

WASTED

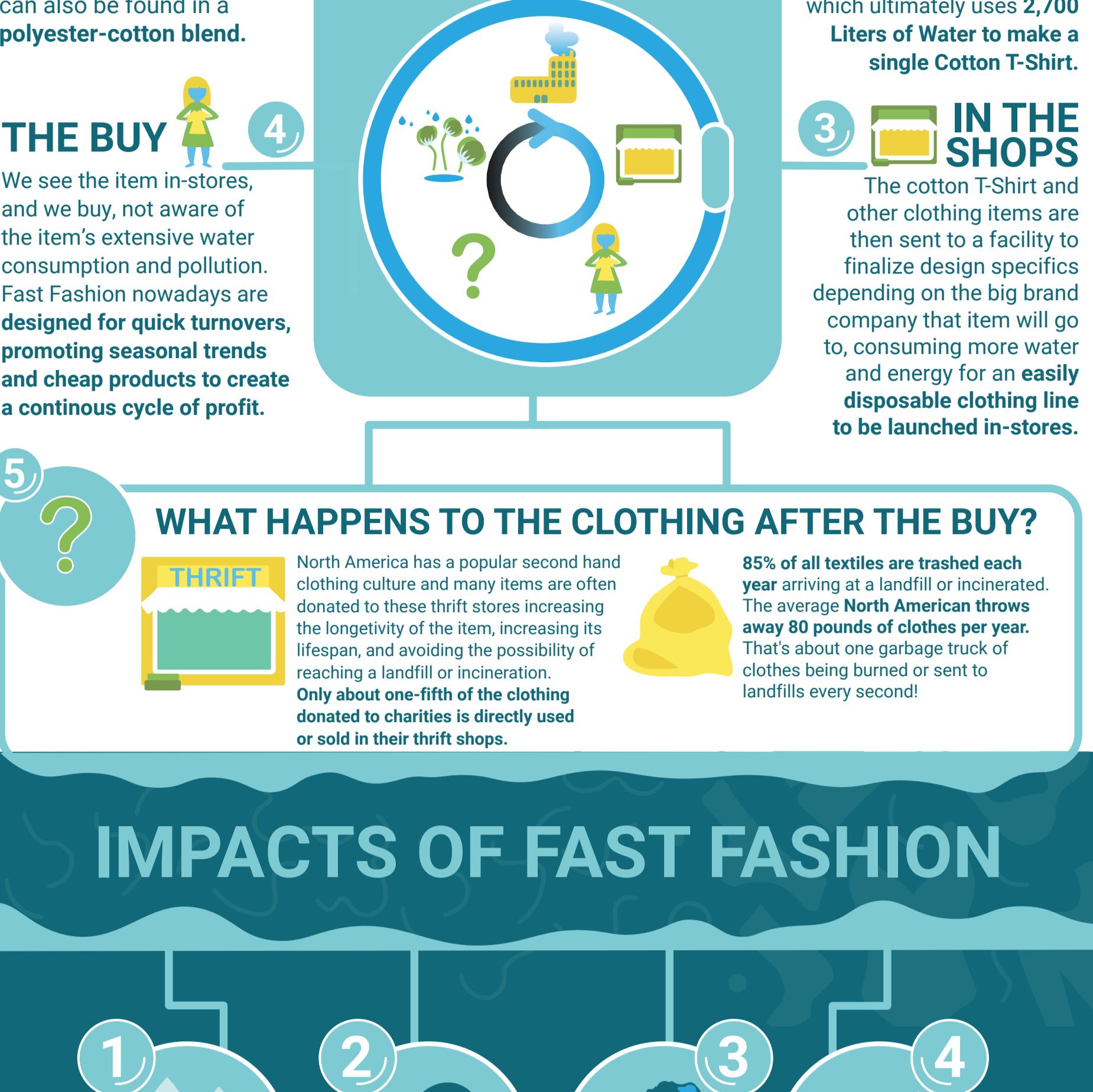
A systematic analysis of the environmental impacts by fast fashion on a global scale.

Did you know?

TEXTILE DYEING is the 2nd largest polluter of water globally.

FAST FASHION

refers to the business model many brands have adapted to sell large amounts of clothing at cheap prices. The word "fast" describes the speed at which retailers make the designs from the catwalk available in stores.



COTTON FARMS

The life of a T-shirt begins in cotton fields that are commonly found in the US or India. They are often made of 100% cotton but can also be found in a polyester-cotton blend.

THE BUY

We see the item in-stores, and we buy; not aware of the item's extensive water consumption and pollution. Fast Fashion nowadays are designed for quick turnovers, promoting seasonal trends and cheap products to create a continuous cycle of profit.

WHAT HAPPENS TO THE CLOTHING AFTER THE BUY?

1. THRIFT

North America has a popular second hand clothing culture and many items are often donated to these thrift stores increasing the longevity of the item, increasing its lifespan, and avoiding the possibility of reaching a landfill or incineration. Only about one-fifth of the clothing donated to charities is directly used or sold in their thrift shops.

2. ENVIRONMENT

93 billion cubic meters of water is used annually. More than half of the clothing is disposed within the year.

3. WATER POLLUTION

To produce a singular cotton t-shirt alone it takes approximately 2700 litres of water, or enough for a person to sustain themselves for about 900 days.

4. TEXTILE WASTE

The textile industry also uses more than a half trillion gallons of freshwater in the dyeing process of textiles each year alone, amounting to 20% of global industrial water pollution.

5. MICROFIBERS

Polyester is a cheap fiber to produce, however it is petroleum based fiber that requires substantial amounts of fossil fuels to manufacture. It also can take up to 200 years to degrade.

6. CO2

The fashion industry contributes about 20% of wastewater and 10% of carbon emissions globally.

7. POLYESTER

The textile industry is responsible for large amounts of clothing waste ending up in landfills. 15% of fabrics used in factories to produce clothing for the fashion industry end up directly in landfills without being used. Furthermore, 33% of landfill waste is textile and fabric alone.

8. CLOTHING DISPOSAL

North American households released more than 870 tonnes of plastic microfibres into the ocean annually from laundry alone, the equivalent weight of ten blue whales.

9. MICROPLASTICS

Microfibres and microplastics are mistaken for food by marine life, and can work their way up the food chain, potentially causing health issues for human consumers.

10. CLOTHING DISPOSAL

Clothing has clearly become disposable. As a result, we generate more and more textile waste. A family in the western world throws away an average of 30 kg of clothing each year. Only 15% is recycled or donated, and the rest goes directly to the landfill or is incinerated.

11. LANDFILLS

Landfills are becoming increasingly full, and the fashion industry is contributing significantly to this problem. In North America alone, landfills receive over 10 million tons of textile waste every year.

12. INCINERATION

Incineration is another method of disposing of textile waste. However, it releases harmful pollutants into the air, including dioxins and furans, which are known carcinogens.

13. POLLUTION

Water pollution is another significant issue caused by the fashion industry. The discharge of untreated effluent from textile mills contains high concentrations of toxic chemicals, heavy metals, and organic pollutants.

14. CLIMATE CHANGE

Carbon emissions from the fashion industry contribute significantly to climate change. The production of synthetic fibers like polyester and nylon requires large amounts of energy and emits greenhouse gases.

15. SOIL DEGRADATION

Soil degradation is another consequence of the fashion industry's impact on the environment. The use of chemical fertilizers and pesticides in cotton cultivation can lead to soil depletion and loss of biodiversity.

16. WATER SCARCITY

Water scarcity is a growing concern due to the fashion industry's high water consumption. The textile industry uses vast amounts of freshwater for washing,漂白, and dyeing processes.

17. ENERGY CONSUMPTION

Energy consumption is another area where the fashion industry is inefficient. The production of synthetic fibers like polyester requires significant amounts of energy to extract and refine the raw materials.

18. AIR POLLUTION

Air pollution is a concern due to the release of greenhouse gases and other pollutants from the fashion industry's operations.

19. LAND USE

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TABLE OF CONTENTS

3

EXECUTIVE
SUMMARY



4

FAST
FASHION



5

RESEARCH
METHODS

WHY FAST
FASHION?

14

GAPS AND
LEVERS



11

SOLUTION
LANDSCAPE



6

PROBLEM
LANDSCAPE

18

KEY
TAKEAWAYS



EXECUTIVE SUMMARY



We are an all female team of University of Waterloo students working to better understand the factors and key players involved in the toxic fast fashion industry. This report provides a systematic analysis of the **environmental impacts of Fast Fashion, and Water Consumption globally**. Fast Fashion is in the **top five** polluting industries, with it being the **second largest** polluter of water in the world (Johansenn, 2019). This industry designs easily replaceable, disposable items for fast turnovers, advertising cheap products that would ultimately have us consumers buying the clothes to wear, dispose and buy new again(Johansenn, 2019). Through extensive research we have explored the many solutions effort, mapped the industry stakeholders, identified the gaps and levers of change and learned lessons on the complexity of learning the environmental effects of such products and changing our ways of shopping, however deep we already are.

FAST FASHION

Add to Cart



Merriam Webster defines fast fashion as “an approach to the design, creation, and marketing of clothing fashions that emphasizes making fashion trends quickly and cheaply available to consumers” (Stanton, 2019). Fast fashion is about the retailers ability to react to trends, and improve response before the market moves onto something new (Barnes, L. & Lea-Greenwood, G., 2010). Fast Fashion has emerged as a result of the high end fashion industry adapting a cheaper business model focused on **mass production** (Baker, S., 2019). This business model thrives on the idea of **more for less**. (Bick, R., Halsey, E. & Ekenga, C.C., 2018).



The fashion industry contributes about **20% of wastewater and 10% of carbon emissions globally** (Somos, C. & Vannavally-Rao, J., 2020). In the last 15 years, the global clothing industry has about **doubled in size** (Baker, S., 2019). In 2014, an individual owned **60% more clothing items** compared to the average consumer in 2000 whilst wearing those clothes for **only half as long** (Boggon, C., 2019).

The immense potential for large profits, and low bottom line costs, continually drives these fashion retailers to maintain these damaging practices, further crippling the environment at every turn.

WHY FAST FASHION?

As young consumers, we believed we needed to become more informed on the practices of the fashion industry. Although initially hoping to narrow it down to a key geographic area, we soon realized that the process takes place all around the world before the garment reaches the customer. Fast fashion uses approximately **79 billion cubic metres of water/yearly, equal to about 2% of freshwater extracted globally**. This amount is set to **double by 2030**, given our current track record (Anon, 2018.). Growing up in a culture of constant demand, we believe it is necessary to educate ourselves and bring awareness about how the phenomenon of fast fashion is depleting our planet's resources and using fresh water sources at an alarming rate.

RESEARCH METHODS

Primary Research Findings

We surveyed **50 North Americans ages 18+** about their **consumer shopping habits**. This is the age where individuals first begin to make their own buying decisions with their independent income. We also measured how informed people are surrounding the environmental impacts of continuing to support the fast fashion industry. **Only 18% agreed they felt educated about the negative practices of fast fashion.**

Further, we reached out to **15 sustainable local businesses** in the fashion industry hoping to set interviews to see specifically how they are combating fast fashion. Due to the outbreak of COVID-19, non-essential businesses were subsequently forced to close, and these interviews were not able to be carried through as initially planned.

Secondary Research Findings

Due to the international scope of this problem and the COVID-19 outbreak we relied heavily on secondary sources. We **followed the lifecycle of a t-shirt** on its journey around the world and researched the **environmental impacts** along the way.



PROBLEM LANDSCAPE

Different perspectives on an international scale that contribute to the environmental decline caused by fast fashion.



RETAILER PERSPECTIVE

Throughout history in fashion, runways have been utilized by designers to share fashion pieces with the world. In 1999 photographers were given open access to these events, and to post, and share these trends for the world to see (Kaikobad, N.K. et al., 2015). As a result, fashion conscious consumers were exposed to, and influenced by, previously restricted designs and styles directly inspired from runways (Kaikobad, N.K. et al., 2015). **It used to take more than six months from design to catwalk a garment, now it takes only five to six weeks to fulfill the demand of the current market** (Kaikobad, N.K. et al., 2015).



A contributing factor for this timeline decrease is that there has been a decline in the length of fashion product life cycles which has put **pressure on retailers to replenish frequently** to keep up to date with market competition (Barnes, L. & Lea-Greenwood, G., 2010).

Celebrity culture, digital media and advertising all contribute heavily to consumers' desire for newness of fashion wears (Barnes, L. & Lea-Greenwood, G., 2010). The repeated exposure to fashion pieces in consumers' everyday lives creates the perception of "**I need to own this now**". **Social media has been called "the laxative of the fashion industry and makes everyone digest everything much faster: trends, product discovery."** (Friedman, V., 2016). The fashion industry understands the capacity, and importance of digital marketing, and uses it to constantly **promote "the next new thing you need in your closet"**. These retailers utilize trend replication, rapid production, and the use of low quality materials in order to bring inexpensive styles to the public as fast as possible (Stanton, A., 2019).

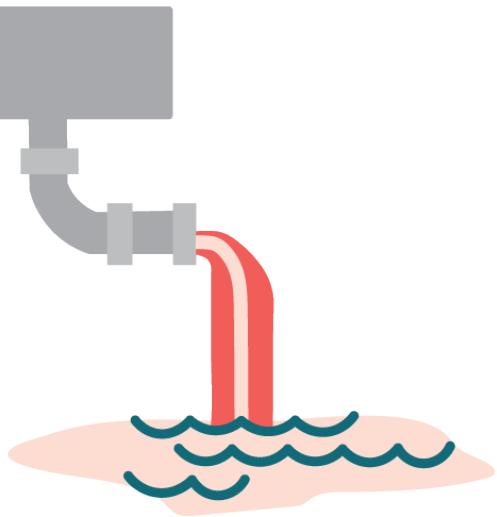


Retailers' strategic outsourcing to offshore companies contributes largely to fast fashion's accelerated timeline being attainable (Quinn, J.B., 1999). This choice gives them the opportunity to produce clothing at the price needed for fast fashion to be successful, and in line with consumer needs when brought to market (Buehler, S. & Haucap, J., 2005). This international collaboration results in increased greenhouse gas emissions. **In 2015, textile production contributed to more CO2 emissions than all international flights and maritime shipping combined** (Hanson, M., 2019). **Making one pair of jeans produces as much greenhouse gases as driving a car more than 80 miles** (Hanson, M., 2019).

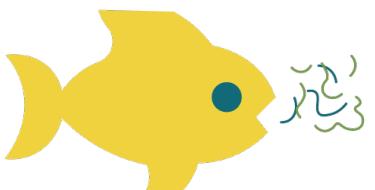
FACTORY PERSPECTIVE



Textile and apparel mills are vital to supporting the insatiable demand in the fast fashion market. The value of the global textile mills market totaled **\$667.5 billion** in 2015 (Lu, S., 2018). Out of the top ten largest exporting countries of textile, **eight are considered developing countries** (Lu, S., 2019.) A main controversy with textile and garment factories being located in developing countries means **legal restrictions surrounding environmental restrictions are usually much lower** than in developed countries (Emmelhainz, M.A. & Adams, R.J., 1999).



In **China, the world's largest clothes and textiles exporter**, the State's Environmental Protection Administration declared that nearly **one third of the countries' rivers are classified as "too polluted for any direct human contact"** (Bick, R., Halsey, E. & Ekenga, C.C., 2018). The harsh chemicals that are used, which are often flushed untreated directly into rivers and oceans, have an **increased negative impact on the plant and animal life** in the contaminated areas to such a degree that rivers and lakes have experienced **a vast drop in biodiversity as well as a complete lack of oxygen** (Bick, R., Halsey, E. & Ekenga, C.C., 2018), (Wicker, A., 2016).



The textile industry also uses more than a **half trillion gallons of freshwater** in the dyeing process of textiles each year alone, amounting to **20% of global industrial water pollution** (Bick, R., Halsey, E. & Ekenga, C.C., 2018). To produce a singular cotton t-shirt alone it takes approximately **2700 litres of water**; enough for one person to sustain themselves for **900 days** (Johansenn, G., 2019).



The textile industry is also responsible for large amounts of clothing waste ending up in landfills; 15% of fabrics used in factories to produce clothing for the fashion industry end up directly in landfills without being used (Johansenn, G., 2019). Furthermore, **33% of landfill waste is textile and fabric alone** (Johansenn, G., 2019).



FARMING PERSPECTIVE

The fast fashion industry is **heavily reliant on cotton production**. The most popular materials used in the fashion industry are cotton, polyester, and viscose (Johansenn, G., 2019). Polyester is a cheap fiber to produce, however it is petroleum based fiber that requires substantial amounts of fossil fuels to manufacture. It also can take up to **200 years to degrade**, depending on the conditions it is in. **Cotton accounts for 90% of all natural fibres used in the textile industry** (Ravasio, P., 2012), and currently the most profitable non-edible crop in the world (WWF Industries, 2020). It provides a source of income for over **250 million people worldwide**, and is responsible for employing 7% of all labour in developing countries (WWF Industries, 2020).

Traditional cotton production it can take approximately **10,000 litres of water to produce one kilogram of cotton fabric** (Better Cotton, 2020). However, water consumption varies heavily on which country the cotton was produced in, and available farming equipment (WWF Industries, 2020). Cotton is the leading agricultural product pesticide use (Johansenn, G., 2019). Pesticides are regularly used in the cotton growing industry because they yield higher agricultural productivity rates (Allali, K., Faldlaoui, A. & Bonou-zin, R., 2019). Large amounts of pesticide use is harmful to farmer's health (Johansenn, G., 2019), heavy pesticide use can damage thriving local flora and fauna (Eales, B., 2019). They are **necessary for humans to survive on earth as flora and fauna produce oxygen, remove carbon dioxide from the air, and balance surrounding ecosystems, and food chains** (Eales, B., 2019). Pesticide use also heavily contributes to soil erosion, contamination of surrounding water tables and water sources, and air pollution (Allali, K., Faldlaoui, A. & Bonou-zin, R., 2019). Cotton alone is responsible for **26% of the world's fibre consumption**. Despite the regular and widespread use of cotton, it is not sustainably produced, and contributes largely to the unfavourable environmental degradation in the agriculture sector.



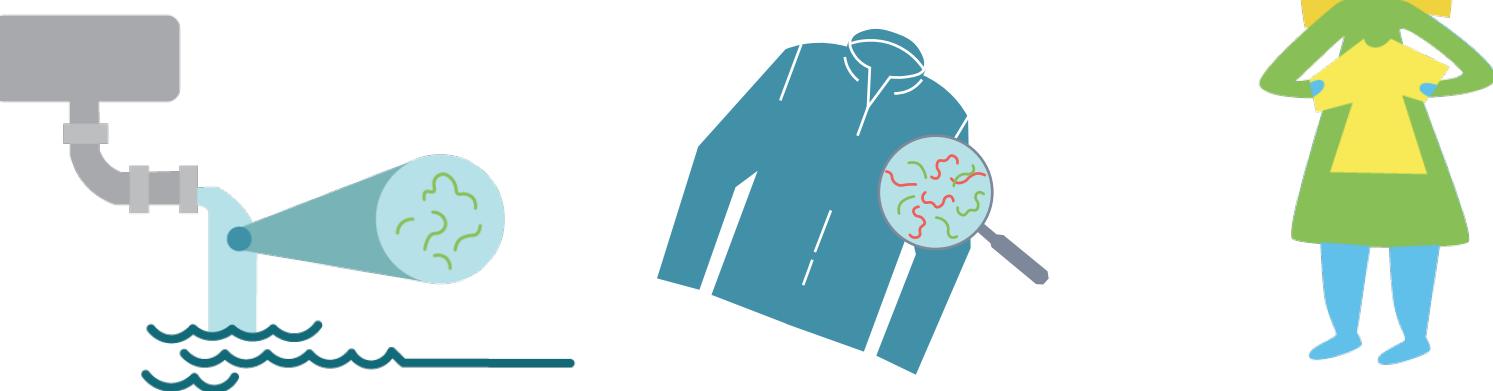
CONSUMER USE PERSPECTIVE

In the 1980s, the average American purchased about 12 new articles of clothing every year. But in 1993, the **North American Free Trade Agreement (NAFTA)** made it much easier to import clothing by abolishing a quota system that had limited the number of items that could enter North America and giving rise to fast fashion (Hanson, M., 2019). In 2016 it is reported that “**the average American buys 64 new articles of clothing per year**” (Hanson, M., 2019). With the addition of celebrity and influencer endorsements as well, the industry experienced a great escalation in demand for trendy clothing at cheap prices to keep up with the ever changing seasonal looks. A contributing reason behind the support for fast fashion is that consumers do not always want to pay the hefty price associated with sustainable clothing.



In a survey completed with 2,000 United Kingdom, and American shoppers found **only 29% were willing to pay extra for an item because it was sustainably made** (Moore, K., 2019).

The average American throws away approximately **80 pounds of clothes per year**. **85%** of this waste ultimately ends up in a landfill or incinerated, which contributes further to the pollution seen as a result of fast fashion (Hanson, M., 2019).



Vancouver-based marine conservation organization Ocean Wise released a report in 2019 that estimated U.S. and Canadian households released more than **870 tonnes of plastic microfibers into the ocean annually from laundry alone, the equivalent weight of ten blue whales** (Somos, C. & Vannavally-Rao, J., 2020). Additionally, micro plastics and microfibers are mistaken for food by marine life, and work their way up the food chain, potentially causing health issues for human consumers (Somos, C. & Vannavally-Rao, J., 2020). As consumers, our reliance on fast fashion and its current supply chain structure supports extreme forms of water consumption and environmental pollution (Somos, C. & Vannavally-Rao, J., 2020).

SOLUTION LANDSCAPE

What is currently working regarding this system?

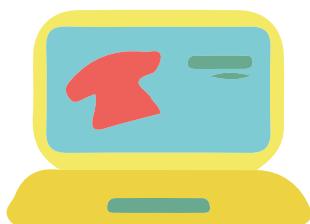


GOVERNMENT POLICIES



High income countries can work towards better environmental health through **trade policy and regulations** (Bick, R., Halsey, E. & Ekenga, C.C., 2018). This will limit unethical practices due to the steep tax that will raise the price of the garment, and the low price is a large driving force in fast fashion. For example: **The USA, can increase import taxes for garments and textiles or place caps on annual weight or quantities imported from low-income or medium income countries** (Bick, R., Halsey, E. & Ekenga, C.C., 2018).

CORPORATE SOCIAL RESPONSIBILITY



Reformation helps their customers make a responsible decision by using a **rating system** for their garments that provides a quick look at the environmental impact.



Use the emotional appeal of eco-friendly and fair trade goods (Bick, R., Halsey, E. & Ekenga, C.C., 2018). Shopping locally lowers the need for international air-transit and **reduces the greenhouse gas emissions** needed to get clothing items around the world from factories to retailers.





CHANGING THE STIGMA

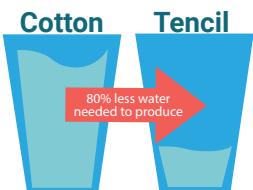
Purchasing high quality clothing at often a higher price supports companies not using a fast fashion model, and increases the lifecycle of that item in your closet (Whiting, K., 2019). Wearing clothing multiple times helps move the consumer mindset away from celebrities and influencers “one time wears” (Whiting, K., 2019). Using thrift stores and pop-up clothing exchanges reduces the environmental impact of the fashion industry through lower consumer demand.



FABRIC ALTERNATIVES

The use of sustainable fibers is key in minimizing the environmental impact of textile production.

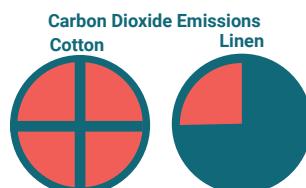
Tencel, a cotton alternative uses **80% less water** (Anon, 2020).



Each pound of alpaca wool saves **400 lbs of CO2 and 1,500 gal of water**, compared to conventional wool (Anon, 2020).



Linen uses hardly any water, and **emits ¼ of the carbon** as cotton per pound of fiber (Anon, 2020).



GAPS AND LEVERS OF CHANGE



DISRUPTIVE COMMUNICATION BETWEEN STAKEHOLDERS:

Stakeholders hold differing values about trends and style. This creates a positive feedback loop and extenuates the negative impacts of fast fashion.

Increase communication and awareness by providing stakeholders with the **necessary education** for their individual perspectives. We believe that there is a **need to create transparency in the supply chain** of fast fashion and educate stakeholders of the trade-offs and **true cost of their purchase** beyond the dollar value.

We suggest creating **different digital media campaigns** targeted towards diverse cultural groups and governing bodies around the world. Two big groups that need to be educated are:

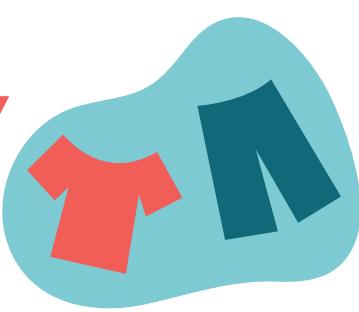


Younger Millennials need to be educated because they are consumption driven, fashion oriented, and **will have increasingly influential purchasing power** which will impact fast fashion in the next decade (Simpson, L.H., 2019).

Influencers need to be made aware of who they are representing because many consumers identify themselves with the influencer. Fashion brands and retailers **use the value of hedonistic motives** by focusing on sensory pleasures in order to increase sales by reaching out to influencers (Linden, A.R., 2016).

By demanding transparency in the supply chain **customers can make responsible decisions** by seeing the effects of their choice. Brands will also be motivated to change their practices **for greater coordination and self-regulation** (Cherny-Scanlon, X. & Agnes, K., 2016). Brands like TenTree provide a transparent choice to their customers through eco-logs of each garment made with numerical data about how much water used, carbon dioxide, and kilograms of waste saved by each item (Anon, Tentree).

LACK OF ACCOUNTABILITY AND REGULATION:



There is a lack of accountability among stakeholders on an international scale which makes it hard to point fingers and pinpoint all the wrongful practices along the way.

This would require **international government collaboration** to declare and enforce laws surrounding impact to key environmental measures such as **greenhouse gas emissions, water usage and pollution** to reduce global consumption (Kutsenkova, Z., 2017).

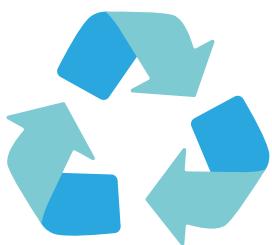
Corporations alone will be unable to create any real and lasting change as corporate conduct has been shown to be **harmful and morally dubious but not necessarily illegal**, therefore, not solvable through national and international law (Back , J., 2017). Most of our clothes are produced in China, Bangladesh, or India, countries that are majorly powered by coal. This is the dirtiest type of energy in terms of carbon emissions (Anon, 2020).



The environmental protection agency estimates that diverting often-toxic trashed textiles into a recycling program would be the environmental equivalent of taking 7.3 million cars and their carbon dioxide emissions off the road (Wicker, A., 2016).

MINIMAL COLLABORATION TO CREATE A CIRCULAR ECONOMY:

Stakeholders give in to fast fashion practices and compete for the never-ending demand rather than work to shift it.



Governments need to **re-evaluate their budget** for textile recycling plants to reduce waste. In the current environment, the large quantities of fast fashion products seen in thrift stores limits the capacity for effective re-use of clothing due to the short life cycle seen with these products (Back , J., 2017).

Currently there are **over 500 textile recycling plants** in The United States of America (LeBlanc, R., 2019). But this is **not nearly enough** to cover the needs of textile recycling.

It is estimated that **95% of wearable and non-wearable textiles found in landfills could be reused or recycled**, but less than 1% of it is(Gray, Z., 2019).

Consumers in high-income countries can do their part by **buying high-quality clothing that lasts longer, shopping at second-hand stores, repairing clothing they already own, and purchasing from retailers with transparent supply chains** (Bick, R., Halsey, E. & Ekenga, C.C., 2018).

Promoting consumer adoption, and dependency on the thrifting industry through social media would **help reduce the need for mass purchasing** and use of fast fashion products (BER Staff , 2019).

We recommend **creating new ways** for consumers to purchase thrifited clothing such as online retailers, or regular pop-up shops and exchanges revolutionize and make the recycling process much more appealing.

KEY TAKEAWAYS

Initially, we assumed that we could isolate this issue to one specific geographic area, but quickly realized that is a **global issue** with our garments travelling all over the world before our closet. We believe the harmful practices and effects of those practices makes fast fashion a truly global issue.

Although there are gaps in our research, particularly in the knowledge of the global government regulations for **all the different countries** and the exact supply chain of brands due to their **lack of transparency**. With our global resources diminishing at an alarming rate it is important to understand the true cost of our clothing.

Due to the differing regulations, resources, and attitudes around the world, it is **impossible for a single solution to address fast fashion globally**. Our system can be used to **understand the gravity of the problem** as a whole and **guide to how a sustainable system tailored to different stakeholders can be implemented**.

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