

Is It Possible To Create A Zero Environmental Footprint In The Outdoor Clothing Industry?

Research Methods and Professional Development
- Research Proposal

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Introduction

It is reported that the clothing industry are the world's biggest manufacturers following the higher growth sectors, automotive and technology (McLaughlin and McMillon, 2015). For the UK and European economies this industry is an essential element and the eighth greatest sector in terms of household spending, ranking fourth in terms of its environmental impact after housing, transport, and food (WRAP, 2017). In 2017 the UK fashion economy was worth 32 billion GBP (British Fashion Council, 2018) with 140 million GBP worth of clothes going into landfill each year leaving some fabrics never to be worn (WRAP, n.d.). More clothes are bought per person in the UK compared to any other European country (ECAP, 2018), with HMRC figures showing an increase in clothes being bought in the UK from 200,000 tonnes in 2012, to a staggering 1,30,000 in 2016 (WRAP, 2017).

It is estimated that globally by 2030 the clothing industry will grow to 102 million tonnes in volume and 3.3 trillion USD in value (Global Fashion Agenda, 2017). Furthermore, the Sustainable Development Goals have predicted by limiting global warming to a 1.5°C increase and striving towards a net zero emission goal by 2050, the global carbon emission needs to have a 45 percent reduction from the 2010 levels by 2030 (IPCC, 2018). If clothing consumption figures continue to increase at the same rate as they do today it is predicted to rise by 63 percent globally (Global Fashion Agenda, 2017), and the UN have stated that by 2050 it would require nearly three other planets to administer the natural resources needed to preserve the prevailing global population (UN, 2020).

With global clothing production and consumption having a huge environmental and social impact with its linear economy model 'take-make-dispose' (Ellen MacArthur Foundation, n.d.), and the most recent COP26 event asking for the fashion industry to declare their plans to cut emissions (Cernansky, 2021) as the world faces the reality of climate change, the need for urgent action is paramount. The future of fashion needs to change.

There is an abundance of research that has already been conducted surrounding the 1980's accelerated 'fast-fashion' business model, which is why I have decided to focus my research on technical outdoor wear. When it comes to outdoor garments sustainability is difficult to achieve, but the brands that fall within the outdoor sector have a passion for nature and endeavour to make positive decisions for the planet. However making sustainable choices are difficult for this industry due to the fact most technical clothing and equipment

is made up of synthetic material, and as a result is difficult to recycle and can take hundreds of years to decompose.

Providing evidence from a wide range of sources such as academic, governmental and industrial findings, I will investigate into this topic through both primary and secondary research. By highlighting the issues technical garments face, I will demonstrate potential innovative ideas and solutions that can be implemented in moving forward sustainably. Even the most progressive outdoor brands come up against limitations, yet by creating a strong collaborative ecosystem with momentum I believe this can brake this mould. With waste in the UK being expensive, sustainability can work out cheaper.

Issues and problems

Through my research process I plan to investigate the major issues surrounding the area of sustainability within the outdoor clothing industry. Following this I will look at key independents and dependent values that are the most current associated problems, this information can then be used as leverage in making a positive change imminently.

Firstly and most importantly, the over consumption of clothing being bought in the UK plays a paramount role in accelerating the environmental damage we face globally. The average consumer now buys 60 percent more clothing than they did 15 years ago (Nijman, 2019). More than two tonnes of clothing are bought each minute in the UK, which is more than any other country in Europe. And by 2030, we are expected as a whole to be discarding more than 134 million tonnes of textiles a year. The sub problems from over buying is that 10 percent of all greenhouse gas emissions, 20 percent of waste water, and 38 million tonnes of CO₂ are being used globally for clothing manufacturing (Beall, 2020).

Technical materials used by the outdoor industry can be extremely tricky when understanding and identifying opportunities for change, and more often than not these materials are made from some type of plastics as it is still thought as more effective for the specification of the product. Some companies have started to reduce their impact by switching to a recycled plastic fabric, but this brings along another problem of micro-plastics. It is estimated that around 20-30 percent of all primary source micro-plastics found within the marine environment come from synthetic clothing (Laitala, Klepp and Henry, 2018 pg 486-488). Further research has found this synthetic material is not only damaging the marine life but also entering the food chain (Thompson, n.d.).

So, what does this mean for the future of outdoor clothing and the planet? The design and manufacturing of a garment should be for longevity and lessening the desire to consume more, unfortunately the culture for sustainable consumption needs to change not only within the fashion industry. We must come up with an innovative solution that involves lessening the manufacturing of material consumption.

The Goal 12 Targets of the UN Sustainable Development consist of implementing a 10-year framework programme around sustainable consumption as well as production. This would require all countries to take action, with the consideration of the capabilities of developing countries, and aims to support the natural resources and energy efficiency (UN, 2020).

Key independents and dependent values

Reflecting on the stages of an outdoor garments lifecycle and the process in how we make, use and dispose of our garments each has an environmental cost. However, the duration at each stage depends on a range of factors such as the nature of the product, price point, level of competition in the industry, overall economic climate, etc. As follows, there are actions that can be applied right now to improve the future of both product and planet.

One key independent is to ensure outdoor clothing and gear is built to last and to only upgrade when necessary, for example by extending the average life of clothes by just three months per garment, we can reduce carbon, water, and waste footprints by 5-10 percent (WRAP, 2012). We know nothing lasts forever, thus by educating ourselves in clothing maintenance, appreciating material quality and changing our state of mind to buy less, this will act in slowing down the cycle by reducing volumes of consumption overall.

Finding innovative and forward thinking companies that offer a care, repair, re-use scheme to assist in squeezing every last drop of life from our gear suggests that their business ethos align with circularity principles and positive solutions. For example, The North Face Design Residency Program educates designers through purposeful solution and establishing principles towards building a circular business model. With the expansion of its program that launched in 2018, the company has created a space where designers are learning with their hands by either repairing or up-cycling products to improve longevity at the design stage through their REMADE collection that is sold online (The North Face

Renewed, 2022). The program has worked with partners such as Carhartt and Osprey to guide them in a viable direct for change (Anderson, 2020).

Many businesses are offering a repair service as part of the company ethos when someone makes a purchase. By providing this opportunity for resale or free lifetime repairs it creates a simple and easy to use journey for the customer in extending the life of their product, making it more desirable to use and likely recommend the brand. I believe a customer should first seek out the company values before investing in a brand.

A dependent variable for an outdoor clothing brand would be to endorse the use of sustainable fibres in reducing water footprint, and choosing a low-impact process during the production stage. Whether a fibre is grown or made is equally as important as the process used to turn that fibre into a product. For example the carbon footprint of a polyester shirt (5.5kg CO₂e) compared to a cotton shirt (2.1kg CO₂e) more than doubles (Kirchain, Olivetti, Miller and Greene, 2015). If manufacturers were to focus on a smaller range of garments and do the practical work of decoupling economic activity from resources being used, this will result in bigger reductions of their circular footprint.

At this stage I would like to identify the specific proposition of researching and investigating the different types of materials outdoor brands use to create their garments, and what sustainable solutions they are or could be working towards.

Hypothesis theory

For the customer, they need to reduce the amount they buy. For the outdoor companies, they need to find better alternatives for technical materials and, if they haven't already, compiling a sustainability report is not only useful but also permits them in being transparent about the risks and opportunities they face and will encourage achievable and realistic goal to be set to reach circular or zero waste. With a low embedded emissions production line and dramatic waste reduction at the supply chain, there will be significant and recognisable positive change.

Carrying out qualitative research and gathering in-depth insights would help to understand the actions that is specific to the industry, whether that is through ethnography, phenomenology, grounded theories or case studies (Queirós, Faria and Almeida, 2017 pg 371). Though this information is most often open-ended, it will be a content generator that

incorporates human experience in giving a better understanding of the attitudes for the driving force.

With mixed groups of people wanting to get outdoors the desire for multifunctional clothing is at an all time high, products need to be designed for an array of consumers as well as activities. These products must also be highly versatile, durable and authentic. Though it is difficult to not have a product fixed by price, brands want to make adventure affordable and accessible, by investing in the latest technology this could make a significant difference even at the supply chain and thus changing the overall price of a technical garment.

Literature review

In the aftermath of COP26, Global Fashion Agenda concluded that the fashion industry could become 80 percent circular by 2030 if there is increased investment in existing recycling technologies and infrastructures (Innovation in Textiles, 2021). Pre-competitive collaborations can play a critical role in accelerating the industry's transition to sustainable and inclusive growth, focusing on the case study of textile recycling.

Sustainability of the Tokyo 2020 Games in Numbers



© Tokyo 2020 Sustainability Report (Olympics, 2019)

A measurement of success was the Tokyo 2020 Olympics, which was not only the most expensive but also the greenest games going beyond carbon neutral, the preparation and

management were based on the third-party certification of event sustainability management system ISO20121 (Olympics, 2021). Through rentals, leasing or partnerships with suitable organisers, this allowed for the games to achieve a staggering 99 percent of non-consumable items being either reused or recycled. These sustainable initiatives were stated from the start and executed across multiple recycled products, everything was designed with the ambition that they will be used afterwards not only during the games. Some examples of the astonishing innovations were; the Olympic torch was produced using the waste remains from the 2011 Great East Japan Earthquake, all awarded medals were made from precious metals recovered from unwanted mobile phone and electronic device donations, Designer Daisuke Obama collaborated with Coca-Cola in creating the Olympic torchbearers uniform made from recycled plastic bottles and Nike developed an innovative Japanese Kimono inspired uniform that was made from 100 percentage recycled material and manufacturers waste (Olympics, 2021).

This unique uniform Nike created for team USA was inspired by the material engineering of the Tokyo 2020 Olympic medals, Nike designers invented a unisex uniform elevating sustainability. The Windrunner jacket is made up of 100 percent recycled polyester and knit together to minimise wastage, the bottoms are created from 100 percent recycled nylon with a 100 percent recycled polyester mesh lining. Team USA medalist stood proud on the podium wearing Nike's lowest-impact footwear Vapormax that is made up of 75 percent recycled manufacturing waste, and finally the defining team national logo was imprinted on to each garment using the recycled Nike Grind rubber (Nike, 2020).

Alongside these pioneering designs in Tokyo, Nike have big ambitions to 'Move to Zero' since the launch of the recent development 'Circularity', guiding the future of design and allowing the brand to focus on every step of the journey through positive progress rather than perfection (Nike, n.d b). Nike believe every athlete should have unlimited potential not only within their sport but also whilst wearing garments. In doing so the brand are securing sustainable commitments from energy and emissions, accelerating transitions to lower carbon economy by diverting 99 percent of all waste correlated with footwear manufacturing from landfill, acknowledging responsibility of material initiatives such as the sustainable cotton challenge (Nike, n.d a), and fabricating yarns from 1 billion plastic bottles per year ready for repurposing into uppers for the Flyknit shoe and jerseys (Nike, 2019).

Limitations

The developments these large global corporations are making with impactful sustainable changes are positive, but we still ask the questions of would it be better to

develop an alternative technical material that will break down quicker and can still achieve the same need, and are natural fibres the answer?

Problems can occur for both synthetic and natural fibres when used in technical garments, though vigorous testing of natural fibres are proving to perform successfully as well as the added benefit of being biodegradable. Natural fibres are known for their tactile qualities so keeping these pure materials with outdoor pursuits feels right, let's take a look at how these fibres perform technically. Tencel lyocell is a high performing fibre made from a eucalyptus tree and is formed in a similar process to paper making, the result is a strong fibre with good moisture management properties. When blended with organic cotton the stretch and fit of a resulting garment is the perfect recipe for yoga clothing (Patagonia, 2014 pg 55). Cellulosic fibres obtained from wood or plants make up nearly 90 percent of cotton fibres (Candido, 2021 pg 599-624), and with cotton fibres being found inside containers after a decade submerged under the sea, this validates its durability (Lewis, 2016).

The Japanese information technology company Teijin Limited, have developed a chemical technology establishing the model Eco-Circle for the harmonisation of both environmental and financial issues (Teijin, 2007). This model allows polyester products to be transformed back into raw material, by chemically breaking down the fabric to forge new polyester pellets that can then be spun into yarn for producing new fabrics for clothing declared as recycled polyester. This development would reduce energy and CO2 emission by almost 75 percent, capturing the original petroleum that limited the original polyester as being closed loop (Patagonia, 2014).

When pioneering outdoor brand Patagonia switched to organic cotton in 1996, paying three times more than they did in 1995 and as a result forcing them to reduce their product line from 91 styles to 66, was a monumental switch for sustainable outdoor wear. Patagonia's goal has been to influence the rest of the apparel industry to use organic cotton and inspire growth in organic cotton farming (Patagonia, 2014 pg 69). Another technical material modification was during Patagonia's search for creating a better wetsuit it successfully led them to a partnership with Yulex, a company that makes planet-based bio-rubbers derived from guayule steams. This successful innovation meant that through a waste-free and water-base extraction process, the use of petroleum based neoprene decreased and was replaced with this natural guayule rubber blend for Patagonia wetsuits (Patagonia, 2014 pg 29). Patagonia have made this proprietary bio-rubber available to the surf industry, as they

believe if the volumes increase, the prices will decline resulting in more surfers choosing less harmful wetsuits.

Another brand leading the way in sustainable outdoor clothing is Swedish outdoor company Houdini, designing their clothes circular from the start. They use either synthetic fibres that are recycled and recyclable or natural fibres that are inherently biodegradable, and never blend naturals and synthetics, because then they can be neither recycled nor decomposed. Exclusively Houdini use two natural fibres, Merino wool and Tencel™ Lyocell that have many benefits when it comes to performance and sustainability (Houdini Sportswear, n.d.). Both of these fibres are familiar when it comes to ethical clothing. Merino Wool has many great qualities such as providing excellent insulation during cold winter days, but can also feel cool against the skin in the summer months. It is naturally antibacterial, keeping the garment fresh longer than any other fabric, and it stays warm even when wet. Tencel™ Lyocell is a strong fibre made from Cellulose, that feels cool against the skin and is highly breathable, the perfect blend for outdoor technical garments (Houdini Sportswear, n.d.).

Natural fibres are continually being developed with the aid of new technology, alongside innovation by using our resources such as raw materials, production, transportation, usage and disposal these carefully plays a vital role in the environmental impact. One of the successes is in the longevity of the product, which is when repair schemes and passing on second hand clothing comes into play.

One of the limitations to these natural solutions are that micro-plastics and fibre fragmentation are escalating. The Microfibre Consortium have made a global commitment to work towards zero impact with fibre fragmentation that come from textiles and go into the natural environment by 2030 (The Microfibre Consortium, 2021). As previously mentioned, using recycled plastics do still release micro-plastics. Every time we wash a synthetic garment it emits these micro-plastics, and is where about 35 percent of all ocean micro-plastics come from (Laitala, Klepp and Henry, 2018 pg 485). On average synthetic garments release 700,000 micro-fibres per wash, or up to one million for fleece, that amounts to 1.5 million tons a year (Williams, 2016).

Methods

By creating a statistical procedure and testing my hypothesis this will help recognise where the limitations and weaknesses are in seeking information, the types of supporting

technologies that may still be in its infancy and financial constraints businesses face. It is important to understand how people perceive the topic of circularity when collecting information through surveys and quantitative research so the questions being asked can be specific and provide as useful. This research topic is challenging conventional ideas about the relationship between innovation and sustainability.

We must understand the struggles in sustaining a products growth during its life-cycle stages and considering the many hindering factors at different stages, whether that is general economic climate, price point or product competition within the industry (Rink and Swan, 1979 pg 219-242). When natural fibres are not blended with synthetics they are then biodegradable meaning they do not contribute to plastic waste or micro-plastics. We understand that natural fibres and synthetics are both good for different reasons, especially when it comes to technical garments. Collating a case study of companies who are already Climate Neutral Certified outdoor brands and those who are well on their way to reaching circular or zero waste in the next decade can prove useful. From here insight can measure their carbon footprint, reduce what they can and then eventually offset the rest.

Another activity that is necessary for completion of this project is breaking down the resources used within the outdoor industry production line. For example, Life Cycle Assessment (LCA) is a science-based methodology with an assessment of a cradle-to-grave or cradle-to-cradle analysis technique to assess environmental impacts associated with all the stages of a product's life (Muralikrishna and Manickam, 2017 pg 57-75). This would be a good starting point when dissecting the production line.

Other, and less obvious factors, to consider are recyclable packaging, economical machinery powered by renewable energy, switching to a dyeing process that requires little to no water, applying new resources and waste strategies, and considering regenerative agriculture.

With many companies such The North Face, Timberland and Patagonia who are working with regenerative farming, others are beginning to explore the option for their products too. This holistic and rehabilitation approach is aimed to help brands work with nature rather than the other way around. By preceding different industrial agriculture practices such as pesticides, tilling, mass-produced fertilisers or orderly placed single rowed crops (Thomas, 2021). Industrial farming has a huge impact on the climate and in order to attain the Paris

Climate Agreement of reaching net zero carbon emission by 2050, agriculture must put an end to these pollutions (United Nations Climate Change, n.d.).

To help a company focus and use their business as a positive influence, they can become B-Corp certified through the nonprofit B Lab. This designation works with like-minded sustainable businesses by reaching rigorous standards of social and environmental performance, accountability and transparency. Signing up encourages companies to keep motivated and holding on to their social mission (B Corp, 2022).

By carrying out theoretical research this would bring a focal point to the varying concepts and assumptions manufacturers and companies encounter, thus allowing for a solution to be explored and reaching a conclusive end result.

Conclusion

Can the outdoor clothing industry change their actions for a better future of both product and planet by working towards a zero environmental footprint? Though we do not have answers at this stage, my examination of evidence and case study examples highlight the importance of turning the outdoor clothing industry circular, and how it is not beyond impossible.

There should government support of community initiatives in setting up repair spaces, and educating the public in understanding both the social and environmental consumption cost of cheap fast-fashion clothing. The circular fundament is that nothing is wasted, over billions of years evolution has built an entity of materials that can degrade ready for something else to grow. It is our responsibility to replace what we borrow from nature.

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