The Future of Sustainable Fabrics and Clothing

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"If current trends continue, by 2030 we will need a 2nd planet Earth in order to satisfy our demands for energy, commodities and water and absorb our emissions. De-linking rising prosperity from resource consumption growth is key to economic prosperity for companies and countries alike. "[i]

It has been calculated that by 2030, 30% of the world's demand for resources could be met through improving resource efficiency[ii], including in the fashion and textiles industry. By extending product-life, a product's increased lifespan would also reduce depletion of natural resources and consequently waste.[iii]

There is a pressing need to transform the way clothes are made, considering the world clothing and textile industry (clothing, textiles, footwear and luxury goods) reached almost $2,560 trillion in 2010.[iv] Whilst a reductionist or isolated approach is common, sustainability is moving 'towards a holistic view... it is no longer enough to resolve one aspect – we must address everything from the source of the raw material through design, production, use and reuse of materials and products.'[v]

A key issue is the need for fibre diversification, resulting from the global use of a small range of fibres, despite growing availability of innovative fibres and fabrics. With water, mineral oil and fertile soil being limited and dwindling resources (all important ingredients for the dominating fibres, polyester and cotton, which account for over 80% of global textile production), alternative fibre choices are essential. More sustainable textiles can mean less water use and wastage across the supply chain, reduced chemical

pollution and waste production, reduced loss of biodiversity, and minimized use of non-renewable resources.

Vitally, awareness and understanding of the impact textile production has on our environment and society is rising. Sustainable textiles are becoming more appreciated, and seen as an exciting opportunity.

The Fashion and Textiles Supply Chain

To address sustainability in fashion and textiles, the supply chain should be considered from the very beginning, when raw materials for textiles and components are cultivated, extracted, harvested and processed. During production, fashion and textiles undergo 'one of the longest and most complicated industrial chains in manufacturing industry.'[vi] The time consuming and resource intensive processes require labour, energy, water and other resources, cumulatively creating a high-impact sector.

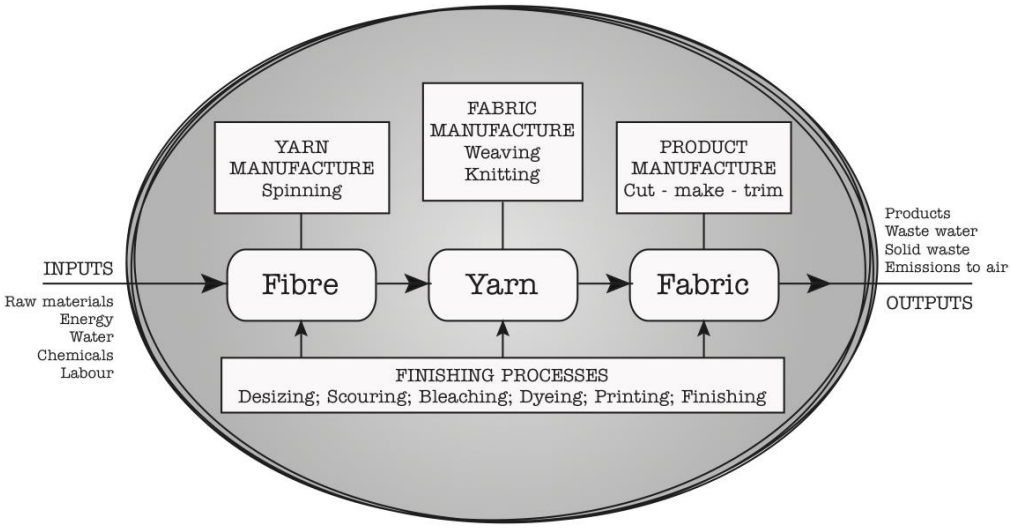

Fig.1 The Supply Chain [vii]

The textile supply chain is characterized by varied social and environmental challenges. Global organizations are helping to improve working conditions and efficiency, and reduce environmental damage through training workers and helping factories

implement structural improvements. Fashion brands can help by choosing more sustainably produced textiles, and engaging with suppliers to rectify issues.[viii] Whilst every link in the chain is entrusted to maintain integrity, including farmers, mills, brands and retailers, traders, certification bodies, and accreditation bodies,[ix] traceability is essential to identify and improve shortcomings.

Innovations in Developing Sustainable Fabrics

Natural fibres should be inherently sustainable, but the dominance of conventionally farmed cotton has caused disastrous depletion and pollution of water sources, and reliance on harmful pesticides and chemicals. Moreover, the cotton industry is constantly changing, as 'world economic conditions shape demand, weather events affect supply, and political upheaval can even shut down production completely'.[x]

Predominantly petroleum-based synthetic fibres account for nearly half of the world's fibre production, despite the potential social, environmental and political issues linked to the extraction and use of oil. Moving towards recycling polyester could reduce energy consumption by a third compared to virgin fibre production.

Furthermore, the traditional viscose process for artificial fibres uses toxic chemicals, causing hazardous air emissions. Increasingly used closed-loop processing can recover and reuse up to 99% of solvents from processing, creating zero discharge.

The finishing and wet processing stages then cause significant impact in terms of toxins, waste water effluent, solid waste from salt and dyestuff, and pollution of water ways. Combining informed fibre choice with technically developed finishing processes would help reduce impact.

To identify innovations and alternatives to traditional materials, the Future Fabrics Expo by The Sustainable Angle has become a significant resource. It showcases commercially viable fibres, fabrics and techniques embodying sustainable principles and

new technologies, sourced from global mills that demonstrate commitment to lowering environmental impact across the supply chain.

The increasing range of innovations available at the expo includes:

- Organic cotton
- Recycled and recyclable polyester, and developments incorporating post-consumer coffee waste
- New viscose technologies including closed-loop cellulosic fibres, and fabrics made with post-consumer food waste such as crab shell.
- Recent bio-engineered innovations made with castor oil plant and other plant matter.

Considering the proliferation of textiles entering landfill, clothing and fibre reclamation and repurposing are also imperative to conserve resources. Processes are being developed to recapture up to 99.9% of polyester and cellulose from cotton fabrics to reintroduce into polyester and viscose supply chains[xi], and chemical recycling technologies are being developed to close the loop on recycling systems. Chemical processes help maintain fibre quality throughout recycling, so the resulting fibres are not downgraded[xii], whilst mechanical recycling is increasingly common, especially in the denim industry, creating beautiful pre-coloured knitted and woven fabrics.

Challenges

Challenges linked to using sustainable fabrics have included aesthetics, quality, price, and accessibility. However, technological developments are generating sophisticated sustainable textiles able to withstand stringent quality controls. Bringing these fabrics to the attention of global brands and designers is leading the fashion industry to catch on to the zeitgeist, demonstrating the ability to reduce environmental footprint without compromising on style or quality.[xiii]

Conventional trade fairs have not traditionally provided opportunities to easily discover sustainable fabrics and information, meaning sourcing them can be an onerous task. However, the Future Fabrics Expo is addressing this, presenting curated sustainable

fabrics and information to encourage informed decision-making, and help navigate sustainable textile sourcing.

Future Trends

Global retailers are producing fashion and footwear collections that are entirely recycled and recyclable, designed to be deconstructed, recycled, and/or reused, and made using organic and recycled fibres and processes. As these initiatives become more widespread, we may even see embryonic conceptual projects become commercial.

We are also seeing an aspiration to replace one-way products destined for disposal with goods that are 'circular by design', creating reverse logistics networks to make a closed loop economy,[xiv] in which we would create lasting products, produce less waste, and promote long-life fashion 'with a connectedness to the environment from which it originated.'[xv] Perhaps reflecting this, consumers are demanding more information, to move towards a deeper and more holistic understanding of the impact sustainable innovation is having on our world.[xvi]

Expected Market and Demand

The Future Fabrics Expo has revealed increasing interest and demand for materials with reduced negative environmental and social impact. This could be attributed to increased environmental awareness, the rising need for diversity and choice, increasing global demand, and the growing scarcity of raw materials and price volatility affecting current supply chain systems.

Additionally, increasing numbers of 'sustainability rating systems' have created demand for sustainability data. Lifecycle and impact assessment tools provide tangible opportunities to measure impact and adopt more sustainable working processes, but

that is only part of a solution – to really create impact the industry needs to engage and collaborate throughout the supply chain.

Conclusion

Undoubtedly, fabrics offering enhanced sustainability are part of a better future for the fashion industry, a future where we can manage resources wisely and cost effectively. By raising the profile of sustainable textiles, the growing number of designers demanding sustainable materials will continue to increase, enabling mills to offer more accessible prices and purchase terms, especially vital to smaller companies.

The future involves taking a holistic view, where sustainable fabrics play an important role in the fashion system, which needs to undergo widespread improvement to reach long-term sustainability.[xvii]

"By galvanizing the creative power of our industry we can design new ways of producing and consuming fashion that excite and inspire without compromising the fragile state of our resources." Harold Tillman (former Chairman BFC)[xviii]

References:

[i] Holdway, R. (2012) *Design Innovation for a Circular Economy. http://the-cadence-team.com/article-design-innovation-for-a-circular-economy-ce/#more-1190*
[ii] Holdway, R. (2012) *Design Innovation for a Circular Economy. http://the-cadence-team.com/article-design-innovation-for-a-circular-economy-ce/#more-1190*
[iii] Stahel, W.R. (1982) *Product-Life Factor* http://www.product-life.org/en/major-publications/the-product-life-factor
[iv] http://www.reportlinker.com/p016087-summary/Global-Textiles-Apparel-Luxury-Goods.html
[v] O'Mahony, M. (2012) *'Key directions for textiles and sustainability in the coming decade'* in Black, S. (2012) *The Sustainable Fashion Handbook*. Thames & Hudson. p.307
[vi] Fletcher, K, (2008) *Sustainable Fashion & Textiles: Design Journeys*, p.41. Earthscan.
[vii] Figure 1 Source: adapted from Fletcher, K. (2008) *Sustainable Fashion & Textiles: Design Journeys*, p.47. Earthscan.
[viii] Textile Exchange. (2013) *Farm and Fibre Report 2011-12*, p.102.
[ix] Textile Exchange. (2013) *Farm and Fibre Report 2011-12*, p.74.
[x] Textile Exchange. (2013) *Farm and Fibre Report 2011-12*, p.26.
[xi] *Interview with Cyndi Rhoades, Closed Loop Executive Officer of Worn Again in* Ellen MacArthur Foundation (2014) *Towards the Circular Economy*. p.33
[xii] Ellen MacArthur Foundation. (2012) *Towards the Circular Economy vol.2*.

[xiii] http://www.thesustainableangle.org/futurefabricsexpo/About.aspx
[xiv] Ellen MacArthur Foundation. (2014) *Towards the Circular Economy*. p.22
[xv] Textile Exchange. (2013) *Farm and Fibre Report 2011-12*, p.26.
[xvi] Textile Exchange. (2013) *Farm and Fibre Report 2011-12*, p.26.
[xvii] http://www.thesustainableangle.org/futurefabricsexpo/About.aspx
[xviii] Centre For Sustainable Fashion (2009) *Tactics for Change.*