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# Environmental and Social Impact of Fashion: Towards an Eco-friendly, Ethical Fashion

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## Abstract:

The fashion industry is one of the largest industrial sectors in the world. The fashion supply chain is diverse and complex, spanning four or more tiers, including design, raw material harvesting, spinning, yarn production, dyeing, weaving, cutting, stitching and final garment construction. Fast fashion, which references apparel with short product life cycles, has emerged as a potent competitive force. Fast fashion brands introduce new styles at more frequent intervals, focusing less on durable quality, and more on low costs and up to the minute designs. One consequence of fast fashion has been an explosion in consumption accompanied by increased waste. Fast fashion leaves a pollution footprint, with each step of the clothing life cycle generating potential environmental and occupational hazards. Due to the large quantity of products manufactured, used, and disposed of, the textile and apparel industry has a big environmental impact in every phase of product life cycle. When we talk about environment it comprises of both natural as well as social environment and production process involves exploitation of both natural and social environment. Sustainable or ethical fashion is a response to the environmental and social devastation brought by conventional production techniques. This descriptive diagnostic paper aims to make consumers more aware of the physiological as well as physical needs that fashion fulfils, and to consider the entire life cycle impacts of clothing – from raw material to disposal.

**Keywords:** Garment Industries, Globalization, Textiles, Fibers, Environmental pollution, Consumption, Dyes, Workers Rights, Ethical Fashion

## Introduction

Under the aegis of global capitalism, economic activity is international in scope and global in organization. "Internationalization" refers to the geographic spread of economic activities across national boundaries which are not a new phenomenon. It has been a prominent feature of the world economy since seventeenth century when colonial powers began to carve up the world in search of raw materials and new markets. "Globalization" is more recent, implying functional integration between internationally dispersed activities. Success of Capitalist global economy lies in espousal of insatiable human greed and ruthless exploitation of human labor and natural resources (Devaraja, 2011).

The fashion industry is one of the largest and one of the oldest industrial sectors in the world. According to United Nations Environmental Program, the fashion sector - comprising textile and apparel creation and production, is the second largest global economic activity in terms of trade. The global sector is valued at $1.44 trillion. The Indian industry generated $63 billion in 2010, accounting for 14 per cent of industrial production and 4.5 per cent of GDP. India, one of the largest producers of textiles and apparel, employs 35 million workers, second only to agriculture (Boon, 2012). There are around 30,000 garment manufacturing companies in India producing just for export. Out if this some 5,000 companies are well established in the sense of performance and stability.

The fashion supply chain is diverse and complex, spanning four or more tiers, including design, raw material harvesting, spinning, yarn production, dyeing, weaving, cutting, stitching and final garment construction. It incorporates handcraft and cottage workers as well as high-volume technology intensive facilities. Fashion supply chains and processes frequently cross international boundaries in pursuit of ideas and inspiration for design, and to access labor during garment construction.

Fast fashion, which refers apparel with short product life cycles, has emerged as a potent competitive force. Fast fashion brands introduce new styles at more frequent intervals, focusing less on durable quality, and more on low costs and up to the minute designs. One consequence of fast fashion has been an explosion in consumption accompanied by increased waste. Fast fashion leaves a pollution footprint, with each step of the clothing life cycle generating potential environmental and occupational hazards.

| **Summary of the waste generated during Textile Manufacturing** | | | |
|---|---|---|---|
| Process | Emission | Waste Water | Solid Waste |
| Fiber preparation | Little or None | Little or None | Fiber waste & packaging waste |
| Yarn Spinning | VOCs | Little or None | Fibre waste & packaging waste, cleaning and processing waste, sized yam |
| Slashing/sizing | VOCs | BOD, COD, Metals | Packaging waste, cleaning waste, Fiber lint, Yam Waste, size unused starch based size |
| Weaving | Little or None | Little or None | Yam and Fabric scrap, & packaging waste, used oil |
| Knitting | Little or None | Little or None | Yam and Fabric scrap, & packaging waste, Off spec fabric |
| Tufting | Little or None | Little or None | Packaging waste, cleaning waste, Fiber lint, Yam Waste, Off spec fabric |
| De-sizing | VOCs from glycol ether | BOD from sizes lubricants, biocides, antistatic compounds | Packaging waste, Fiber lint, Yam Waste, cleaning and maintenance materials |
| Scoring | VOCs from glycol ethers and scoring solvents | Disinfectant, insecticide residues, detergents, oils, Knitting Lubricant, spin finishes, spent solvent | Little or None |
| Bleaching | Little or None | $H_2O_2$ , stabilizers, High PH | |

| | | | |
|---|---|---|---|
| Singeing | Small amounts of exhaust Gases from the burners | Little or None | Little or None |
| Mercerizing | Little or None | High PH, NaOH | Little or None |
| Heat setting | Volatilization of spin finish agents synthetic fiber manufacture | Little or None | Little or None |
| Dying | VOCs | Metals, Salt, Surfactants, acidity, alkalinity, colour, BOD, COD, Spent solvent, organic, processing assistants | Little or None |
| Printing | Solvents, acetic acid Drying and curing oven emissions combustion gases | Suspended solids, Urea solvents, color, metals, heat, foam, BOD | Little or None |
| Finishing | VOCs, contaminants In purchased chemicals, formaldehyde vapors, combustion Gases | COD, suspended solids, spent solvents, toxic materials | Fabric scraps & trimmings; Packaging waste |

**Table 1 Source: (Parvathi ,Maruthavanan , Prakash ,2009)**

A University of Cambridge study conducted on 2006 found that UK consumers were buying one-third more clothing in 2006 than in 2002, with only a fraction being recycled. According to the US, Environment Protection Agency (EPA), more than 13 million tons of textiles were disposed of in the US in 2010. Only 15% was diverted from landfills or waste systems (Boon, 2012).Due to the large quantity of products manufactured, used, and disposed of, the textile and apparel industry has a big environmental impact in every phase of product life cycle (Anastas, and Zimmerman,2003)

**The Major Environmental Issues Associated With Clothing:**

a) **Resource consumption**. The key resources here are fossil fuels and water. The consumption includes use in growing or obtaining the raw materials, in producing the clothing, and in transporting the raw materials and final product.

b) **Greenhouse gas (GHG) emission**. The UK clothing industry is responsible for the release of 3.1 million tonnes CO2 equivalent per year, or about 0.4% of total UK emissions. Again, the level of emissions depends on the fabric type and processing system involved. Polyester/cotton blend - often used for corporate clothing - is believed to have the highest GHG influence in the steaming process, with almost all the emissions being CO2. On the other hand, wool has a greater GHG impact earlier in the production, due to methane released by sheep before manufacture has even begun (Allwood, Laursen, et al., 2006).

c) **Land Use:** Particularly significant for natural fibre production, and especially with intensively grown monocultures, is the land degradation that can come from chemical pollution of soil and groundwater through use of herbicides, insecticides and fertilisers, and loss of biodiversity.

d) **Toxic production processes**. Some manufacturing practices in the textile industry use hazardous or acidic chemicals, which can sometimes be released in effluent.

e) **Landfill**. Most textiles in the UK (approximately 1.2m tones) end up in landfill. Not only are textiles pretty bulky compared with other household wastes, and quickly use up the limited space available, but also the (typically 50%) biodegradable fraction then breaks down, releasing Green House Gases (Allwood, Laursen, et al., 2006).

**(A)Major Environmental Footprints of Fashion:**

**1. Environmental impact of different fiber production (both natural and synthetic):**

The textile industry is shared between natural fibers such as wool, silk, linen, cotton and hemp, and man-made ones, the most common of which are synthetic fibers (polyamide, acrylic) made from petrochemicals. Most of the clothes in our wardrobes contain polyester, elastic or Lycra. These cheap and easy-care fibers are becoming the textile industry's miracle solution. However, their manufacture creates pollution and they are hard to recycle (with nylon taking 30 to 40 years to decompose).The textile and clothing industry is a diverse one, as much in the raw materials it uses as the techniques it employs. At each of the six stages typically required to make a garment, the negative impacts on the environment are as numerous as they are varied. Spinning, weaving and industrial manufacture undermine air quality. Dyeing and printing consume vast amounts of water and chemicals, and release numerous volatile agents into the atmosphere that are particularly harmful to our health. Polyester, the most widely used manufactured fiber, is made from petroleum. With the rise in production in the fashion industry, demand for man-made fibers, especially polyester, has nearly doubled in the last 15 years, according to figures from the Technical Textile Markets. The manufacture of polyester and other synthetic fabrics is an energy-intensive process requiring large amounts of crude oil and releasing emissions including volatile organic compounds, particulate matter, and acid gases such as hydrogen chloride, all of which can cause or aggravate respiratory disease. Volatile monomers, solvents, and other by-products of polyester production are emitted in the wastewater from polyester manufacturing plants (Luz Claudio, 2007).

**2. Conventional Cotton Farming:**

Cotton uses approximately 25% of the world's insecticides and more than 10% of the pesticides (including herbicides, insecticides, and defoliants). The Environmental Protection Agency considers seven of the top 15 pesticides used on cotton in 2000 in the United States as "possible," "likely," "probable," or "known" human carcinogens (acephate, dichloropropene, diuron, fluometuron, pendimethalin, tribufos, and trifluralin).

Cotton is a very water intensive crop. Over fifty percent of cotton fields in the world require irrigation, and the majority of these crops are in regions where water is scarce. These irrigated cotton fields produce over seventy percent of the total cotton grown in the world (Soth, , Grasser, and Salerno, 1999). It takes an average of 3,644 cubic meters of water to grow one ton of cotton in the top fifteen cotton producing countries (Chapagain, Hoekstra et al.2009). That equates to about 347 gallons of water to grow one pound of cotton. The impacts on the Aral Sea are a notorious example of the effects of water abstractions

for irrigation. In the period 1960-2000, the Aral Sea in Central Asia lost approximately 70% of its volume as a result of diverting water from the rivers that ran to the sea in order to grow cotton in the desert (Loh, and Wackernagel, 2004).

**3. Synthetic Fibers (Polyester, Nylons and Acrylics):**

The consumption of non-renewable resources (petrochemicals) is required to produce two very common synthetics used in the apparel industry, polyester and nylon. Relatively large amounts of energy are consumed in the production of synthetics, which has far-reaching environmental implications, including the release of green house gasses. Emissions to air and water that have a medium to high potential of causing environmental damage if discharged untreated including: heavy metal cobalt; manganese salts; sodium bromide and titanium dioxide. Rayon and Acetate represent an estimated 4 % of the market. Rayon a cellulosic raw material is manufactured from sources such as bamboo or wood pulp, via a chemical-intensive process, and also contributes to deforestation and pollution in developing countries like Indonesia (www.KateFletcher.com).The solvent used in the viscose rayon process called carbon disulfide is a toxic chemical that is a known human reproductive hazard posing dangers to factory workers, surrounding communities and the environment via air emissions and wastewater. Approximately half of the carbon disulfide solvent is recovered and half ends up in the environment. Sodium hydroxide and sulfuric acid are other potentially hazardous chemicals used in the viscose process (Patagonia, 2009, April).

**4. Air Pollution during Manufacture of textiles**:

Most processes performed in textile mills produce atmospheric emissions. Gaseous emissions have been identified as the second greatest pollution problem (after effluent quality) for the textile industry. Speculation concerning the amounts and types of air pollutants emitted from textile operations has been widespread but, generally, air emission data for textile manufacturing operations are not readily available. Air pollution is the most difficult type of pollution to sample, test, and quantify in an Air emissions can be classified according to the nature of their sources: Point sources: Boilers, Ovens, Storage tanks and Diffusive: Solvent-based, Wastewater treatment, Warehouses, Spills.

| Average water consumption for various types of fabric | | |
|---|---|---|
| Processing sub-category | Water consumption ($m^3$/ton fibre material) | |
| | Minimum | Median |
| Wool | 111 | 285 |
| Woven | 5 | 114 |
| Knit | 20 | 84 |
| Carpet | 8.3 | 47 |
| Stock | 3.3 | 100 |
| Non-woven | 2.5 | 40 |
| Felted fabric finishing | 33 | 213 |

**Table -2 Source: (Parvathi ,Maruthavanan , Prakash ,2009)**

Textile mills usually generate nitrogen and sulphur oxides from boilers. Other significant sources of air emissions in textile operations include resin finishing and drying operations, printing, dyeing, fabric preparation, and wastewater treatment plants. Hydrocarbons are emitted from drying ovens and from mineral oils in high-temperature drying/curing. These processes can emit formaldehyde, acids, softeners, and other volatile compounds. Residues from fiber preparation sometimes emit pollutants during heat setting processes. Carriers and solvents may be emitted during dyeing operations depending on the types of dyeing processes used and from wastewater treatment plant operations. Carriers used in batch dyeing of disperse dyes may lead to volatilization of aqueous chemical emulsions during heat setting, drying, or curing stages. Acetic acid and formaldehyde are two major emissions of concern in textiles (Moustafa**).**

**5. Over use and Contamination of Water:**

The textile industry uses high volumes of water throughout its operations, from the washing of fibers to bleaching, dyeing and washing of finished products. On average, approximately 200 liters of water are required to produce l kg of textiles. The large volumes of wastewater generated also contain a wide variety of chemicals, used throughout processing. (Parvathi,Maruthavanan,Prakash, 2009**)** These can cause damage if not properly treated before being discharged into the environment. Of all the steps involved in textiles processing, wet processing creates the highest volume of waste water. The aquatic toxicity of textile industry wastewater varies considerably among production facilities. The sources of aquatic toxicity can include salt, surfactants, ionic metals and their metal complexes, toxic organic chemicals, biocides and toxic anions. Most textile dyes have low aquatic toxicity. On the other hand, surfactants and related compounds, such as detergents, emulsifiers and dispersants are used in almost each textile process and can be an important.

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**6. High Impact Dyes:**

Many dyes present health risks to those working with them as well as damaging the environment in a number of ways. The dyeing process generally involves a range of toxic chemicals such as dioxins, which are carcinogenic and possibly disrupt hormones; toxic heavy metals such as chrome, copper, and zinc, which are known carcinogens; and formaldehyde, a suspected carcinogen. Many dyes, including natural dyes, do not “stick” to the fabric well enough to prevent a large amount of colored water from being washed off the fabric right after it is dyed. For example, only about 80% of synthetic dyes called direct dye are retained by the fabric; the rest is flushed out from the garment. Each year, the global textile industry discharges 40,000-50,000 tons of dye into rivers and streams, and, in Europe alone, 1,000,000, tons of salt (used in the process to even out color) are discharged every year. Although this waste water can be treated to remove the dye, salt and other toxic chemicals such as heavy metals to make the water safe to return to water systems, this treatment process is expensive and does not always happen. Finally, even when the water may seem clean, the temperature of the water can be an issue. The water used in the dye process is heated resulting in hot waste water discharged into river systems that can impact and harm the fish and ecosystem (www.betterthinking.co.uk).The production of synthetic dyes requires strong acids, alkalis, solvents, high temperatures, and heavy metal catalysts. Increase in cost of energy: Petroleum is the starting material for all synthetic dyes and thus the price of dyes is sensitive to the price of petroleum. Producing synthesis is also very energy intensive (using

super-heated steam, boiling acids, etc.), making the process very sensitive to energy prices, and creating greenhouse gases (www.betterthinking.co.uk).

**7. Hazardous waste generation:**

The synthetic production of dyes a major environ material and are produced in central facilities, transportation of dyes from manufacturing plants to textile dyeing and printing facilities is a major cost factor and a logistic challenge(betterthinking.co.uk).

Once bought, an estimated 21% of annual clothing purchases stay in the home, increasing the stocks of clothing and other textiles held by consumers, according to Recycling of Low Grade Clothing Waste, a September 2006 report by consultant Oakdene Hollins. The report calls this stockpiling an increase in the "national wardrobe," which is considered to represent a potentially large quantity of latent waste that will eventually enter the solid waste stream. According to the Environment Protection Agency Office (EPA Office) of Solid Waste, Americans throw away more than 68 pounds of clothing and textiles per person per year, and clothing and other textiles represent about 4% of the municipal solid waste and this figure is rapidly growing (Luz Claudio, 2007).

In her book Waste and Want: A Social History of Trash, Susan Strasser, a professor of history (in Luz Claudio(ed), 2007). at the University of Delaware, traces the "progressive obsolescence" of clothing and other consumer goods to the 1920s. Before then, and especially during World War I, most clothing was repaired, mended, or tailored to fit other family members, or recycled within the home as rags or quilts. During the war, clothing manufacturers reduced the varieties, sizes, and colors of their productions and even urged designers to create styles that would use less fabric and avoid needless decoration (Luz Claudio, 2007).

Industrialization brought consumerism with it as an integral part of the economy. Economic growth came to depend on continued marketing of new products and disposal of old ones that are thrown away simply because stylistic norms promote their obsolescence. When it comes to clothing, the rate of purchase and disposal has dramatically increased, so the path that a T-shirt travels from the sales floor to the landfill has become shorter (Luz Claudio, 2007).

Yet even today, the journey of a piece of clothing does not always end at the landfill. A portion of clothing purchases are recycled mainly in three ways: clothing may be resold by the primary consumer to other consumers at a lower price, it may be exported in bulk for sale in developing countries, or it may be chemically or mechanically recycled into raw material for the manufacture of other apparel and non-apparel products (Luz Claudio,2007).

**8. Pollution during Packaging:**

**Table -3**

**Harmful Chemicals Used in textile Industries**

| | |
|---|---|
| **Detergents:** Non ionic detergent based on nonylPhenolEthoylates | problem on biodegradation, generates toxic metabolites highly poisonous to fish |
| **Stain remover:** Carry solvents like CCl4 | ozone depletion, capacity of ten times more than CFC |
| **Oxalic acid** used for rust stain removal | toxic to aquatic organisms boosts COD |
| **Sequestering agents:** Polyphosphates like Tricsodium, Polyphosphate, Sodium hexametaphosphate | banned in Europe still used in India in water and house hold detergents |
| **Printing gums:** Preservative Pentachlorophenol is used in Europe & India | dermatitis, liver & kidney damage, carcinogenic banned |
| **Fixing agent:** Formaldehyde and Benzindie | harmful internationally banned |
| **Bleaching:** Chlorine bleaching | itching, harmful |
| **Dyeing:** Amino acid liberating groups | carcinogenic, internationally banned |

A great deal of packaging is used through the apparel industry. This includes the packaging to transport and distribute the products from the factories to distribution centers to retail stores as well as the retail

Packaging that goes to the consumer. Packaging is often the part of the product with the shortest span of use, typically ending up in a landfill, gutter, or ecosystem shortly after purchase. Furthermore, excess packaging materials are frequently used to enhance a product's visibility, unnecessarily drawing on resources that do not affect the product's serviceability (University of Delaware Sustainable Apparel Initiative.2009).

**(B) Social Impact of Fashion Industry:**

When we talk about environment it comprises of both natural as well as social environment and production process involves exploitation of both natural and social environment. Social impact of textile and fashion industries includes:

1. **Globalisation, vulnerability of global capital and subsequent volatile employment opportunities in the developing countries:**

   Garments sold in the developed countries under brand names originate from all around the world, often from developing countries. This global trade can lead to improved economies, and creates employment for many people - often women - providing them with financial stability and a chance to escape poverty. But the process is not perfect, with recession, low wages, poor worker's rights (inadequate health and safety, long hours, no contracts) and child labour apparent in some countries (www.uniformreuse.co.uk/corporatewear-issues.html)

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2. **Growing feminization of the workforce:-**

Given the labour requirement of the industry, the garment industries has been enabled by growing incorporation of women & children into the workforce apart from sourcing of migrant labour from arid agricultural hinterlands. The significant observation is the phenomenal growth in the use of female labour. The proportion of female labour in the total workforce has increased. In absolute terms, the number has increased from an average number of female workers to large number of female workers in this sector. This is due to the segmentation of the workforce along the gender & age lines. Women are preferred as

cheap labour, for their docility, lesser bargaining power and easy retrenchibility. Women predominate low paying, monotonous lower level positions where as all significant position of power and perquisites are enjoyed by men.

**3. Segmented Labour Market:-**

Though the children have been employed in this industry before, with the movement to the export market, the quantum of use has increased manifold. Though it is difficult to come up with estimates of the absolute magnitude, informal sources place the workforce in this sector. The labour market is highly segmented with women & children confined to a specific set of jobs in which men predominate. There is no discrimination in wage rates against women within the job type. Women are employed predominantly in the lesser paying jobs. Demand has become more Seasonal in the movement of uncertain & flexible Global Market. It is, therefore, imperative for capital to flexibilize the workforce to adjust the quantum of labour employed to production requirements. It is expensive for the factory to maintain a permanent workforce. There has been a growing casualisation of the workforce, with recruitment 'just-in-time'. Workers especially tailor who constitute bulk of the labour force, are recruited indirectly through labour contractors who would bring in labour whenever required. These labour 'gangs' under the contractors move from firm to firm depending upon the availability of employment.

**4. Mode of Wage Payment**:-

During the initial phase of exports, when quality requirements were low, payment of wages moved to piece-rate system from the time-rate system. It was felt that under the piece rate system, workers were not paying sufficient attention to the quality of stitching & that the piece rate system was detrimental for production in the new segment.

Despite periodic wage agreements between trade unions & exporters' associations, & consequent nominal hikes in wage rates, real wage have continued to stagnate since the early 1980's. It is difficult to anticipate any improvement in the total income earned as well. The wages do not constitute a 'living wage', is clear from the fact that most worker households tend to send more than 1 member to work in the industry. The Indian garment industry consists of a considerable workforce, with one account estimating over 38 million people involved with the industry & is characterized by fairly autonomous, small-scale units located in poor rural areas; typically feeding into semi urban Industrial centers. The range & dispersal of activities, together with the low technical requirements, causes the industry to employ a relatively large proportion of informal sector workers, who carry out their work either at home, the typical cottage industry or at a small & medium sized enterprises (SMSs'). This has been noted that dependence of the Garment Industry on sub-contracting casual & informal workers was a result of various factors, including the seasonal nature of export demand, the tight deadlines faced by producers & the competitive pressures from the other developing country exporters one might also add the factor that non-farm rural industrialization did not manage to provide employment to a large cross-section of the rural population ( Mukherjee & Chang 2005 ) thereby spurring people to take up casual employment opportunities within the Garment Industry.

**5. Workers rights**:

Under the Indian Factories Act of 1948, the Shops & Establishment Act, workers ought not to work for more than 48 hrs per week. Given the importance of sticking the delivery schedule, workers during peak season are found to work intensively for lengthy periods. In tailoring units, workers including child workers tend to work for 36 hrs at a stretch when there is a high overseas export orders. They often work in unhealthy working conditions devoid of proper drinking water and toilet facilities. (Mukherjee Sudeshna, 2011)

Falling clothing prices have put cheap production in demand all along the supply chain, from pickers and labourers on farms to factory workers. There is added pressure on producers to cut corners, and workshops with poor standards are seen as a

'hidden' way to do this. Much of the manufacture of garments employs unskilled - or low skilled – mostly women workers who lack of knowledge of rights, or are prevented from joining together in trade unions. These women are often exposed to sexual harassment, physical torture, poor working environment, low wages and long working hours.

**6. Health and Safety:**

Workshops in developing countries can have less stringent restrictions through regulations than those in the developed nations. Where working conditions are poor, workers' health do suffer with the health hazards like of backache, varicose vein, asthma, miscarriage, acidity, eyestrain, burns and other injuries. There are even reports of restricted allowance of toilet breaks, leaving workers with severe kidney problem and when long hours (up to 16 hour a day) in some countries are factored in, fatigue can compound the likelihood of accidents( Mukherjee Sudeshna,2011).

**7. Sexual harassment:**

Predominance of women workers in the factory premises and their relative powerlessness in terms of their near absence in the higher managerial position and challenged socio-economic background, often make them sexually vulnerable. Incidents of sexual harassment both in terms of physical and verbal violence are very high in garment factory premises. Although some redressal mechanism do exists, but their justice dispensing capacity to the victim is really questionable. (Mukherjee Sudeshna, 2011).

**8. Children:**

Even though the elimination of child labour is one of the goals of the International Labour Organization (ILO) it remains a challenge in the clothing and textiles industry mostly due to the difficulty of monitoring subcontractors, indirect workers and home workers (Allwood, Laursen, et al., 2006).

Apart from the above mentioned high social impact of industry on its workers there are other impacts with far reaching consequences. They are:

**Cultivation techniques**: Crop cultivation can also impact on health. Pesticides used on cotton farms have been known to poison workers out in fields applying it to crops all day, and operating machinery always carries inherent risks.

**Animal Welfare**: With materials such as wool, leather and fur farming and handling of animals is an integral part of the production process. Poor farming practice can lead to neglect or mistreatment of animals, with malnutrition, infections and illness are potential symptoms. Some countries have much less restrictive regulations to protect animal welfare, particularly in respect of transportation and Slaughter (www.uniformreuse.co.uk/corporatewear-issues.html)

**Ethical Fashion: A step in the right direction:**

Sustainable or ethical fashion is a response to the environmental and social devastation brought by conventional production techniques. It strives to provide a platform for ethnic communities and artisans, just treatment for workers and mitigation of harmful environmental effects. Ethical fashion captures some model examples of business social responsibility and environmental sustainability throughout the fashion supply chain. (Boone, 2012) Designers often use ethnic identities and native cultures as a source of inspiration and branding - frequently without giving credit or acknowledgment to the respective cultural traditions or artisans. In addition, conventional design processes tend to be relatively linear, with designers and their buyers sourcing raw materials and garments without much input from manufacturers. Some ethical designers, on the other

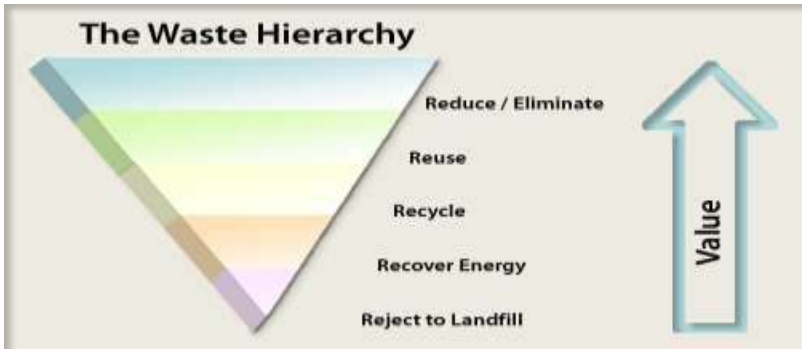
hand, integrate crafts people and artisans into the design process, providing them with recognition and compensation for their craft. In effect, they become collaborators with the designer rather than labourers. This allows the designer to benefit from their knowledge about fibers, fabrics and techniques while providing timely market feedback to the artisans about their work (Boone, 2012).Ethical fashion includes:

**Reuse and Remanufacture:** Reuse and remanufacture come at a high end of the waste hierarchy, meaning they are often environmentally and economically next best options to reducing the quantity of waste produced. This is typically because the whole product is retained, and often - particularly in straight reuse - very little input is required to either bring it to or maintain a useable standard.

- Straight reuse (probably by someone else!), possibly in a different way.
- Refurbishment – cleaning, lubricating or other improvement.
- Repair – rectifying a fault.
- Redeployment &cannibalization – using working parts elsewhere.

With secondary markets available in many countries, including nations in Africa, Asia and across Eastern Europe, end-of-life clothing is a valuable commodity. There are plenty of organizations collecting clothing in the developed countries, and many offer significant financial incentives.

Higher quality clothes, and those with little wear, command the highest prices, but even soiled or ripped and torn clothing can be sold on for use as low value wipers, or recycled into fibers for applications such as fillings for the automotive, audio and mattress industries.




Source: www.uniformreuse.co.uk

Anastas and Zimmermann developed some principles of green engineering to provide a framework for scientists and engineers to achieve sustainability when designing new materials, products, processes, and systems:

a) Designers need to strive to ensure that all material and energy inputs and outputs are as inherently nonhazardous as possible.
b) It is better to prevent waste than to treat or clean up waste after it is formed

c) Separation and purification operations should be designed to minimize energy consumption and materials use (Bennett, Helmkamp et al. 2008).
d) Products, processes, and systems should be designed to maximize mass, energy, space, and time efficiency.
e) Products, processes, and systems should be "output pulled" rather than "input pushed" through the use of energy and materials.
f) Embedded entropy and complexity must be viewed as an investment when making design choices that affect recycling, reuse, or beneficial disposition.
g) Targeted durability, not immortality, should be a design goal.
h) Design for unnecessary capacity or capability solutions (e.g., "one size fits all") should be considered a design flaw.
i) Material diversity in multi-component products should be minimized to promote disassembly and value retention.
j) Design of products, processes, and systems must include integration and interconnectivity with available energy and materials flows.
k) Products, processes, and systems should be designed for performance in a commercial "afterlife."Material and energy inputs should be renewable rather than depleting (Anastas, and Zimmerman. 2003).

Ethical fashion relies on conscious consumption by consumers. Designers are able to influence buyers' behavior to some extent, but consumer engagement is important. It emphasizes durable, aesthetic and construction quality, and opposes standardization and fashion fads.
Next, the local fashion movement emphasizes the importance of place in fashion in order to strengthen the relationship between consumer and producer. Make consumers more aware of the physiological as well as physical needs that fashion fulfils, and to consider the entire life cycle impacts of clothing – from raw material to disposal. Buying local also helps to sustain local materials and skills. Buying clothes close to their point of production helps to reduce the environmental impact of transporting clothing globally.

## Conclusion

Ethical fashion requires collaboration between designers, manufacturers and consumers to adequately address the impact of production processes and consumption patterns. Ethical designers must meet consumers' needs in terms of style, comfort, quality, value and aesthetics while minimizing environmental and social impacts. Consumers must consider how their buying habits and patterns of apparel use affect environments and cultures.

Ethical eco fashion includes:

**1**. Products made by using organic raw materials, such as cotton grown without pesticides and silk made by worms fed on organic trees.

**2**. Production process should not involve the use of harmful chemicals and bleaches to color fabrics

**3**. Products are often made from recycled and reused textiles. High-quality garments can be made from second-hand clothes and even recycled plastic bottles.

**4** Products are made to last, so that people keep them for longer

**5.**Productscome from fair trade - the people who make them are paid a fair price and have decent working conditions.

**6.** Fabrics considered in this list include organic cotton, Organic silk, Organic wool, Jute, soy silk, Milk-silk, Pine apple fabrics, Hemp, Peat, corn fiber, bamboo, Recycled fabrics from recycled fiber. Fabrics not currently in this list include: linen, silk, kenaf, and switch grass, but they are forthcoming.

To enhance awareness about the environmental impacts of products, the Ministry of Environment and Forests (MoEF), Government of India has initiated a scheme in 1991, which is basically a scheme of labeling the eco-friendly products .It is known as "Ecomark" scheme and aims at easy identification of eco-friendly products. The scheme is based on a "cradle to grave" approach and takes into account the impact of a product from the raw material extraction, to manufacturing, and to final disposal. Thus as ethical consumers it is our responsibility to purchase products on the basis of its eco friendliness and our consciousness will force producers to go for more eco friendly fashion and cleaner and greener earth.

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