# Low Impact

*Low-impact processes use minimal natural resources in ways that reduce environmental impact on water, air, soil, wildlife, and human health. But the hard truth is that conventional fashion has a high impact on both the planet and people. It's probably not something you think about when you get dressed in the morning, but high-impact fashion is definitely not eco fashion.*

## THE HIGH-IMPACT CONSEQUENCES OF FAST CONSUMPTION FOR THE ENVIRONMENT AND HUMAN HEALTH

Mass market, cheap consumer goods come with many environmental hazards. As consumers demand lower prices and faster production of low quality goods, manufacturers and producers respond by cutting environmental standards and gobbling up more and more natural resources in the process. This profit-centered approach to the economy is unconcerned about the long-term environmental consequences to such consumption patterns.

As a result, industries large and small create damage to ecosystems, pollution of air and water, poisoning of wildlife and humanity, and contribution to climate change throughout the supply chain. Far from low-impact, conventional production of electronics, building supplies, appliances, fashion, and other consumer goods results in extremely adversely high-impact consequences for the planet and human health.

### THE HIGH IMPACT'S OF FAST CONSUMPTION ON THE PLANET'S WATER SUPPLIES

Throughout the fast consumption value chain, there are numerous points at which water is consumed in vast quantities. The fact is that we don't have *any* water to waste because our fresh water supplies are severely limited. Consider this: The earth is 70% water, but 97.5% of that water is salt water and only 2.5% is fresh. Of that 2.5% fresh water, only 0.007% is available for human use. The rest is locked up in icecaps or dissolved as soil moisture. [i] The UN has said that water consumption exceeds 10% of renewable freshwater resources, leaving 80 countries and 40% of the world's population with water shortages.[ii]

Yet we Americans consume more water today than ever before. In fact, water consumption around the world is increasing. In the US, for instance, fresh water consumption has increased by 14% from 1985 to more than 260 billion gallons of water used per day.[iii] The global water consumption average is 1,385 m3 water per year, but Americans consume more than double that, at 2842 m3 per year, with 20% of that water footprint falling outside of the country.[iv]

If you look at the biggest water consumption sectors, you'll soon discover why we're using so much water per capita:

- **Agriculture water use:** Irrigation of agriculture crops in the US consumes the most fresh water. In fact, this sector consumes 65% of all fresh water withdrawals.[v] Believe it or not, it takes 150 gallons of water to create one loaf of bread[vi] and 1,700 liters (449 gallons) of water to produce enough chocolate for a 100-gram (0.22 pound) chocolate bar. [vii]

- **Water use for meat & leather:** It takes enormous quantities of water to irrigate crops for animal feed and to provide drinking water for these animals as well. To raise animals for meat and leather, the world uses 8% of all fresh water in order to water crops used to cultivate feed for these animals and provide drinking water for them day to day.[viii] It takes between 616 and 1,300 gallons of water to produce a fast food quarter pound burger and 65 gallons to create a gallon of milk.[ix] By contrast, it takes 8,000 liters (2113 gallons) of water to create a pair of leather shoes.[x]

- **Thermoelectric power water consumption:** Fresh water and saline water are used for producing electricity, too. The water is most often used for once-through cooling at power plants. In the US, 48% of all fresh water and saline water withdrawals are for this purpose.[xi] Much of this energy is used by the industry to power their various equipment, vehicles, and machines. Power plants in the US are already feeling the stress of droughts in the region – four nuclear plants were shut down during July 2012 because of water shortages.[xii]

- **Industrial uses:** In the US, industry consumes 5% of all fresh water for things like fabricating, processing, washing, diluting, cooling, and transporting their products. Water is also used directly to create products, and for sanitation in manufacturing facilities. For instance, to manufacture one laptop computer, industry consumes the equivalent of 70 loads of laundry water; and 1,500 gallons of water to make a desktop computer.[xiii] The average American consumes 512 pounds of paper every year, which requires 1,160 gallons of water to create.[xiv]

These are general numbers on water consumption, but if you focus on the conventional fashion industry alone, you'll see that it has a very significant, detrimental impact on world water supplies. For instance, the textile industry is incredibly water intensive. During the dye process, water is consumed at several stages. Most importantly, water is used in the initial dyeing stage, and a new clean vat of water for every stage in the multi-rinse process.

Unfortunately, if for some reason the first-time dyeing process fails to meet expectations for color matching, the whole process is repeated again.[xv] This process uses significant quantities of clean water that could otherwise be used to water crops or quench someone's thirst, making textile dyeing especially burdensome for already water-stressed regions.

The dyeing process isn't the only major water consumer in the fast fashion industry. You've already seen the water consumption in the leather industry, but growing crops and many other industrial processes consume significant quantities of water. Consider these statistics:

- **Textile dyeing water consumption:** It is estimated that dyeing of textiles consumes 2.4 trillion gallons of water every year.[xvi] The ratio of water to textile production is 200 tons to 1 ton in most fabric manufacturing facilities.[xvii] 500 gallons (1,893 liters) of water is required to produce enough fabric to cover a couch.[xviii]

Water shortages worldwide are predicted to be the next trigger for violence and war, not oil or other energy sources. We must, as a human species, curb our consumption of water if we want to establish and maintain world peace.[xix]

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Perhaps even more concerning than water shortages is the toxic impact fast consumption has on our planet's water supplies. In virtually every industry you'll find toxic pollution flowing into our water systems – rivers, streams, lakes, oceans, and ponds. The pollutants are often dumped untreated, creating massive environmental and human health hazards.

### Leather Tanning and Water Pollution

One such pollution source is the traditional leather industry, which is fraught with water-related environmental concerns. To start, the tanning industry is one of the most polluting on the planet. That's because in addition to huge quantities of water used during the wet tanning processes, tanneries use very toxic organic and inorganic compounds, including things such as mercury, formaldehyde, coal-tar derivatives, oils, dyes, and cyanide-based ingredients, which are flushed into waterbodies in local communities.

One of the biggest problems is that most tanneries use chrome, which means the wastewater generated at these facilities contains chromium, a substance classed as "hazardous" by the US Environmental Protection Agency (EPA). In addition to chromium, the water coming out of tanneries contains lime, sulfides, acids, and a lot of salt, all of which is hazardous to wildlife and marine ecosystems.

- Over 16 million lakes and 1.2 million river miles in the US are contaminated with mercury (partially from gold mining), requiring fish consumption advisories.[xx]

- Cyanide the size of a grain of rice is fatal to humans, and only 1 microgram of cyanide per liter of water is fatal to some fish.[xxi]

- Cyanide from mining operations contained in a tailings pond in Romania breached and flowed into a local watershed, cutting 2.5 million people off from their fresh water. Virtually all of the fish in the area died as a result.[xxii]

Many of the substances in wastewater have been linked to cancer. Employees working in tanneries and those living close to tanning operations experience higher incidences of cancer and other serious health conditions than is normal for the average population.

- Residents living near a tannery in Kentucky have cancer rates five times the national average according to the US Centers for Disease Control and Prevention.[xxiii]

- Studies in Sweden and Italy have found that cancer risks are between 20% and 50% higher in tannery employee populations.[xxiv]

- A German study found that toxic, carcinogenic substances used in tanning leather were still detectable in 50% of the finished leather products they tested. This means consumers wearing leather may be exposing themselves to these toxic hazards as well simply by wearing leather fashion.[xxv]

Tanning leather is a highly toxic process, and one that's literally killing humans. Imagine the consequences for these pollutants on wildlife, too! It's a mess that we should not support.

### Livestock and Water Pollution

Water pollution is also an extremely important issue when it comes raising animals for leather. Factory farming has a significant impact on water bodies throughout the world. Confined animal feeding operations (CAFOs) are the giant, big business farms that raise millions of livestock. These CAFOs contribute 20 tons of manure annually to our water systems by accident. [xxvi]

How? The urine and feces from farm animals is contained in often-faulty holding tanks and ponds that are unlined when rainwater is added they exceed capacity. As a result, this excrement, which can contain parasites and high concentrations of hormones, spills into lakes, rivers, and streams. Consider this story: a North Carolina hog farm spilled 25 million gallons of excrement into local waterways in 1995. The spill killed between 10 and 14 million fish immediately. A virulent microbe has killed an additional billion fish since then.[xxvii]

CAFOs also contribute to water pollution by consuming vast quantities of fertilizers and pesticides for growing crops to feed livestock. These chemicals can be highly toxic and are often petroleum-based, making them unsustainable.

### Textile Dyeing and Water Pollution

Water is also a concern in the industry responsible for dyeing textiles. Textiles are one of the biggest consumers of chemicals, second only to agriculture, and these chemicals end up in our waterways. Chemicals are used for a wide variety of functions, but most often for dyeing and treating textiles.

Unfortunately, the textile business, much of which is conducted in developing countries, is not very regulated, and as a result, both employees and the environment are unnecessarily exposed to toxic chemicals used to create the textiles we wear. In many regions, the wastewater from textile plants goes untreated or only partially treated, and is dumped into freshwater rivers, lakes, and streams. These are some of the results:

- **Quantity of toxins from textiles:** More than 72 toxic chemicals are used for textile processing. [xxviii] Wastewater from these plants may contain things like caustic soda, acetic acid, soda ash, and phosphates.[xxix]

- **Cancerous substances from textiles:** Chemicals such as carcinogenic heavy metals and salt residues are also commonly found in textile wastewater, which leach into water and soil that nourishes humans and farm communities, resulting in serious illness for people and death of many animals and fish.

- **Total pollution contribution of textiles:** According to the World Bank, 20% of all industrial water pollution originates from textile dyeing and processing.[xxx]

### The High Impact's Fast Consumption has on Climate Change

Water consumption and pollution aren't the only environmental problems with the consumption of cheap goods. There are many points along the fashion value chain that have an impact on climate change, too. There are many sources of greenhouse gas emissions – from vehicles for transport to livestock emissions to energy consumed by machinery. It all contributes to this serious problem that threatens to have widespread adverse impacts on the planet and humanity.

In fact, 97% of all scientists agree that climate change is real and being caused by humans.[xxxi] These same scientists are warning of serious consequences if we don't do anything about climate change, such as:

- Prolonged and severe droughts and water shortages leading to food supply problems
- Hotter, more violent forest fires (due to drought conditions)
- More intense, and more frequent tornadoes and hurricanes
- Sea level rise and loss of coastal lands
- Increasing ocean acidity and damage to marine ecosystems and fish populations

This is just the tip of the iceberg if we don't get our climate under control by limiting our production of greenhouse gas emissions like carbon dioxide and methane. Yet the fast fashion industry continues to churn out cheap fashion that has a big carbon footprint.

### Greenhouse Gas Emissions from Leather Production

Consider how raising animals for the production of leather produces greenhouse gas emissions and supports the petroleum industry:

- **Enteric fermentation and climate change:** Animals like cows, sheep, goats, camels, and other animals produce huge quantities of greenhouse gases during their normal digestion. Methane (CH4) is 20 times more potent in its heat-trapping ability than carbon dioxide, and nitrous oxide (N2O) 210 times more potent![xxxii] It is estimated that raising animals for meat and leather contributes more to climate change than all the cars on the road worldwide.[xxxiii]

- **CAFOs and deforestation:** Factory farms also have a big part to play in creating serious trouble for our forests which are essential to maintaining a stable climate. Worldwide, the demand for meat and leather is growing, and with that demand our forests shrink. This is because forests are cleared to first make way for agriculture space for growing feed crops for animals, and second for grazing land for these animals as well. Forests are absolutely necessary for human survival. They clean our air and mitigate the effects of greenhouse gases, provide resources for homes and furnishings, filter water, prevent soil erosion, exist as a habitat for wildlife, and much more.

When taken together, 40% of all human-related methane emissions and 60% of all nitrous oxide emissions comes from livestock, which means leather is not sustainable for the climate.[xxxiv] Clearly raising animals for the production of food and fashion is problematic for our planet and its people.

*Greenhouse Gas Emissions from Factory Energy Consumption*

The consumption of energy, which relies heavily on the burning of fossil fuels, is also a climate problem for the fashion industry. Energy is used throughout the textile value chain. Both electrical and thermal energy are required in various stages.

For instance, textile energy used for electricity is required to generate air flow which passes through the textiles for drying, to exhaust excess heat from machines, to bring in fresh air flow, in yarn manufacturing, and to drive the main machines like rollers, spinners. Thermal energy is also required for warming materials, for water evaporation, for dyeing, heating conveyor belts, and much more. Though many advances in modern textile machinery are being made, this industry is still incredibly energy intensive.[xxxv]

- Between 9% and 10% of all energy consumed in India is used to textile energy in mills.[xxxvi]
- Energy consumption in the textile industry in China is so huge that the government is involved. They've identified existing textile energy-saving technologies for the production of textiles that would reduce energy consumption by 30% to 40%.[xxxvii]

More advances need to be made to create a more carbon neutral textile and fashion industry.

### The High Impact's of Fast Consumption on Natural Ecosystems

It should be no surprise that with all of this environmental destruction – from air and water pollution to overconsumption of fresh water resources to climate change – that natural ecosystems are also negatively impacted by the fast consumption value system.

Other activities that support fast fashion also have a negative impact on the planet. For instance in Central America, forests have been reduced by 40% in the past 40 years, mostly cleared for pasture and cattle populations.[xxxviii] Nearly 70 percent of the Amazon forest has now been cut down, much of which is being used to graze animals.[xxxix] Forests are also cleared to make way for agriculture crops, having an equally devastating impact on forest ecosystems.

We could go on, but by now you should have a pretty clear idea that fast fashion is also high-impact fashion, and not the kind of high impact you want. From water pollution to water consumption, air pollution to climate change, and much more, high impact fashion creates all kinds of environmental problems that we humans just cannot afford.

## TURNING THE TIDES WITH LOW-IMPACT FASHION

Low-impact fashion is born when artisans and manufacturers alike use materials, and practice processes that leave as little a foot print as possible. Hearts Eco fashions aim to be as low impact as possible. In a business full of forward momentum the Hearts design team takes time to think through process and produce the best outcome possible for the environment and its inhabitants. Hearts will always choose eco practices over quick fixes. Low-impact processes mean creating fashion in ways that minimize the environmental damage we've been talking about. Low impact products keep our oceans blue, our forests lush, and benefit all who share this plant.

Some of the basic principles of low-impact fashion are as follows:

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- **Minimize pollution:** This means using processes and materials that require little to no chemical processes or additives to create a finished product. This helps to reduce or eliminate air, water, and soil pollution and protect human and environmental health.
- **Minimize waste:** Waste comes in many forms – from feces and urine in the livestock industry to overburden waste in the textile industry. Whatever the process, low-impact fashion should reduce waste so that little to no "unusuable" resources are discarded throughout the value chain.
- **Minimize ecosystem disruption:** Whether you're looking at growing a plant-based textile crop or creating jewelry, the ecosystem disruption throughout every process should be minimal. Using a seventh generation mentality, low-impact production should also consider the consequences of activities for humans and the planet seven generations from today.
- **Minimize energy and water consumption:** A very important aspect of all low-impact fashion is the reduction of water and energy consumption. By preventing overconsumption of these resources, we fight climate change and help prevent future water wars.
- **Upcycle waste products:** Rather than extracting virgin natural resources from the planet, low-impact fashion often will make use of waste products through upcycling and recycling. This helps to reduce the strain on landfills, prevents the harvest of new materials, and cuts energy consumption and pollution production, too.

At Hearts, we use all of these techniques to create the lowest possible impact on the environment and human health when creating our eco fashion. Our ethical fashion line includes innovative products, like Ultrasuede and AirDyed textiles, as well as upcycled and recycled waste materials. We also make efforts to reduce our consumption of energy through production and transportation by using indigenous materials and handmade fashion techniques. We'll explore a few of these low-impact techniques here.

### ULTRASUEDE AS AN ALTERNATIVE TO TRADITIONAL SUEDE AND LEATHER

Ultrasuede is made by a company called Toray using advanced fiber technologies. Today, Ultrasuede is made from 100% recycled ultra-microfiber reconstituted from post-industrial materials like scrap polyester film. Ultrasuede has the texture and quality of animal based suede, but is stain resistant, extremely durable, machine washable, and much more sustainable. Other companies that manufacture similar products include Sensuede and Magilite, though many other knock-off fabrics are often referred to as "ultrasuede."

Ultrasuede was originally engineered by Dr. Miyoshi Okamoto in 1970. It is created using fine ultra-microfibers that are spun into even finer threads that are turned into a felt-like material and finished with a protective polymer coating. The finished product is non-woven and has exceptional durability and snag-resistance.

Ultrasuede and other vegan leather materials like it are an excellent alternative next to leather in that they produce far less pollution than traditionally-made leather goods. And by avoiding the toxicity problems of the leather tanning industry, vegan leathers like Ultrasuede help to protect human health.

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Using recycled bottles to make Ultrasuede is also good for the environment. Taking a “waste” product like plastic bottles and using them to make something new not only saves water and energy, it requires fewer resources that are petroleum based. Not only that, but recycling plastic also helps to save landfill space, which is good for the natural landscape and beneficial for taxpayers (maintaining landfills is incredibly expensive). By recycling post-industrial polyester fibers, Ultrasuede is able to reduce energy consumption and greenhouse gas emissions by up to 90%.[xl]

Of course, by reducing the demand for products from factory farms, which contribute to water pollution, water consumption, deforestation, and climate change, microfibers like Ultrasuede also help to reduce the environmental impact of clothing production. This benefits both wild and human communities.

### AirDye Technology Reduces Water Waste for Textile Coloring

Colorep, a California company, has developed their AirDye technology which helps to bind color to textiles without the use of toxic fixatives and with no water at all. Rather than water, the AirDye technique uses heat to transfer dyes from paper to the surface of textiles, which means the color is transferred at the molecular level. In this eco-friendly dye technique, all paper is recycled, and since the dyes are inert, any waste dyes can be reused in their original state.

AirDye technology helps to create a sustainable textile dyeing method in the following ways:[xli]

- Uses 95 percent less water
- Requires 87 percent less energy
- Reduces damaging of goods (Up to one percent of goods are damaged using AirDye compared to 10 percent of traditionally dyed garments)
- Reduces laundering energy use because AirDye textiles can be washed at any temperature, with whites or colors, with or without bleach
- Allows for new designs. Dye different sides of a single piece of fabric different colors or designs

We should note, however, that at present, the AirDye technology is only available for certain types of synthetic textiles, including swimwear fabrics, linens, jersey, satin, upholstery fabrics, and so on. It is also only available in the US (where only a small fraction of textiles are made), though the company hopes to expand their operations in the near future.

### Handmade Textile Fashions for Energy Savings

Machines certainly do increase the quantity of clothing that can be produced, but they are incredible energy users. Though manufacturers are working hard to improve textile energy efficiency of their machines, it will be many years before they are able to make them 100% carbon neutral. A much more sustainable method for producing low-impact fashion is to create sustainable textiles based on old-world, handmade techniques that require no machines at all. This is a technique we love at Hearts and readily support by working with handmade fashion artisans at home and abroad.

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### Sustainable Metals Alternatives

At this time sustainable mining practices are very new and there are very few regulations set for standards. However, there are other ways you can minimize your impact that we here at Hearts would suggest, and fully support whenever they are options. First, purchasing fashion items that come from up-cycle materials is always best. There is minimal process needed and deducts from the amount of waste sent to the landfills. Hearts tries very hard to use vintage or dead stock chain in our designs. This is an option we always explore before seeking additional metal alternatives as it is the least impactful and most resourceful. Another option is to purchase recycled jewelry made with up cycled metals such as silver, brass or bronze to name a few. This is another valuable choice that will keep reusable materials in circulation and keep them out of the landfills. Lastly we suggest to be sure and support local USA businesses that have more control over where there materials come from and the practices used. When all is said and done the environmental atrocities created in the process to mine metals is large, and with very little regulation it can be very hard to know what is being supported in purchasing metal goods. We strongly plea for help in asking the questions, making the demands and seeking the answers to ways we can all improve both as a producers and a consumers.

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## GREEN LIVING TIPS FOR SUPPORTING LOW-IMPACT ACTIVITIES EVERY DAY

- **Recycle old jewelry:** Don't throw away your gold, silver, and other jewelry pieces – instead, donate them to a good cause of give them to a local handmade jewelry artisan to ensure these precious metals are reused. This helps to prevent the need for more mining operations and reduces both energy and toxicity of any new jewelry made from your old stuff.

- **Reduce consumption of plastics:** The production of plastics is highly toxic. Whenever eco shopping for fashion, look for pieces made from plant-based fibers like help and linen rather than polyester. And reduce plastics in the rest of your life, too, to withdraw your support from this toxic industry.

- **Look for low impact dyeing for textiles:** When choosing sustainable textiles, look for those made with low-impact dyes helps to reduce your water footprint and the pollution generated to create your garment.

- **Look for recycled materials:** Supporting the recycling industry helps to create jobs, supports a local economy, and keeps valuable resources out of the landfill. Ultrasuede is one example - it is a recycled clothing textile alternative made from recycled plastic soda bottles rather than virgin petroleum.

- **Be conscious about leather Products:** Buying new leather contributes to an industry that adds more to your climate footprint than the car you drive. If you must have leather in your fashion, choose upcycled leather made from scraps created in the production of leather goods.

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- **Recycle everything:** Every time you go to throw something in the trash can, consider whether that material could be used to make a new product. Most items can be recycled or upcycled, which saves natural resources, reduces landfill space consumption, lowers energy and water requirements, and minimizes the production of more toxins.

- **Tell your politicians that you want fair global water trade:** Many nations, including the US, will import consumer goods that are water-intensive. Tell your politicians that you want trade policies that protect global water resources by reducing the quantity of water intensive product imports and exports.[xlii]

- **Get active for a national water footprint accounting:** America needs a national water footprint accounting framework to account for the internal and external water we consume. Only when we know that information can we begin to conserve our water resources.

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