processed by ancient Mexican and Indus valley cultures from around 3000 BCE,” and the introduction of the spinning wheel into Europe around 1300 increased the use of cotton there, so by the time of the Renaissance, it was a very desired good (Lavergne 2015, 18). Knowing that cotton was both used and valued over 5000 years ago, as well as during the Renaissance and still today is remarkable. For most of history, though, there was no “fashion industry” like we know there to be today. There were no ever-changing trends each season or constant consumption of entirely new garments. Before the nineteenth century, “every process necessary to the manufacture of clothing - from spinning yarn, to weaving fabric, to sewing elaborate gowns - was done by hand,” and there certainly was no large-scale production (Farley Gordon and Hill 2015, 79). Therefore, most people did not have a lot of garments. Until recently, there has historically been a relatively slow progression of change in regards to how clothing is consumed and viewed. Contrastingly, the state of fashion in the past three centuries is key to understand because these periods contain moments that stand

out as shifts in technology, manufacturing, and overall views of fashion, which ultimately led to the current state of clothing and the industry today.

In the eighteenth century, when mechanization for clothing production had yet to fully develop and take off, massive amounts of labor were required to produce garments, and this resulted in “lasting value, meaning that clothing and textiles were reused and used up, rather than simply discarded” like they often are today (Farley Gordon and Hill 2015, 79). Even among the wealthy, fabrics were often saved and repurposed because buying entirely new textiles or garments was so expensive. Therefore, little waste was produced. For example, instead of purchasing a new dress, women would add alterations like lace trimmings in order to give the dress new life (Farley Gordon and Hill 2015, 82). Though garments were expensive, it also meant that fashion was highly sustainable during this time and garments held a large amount of value, both monetarily and personally to its owner/wearer. Little production of textiles meant few resources were being extracted and used. Producing and processing raw materials was not done on nearly the scale it is today, and therefore pollution was not a prevalent issue related to fashion. Additionally, synthetic fibers were not developed at this time. Rather, materials such as cotton and yarn were commonplace, so the ecological costs associated with producing synthetic fibers, such as oil extraction, were nonexistent. Though the concept of “sustainability,” particularly in fashion, certainly was not yet developed, it was nonetheless innately embedded into the fashion system of the time.

By around the mid-eighteenth century, though, technological and manufacturing change was needed because demand for fabric was higher than the supply (Farley Gordon and Hill 2015, 84). For example, the spinning jenny, “a machine that mechanized the spinning of yarn for weaving,” was patented in 1770 by English inventor James Hargreaves, ultimately allowing for

quicker production of yarn. Further technological developments and improvements took place a few years later, ultimately creating a version of the spinning mule which was automated and produced stronger yarns than before (Farley Gordon and Hill 2015, 84-86). This manufacturing innovation that took place in the eighteenth century was minimal in comparison to that of the following century, but nevertheless important to the process of progression and laying the groundwork for producing fashion on a larger scale.

The early nineteenth century saw the fashion industry transition from hand labor to mechanized labor. One aspect of this transition was the Jacquard loom. The Jacquard loom mechanized silk production and allowed for woven fabrics to be “produced over 24 times faster” than with a handloom (Farley Gordon and Hill 2015, 85-86). They were incredibly efficient in terms of time and labor. While it was evident that garment production was changing quickly, attitudes regarding clothing production were slow to change for some people. Many women still maintained the practice of purchasing expensive fabric for dresses to be made in order to last and hold value, thus conserving money and textiles in the long run. So while the quantity and availability of clothing was increasing during the first half of the century, not all Americans were quick to adjust. That being said, the second half of the century saw an even greater shift in the way clothing was produced and consumed.

In the United States, fashion as it was known was turned on its head in the mid-nineteenth century, and it was primarily due to one machine: the sewing machine. The first sewing machine was patented in 1846 and was designed by an American named Elias Howe. The cost of a machine originally was quite expensive at \$3,000, however over the next 20 years it decreased significantly to \$60, making them much more accessible for Americans. They not only stitched neater and stronger than work done by hand, but stitching was around seven times faster

as well (Farley Gordon and Hill 2015, 92). This also meant that labor costs were significantly reduced because instead of needing a couple thousand hand sewers, for example, a factory would now only need a few hundred sewing machine operators. More garments than ever before could now be produced at a rate previously unimaginable. Other results that came from the introduction of the sewing machine included a boost to the United States economy and solidifying the status of the United States as an industrial nation. Now that clothing could be made quicker and easier, not only labor costs decreased significantly, but the cost of garments dropped as well (Farley Gordon and Hill 2015, 92-93). Subsequently, it was accessible to a widening trove of consumers. As a result, more clothing than ever before was being produced, sold, purchased, and worn in the United States.

Though those impacts are significant, perhaps the largest impact of the sewing machine was the rise of ready-made, or ready-to-wear, fashion. This is the type of clothing most people purchase and wear today; as the name suggests, it is clothing that is ready to wear as soon as you buy it because it was made in standard sizes in a factory of some sort and requires no alterations. Ready-to-wear was made possible by the sewing machine, but initially grew partly out of demand for Civil War uniforms. That is why ready-to-wear clothing first was widely available for men, and became more and more prevailing for women as the century went on (Farley Gordon and Hill 2015, 93). The first garment to be mass produced for women was the shirt-waist blouse, which rose to popularity at the end of the century (Farley Gordon and Hill 2015, 94). The introduction of the ready-to-wear phenomenon is where we begin to easily and markedly recognize aspects of our current fashion industry. One could say that the rise of ready-to-wear was also the introduction of elements of fast fashion. Similar to fast fashion, “the rise of ready-made fashion is considered a key progenitor of problems within the industry - including

excessive waste, pollution and poor labor conditions” (Farley Gordon and Hill 2015, 92). Now that clothing could be produced and purchased more cheaply and more frequently, more resources are needed and exploited. Though still to a much smaller scale, consistencies with the industry today are now obvious during this time in the nineteenth century.

Characteristics of labor practices that are frequently associated with fast fashion today are consistent with some labor practices that became prevalent in the nineteenth century. As Chapter 4 of this paper discusses in greater detail, poor working conditions and wages for garment workers are all too common today. Cotton and textile mills that began to spring up in the United States in the mid to late 1800s commonly forced workers to work long hours; 75-hour work weeks were common in some mills (Farley Gordon and Hill 2015, 201). Additionally, many workers were severely underpaid. It is estimated that a typical family employed by a mill would make \$10-\$15 per week, although there are reports of salaries less than that as well (Farley Gordon and Hill 2015, 201). Finally, just as is the case with many garment factories today, mills in the nineteenth century were often unsafe and unclean environments to work in. For example, machinery could easily cause injury, and a lack of control of cotton dust could cause respiratory issues (Farley Gordon and Hill 2015, 202-203). So while fashion was becoming more and more accessible, it was not without consequences. Innovative machines used in fashion production still required human labor to operate them, resulting in a human cost associated with more efficient clothing manufacturing.

Around the mid-nineteenth century was also the time when natural dyes were being replaced by synthetic ones. Natural dyes were commonly derived from plants and insects. The first synthetic dye to take off commercially was aniline, developed by accident in 1856 by chemist William Henry Perkin (Farley Gordon and Hill 2015, 172). It was made from coal tar,

and while it made use of the waste generated from the process of turning coal to gas, it was not a sustainable innovation, both environmentally nor in terms of longevity. The chemicals in aniline proved dangerous to the textile workers who dealt with the dye, consumers who wore clothing dyed with aniline, and waterways polluted by them. Aniline, though, led to a plethora of new dyes in endless colors to be developed throughout the century, many of which were also not sustainable or safe, as discussed in Chapter 1. Synthetic dyes were not only brighter in color, but they were cheaper as well (Farley Gordon and Hill 2015, 174). Thus, the use of synthetic dyes has made its way into the manufacturing process of most of the clothing we wear today in our daily lives.

By the early twentieth century, ready-to-wear clothing was all the rage, while still continuing to grow. Any type of garment could be purchased as a ready-made piece, and thus the average American's wardrobe was growing more than ever before. Synthetic fibers were being developed as well, further decreasing clothing prices, while "simultaneously increasing the speed of the fashion cycle" (Farley Gordon and Hill 2015, 98). Mass production had picked up and garments were being made and sold at unprecedented rates. During this century, the decade of the 1960s is seen as a revolutionary one in fashion, in part because of the desire for "disposable" and "fun" fashion (Farley Gordon and Hill 2015, 104 and 105). Clothing was no longer viewed as so much of a status symbol; instead people were simply attracted to the array of fabrics, colors, and styles now available at a cheap cost. That being said, for some Americans, high-end and custom clothing was still all the rage. Prominent American and European designers such as Christian Dior, Cristobal Balenciaga, and Pierre Balmain dominated the world of high fashion and couture in the mid twentieth century - and are still among the biggest and most prestigious names in fashion today (Farley Gordon and Hill 2015, 101). However, for the everyday

American consumer, these brands were not where they were buying their clothing. Instead, it was the mass produced, ready-to-wear clothing that was cheap and accessible. This overall shift in Americans' mindsets and views of fashion gave way for overconsumption of fashion to be normalized.

The twentieth century was also when the first automatic washers were developed, although they did not become common in homes until well into the middle of the century (Marcketti 2020, 190). Prior to this, clothes were still washed either using hand-crank washers or basins with washing boards and then hung up to dry. While automated washers and dryers certainly require less human work, they are more energy intensive. Furthermore, they also contributed to the shift in Americans' standards of cleanliness that took place in the twentieth century. Women were increasingly expected to maintain high standards of cleanliness in the home, and laundry was part of that (Marcketti 2020, 191). Yet, the "average amount of time that women spent taking care of clothes" decreased significantly in the twentieth century; in 1920, over eleven hours per week were dedicated to caring for clothing, while in 2016 it was a mere 0.29 hours (Marcketti 2020, 191). The shift in time spent caring for our clothing is perhaps part of the reason why today we oftentimes have a throwaway mindset and general lack of regard for many of our clothes.

That brings us to contemporary fashion. As mentioned earlier in this chapter, fast fashion has come to dominate the industry. Beginning in the 1990s with stores like Zara, fast fashion began to take its hold and grow (Thomas 2019, 36). And grow it did; between the years of 2001 and 2018, Zara, for example, opened nearly 1,700 new stores, putting the company in ninety-six countries (Thomas 2019, 36). Additionally, "between 2000 and 2014, the number of garments produced doubled to 100 billion annually," and during that same time clothing prices dropped

and the average consumer's purchasing of clothing "increased by 60 percent" (Thomas 2019, 38-39). Other popular and profitable fast fashion brands include H&M, Uniqlo, ASOS, and Shein. Because of the cheap prices these brands offer, consumers can rationalize purchasing large amounts of garments each season or year, and discarding them when they either are no longer trendy or physically break down – which often happens quickly due to the cheap nature of the materials used in most fast fashion garments. It is important to note, however, that certainly not all clothing being produced nowadays is like this. There are still many luxury and high-end brands that use long lasting, high quality materials. There are also more mid-range sustainable brands than ever before.

The roots of the contemporary sustainability movement in fashion can be traced back to the 1970s when handmade and secondhand clothing was worn by hippies as a statement to express opposition to the ideals of fashion and its environmentally harmful practices (Farley Gordon and Hill 2015, 111). The overwhelming majority of American consumers, though, were not concerned about which materials their clothes were made out of, how they were made, or who made them. Since then, the movement has certainly evolved tremendously, though. It is now not only cool for fashion brands to be ethical and sustainable, but increasingly it is becoming a smart move financially.

All of these technological advancements and shifts in attitudes over the past three centuries have culminated to produce the world of fashion we live in today. Key to fulling comprehending this history is also understanding that it was driven by the belief system of capitalism (Lavergne 2015, 30). Fashion's modern history was incredibly innovative, and continues to inspire innovation today, however, it has also led us to have an extremely flawed system driving the industry today. Those flaws can only be understood and addressed by

recognizing that industry and the drive for economic expansion prevailed to such a degree within the textile industry that it has become dangerously unsustainable. The fashion industry as we know it today is built upon a system of exploitation (Lavergne 2015, 31). Exploitation of both people and the planet uphold the industry now. The trends toward mass-production and over-consumption, and the disregard for their consequences, has not only become the status quo, but has also become extremely profitable.

Chapter 3. The Economics of Our Clothes and Climate

In order to fully understand the fashion industry today, how it operates, and how it can be more sustainable, one must look to the economics of the industry. Just like almost any other industry, it operates under the system of capitalism, and while fashion is a field characterized by art and creativity, its primary goal at the end of the day is to make money, oftentimes even if that means environmental and human health is put at risk. Clearly this has worked, given that fashion is a \$3 trillion industry (Cokar 2019, 350). Yet this is why careful analysis of things like consumer purchasing habits and the cost of industry emissions and abatement are crucial to developing sustainable change; companies and brands will not reform if they will no longer be making profits that are worthwhile. Through using tools like a cost curve analysis, the economic viability of decarbonization levers can be examined. That examination has concluded that the path to a more sustainable fashion industry is visible, achievable, and economically viable.

The act of frequently purchasing and consuming clothing is a behavior that gives consumers utility, or a feeling of satisfaction, and now that so much of fashion is inexpensive, that utility can easily be chased and increased. Fast fashion in particular has increased the

choices of clothing available due to the low prices (Anguelov 2016, 117). These low prices allow consumers to afford a range of clothing purchases, as well as allows for purchases to be repeated and bought again if the consumer wishes to in order to achieve a greater sense of utility. As Anguelov further explains, “consumer utility is defined by value derived from the amount of money spent on an item in relation to discretionary spending” (2016, 120). Because utility is gained from purchasing clothes, and because there is now such a large volume of clothing available at our fingertips, one may assume that a significant amount of the average American’s income is spent on clothing. However, that is not really the case. According to the American Bureau of Labor Statistics, the average household consumes \$51,000 of goods and services annually, yet only \$1,600 of that is spent on clothing, while \$8,000 is spent on food, around \$5,000 on health care, and \$18,000 on housing (Anguelov 2016, 120). This is just over 3% of spending. One explanation for why this number is not higher is because clothing prices have continued to lower in recent years.

When considering the economy of fashion, one may wonder if or how that number of \$1,600 fluctuates. That is where the idea of elasticity comes in. Fashion sales should tend to be inelastic based on consumption theory that states “inelastic utility functions lower the probability of substitution, particularly when the question of price is settled,” yet despite this, “traditional fashion economic theory rests on the assumption that apparel sales are elastic (Anguelov 2016, 121). This is primarily due to two reasons. First, there is a large amount of choice in clothing items. Second, a high tendency for change in choice contributes to the elasticity. This means that consumers tend to buy a clothing piece with other items it could be worn with in mind, so therefore purchases can easily shift. Ultimately, producers and fashion brands obviously want consumers to spend their roughly \$1,600 on their products, but because there is so much choice

today, producers face more competition. With that said, when the price and quality of two products from two different brands are equal, consumers turn to purpose in the sense of social responsibility as a deciding factor. In fact, from 2008 to 2012 the role of purpose as a purchase trigger rose 26% (Cokar 2019, 328). This is indicative of how there is more economic potential yet to be unlocked by brands prioritizing sustainability.

Brands are certainly catching on to the fact that consumers have a growing demand for putting their money towards a product or company that values social responsibility and environmental sustainability. Most consumers are simply more likely to purchase from a brand that supports causes they believe in as well. In fact, 72% of consumers have followed this logic (Cokar 2019, 329). Furthermore, in 2016, 60% of consumers in the United States said that they “felt it was important to purchase goods from companies that demonstrated social consciousness,” meaning that it is in fashion brands’ best financial interest to operate according to principles of social consciousness (Cokar 2019, 329). Increasingly, consumers clearly value where their money is going and what it is supporting. A 2020 survey found that 34 percent of consumers would stop shopping at a brand if they discovered that that brand mistreated their employees or suppliers (“State of Fashion 2021, 47). Additionally, 33 percent of consumers stated that they would significantly reduce shopping at a brand if the same fact was realized; this means that two-thirds of consumers feel strongly enough about brands’ labor standards that their purchasing habits depend on it. This also demonstrates that consumers believe in the power of their purchase. Choosing to support a company that is socially conscious or environmentally sustainable over one that is not is a testament to how many consumers believe they can have a positive impact through the act of buying a good or service. This is all extremely important for

the future of brands because if they want to retain customers, or gain new customers, who value sustainability, they will need to adopt sustainable practices and goals in order to do so.

It is also in brands' best interest to practice transparency and traceability. These go hand in hand. Traceability refers to the "ability to "identify and trace the history, distribution, location, and application of products, parts, and materials"" and therefore guarantees transparency (Cokar 2019, 330). In other words, a traceable system or supply chain has records of a product's journey from start to sale, including where materials come from, who supplies them, where processing takes place, and finally the distribution process. This translates to transparency; a brand makes this information public, along with information on things such as quantity of resources required to produce a garment, how those resources were farmed, how employees and garment workers are treated and paid, as well as environmental and social goals the brand may have (Cokar 2019, 352). A brand may adopt this level of accountability for the sole sake of appealing to conscious consumers, however in the process it hopefully encourages the implementation of more aggressive sustainability goals. Additionally, supply chain transparency aids in identifying where greater efficiency can be achieved and where supply costs can be reduced (Cokar 2019, 352). Finally, if a brand is in need of investors, supply chain traceability and transparency provide reassurance to investors that they are lower risk (Cokar 2019, 352). This is once again an example of why it is financially advantageous for fashion brands and companies to engage in environmental sustainability and social responsibility efforts.

According to the 2020 "Fashion on Climate" report, there exists an accelerated abatement potential for the industry of 1.7 billion tonnes of emissions by 2030 (10). Accelerated abatement in this case refers to the potential for reducing emissions if the fashion industry "continues its production in line with growth forecasts and significantly accelerates its decarbonisation efforts

across the selected levers” (“Fashion on Climate” 2020, 27). It is essentially an analysis of what can be done by 2030 to significantly mitigate fashion’s harmful impact on climate. This abatement is not only a huge opportunity, but it is a vital one as well. The report includes a cost curve under accelerated abatement which illustrates various levers of decarbonization and to what degree they would either incur additional costs or result in cost savings. Additionally, as

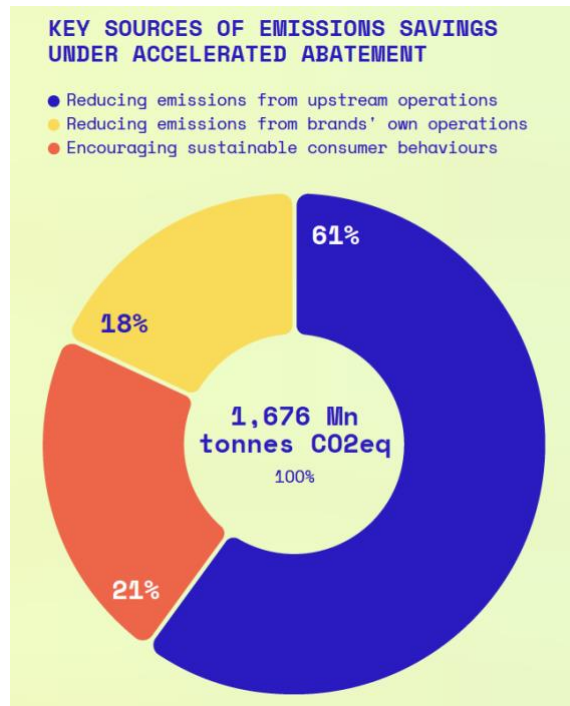


Figure 1

seen in Figure 1, accelerated abatement potential can be broken down to reveal that 61% of potential lies in decarbonizing upstream operations, 18% in brands’ own operations, and 21% from encouraging sustainable consumer behaviors” (“Fashion on Climate” 2020, 9). Each carbonization lever falls into one of these three groups. For example, decarbonizing material production and material processing, as well as improving material mix are all upstream operations that have potential to improve, though each of these results in some degree of increased operating costs. However, other upstream operations such as minimizing production

wastage, minimizing manufacturing wastage, and decarbonizing garment manufacturing all reduce operating costs (“Fashion on Climate” 2020, 18-37). So while it is no secret that abatement can cost money, many approaches actually save the industry money, and many others simply have low costs.

While upstream operations hold a lot of potential for reducing emissions, it is important to include efforts targeting the reduction of emissions from brands’ own operations in the overall abatement strategy as well. The “Fashion on Climate” report discusses six ways for brands to reduce their emissions. Increased use of sustainable materials could save 41 million tonnes of greenhouse gas emissions, increased use of sustainable transportation could save 39 million tonnes of emissions, improved packaging could save 5 million tonnes, decarbonization in retail operations through reduced energy consumption, increased energy efficiency, and a transition to 100 % renewable energy could save 52 million tonnes, a reduction in the e-commerce return rate of 35% to 15% would save 12 million tonnes of emissions, and finally a 10% reduction in overall overproduction could save 158 million tonnes of greenhouse gas emissions by 2030 (“Fashion on Climate” 2020, 12). When put together, these changes that would be implemented under an accelerated abatement strategy have the potential to cut over 300 million tonnes of greenhouse gas emissions.

On a consumer level, accelerated abatement encourages sustainable behaviors too. In fact, actions taken by consumers are related to roughly 21% of accelerated abatement potential (“Fashion on Climate” 2020, 14). This potential can be tapped into in several ways. For instance, a roughly 16% reduction in washing and drying clothing, as well as washing loads at cooler temperatures, can save 186 million tonnes of greenhouse gas emissions (“Fashion on Climate” 2020, 14). Laundering practices are not something typically discussed or considered when most

people think about sustainable fashion or limiting their environmental impact, however, it is perhaps one of the simplest and most accessible actions consumers can take. Additionally, embracing circular business models and increased garment recycling could save an additional 161 million tonnes of emissions (“Fashion on Climate” 2020, 14-15). This would reduce the amount of clothing that either gets incinerated or is brought to landfills. Currently, less than one percent of garments are recycled into new ones (The State of Fashion 2021, 63). Extending the life of a garment also works to conserve resources because fewer new garments need to be manufactured. Circular business models and promoting longevity in garments can also work to preserve the value of said garments after they have been purchased, which can be valuable for the brand (“Fashion on Climate” 2020, 15). Longevity can be achieved through upcycling, repairing, reselling, and renting clothing, to name a few methods. Furthermore, adopting circular business models will require participation and collaboration between all players involved in fashion, including large and small brands, as well as consumers.

While accelerated abatement incurs costs in some ways, it is essential to understand that it is an investment, and in fact, 55% of the levers discussed in the “Fashion on Climate” report actually save the fashion industry money (“Fashion on Climate” 2020, 20). Furthermore, “89% of abatement can be achieved at a cost of less than USD50 per tonne of GHG emissions, a relatively modest amount compared with other industries” (“Fashion on Climate” 2020, 20). Therefore, it is financially advantageous for the industry to pursue this abatement investment. In regards to some of the levers for potential abatement discussed previously in this chapter, some that represent a decrease in cost and an increase in savings are: promoting garment longevity, decreasing washer and dryer usage, and increased energy efficiency in aspects of upstream production such as wet processing and sewing (“Fashion on Climate” 2020, 18). It is clear that

the research and groundwork has been done for shifting the industry towards a sustainable future while still allowing it to flourish. Any investment cost incurred from pursuing accelerated abatement is likely to be much smaller than the cost of not pursuing it because the industry will face significant consequences and challenges in the future if ecosystem services are depleted and climate change is unmanageable. Overall, “63% of accelerated abatement potential lies in energy efficiency and the transition to cleaner energy sources” (“Fashion on Climate” 2020, 11). If this abatement is achieved, the result would be an emissions percentage change of 50% less than 2018’s emissions. In other words, the greatest opportunity for fashion brands and companies to approach the accelerated abatement investment lies in switching to energy sources that are cleaner and more efficient. This would have a significant positive impact on the industry’s overall emissions levels as well.

On the topic of consequences, imperative to the discussion of economics in fashion is the issue of negative externalities. Negative externalities are the harmful costs that are inflicted onto a party not directly involved in an activity, such as manufacturing clothing. They exist along the entire fashion supply chain and create “a disproportionate burden of environmental health hazards” for the people living or working in areas near manufacturing facilities (Bick, Halsey, and Ekenga 2018, 1). They impact not only human health, but also human rights and the environment. Examples of negative externalities from the manufacturing of fashion include air pollution and contaminated water systems from harmful dyes (Bick, Halsey, and Ekenga 2018, 2). More specifically, the process of dyeing textiles creates wastewater that is often left untreated and is then “discharged into local water systems, releasing heavy metals and other toxicants,” which subsequently have the potential to harm local residents and wildlife (Bick, Halsey, and Ekenga 2018, 2). These scenarios that create negative externalities are instances where producers

are valuing profits over environmental and public health. Furthermore, they represent economic activity that is not controlled in a way which prevents social costs and losses for the public and the environment. Ultimately, instead of fashion brands and companies incurring financial losses for their desire to achieve and maintain continuous economic growth no matter the means, negative externalities are created.

It is clear that fashion is an extremely lucrative industry. It is also clear that practices that characterize the industry today, such as mass-producing garments at the lowest possible price, are not sustainable long-term, no matter how profitable they may be in the moment. It is imperative that fashion brands and companies understand this and how prioritizing environmental sustainability is necessary for protecting resources and ecosystem services and mitigating climate change. Additionally, pursuing accelerated abatement strategies can be a worthwhile investment financially. Now more than ever, this is true as gen-z and millennial consumers “rank social and environmental responsibility as two of the top five factors they consider before buying a product” (Thomas 2019, 179). Similarly, practicing traceability and transparency is financially advantageous for brands because it can lead to cost reductions and consumers are increasingly drawn towards brands that are open and honest about their supply chain, environmental impact, and social responsibility. As mentioned in the context of negative externalities, the implications of fashion’s practices are not only economic-related issues, but they are also issues of ethical concern, which will be discussed further now.

Chapter 4. Airing Out the Dirty Laundry: Fashion’s Unethical Practices and Consequences

We begin to develop our understanding of good and bad, and right and wrong at a very young age. It is standard practice to teach children that treating others with respect and kindness is morally good, while lying, cheating, and stealing are morally bad. But as we get older, we realize many situations are not so black and white. As Jung E. Ha-Brookshire puts it, “something that is nearly harmless at home could result in morally-challenging situations in other areas” (Marcketti 2020, 7). This is true of the fashion industry. Here in the United States, for example, buying \$15 tops and \$40 pants several times throughout the year is completely normal. However, rarely do we think about why we are able to do this, and when we do, we encounter one of those “morally-challenging situations.” The truth is the fashion industry is filled with realities that are morally and ethically questionable.

At this point it is clear that fashion has major negative impacts on the environment and ecosystem services, but the industry’s issues go even deeper. The myriad of unethical practices and consequences related to fashion extend beyond the fact that we as humans are damaging the earth. Billions of animals are used and suffer every year for clothing to be made and worn for solely aesthetic purposes. Additionally, the labor practices that have come to make the fashion industry go around are extremely exploitative. Poor working conditions and wages are commonplace in the factories that produce so much of the average American’s wardrobe. Finally, the negative environmental effects of the fashion industry, such as climate change, also impact the lives and well-being of people who do not even work in the industry, particularly vulnerable populations such as the poor and people of color - ultimately creating issues of environmental injustice.

Several materials commonly used in garment manufacturing are derived from animals, including but not limited to silk, wool, leather, and fur. Leather is one of the most prominent

materials in discourse surrounding animal welfare and the ethics of its use. Most leather comes from India and China where few animal welfare laws exist or are enforced. In the United States, leather is the most valuable coproduct of the meat industry (*The Leather Industry*, PETA). Because most leather is a coproduct, or by-product, some believe that it is more ethical and sustainable than fur, for example, because the animal is not being reared for the sole purpose of fashion and it ensures less of the animal goes to waste (Styles 2014, 26). While those points may be valid, this line of thinking does not address the welfare issues associated with the animals' overall life and death. Additionally, leather can also be very harmful environmentally. The process of turning the animal skin into leather uses large amounts of chemicals and can create wastewater that is dangerous to both the environment and the health of people (Marcketti 2020, 60). Chemicals are used along nearly every stage of the leather production process, including removing hair and lime from the skin, tanning the skin, and dyeing it. Alternative methods used in producing leather, such as vegetable-tanning, exist as well. Vegetable-tanned leather "uses no chemicals to treat the leather at all," making it a more natural option (Styles 2014, 26). So while not all leather is produced using the same practices, it is important to note that many chemicals often used in producing leather have proven to be carcinogenic and "chemical/dye workers have a higher incidence of bladder cancer due to occupational exposure" (Marcketti 2020, 62). Thus, the ethical debate surrounding leather is not just an issue of animal welfare, but human health as well.

Similar to leather, fur is another highly controversial material in fashion. It is also frequently a by-product of the meat industry, yet the rearing of animals purely for their fur is not uncommon either (Styles 2014, 30). The debate about fur is generally simple, but can vary to certain degrees. One question certainly is whether or not it is ethical to breed and kill an animal

solely for its fur. Another is if wearing fur that was a by-product of the meat industry is ethical. Furthermore, consumers typically do not know which of these was the case with a given fur garment, so the question remains: is it ever ethical to wear fur? Answers are certainly subjective and constantly debated, but in recent years the industry has sided more and more with the opinion that fur is unethical. Many claim that fur is dead (no pun intended). Based on actions of major players in the industry, there is definitely some truth to this statement. In the past few years, many large luxury brands, including Gucci, Armani, Burberry, Versace, and Tom Ford have all gone fur-free (Pinkhasov 2018). London Fashion week has done the same, as did the country of Norway in 2018, making it the 14th country in Europe to end its fur farming practices (Pinkhasov 2018). Stella McCartney is one brand that has long been against the use of fur and instead has utilized faux fur as an alternative. However, while more ethical in terms of animal welfare, many faux furs are not very sustainable environmentally. It is typically made out of petroleum and is not biodegradable. The fibers that make up the fake fur can also “contaminate water and food chains” (Pinkhasov 2018). Though real fur is renewable and biodegradable, it has environmental implications as well, in addition to its animal welfare concerns. Tanning of fur does not use as many chemicals as with leather, but like leather, the processes used in the fur industry can be highly polluting. Chemicals that are used can be toxic to both wildlife and humans who are exposed to them (Styles 2014, 31). When considering this, the ethical debate of fur is also an environmental one, ultimately worsening the general case for producing and wearing fur.

As touched on, no matter the way an animal was raised, the issue still persists whether or not using another living creature for parts of its body is an acceptable practice. An important point to consider is that these animals are used without their consent and are not given a choice

in the matter. Additionally, in these instances, they are not being used for survival or sustenance by humans, but rather purely for fashion, style, and economic gain for the companies selling the products. The potential for environmental harm cannot be ignored either and adds another layer and dimension to the fur discussion. Some still consider real animal fur to be a symbol of luxury and status, however, the days when this belief was widespread are seemingly coming to an end as more and more consumers and brands come to understand the ethical ramifications of fur and place value in that understanding over aesthetics.

The role of animals is not the only ethical dilemma within the fashion industry. The rights of garment workers is a tremendous issue that is too often pushed under the rug by fashion brands and as a result, consumers are typically kept in the dark about it. In order to keep clothing prices for Western consumers low and profits high, fashion companies have figured out how to achieve extremely low labor costs. That solution is countries such as Bangladesh. Here, about 3.5 million people work in the garment industry and “fashion accounts for 78 per cent of the country’s total exports” (Styles 2014, 39). Due to much of the population living at or below the poverty line, people are willing to work for very low wages and in unsafe work environments. In Bangladesh, the minimum wage is 2,800 taka, or around \$33 per month (Styles 2014, 40). Some garment workers earn more than this, yet it is still barely enough to support a household’s basic needs. This means that while manufacturing costs are extremely cheap for companies, laborers are still left struggling financially. Low wages are only one issue garment workers around the globe must endure, though. Several reports over the past two decades alone have exposed companies such as Target and Wal-Mart, among other American retailers, of textile and garment factories running operations involving work days of up to 20 hours, physical and verbal abuse, and inadequate housing accommodation (Marcketti 2020, 108). Workers are further exploited

due to hazardous conditions such as exposure to chemicals and a lack of adequate building safety standards (Styles 2014, 42). What are clearly human and labor rights violations in the United States are in fact being perpetuated by American companies.

This issue of unsafe work environments, and the ethics of garment manufacturing in general, was highlighted on a global scale when Rana Plaza, a building housing several garment factories, collapsed in April 2013 in Bangladesh. Over 1,100 people were killed and thousands were injured (Styles 2014, 44). As seen in Figure 2, the destruction was severe (Appelbaum and Lichtenstein 2014, 59). Workers had previously expressed their concern about the state of the building to its owner, however nothing was done. This tragic incident brought attention to the

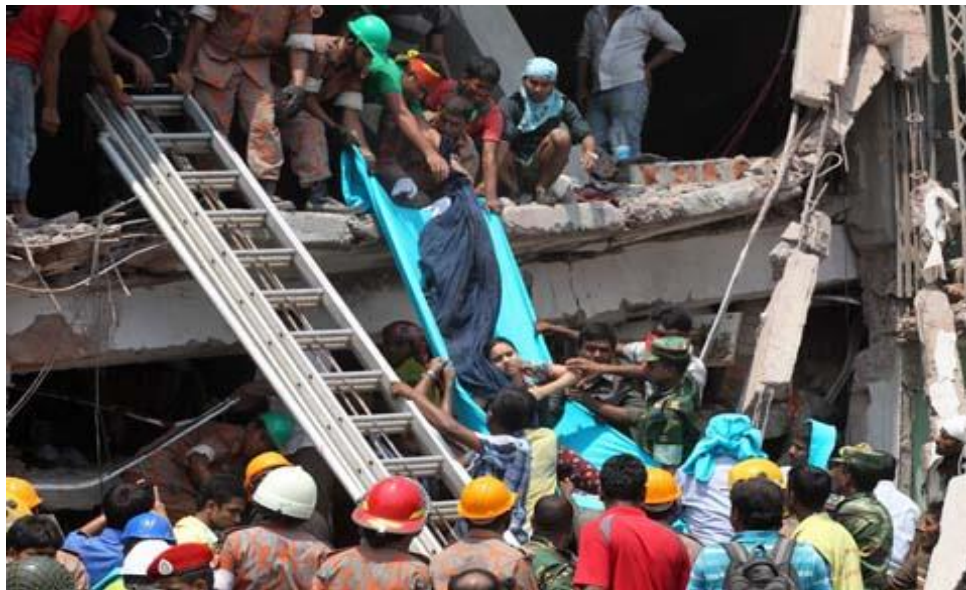


Figure 2

reality of where and how much of the West's clothes are produced. The question that must be addressed is one about what we value, or should value, more in society. The exploitation of millions of people in exchange for a cheap t-shirt or pair of pants should not be the norm.

However, the solution cannot simply be the demise of the companies perpetuating this poverty and exploitation by paying such low wages. The 3.5 million people of Bangladesh working in

garment manufacturing cannot lose their jobs, as that would create an entirely new issue. Rather, consumers must decide if they can continue to stand for this, and if not, must put pressure on fashion companies to raise wages and improve working conditions. This also means consumers must be willing to pay slightly more for their clothing. If the minimum wage in Bangladesh were to be 5,000 taka, consumers would pay around \$1 more for their clothing (Styles 2014, 41).

It is clear that garment workers suffer under the hand of the fashion industry, but they are not the only people impacted negatively. As previously established, the fashion industry is a massive polluter that contributes heavily to climate change. Though climate change is a threat to the entire world, not everyone faces the same level of risk when it comes to dealing with its impacts. Globally, those living in “the developing world, particularly the poor and most vulnerable including women and children,” are disproportionately impacted by climate change and its extreme effects (“Climate Change and the Developing World” 2020, 1). These effects include conflict and displacement from extreme weather, food and water insecurity, increased exposure to deadly infectious diseases for up to one billion people due to warmer temperatures, and finally economic impacts that “could push an additional 100 million people below the poverty line by 2030.” By 2050, rising sea levels will also threaten at least 300 million people living in coastal cities in developing countries (“Climate Change and the Developing World” 2020, 1). So, despite the fact that garment workers and populations in developing nations are not the primary or target consumers of fashion, they are the ones forced to experience the worst consequences of the industry. Meanwhile, consumers in developed nations will not bear the brunt of the impacts fashion has on the climate crisis and the implications that are already arising from it.

In the United States, again, not everyone faces the same level of threat from pollution and climate change and ultimately, the disproportionate violence against people of color in the United States can be tied to racism and colonialism. This is a central idea of the environmental justice movement which emerged in the U.S. in the 1980s. As explained in *Environmental Justice in a Moment of Danger*, “people of color, particularly African Americans and Indigenous peoples, have been made to live within environmental and bodily risk historically” (Sze 2020, 8). In other words, built into American history is disproportionate violence against people of color in varying forms. Some of these forms include land dispossession, pollution and its dangerous health implications, and the harmful effects of climate change. Land dispossession in the United States dates back hundreds of years to when Natives were killed for their land by colonists. Today, Indigenous peoples and their land are still being targeted. Environmental justice cases such as the Dakota Access Pipeline and the Keystone XL pipeline are primary examples (Sze 2020, 26). Pollution and the health effects it causes disproportionately affect low-income communities and communities of color. For instance, asthma rates from air pollution are exponentially higher in New York City neighborhoods that are low-income and predominantly people of color (Sze 2020, 17). The water pollution in Flint, Michigan is another prime example of this. Finally, climate change follows the same pattern.

Fashion’s impact on climate change cannot be denied, and neither can the fact that race and class play a central role in who is most impacted by the climate crisis and the extreme effects it is already producing. In the United States, one of those effects is extreme weather events, such as hurricanes. As Robert Buller, the man known as the “Father of Environmental Justice” explains, in the case of Hurricane Harvey which hit Houston, Texas in 2017, African American and Latino areas were hit the hardest (Amanpour & Company 2020). This is due to several

reasons including institutionalized racism and insufficient representation and advocacy for these communities politically. In general, disadvantaged and vulnerable communities typically lack the economic and political power to fight for and implement environmental justice. If climate change will continue to hit vulnerable communities hardest, that also means they are less equipped to deal with the impacts. We know this is the reality vulnerable communities in the United States and around the world are facing.

Environmental justice issues are also frequently linked to capitalism (Sze 2020, 8). Industry and profit are often valued over the health, safety, and lives of low-income communities and communities of color. As discussed in Chapter 4, the fashion industry operates under a capitalist system. Therefore, its fundamental goal is to make more and more profits, even if it is through unethical practices and at the expense of the environment or animal or human well-being. The environmental sustainability and ethical problems of the fashion industry not only relate to those addressed by the environmental justice movement, but they overlap and are interconnected because they all are rooted in capitalist goals.

This issue of climate justice is “a question of responsibility and morality” (Sze 2020, 11). Can the consumers who are not directly seeing or experiencing the ugly practices and consequences of fashion continue to uphold and perpetuate this reality? Is this consistent with our values and morals? If the answer is no, then evaluating and acknowledging the role we each play in the system, and taking responsibility, must occur. Similarly, the myriad of other ethical dilemmas associated with the fashion industry, including animal welfare, the health of the environment, and the health and safety of humans must be examined by consumers whenever possible. If fashion is ever to rid itself of any unethical practices, supporting and advocating for ethically produced clothing is the most vital action consumers can take.

Chapter 5. The Future of Fashion: Recommendations for Sustainable Change

For the sake of the planet and humans, and based both on the overall quantitative data of the fashion industry as well as the specific practices and consequences discussed in previous chapters, it is clear that sustainable change in fashion is needed. Chapter 1 discussed the term “sustainability,” what exactly that means, and if it is even possible to achieve within the fashion industry. Given the nature of how clothing is produced today, creating a 100 percent sustainable fashion industry is both unlikely and virtually impossible. The scale of the industry has become so massive where some of the key aspects of sustainability cannot be fully realized. For instance, sustainability generally implies 1) not taking and using resources from the earth at a faster rate than they can be replaced and 2) not inflicting damage upon ecosystem services. At the most fundamental level, clothing requires large amounts of resource use because the fibers need to be grown or produced, the garment must be manufactured, and then it must be cared for after it is purchased. In one way or another these steps will inevitably have unsustainable impacts. Fashion brands and companies also operate under capitalism and in order to make a profit. It is unrealistic to assume this will ever change. Despite these truths, it is no secret that the industry can and must do much better in terms of sustainability. While it may never be perfect, it is imperative that it tries to get as close as possible.

The information taken from the previous chapters and their various disciplines should be used to see the industry’s flaws from various perspectives because the issues at hand truly are interdisciplinary and cannot be solved by viewing them from a single lens. Furthermore, sustainable change can and should come from multiple stakeholders and sources, including

brands themselves, policy-makers, and consumers. Each group holds a significant amount of power that is necessary to tap into in order to truly enact sustainable change. The brands are the ones producing the clothing, and therefore have the most power to make immediate changes. That being said, they are also in business to make profits, and therefore are often opposed to enacting more sustainable practices because it may cost slightly more money than their current practices (or it is possible they simply do not know how to begin implementing changes). That is why brands cannot always be trusted to choose sustainable practices on their own, and instead policy and intense consumer pressure are required. My recommendations for how brands, policy-makers, and consumers can all contribute to a more sustainable future for the fashion industry are discussed below.

Brands. The first crucial step towards a brand becoming more sustainable is for them to have traceability and transparency in their operations, and to track and analyze their own performance. This is important because it lets consumers know that the brand values accountability. Additionally, given that consumers value this openness, it is smart financially to make supply chain and production information public. It can also help the brand better understand where along the supply chain costs can be reduced or efficiency can be optimized. Part of this overall process should include brands and retailers analyzing “their own specific abatement curves, which will help them focus on key levers and define or adjust their decarbonisation roadmaps” (“Fashion on Climate” 2020, 22). They should have goals that are science-based and fit into clear timelines that have been developed. While some brands have already begun doing this to varying degrees, it must be more widespread. It is especially necessary that the top global fashion companies do this and require all brands they own to analyze their practices, impacts, abatement cost curves, etc. and set ambitious targets. By making

this customary, large fashion companies and brands will be able to both reduce their environmental impact and set a standard in the industry.

Similarly, if a brand does not already have a Corporate Social Responsibility (CSR) plan, they should develop one immediately. CSR is used to “reduce the negative social and environmental impacts of a company” (Cokar 2019, 326). Practicing CSR is not only important for large companies, but smaller brands as well. Establishing CSR objectives helps a business identify areas of improvement, whether it be large or small. An example of a small goal may be implementing energy-efficient lights and toilets in all company facilities; a large-scale objective may be sourcing raw materials more sustainably or improving living and working conditions for garment workers (Cokar 2019, 330-331). For bigger goals like these, it is beneficial to break down exactly how they can be achieved. For example, in 2015 Eileen Fischer developed a plan with the overall goal of achieving “100% sustainability.” This is certainly a large and broad goal, but it is further broken down into smaller ones that each have a different focus, including: “materials, chemistry, water, carbon, conscious business practices, fair wages and benefits, worker voice, and worker & community happiness” (Cokar 2019, 331). This approach makes managing and achieving the overall goal more feasible. Again, responsibility and transparency are key to this process as well. It is also relevant to know that CSR looks different at every company; some may have a specific team dedicated to CSR, while others might build CSR into each separate department and role at the company.

Part of having responsible practices as a brand is working to limit emissions. In Chapter 3 I discussed how 18 percent of accelerated abatement potential lies in methods of decarbonizing within a brand’s own operations. Tapping into this potential and pursuing the decarbonization levers discussed is essential to limiting the industry’s overall greenhouse gas emissions and contribution to climate change. There are six primary areas, as seen in Figure 3, where brands can save emissions: improving the mix of materials used in production, increasing the use of sustainable transportation, improving packaging, decarbonizing retail operations, minimizing returns, and reducing overproduction (“Fashion on Climate” 2020, 12). The most potential lies in reducing overproduction. In order to reduce emissions by 158 million tonnes in 2030, reducing overproduction by 10 percent is necessary (“Fashion on Climate” 2020, 12). Reduction could be achieved by better management of stock and predicting demand through the use of technological tools.

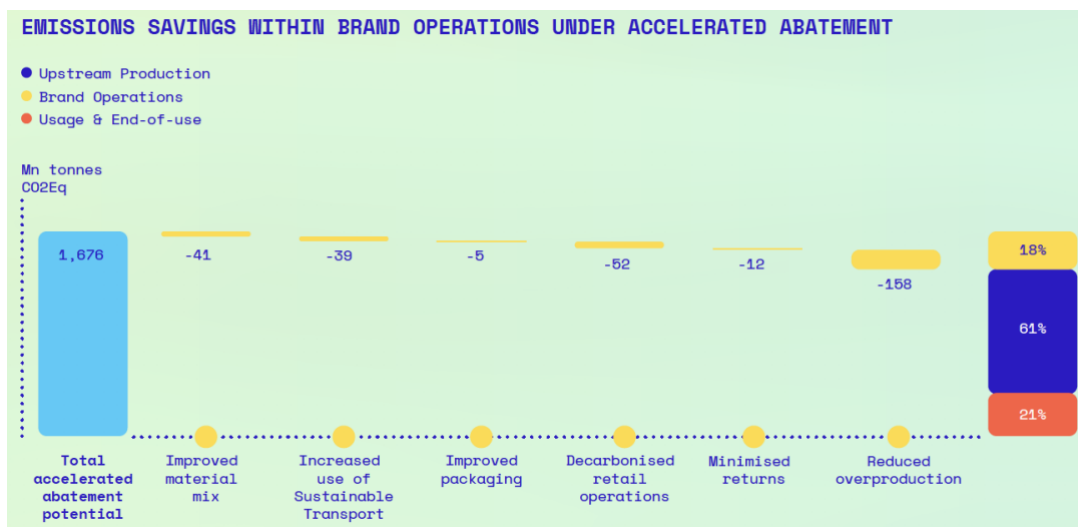


Figure 3

Material usage is another area in brand operations that must be addressed. Utilizing a mix of more sustainable options will save on emissions. As discussed in Chapter 1, many fibers used in garments are very resource intensive to grow and produce, and also contribute to the

degradation of ecosystem services. This is another reason why brands must implement a shift in their materials towards primarily using sustainable options. For cotton use, increased adoption of organic cotton and Fairtrade cotton would increase sustainability. Organic cotton cuts back on the use of synthetic pesticides and fertilizers, thus also reducing the rate of nutrient loss in soil (Fletcher 2014, 26-27). Pesticide and fertilizer use can also increase risk of water contamination, so organic cotton diminishes this risk as well. A primary issue with organic cotton is that, because things like fertilizers and pesticides are not used, yields are much lower than that of conventional cotton. Thus, to meet the same level of demand, significantly more land is needed to grow organic cotton. This is something the industry must address in collaboration with scientists and farmers. Another option is Fairtrade cotton. Certified Fairtrade cotton ensures that farmers make a set minimum price for the cotton, addressing the issue of low pay often associated with conventional cotton cultivation. Furthermore, Fairtrade cotton attempts to reduce the use of harmful pesticides, and if pesticides are used by farmers, requires protective equipment to be used when spraying (Fletcher 2014 and Thomas 2019, 32). Together, these protections help to ensure greater care is taken of both the environment and workers in cotton production.

Other sustainable fabrics that should be utilized to a greater degree include organic wool, hemp, biopolymers, lyocell, soybean fiber, and recycled fiber. (Fletcher 2014, 26-43). Each has its own benefits and challenges, but all have potential to reduce dependency on the harmful materials that have come to dominate garment production, especially when all of them together are used more widely. For instance, hemp has many benefits in its growing process such as controlling weeds, pests, and erosion, and improving soil structure. Biopolymers are an alternative to polyester and use renewable sources rather than fossil fuels to be produced.

Additionally, recycled fibers reduce energy and chemical consumption (Fletcher 2014, 34-41). The materials of fabric are the building blocks of clothing; ensuring that this foundation has as little environmental impact as possible is essential to creating a garment that is as sustainable as possible too.

Going along with this idea of increasing implementation of more sustainable fibers and materials, brands should encourage sustainable decision-making in the design stage. Considering a garment's environmental impact from the very beginning of its life cycle creates the potential for its entire life cycle to be sustainable. One way to do this is from a design perspective is to shift from thinking solely about the product being created to the results that the product is for and "whether those results can be delivered but with less of a draw on resources" (Fletcher 2014, 103). For instance, given that laundering practices have a large environmental impact, designing clothing with the intent of addressing this could be beneficial. Possibilities include clothing that is made from materials that can be washed at low temperatures and clothing that utilized stain and bacteria resistant technology so it rarely has to be washed (Fletcher 2014, 100-101). Approaching the design process in a way that is cognizant of more than just the aesthetics of the garments could lead to exciting innovation and impactful results.

A brand that has been a champion of sustainability within the fashion industry for roughly two decades now is Stella McCartney. Since the brand's inception, it has weaved sustainability into every aspect of its operations. For starters, McCartney ensures all of their materials are ethically sourced. They also utilize organic cotton and regenerative materials (Thomas 2019, 190). As advocates for animal rights, the brand has never used materials such as leather or fur, asserting that the processes of producing them is not only unethical for the animals involved, but also harmful to the planet's land, water, air, and biodiversity (Thomas 2019, 182).

Retail stores even run on wind and solar power, and the brand constantly monitors its environmental influence in an effort to figure out “how to bring impact percentages down, and down further” (Thomas 2019, 186). The commitment to sustainability that Stella McCartney exhibits is arguably unrivaled in the fashion industry. It’s dedication and innovation serve as a great example to other brands for how to approach sustainability throughout every facet of one’s operations, be it large or small.

Policy-makers. Though it is vital, responsibility from brands on their environmental impact is frequently tough to come by in the fashion industry. What is even more difficult to achieve is a consensus across the industry and all major fashion brands/companies on their collective damage. Therefore, in order to enact widespread action, legitimate policy must be put in place. For example, the International Labor Organization (ILO), a United Nations agency that works toward advancing social justice, should enact a livable minimum wage that fashion companies must pay its laborers in the respective countries they operate in. As established in Chapter 4, millions of garment workers are unfairly compensated for their work, and are often forced to work in unsafe facilities. To combat this, the ILO should also establish safety standards for the buildings in which fashion companies manufacture their clothing. These standards should be upheld through annual audits. This would ensure no more tragedies such as the one at Rana Plaza in 2013 occur. Addressing the labor rights of garment workers is just as important as addressing purely environmental issues in the goal to shift the fashion industry towards a more sustainable future. The systems and practices within the industry cannot be called sustainable if those who are doing the leg-work are exploited in any way. The same is true of clothing itself: a piece cannot be sustainable if the people along each step of the supply chain were not treated and compensated fairly, even if the garment is made from organic cotton, is free of harmful dyes, etc.

In order to combat the intense greenhouse gas emissions and contribution to climate change, law makers and government leaders must push the industry to implement the accelerated abatement strategy discussed in Chapter 3 and the “Fashion on Climate” report. Key aspects of this include decarbonization of material production and processing, as well as minimizing production and manufacturing waste. Governments can aid in this by incentivizing decarbonization and limiting waste. This should be aided and expedited by policy-makers through aggressively supporting legislation and regulation which enable accelerated abatement.

Consumers. The final component essential to the future of a more sustainable fashion industry is the consumer. The consumer is the driver of the industry; brands rely on them for profits, and therefore consumers hold significant power over brands. Recognizing this is essential and empowering, because only then will consumers realize that if they want sustainable change from a brand, they can demand it. Pushing brands to implement better practices is one way consumers can make a difference. Consumers should also push policy-makers to uphold and expand legislation and regulation that promote mitigating climate change and pollution, as well as improved labor laws. Similarly, consumers must use their political power to support candidates and leaders who back ambitious environmental goals and policies when running for elected office.

Chapter 3’s discussion of accelerated abatement strategies is once again relevant here in terms of how I suggest making fashion more sustainable. Potential abatement related to consumer behavior is 21 percent of the entire potential abatement that exists. Three strategies comprise that 21 percent: increasing the use of circular business models, reducing washing and drying, and increasing recycling and collection of clothing (“Fashion on Climate” 2020, 14). All three of these must be put into effect. By supporting circularity, including business models that

utilize reselling, renting, and repairing clothing, consumers are not bringing more new garments into use. Rather, the life of a piece is extended and there is a reduction in resource use and exploitation, as well as potential pollution. Similarly, recycling and collection reduces consumption of new clothes and cuts down on the volume of clothes that are sent to landfills or incinerated (“Fashion on Climate” 2020, 14). The third and final approach consumers can take to reduce emissions under the accelerated abatement model is washing and drying clothes less frequently. Now, I am not suggesting to never wash your clothes. However, getting a little more use out of your clothes before washing them and skipping a load here and there is environmentally beneficial – plus who does not want less laundry?

While engaging with both brands and policy-makers to improve sustainability efforts is certainly positive, the simplest and most impactful action consumers can take is to purchase less clothing. Limiting your intake of new clothing is beneficial because “if lower quantities of fashion items are produced, distributed, sold, consumed, and disposed of, fewer resources are used and less waste and pollution are generated” (Marcketti 2020, 231). Given the extremely quick fashion cycle and fast paced nature of trends that exists today, it can be difficult to resist the temptation to purchase trendy items. Particularly when items are extremely affordable from fast fashion retailers and websites it is very easy to buy new clothing that we do not need and will likely only wear a handful of times. Instead, once again we must embrace circularity. Making use of clothes that already exist, rather than buying new ones is the most sustainable way to participate in fashion. This can also mean purchasing used or secondhand items. Sometimes it is necessary to buy a new shirt or pair of jeans for example, though. When possible, investing in high quality pieces that will last for years is a better way to purchase new clothing than buying low quality pieces frequently because they do not hold up for long.

There is not one straightforward solution to the sustainability problems that the fashion industry faces. Because it is such a large global industry, its implications are vast and varied. Much is at stake: natural resources and ecosystem services, the livelihoods and safety of garment workers, and the trajectory of the climate crisis and its disproportionate impact on vulnerable populations, and the future of fashion brands themselves. While addressing all of these things may be a complicated and challenging feat, it does not mean sustainable change is not possible. A multitude of ambitious yet feasible goals and solutions already exist - they just need to be implemented more widely. The collaborative efforts of fashion brands, policy-makers, and consumers are necessary to restructure and shift the industry towards a better, more sustainable future.

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