Chapter 6

Sustainable Fashion Legislation

An Analysis of Emerging Networks in Global Governance

The Need for Formal Governance as a Function of Industrial Innovation and Growth

To incentivize innovation toward developing more viable "circular" production, governments are taking action. Legislation is evolving at the local, national, and supranational level to usher in a system of transparency in production and supply chain management. Such legislation is a function of the legacy of a growing body of research on transparency in fashion supply chain initiatives (Bhaduri & Ha-Brookshire, 2011; Egels-Zandén, Hulthén, & Wulff, 2015; Khurana & Ricchetti, 2016). The findings sum up the fact that such initiatives are, at large, voluntary and taken at the firm level. The benefits accrue to participating firms to help them build "eco-cache" with customer bases, which improves competitiveness for brands in a culture of growing social support for sustainability, however one defines it. The research notes that the incentives to participate bear higher operational costs. Therefore, few producers choose to make viable policy commitments toward a systemic increase of such costs in an industry that competes on price (Birkey et al., 2018; Köksal et al., 2017; Perry & Wood, 2019).

To tackle the challenges, a goal to develop a formal governance framework was agreed upon by the main apparel conglomerates and government

representatives under the UN Sustainable Development Goals in a series of UN initiatives launched since 2018 (Gardetti & Muthu, 2020). Until that moment, governance of the apparel sector had never been designed or applied with sustainable production goals. It had been focused on issues of free trade, market access, and more recently, labor protection (Anguelov, 2015; Anner, 2009, 2011, 2019). As already explained, the urgency to undergo legislative innovation to address environmental impact, as well as labor issues, stems from the significant ecological impact of the industry, as it continues to grow (Pal & Gander, 2018).

With the on-going retail innovations, including fast fashion, super-fast fashion, and online commerce, sales volumes keep on increasing. Having followed a steady trajectory of expansion, the retail value of the clothing and textile business is estimated at $1,500 billion annually, with future growth rate projected to increase in terms of both volume and value. According to the International Cotton Advisory Committee (ICAC), annual textile consumption is projected to grow at a rate of 3.1 % until 2025 (Sodhi, 2017). Such expansion is most-directly linked to the on-going expansion of fast fashion retail (Nucamendi-Guillén, Moreno, & Mendoza, 2018; Wen, Choi, & Chung, 2019).

Along with fast fashion, two fairly new business models that are transforming retail are expected to play significant role in the future growth of the industry. They are "mass customization" and "athleisure." Mass customization is offering product lines with choice, where customers can pick apparel features or even, as is the case with American-based *Stitch Fix*, alter and/or mend old clothes (Choi, 2013; Fiore, Lee, & Kunz, 2004). Athleisure is sporty apparel, including clothes, shoes, and outerwear, that people wear regardless of a physically active lifestyle and almost never to actually exercise (Craik, 2019; Lipson, Stewart, & Griffiths, 2020). These two platforms merit analysis as they have the potential to redefine production needs in materials, purchasing behavior of consumers, as well as the emerging sustainability governance of the industry.

Mass customization developed as a niche platform for the better part of the last two decades as technology allowed more customer input into the production process. First introduced in the late 1980s, mass customization was more or less an exploratory platform for high-end design (Rahman & Gong, 2016). At its core, it is a modern brand-based seamstress model, meaning making tailored clothes based on customer specifications. It was not until the beginning of the 2000s, however, that mass customization became a viable mass-market commercial model. Even then, it remained

mostly vested in luxury and prestige brands that allowed customers options, in what is called "co-design," where customers can choose features from a variety of available options (Azuma & Fernie, 2003; Ulrich, Anderson-Connell, & Wu, 2003).

About a decade ago fashion scholars and experts on consumer marketing and relations made the link between mass customization and "sustainability," exploring the opportunities to reduce waste (Black & Eckert, 2010; Niinimäki & Hassi, 2011). The assumption is that more input into the design process, better measurement information, and a responsive system of customer relations based on smart technology, would allow for the direct production of apparel to exact customer specifications. Hence, less "needless" variety would have to be manufactured, leading to lesser degree of discarding of unwanted clothes. Under such assumptions, mass customization can lend itself to claims of sustainability, as Black and Eckert (2010) explain, but only in terms of reducing waste.

In an effort to develop business models that embrace the waste-reducing quest, under mass customization specifications, certain innovative fashion retail start-ups have developed the emerging commercial platform of "rent" vs. "buy" (Hu et al., 2014). Todeschini et al. (2017) provide the most recent and comprehensive analysis of sustainability features in apparel retail innovation, including mass customization under the "born sustainable" classification. The authors track the growth of "rent" vs. "buy" commerce with a movement to create a "fashion library" culture. Companies that rent outfits include the appropriately named *Rent*, *Runway*, and *LENA*.

Interest in "rent" vs. "buy" is growing, proliferating outside innovative start-ups to the global conglomerates (Hanbury, 2019). Prestige brands, such as *New York & Company* and *Bloomingdales*, are offering renting monthly subscription-based services. Even "masstige" brands, such as *Banana Republic* and *GAP* offer rental options, leading *H&M* – the powerhouse of fast fashion retail – to announce plans to launch rental services in its flagship Stockholm store for premium-priced lines, focused on products that include recycled inputs (Dowsett & Fares, 2019). A noble plan, or another PR opportunity for *H&M* to showcase commitment with vacuous promises? Time will tell.

Rental business model options are currently in the developmental stages of proliferation and still at relatively high price points. It makes sense to rent expensive garments. The challenge is launching customization retail, be it with rental options or custom-made options, in the broader "mass" fashion market. A successful example comes from Todeschini et al. (2017: 768) who describe a collaboration of Italian retailers to launch, as the authors

put it: "an Italian e-commerce platform." It offers entirely made-in-Italy men's clothing that is (a) made to measure with a 3-D configurator, (b) locally sourced, (c) has a face-to-face option for tailoring in major cities, and (d) offers up to 10 million combination options of choice. Collaborations as these can lead to customization retail "at scale," as is the industry term, meaning able to serve millions of customers globally. The mass-customization retailers that are tackling the challenge of "production to scale," at masstige to prestige price points, are US-based *Stitch Fix*, *Trunk Club*, Germany's *Adidas* and start-ups such as *Suit Supply* and *True & Co*, and Delhi-based *Pernia's Pop-Up Shop* (Sodhi, 2017, 2018).

Along with such hopeful innovation in product development and retail models that explore commercial ways to reduce the industry's carbon footprint, there is also a style redefinition in what consumers value as fashion. This redefinition is a growing preference for, what Chapter 1 in this book described as, "activewear" and "sportswear" in traditional fashion retail. The new metamorphosis of this decades-old-by-now, and still growing, cultural embrace of athletic rather than fashionable apparel is in modern-day's growing popularity of athleisure. Athleisure blends well with fast fashion as it is mainly a design-based innovation. It can be mass-produced and positioned with the same or similar turnover rates as fast fashion product lines. However, it makes no claim to "fashion," in terms of being reflective of high-fashion trends.

The volume of athleisure commerce keeps increasing. According to Morgan Stanley research, its growth rates were strongest between 2008 and 2015 (Sodhi, 2017). In 2014, CNBC business analysts event went as far as claiming that the athleisure trend "spells the death of denim" (Korber & Reagan, 2014). An example of how important the trend is for the whole industry comes from the opening lyrics of pop star Cadri B's 2019 hit "I like It," where she sings: "I like those Balenciagas; the ones that look like socks." "Those Balenciagas" are form-fitting boot/sneaker hybrid that one pulls on their feet like socks. *Balenciaga* – one of the oldest luxury fashion houses – invests in the creation of futuristic-looking athleisure products, targeting a customer base that defines style from popular culture cues. Along, of course, with jewel encrusted stilettos.

Balenciaga has no choice. In order to survive in a global marketplace defined by fast fashion and social media, where style is demarcated by influencers outside of the circles of design royalty, all retailers have to offer product that can blend style with comfort and performance. The Balenciagas of the industry must learn to survive not only against the fast fashion Zaras and H&Ms, which increasingly, and more baldly, diversity into

luxury product lines, as their social importance rises. They must also survive against the industry's tech innovators, such as Boston-based *Ministry of Supply*, a start-up launched by two MIT-trained textile mechanics engineers in 2012. *Ministry of Supply* defines its mission as "to design and construct garments true to the form of human body… where form and function intersect," boasting the use of technologies used in NASA space-suit exploration gear. The promotional materials on *Ministry of Supply's* home page include quotes from *Vogue* magazine, naming it "one of the 59 digitally native brands you'll see everywhere in 2019." I still haven't at the end of 2020, but the point is that with such innovators, the industry is now entering a new phase – "engineered apparel" that is "digitally native."

Engineered apparel is the launch of clothes made from "functional fabrics," traditionally developed for athletes and professionals in fields that needed protective clothing (Hayes & Venkatraman, 2016; Shishoo, 2015). Digitally native retailers, such as *Ministry of Supply*, are well, exactly that, also referred to as "online only" or "online first" retailers (Bell et al., 2018). The term "digitally native" is most-often used to describe the consumer behavior of millennial and Z generations, as having grown-up with technology in a cultural cyber space (Howe & Teufel, 2014). Members of those generations favor online communications, advertising, and commerce, feeling comfortable with "online only" retailers. The problem is that these "functional textiles," driving "digitally native" "athleisure" product development, are synthetic.

Innovation in material development had been decoupled from sustainability concerns. Even as fast fashion commerce was escalating and concerns were being raised of its ecological impact, fashion designers continued to create and laud the use of "modern fabrics." In the documentary *DRIES*, Belgian designer Dries van Noten tracks his most important collections that define his 30-year career to establish him as one of today's most innovative designers. He explains that it was his 2007 summer collection that defines him as "pushing things really forward" and he means using materials such as taffeta and silk and polyester blends to make fabrics look different and move differently (Holzemer, 2017). The designer explains that from that point on, his designs were about contemporary clothes and contemporary fabrics. The issue is that those "contemporary" fabrics and their production is the core problem in textile toxicity. It is these types of fabrics that, as explained in Chapters 3 and 4, constitute the main problem for fashion circularity – they cannot be recycled. They are toxic in production and care and they are ubiquitous in almost all clothing items. Today one would be hard pressed to find a garment that is, as used to be known,

100% cotton or other mono-yarn material. The embrace and promotion of "contemporary fabrics" by designers is the core issue that frustrates the fashion sustainability movement.

There has been a decided move away from the interest in "natural" fibers, best captured by the "organic cotton" movement of a decade ago, into innovation in athleisure production that is focused on "functional fabrics" (Tadesse et al., 2019; Yan et al., 2018). Functional fabrics define apparel innovations which include:

(a) odor-controlling technology (Klepp et al., 2016; McQueen & Vaezafshar, 2019), most successfully commercialized by South Korean conglomerate *Polygiene*
(b) non-irritating graphene textiles (Malhotra & Mandal, 2019), commercialized by Italian *Directa Plus*
(c) metal-organic framework (MOF) powders (Rose et al., 2011), developed to remove toxic compounds in "protective clothing," for military and first responder professionals

Product features in such developments promote lower "toxicity" and the use of recycled inputs from reclaimed polyester. As discussed in previous chapters, however, such reclaiming is far from constituting a viable carbon-footprint-reducing, "circular" fashion economy. Developing fabrics that can be promoted for their sustainability-improving features is an on-going process, which currently, has not yet been able to deliver products that are mass-market ready. Yet, innovators are emerging, such as the Swedish *Re:newcell* that is successfully pioneering denim recycling at scale.

The company's operations are featured in the special segment *The New High-tech Way to Recycle Clothes* by BBC's series *Click*, which tracks global innovation trends across industries (BBC, 2019). *Re:newcell* uses, as is the emerging term "climate positive" operations to turn reclaimed denim into viscose. It relies on pre-sorting suppliers that collect and disaggregate the denim to remove the stitching, which is not made of recyclable natural fibers, and then an "eco-friendly," according to the company's promotions, "chemical process" is used to break down the fabric and de-dye it.

Although not specified in the program or on *Re:newcell's* media platforms, these processes most likely involve the use of enzymes. To remove indigo-based dye, peroxidase enzymes or laccase enzymes are used. For Sulfur-based dies, esterase enzymes can be used (Singh, Singh, & Singh, 2015). The use of enzymes as alternatives to chemical auxiliaries in textile

coloration (the term used for both dyeing and removing color) has gained popularity in research for its relatively lower environmental impact (Bansal & Kanwar, 2013; Fu et al., 2012). How much lower? It is still being evaluated and tested by cleaner production textile scientists.

Not all color can be removed completely in such processes. Any remaining color has to be removed through "chlorine-free" bleaching, as *Re:newcell* claims. Then the wet pulp is dried up into sheets of thick canvas, resembling that used in oil painting, called "circulose" to be sold on to the next tier of companies that use this canvas to turn it into thread. That thread is not yarn; it looks and feels like natural cotton wool. The circulose is then sold on the yarn weavers. Although the film refers to the product as circulose, it is in effect a type of lyocell or viscose, which are made from wood (Sealey et al., 2004; Zhang et al., 2018) and have been part of niche eco-textile development for a few decades.

Yarns made from lyocell and viscose are fragile and have very limited commercial use, therefore, they have not gained mass-market popularity. This fact is not mentioned in the documentary *The New High-tech Way to Recycle Clothes*. The segment ends on a positive note, promoting *Re:newcell's* product – circulouse.

As with previous such programs, the narrative ends with an upbeat message, promoting a product. The problem is that this product is just one of the inputs tier 3 suppliers can choose for weaving fabric. How the choice of a textile factory to use circulouse helps with the most toxic operational steps in fabric production, outlined previously in Chapter 3, weaving and dyeing of yarns, is not discussed. The next frame in the film shows the narrator handling a bright yellow casual dress, stating: "…it's pretty nice; it's made of viscose and it's recyclable again…" But is it? With existing chemical recycling options that would turn it back into circulose? Who is going to recycle it? How fragile would the reclaimed pulp be? The narrator claims that the yellow dress can be "recycled up to five or six times." She then gives an astonished smile, and the scene ends.

Explaining the market dynamics, the CEO of *Re:newcell* Mattias Jonsson states that the company opened at-scale operations in 2018. It prototyped the "yellow dress" during "fashion weeks" in 2014 to showcase designers what is possible to create with circulose. Mr. Jonsson states that the capacity of the production facility is up to 7,000 tons annually, which equals the weight of 30 million t-shirts. He claims that *Re:newcell* is the first company in the world to be producing on industrial scale. The camera work shows the evidence – sophisticated heavy machinery in a large industrial complex

(of course on the bank of a river) in Sweden. It must be noted that this example comes from the nation that gave the world fast fashion, where its economy is dependent on the success of *H&M's* global operations, and where the government has implemented laws to incentivize such operations. Paras et al. (2018) explain that the Swedish tax agency has "recently" created a value-added exemption for organizations that have collection and/or processing operations for second-hand clothes. *Re:newcell* must be benefiting from such a tax exemption. To relate such support to the concept of nation branding, covered in Chapter 2, the Swedish government is actively promoting its sustainability initiatives, while at the same time, engaging in the international promotion of the Swedish firms (Mansson, 2016). That is why, consumers the world over are eager to believe *H&M's* social justice proclamations and its extremely effective greenwashing campaigns.

Even with such government support, there is not enough resources to keep operations profitable for *Re:newcell*. The firm relies on denim, imported mainly from the United States, and at this point, treating denim is the only operation the company can do. The reason is that, denim is comparatively easy to de-dye, but only the denim that has been dyed with 100% indigo-derived dye. However, most denim has been dyed with a combination of indigo and Sulfur or 100% Sulfur-made dye, which is the case for black and colored denim. Those types of dyes are not as easy to remove. Textile engineers are experimenting with innovations (Buscio, Crespi, & Gutiérrez-Bouzán, 2015; Maryan, Montazer, & Damerchely, 2015; Silva et al., 2018), including the use of lasers (Dascalu et al., 2000), yet from the literature examined in this book and its prequel, there is little evidence that such technologies are being deployed on a commercial scale.

The main reason is simple. The deployment of such innovations at scale would be very expensive. A lot more firms similar to *Re:newcell* would be needed to generate the demand for a separate tier of engineering equipment firms to respond by producing the necessary machinery.

There are no other materials that *Re:newcell* can process, which means that this promise that the "yellow dress," prominently displayed beyond the CEO of the company during the interview, would have to be "recycled up to five or six times," not there. Then where? No such questions are asked. The segment ends with the typical greenwashing promotional statements that *H&M*, an investor in the company – a piece of information strategically saved for the last minutes of the segment perhaps to increase the "feel good factor" of the story – will "soon have clothing originated from this process on their shop floors." Yet, as expected, no discussion of costs accompanies

this segment, or the other related segments in innovation in the *Click* series dedicated to sustainable fashion.

So far *Click* has produced few episodes on innovation toward circular transformation. In the above-summarized segment *The New High-tech Way to Recycle Clothes*, the ending minutes even offer the claim that the industry's goal is to be fully circular or sustainable by 2030. We, as the audience, want to hear such news. And we, as the industry and policy professionals, want to have such goals. The problem is that reaching them requires time and resources. So far, if history has taught us anything about innovation in the industry, it is that it has taken over 20 years of political and social action to get the first and only industrial scale production facility open that treats the basic fiber in clothes – cotton – and only one type of clothing item made from it – denim. Making claims and promises that all fabric, including poly-blends, synthetics, and leathers, would be able to be included in operations that would transform the whole industry to "fully circular" is unwise, if not irresponsible.

The main issue with such promises is the fact that innovations in material improvements are just beginning to gain the interest of fabric manufacturers. Furthermore, depending on market niches and opportunities, producers can focus on different features that can be branded as "sustainable" innovations. For example, attention is placed on the integration of "functional powders" into fabrics (Yadav et al., 2006; Yang et al., 2012) – a technology refined by French *Fibroline* with the use of high voltage generators to alter electric fields. This is a process that does not require water or solvents.

The goal to limit water use is also reflected in innovation for "100% water-free garments," (Samanta, Basak, & Chattopadhyay, 2017; Pal, Chatterjee, & Sharma, 2017). The best example to date is the much-publicized *Phoenix Jacket*, launched in 2019 by outdoor brand *Marmot*. The promotion claims that it is the first-ever garment to be made without the use of water in any stage of production, manufactured with technology employing solution-dyed yarns and dry fabric finishing. The problem is that it is all nylon – a petrochemical product, the production of which is akin to a plastic bag – and it retails at luxury price points. *Marmot's* website lists the cheapest option at $175 for what in essence is a light raincoat. How many customers will be concerned enough about their ecological footprint, wealthy enough, digitally savvy enough, and most-importantly, be convinced that the *Phoenix Jacket* is indeed a "sustainable" garment to buy it? How many will question it and opt for a light rain coat from *Target*, one fifth the price? Time will tell.

With such noted limitations in clarity, the digitally native, modern apparel consumer exists in a fashion industrial culture permeated with messages of sustainability innovation. Brands are using the concept for their own promotional purposes, boasting self-established norms and regulations to showcase commitment to environmental stewardship. What started a decade ago as a niche in the industry, at the time referred to as "eco fashion," has now become a constant promotional rhetoric for retailers and their suppliers, who feel the pressure to show evidence of sustainability in their operations. The quest to incentivize viable improvements toward quantifying such evidence has moved toward redefining the role of governments in the fashion market.

Formal Governance: Foundations and Evolution

Today most industry-level regulation is focused on labor. Yet, despite effort to address sweatshop working conditions, establish health and occupational safety guidelines, and regulate enforcement to protect workers, problems continue. For example, despite all the social attention and outcry for the poor working conditions in facilities in Dhaka, Bangladesh after the tragic collapse of the Rana Plaza complex in 2013, in 2020 173 factories were found unsafe, according to standards of the Bangladesh Department of Inspection for Factories and Establishments (DIFE) (Glover, 2020). The main reason is regulatory capture. Industrialists and politicians are part of the same social elites and are often both.

Politicians have industrial interests and with those, have direct monetary incentives to increase profitability of their ventures and keep operating costs competitively low. In the developing nations most dependent on apparel production, pressures rise congruent with development. As development levels increase, so do labor costs as wages go up (Cui & Lu, 2018; Jong-Wha & Wie, 2017; Yang, Chen, & Monarch, 2010). This is very much the case in China today, as it was in South Korea in the 1980s when textile producers started locating out of South Korea into lower cost locations (ESCAP, 2008; Maurice & Hermann, 2017).

Indirect costs of waste and pollution mitigation also rise with institutional development, as the general public values cleaner environment and laws are developed to curb pollution. As already explained, this process is the focus on academic works on the Kuztnets Curves from across industrial sectors (Antonakakis & Collins, 2018; Piketty, 2006; Rudra & Chattopadhyay, 2018). The most direct effect of such legislation is to increase the average operating

costs of producers by making them pay for the deployment of purification and filtration technologies (Cherniwchan, Copeland, & Taylor, 2017).

In terms of legislating incentives for such internalization of the high social costs of fashion pollution, since the 1990s Europe has been the leader in toxicity mitigation laws, banning the use of certain inputs, such as the highly toxic azo dyes (Brüschweiler et al., 2014). Azo dyes do not biodegrade and when expelled into run-offs, tend to "bioaccumulate" in aquafers, having a negative effect on safe farming and of course, wild life (Bafana, Devi, & Chakrabarti, 2011). Since most dyeing and finishing happens internationally, the current legal efforts in Europe, established under the REACH regulation of 2007, differ from the set of 1990s laws, including Germany's MST and MUT laws that set standards for pollution contents in finished goods and production processes at the national level (Anguelov, 2015: 115–116). MST and MUT applied only to Germany. REACH stands for Registration, Evaluation, Authorization, and Restriction of Chemicals, and is under the scope of the European Chemical Agency, with authority (at least on paper) over all EU member states.

The earlier set of laws banned the commerce of product made with certain toxic chemicals, mainly colorants. In general, they applied to imports into one specific nation, as in not allowing clothes made outside of Germany with banned dyes (in relation to the MST and MUT laws) to be sold in Germany, for example. REACH, on the other hand, applies in production process regulations for the whole of the European Union and across operational tiers. REACH is supposed to regulate the manufacture, import, marketing, and end-use of chemicals.

REACH's authority is broad, and as such, prone to high level of administrative discretion. As its acronym describes, it does indeed "Register" and "Authorize" chemical use. Yet, according to the language on its website, it only "Restricts" it when its "Evaluations" reveal that the use of certain chemicals, at certain levels, poses "risks that cannot be managed."[1] With respect to apparel production Jacometti (2019) explains that REACH provisions can be applied to chemical companies, textile manufacturers, and leather tanneries in the use of colorants, auxiliaries, and biocidal additives, which are used in leather and textile treatment as fungicides to inhibit bacterial growth. Since 2007, these provisions have guided production inside the European Union. However, since most apparel inputs are actually manufactured outside of its jurisdiction, new legislation is being developed with respect to global supply chains.

The new legislative efforts, set forth by *Resolution of 27 April 2017 on the EU Flagship Initiative on the Garment Sector* 2016/2140, put the attention on supply chain transparency (European Parliament, 2017). It merits to

describe this Resolution, as merely an effort because its language calls for the "development of a legal framework" that includes "measures on due diligence obligations" (Jacometti, 2019: 27). How and under what jurisdiction this "framework" would operate, under what mandates, and most important, with what oversight and enforceability of compliance, is unclear. Afterall, as Niinimäki et al. (2020) show, over 80% of clothes sold in the European Union are not manufactured in Europe. If anything, it is troublesome that the precedent, which the Resolution seems to propose to follow, is based on voluntary participation of EU Ecolabel.

EU Ecolabel was launched in 2011. Jacometti (2019) offers a detailed breakdown of its legal provisions and explains all are voluntary, there are no punitive measures for non-compliance, and all brandish bombastic, ambiguous language, such as "circularity" and "product and organizational footprint." The caveat is the EU Ecolabel platform operates like any other of the "eco-fashion" voluntary certification bodies, leading among then being OEKO-TEX, and until recently *Made-By*, proven to be irrelevant and even defunct. *Made-By* filed for bankruptcy in 2019.

These bodies are, in effect, consultancies that one can cavalierly state "help" brands make "better choices." The reality is that they just allow brands to create reasons for price mark-ups of certain product lines, without holding them accountable to any commitments in their overall production practices. Writing for *Eluxe Magazine*, Caric (2019) ranks the 10 leading "ethical" fashion certification bodies and offers honest criticism in each one's special provisions of the notable limitations for oversight of compliance. The conclusions do not show any convincing beneficial evidence.

One goal is emerging from the analysis of the formal legal actions taken in Europe. It is the reduction of waste (Jacometti, 2019; Moorhouse & Moorhouse, 2017; To et al., 2019). The Waste Framework Directive 2008/98/EC of the European Parliament "establishes some fundamental principles," as Jacometti (2019: 27) puts it. The three main principles are as follows:

1) obligation to handle waste in best effort to protect public health
2) the principle of waste hierarchy and
3) following "the polluter pays" principle

These principles are broad, and in that fact lies the problem. Specifically, principles (1) and (2) can arguably be described as symbolically vacuous. Whose "obligation" and "best effort" to protect public health does the first principle impact? Federal or local government, waste management authority,

out-contracted waste management providers, or producers? How are infractions to this principle quantified, and how are infractions to be adjudicated?

The second principal of "waste hierarchy" is even more problematic. It is a step-wise goal in waste management legislation to consider options in mitigating environmental damage before formal waste disposal at the processing level. The hierarchy should follow this order: (1) prevention, (2) preparing for re-use, (3) recycling, (4) "other" recovery, and (5) disposal (Giacometti, 2019). It is unclear who has oversight in each of the links in the order, or how compliance is to be measured, with what level of discretion, and under what jurisdictional authority (Corvellec, 2016; Gharfalkar et al., 2015).

In textile waste management, (2) and (3) are of specific importance because (2) can serve as a legal incentive structure for business innovators such as *Stitch Fix* to employ discarded fabric and trim. However, (3) is unfeasible because, as explained in Chapters 3 and 4 of this book, it is almost impossible to recycle fabric in a way that can be seen as a step toward protecting the environment. Mandating "recycling" in waste management is currently akin to mandating a disposal method for discarded apparel that separates it from other waste. That is it. Yet, how specifically that legal platform is to be implemented is unclear.

Are clothes to be included in recycling bins with paper, plastic and glass? Are they to be collected separately, which currently is the standard platform? This standard platform creates issues because citizens must first make the choice to recycle their old clothes and then have to bear the transaction costs of actually locating and making a trip to an appropriate drop off point. Research has shown that very little of this dynamic is happening (Ekström, & Salomonson, 2014; Kapoor & Khare, 2019; Sandvik & Stubbs, 2019).

As already explained in previous chapters, only apparel made from either purely natural yarn fabrics – cotton, linen, wool, or purely man-made, and only certain types of polyester – can be recycled, and not in ways that are ecologically safe. As businesses have developed around both, more social attention has been placed on treating natural fibers, which is understandable due to the general sustainability mentality to discourage the use of petrochemical products, which include polyester. Yet, there is an important dynamic that must be incorporated in policy and legal design to incentivize circular fashion, and that is the fact that apparel can be made much more cheaply from polyester inputs, which can negatively impact recycling efforts of natural yarns. Kapoor and Khare (2019) offer the most compelling example of this unfortunate reality analyzing a cluster of factories in India that, for a decade, had specialized in recycling wool and using it to

manufacture blankets for emergency relief and disaster first-responder use. First, one must note the end product of such recycling. It is not clothes retailed in stores that must be durable and easy to care for, withstand repeated washing or dry cleaning, come in different colors and textures, and most importantly, appear enticing next to unrecycled substitution options. The end product is blankets, and not for home-product commerce, which would require them to have features similar to clothes, but for disaster relief. This fact, although not discussed by Kapoor and Khare (2019), captures the reality of what can be manufactured from recycled yarns – product that is fragile, lacks versatility, and therefore can be of limited commercial use. The authors offer sobering input of the fact that cheaper, finer, lighter, and softer polyester blankets from China are driving the sector out of business. The Indian recycled wool blankets wholesale at around $7 US – the price reflects the complicated import structure of discarded apparel mainly from the West. The Chinese competitors come in at $2 a piece. Since the customers are government organizations and relief military units without clear sustainability mandates, their procurement officers have no incentive to choose the more expensive products and they do not.

Such reports show a developing interest in the academy to understand fashion economic incentives when it comes to sustainability goals in a reality of substitution options that are more competitive because they are cheaper. Such works also honestly explain the production actuality in apparel, which is concentrated in few under-developed nations that are heavily reliant in their national economies on textile exports. Production for the European market happens there – Bangladesh, India, Pakistan, China, Viet-Nam, Cambodia, Ethiopia, North Korea and about 10 others (Miroux & Sauvant, 2005). What are the implications of the European Commission Waster Framework Directive 2008/98/EC for processes that occur in those nations? None, according to the very detailed analysis of the legal provisions of the Directive and in particular its Articles 5 and 6 that have been rewritten to denote waste to be valued as a resource (Gacometti, 2019). With respect to regulating chemical use, Niinimäki et al. (2020) show that because the majority of textiles imported into the EU are "partially treated" items, which are then "finished locally," the current oversight structures make it difficult to understand total chemical usage.

The language of the European Commission Waste Framework Directive makes it clear that all provisions apply only to EU member states. The wording of compliance guidelines denotes a lack of enforceability with phrases such as "the Commission should be empowered to adopt implementation acts." It

should be, but it is not. The Commission does not set any criteria at the European Union level, leaving the establishment of criteria to member states.

This platform has two major loopholes that allow for the business-as-usual dynamics of the industry to continue with very little impact or real sustainability improvements. The main one is that none of the provisions have jurisdiction over international suppliers or a legal way to incentivize imports from any sourcing markets that may be willing to adopt and comply with cleaner production policies. The second loophole is that the directives are to be interpreted, internalized, and set into policy by individual member states.

Such lack of clarity on how directives apply through the global supply chain that manufactures clothes for the European Union is behind the major challenge for the third principle of the European Commission Waste Framework Directive – "the polluter pays" principal, which has guided European waste law for the past several decades (Van Calster, 2015). In effect, all the directives behind the principal apply to producers. Yet, there is an extremely small portion of any apparel production that actually happens in Europe. Again, most of it is in the processing of semi-finished garments, not in the fairly more toxic stages of thread and fabric weaving (Niinimäki et al., 2020). Although some facilities are operating in Eastern Europe, there is very little evidence that they are complying with such EU principals (Anguelov, 2015: 100-102).

How can "the polluter pays" principle impact the international suppliers of apparel production components, as tracked in Chapter 3, is still a subject to debate. Some progress has been made with the advent of "environmental scorecards" (Garcia-Torres, Rey-Garcia, & Albareda-Vivo, 2017; Madsen & Slåtten, 2013; Turker & Altuntas, 2014). France is currently exploring legislative options to mandate putting environmental scores on labels (Remington, 2020).

The problem is that even if such legislation is passed, a system has been developed in the past decade around scorecards that is, in effect, a separate industry of consultancies. As with any industrial free market structure, there's competition. *Made-by* filed for bankruptcy while its competitors thrive, including San Francisco-based *Sustainable Apparel Coalition*, developers of *Higg Index*, to be analyzed in some detail shortly. The main competitive dynamic among such consultancies is to *disagree* with each other on prioritizing operations, foci, options, and even chemical inputs.

Such firms offer brands their services in analyzing production and operations steps, measuring the ecological impact at each, and developing a guide for improvements. The specific deliverables are most-often advising

individual suppliers in a brand's production chain to choose less-toxic chemicals, when feasible. Currently, one such consultancy, Amsterdam-based *Go-Blu* is developing an app that would track chemical inputs for textile factory managers. The issue is that less-toxic options are not always available for specific color combinations and products. As dyeing is the most toxic process, the often-given advice is to opt for "natural" dyes, which bring their own set of problems.

One must bear in mind that before they are used commercially, natural dyes are produced in very water, resource, and labor-intensive ways from plants, seeds, lichens, fruits, and seeds. Their manufacturing has a large ecological footprint. Natural dyes are of a lesser color intensity and fade in natural sunlight, from body heat, and in washing. Therefore, garments made with natural colors would be discarded fairly fast by consumers – not necessarily improving the fast fashion consumption problem. But most importantly, they require the use of toxic fixatives called "mordants" to bond to the fibers, which are the real culprit in both natural and synthetic dyes (Prabhu & Bhute, 2012).

Mordants containing metallic salts are most-often used to improve the vividness in natural dye coloring. Those compounds – Potassium Dichromate (chrome), Stannous Chloride (tin), Copper Sulfate and Iron Sulfate – are lethal in industrial concentrations (Ransom, 2020). Furthermore, natural dyes can only be applied on natural yarns. Polyester and poly-blend fabric producers cannot use them. Therefore, brands that rely on athleisure product lines, athletic brands, and most fast fashion brands that offer poly-blend clothing, which let's be honest, is most often the case, cannot honestly be expected to improve their environmental scorecards by asking their dyers to opt for natural dyes.

The platform of scorecarding is not only voluntary, it is also non-binding in adherence. Brands can choose to follow the recommendation of the consultants or not. Most importantly, they can choose to either rely on consultant certification services (or not) in their own environmental self-assessments. Those are the reasons why scorecarding is an industry of consultants. Most of what they do is try and "convince" brands to "sign up" for their services. The problem is that participation raises the operational costs for brands on two fronts. One is direct – paying the consultants. The other is a more diffuse spike in operational costs that has to cover the entire supply chain. It means implementing standards developed by the consultants on use of inputs and also developing a compliance and monitoring

system with suppliers. Despite such challenges, there is evidence that a platform of voluntary self-regulation initiatives is emerging.

Voluntary Governance in Sustainability Compliance: The Implications of Self-Regulation

Today, the *Higg Index*, launched by the *Sustainable Apparel Coalition*, is among the most-celebrated, voluntary, self-regulation collaborative initiative in the sector. Industry insiders, as well as emerging academic analysis, are linking it to the UN Sustainable Development Goals as the retail module to follow (Gardetti, 2015). The Index is being used by hundreds of textile and footwear manufacturers, brands, retailers, and other stakeholders (Sodhi, 2018). It consists of a "self-assessment" suite of tools.

The suite of tools is comprised of three modules that use a standardized scoring methodology to rate the performance of an apparel company's brand, facilities, and products. One of the issues with the current state of the Index is the lack of connectivity between the product and facility modules (Connolly, 2015). It is due to the fact that "facilities," in terms of factories and production and processing centers under brand ownership, do not exist in the "born global" retailers of today. *H&M* is one such conglomerate that does not own any factories (Wada, 1992), but relies on independent producers through a series of tiers, as explained in Chapter 3. The reality is that Tier 1 suppliers, often the sewing facilities, may be the extent of brands' knowledge of who is in their supply chain. When it comes to order placement, it is Tier 1 purchasing offices that source inputs from Tiers 2 and 3. Brands rarely have knowledge, much less oversight, of Tier 2 and 3 firms.

Although brands have different ways of defining "tiers," and everything shifts when there are agents involved that help broker deals between brands and manufacturers, none of the tier suppliers' clients have supervisory functions or powers. There are initiatives underway to address this disconnect, and some research is examining their effectiveness. For example, M. Tachizawa and Yew Wong (2014) explain the evolution of sustainability mandates through the tier system and note that often first-tier suppliers train managers in lower tiers to use environmental databases. It is a challenging undertaking because traceability through the multiple links in Tiers 2 and 3 is not executed in an integrated supply-chain format. That is the case because ownership of tiered facilities is under multinational

conglomerate structures of management bodies, called "groups," which vary greatly in nationality, in terms of headquarter location and incorporation (de Abreu et al., 2012; Narwal & Jindal, 2015; Singleton, 2013).

Arora et al. (2004) use the phrase "stateless corporations" to denote that these conglomerates own a variety of firms located in different countries, incorporated often in tax-havens, funded by international banks and wealth funds. Whose laws do they abide by? On paper, should there be an issue in international dispute litigation, the corporate parent owner and the laws of the nation of incorporation of that entity would apply. Yet in fashion, when it comes to "compliance" with "norms, guidelines, and standards," which are legal provisions without binding mandates, infraction can only be handled by a choice of customer to withhold business. For example, the *Shinest Group* is one of *H&M's* "preferred suppliers" and its facilities in Bangladesh produce *H&M's Conscious Collection*. The *Shinest Group* consists of 12 different factories, specializing in different processes – from assembly to embroidery to manufacturing trim, meaning buttons, zippers, and toggles – and producing for many different clients. To put the *Higg Index* into context here, the Index's mandates apply to *H&M*. Should *H&M* choose to follow its self-assessment suit of tools, it bears the responsibility to monitor the operations of the *Shinest Group* for compliance. Investigative analysis of this hypothetical dynamic shows that not only not to be the case, but also exposes alarming exploitation and greenwashing under this seemingly well-established partnership to manufacture a product line that boasts to be the flagship sustainability initiative of *H&M* (Maurice & Hermann, 2017).

The latest version of the *Higg Index 2.0*, launched in 2013, aims to develop a standardization for production organizations that include the brands and their tiered suppliers, on how to measure and evaluate environmental performance. Blockchain technology can be implemented and much experimentation is on-going with the development of "circular digital ID" for apparel. It is unclear yet however, exactly how the measurement of such environmental performance translates onto labels.

Analyzing the specific outcomes of the *Higg Index*, Nidumolu et al. (2014) posit the *Higg Index* is influencing capital investment, as in providing a platform for funding sustainable innovations in material science and operational performance. The authors go as far as claiming that the Index is changing operational behavior. It is linked to the advent of formal policies governments are adopting, such as Zero Liquid Discharge, Zero Waste to Landfill Facilities and Zero Discharge of Hazardous Chemicals (ZDHC) in India, Pakistan and Bangladesh (Rajamani, 2016; Yaqub & Lee, 2019; Tong

& Elimelech, 2016). In essence, those policies mandate that factories have a treatment facility. Unfortunately, as explained in Chapter 3, these policies are not followed stringently by factories and emerging effluent treatment innovations are not widely used.

With such evidence coming out of on-site compliance investigations, it is not surprising that the latest academic analysis of the effectiveness of the *Higg Index* shows it to be limited, at best. University of California, Berkeley's Professor of Environmental and Labor Policy Dara O'Rourke, who since the 1990s has been among the leading environmental policy scholars focused on apparel, with PhD candidate Niklas Lollo, offered a comprehensive report on *Higg Index* compliance, based on three years of data from leading facilities in Bangladesh and China (Lollo & O'Rourke, 2020). The report analyzes the Higg Facility Environmental Module (FEM). FEM is just one component of the *Higg Index* suite of tools. Thousands of factories claim to use it, in what is becoming the standard of industrial environmental monitoring – self-assessment. In effect, each facility uses FEM to track its chemical use, energy use, and labor and safety policies. Oversight is internal, meaning handled by factory management, and the information is used for building customer relations. Factories try to show evidence of sustainable practices to appeal to clients. Hence, Lollo and O'Rourke (2020) sum up in their findings that factories share this information privately and with discretion between suppliers and buyers only. Greater transparency and sustained compliance information is unavailable. That is why, on-site researchers on ETP and LZD use find major lack of veracity in compliance claims (Anas, 2015; Dasgupta et al., 2015; Holkar et al., 2016; Mohan et al., 2017; Sakamoto et al., 2019).

A system has formed of mutually beneficial collusion. It is because both suppliers and buyers have an incentive to keep costs as low as possible. As buyers specifically evaluate suppliers mainly on lowest costs, they have no incentive to raise concerns of non-compliance in this system where information is shared from supplier to buyer. Putting buyers into the overseer role only increases the perverse incentives to maintain a cost-cutting competitive structure.

Note

1 See: Understanding REACH, available at: https://echa.europa.eu/regulations/reach/understanding-reach