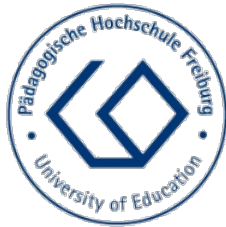


# From Sustainability Triple-Bottom Line to Advanced Aspects in the Context of Textiles and Fashion



Hochschule Reutlingen  
Reutlingen University



Co-funded by  
the European Union

# Learning Objectives

After this lecture you should be able to:

- Define the terms sustainability, sustainability goals and its role as a guiding principle.
- Explain the dimensions of the triple-bottom-line concept.
- Explain how the textile and clothing (TC) supply chain is organised by a detailed profiling of the industry.
- Discuss the relationship between producer and consumer in the context of resources and pollution.
- Describe what actions need to be set in place to mitigate the CO<sub>2</sub> footprint of the textile and clothing industry, including the actions of customers, the industry and fashion designers.

# Outline

1. Introduction - definitions of sustainability - global inequalities - triple-bottom-line concept
2. Profiling the textile and clothing industry and its supply chain
3. Resources, environmental and social burdens of the TC industry
4. Sustainable actions - a new TC production supply chain
5. Sustainable actions - principles of a sustainable textile consumption
6. Recommended actions and information for conscious consumers

# Definition of Sustainability

- The idea of *sustainability* was verbalised by E.F. Schumacher in 1972, as ‘permanence’, where nothing makes economic sense unless its continuance for a long time can be projected without running into absurdities.
- *Sustainable* as an adjective was institutionalised by the Rio Earth Summit conference in 1992 and is seen as an indication of environmental goodness and a long-term perspective (United Nations, 1992).
- In 1983 the World Commission on Environment and Development (WCED) was established. The result of their work was formalised in the 1987 Brundtland Report ‘Our Common Future’ (United Nations, 1987). It defined sustainability as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (...in particular the essential needs of the world’s poor and future needs).

# Sustainable Development as a Guiding Principle of Society

“The needs of the present generations should be satisfied without threatening the needs of future generations. That means resources should only be used to the extent as they can be regenerated. Furthermore, there should be *equal opportunities for every human being on earth*, which means that industrial countries need to stop living at the expense of people in the Global South.” (United Nations, 1987).



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## UN Conference in RIO, 1992

# Equal Opportunities and Expenses? A Positioning on ... Child Labour

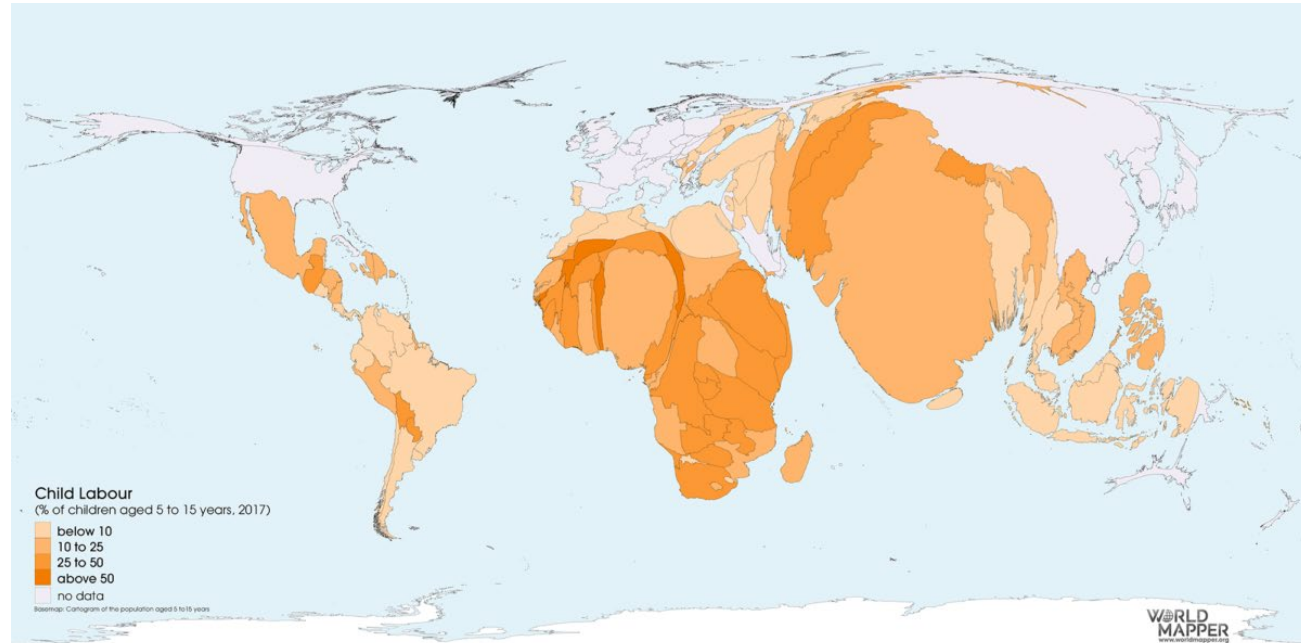
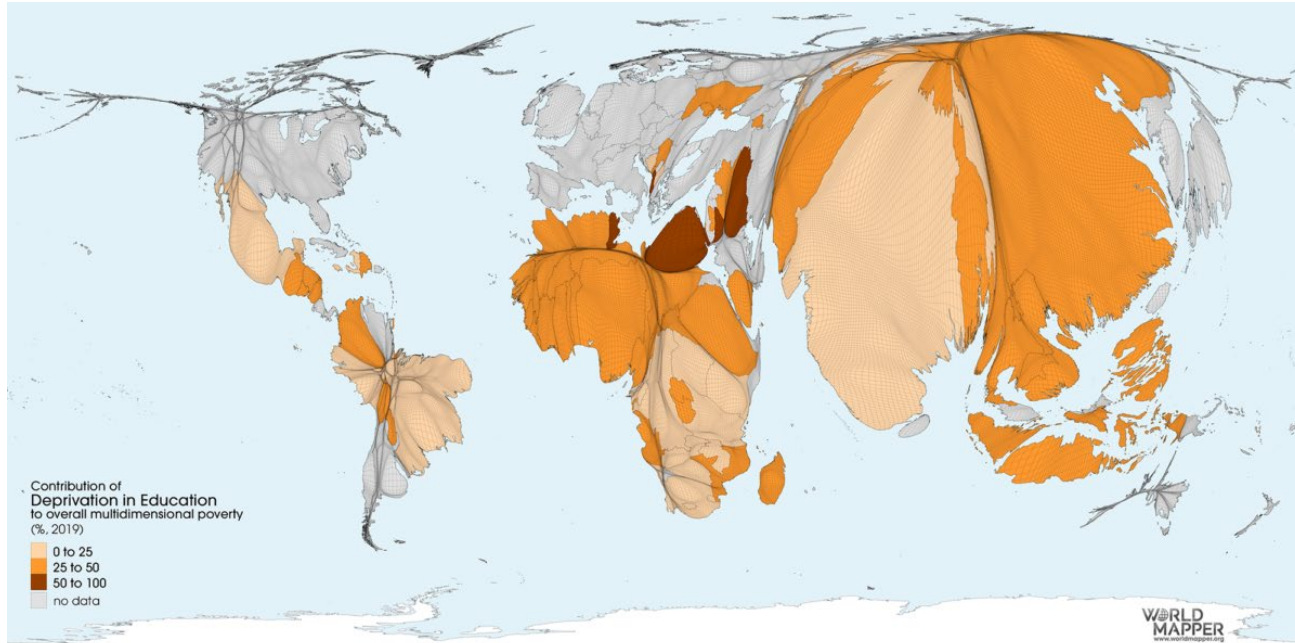


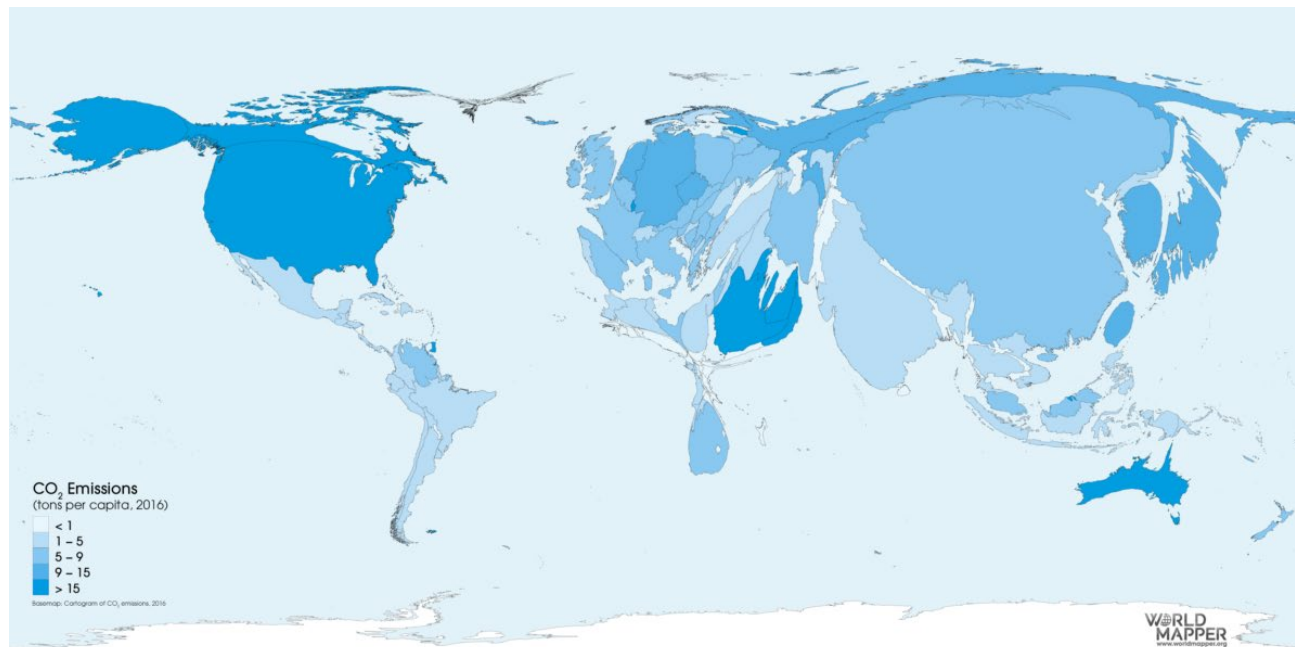
Figure taken from *Worldmapper.org*, a collection of world maps called cartograms, where territories are resized on each map according to the subject of interest. Find further aspects of inequalities, e.g.: social insurances for workers, founding of labour unions, etc.

# Equal Opportunities and Expenses? A Positioning on ... Education



Find further aspects of inequalities, e.g.: In high-income countries educational work is necessary to explain the higher prices of sustainable textile products, and to increase the sense of responsibility, etc.

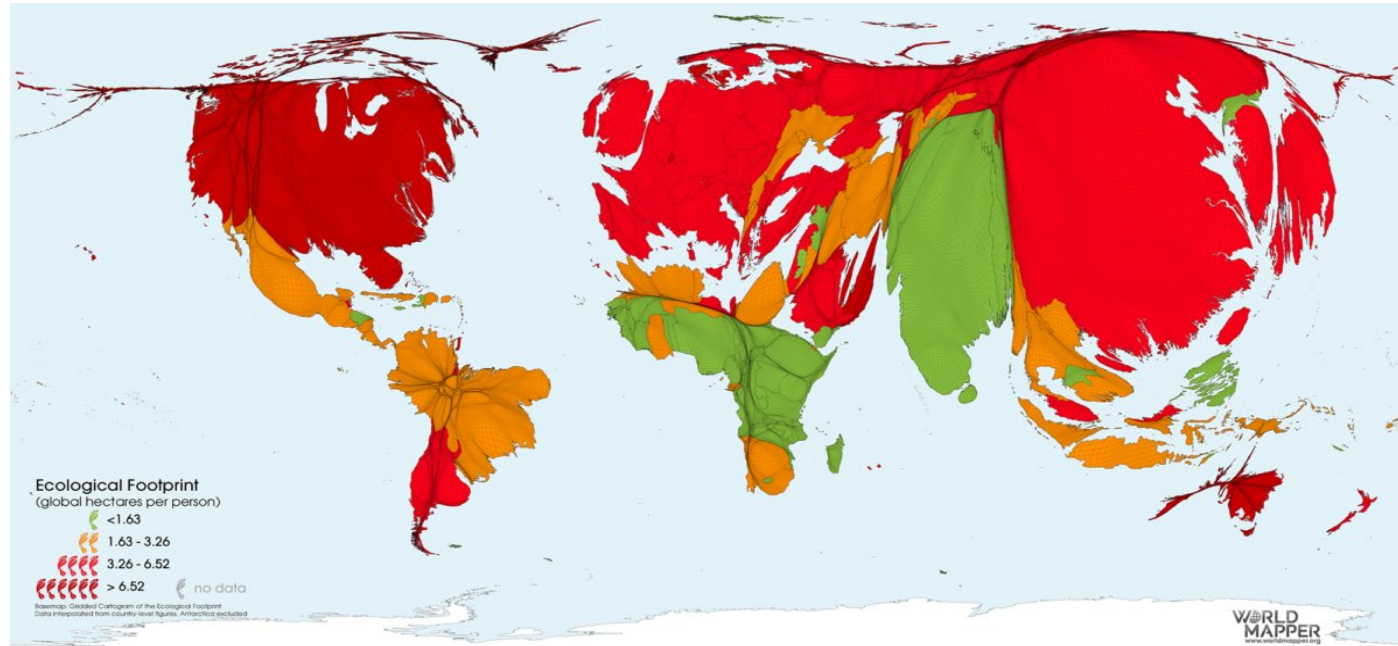
# Equal Opportunities and Expenses? A Positioning on ... CO<sub>2</sub> Emissions



Find further aspects of inequalities, e.g.:  
Decreased use of chemicals in producer countries, reforestation, drinking water protection etc.

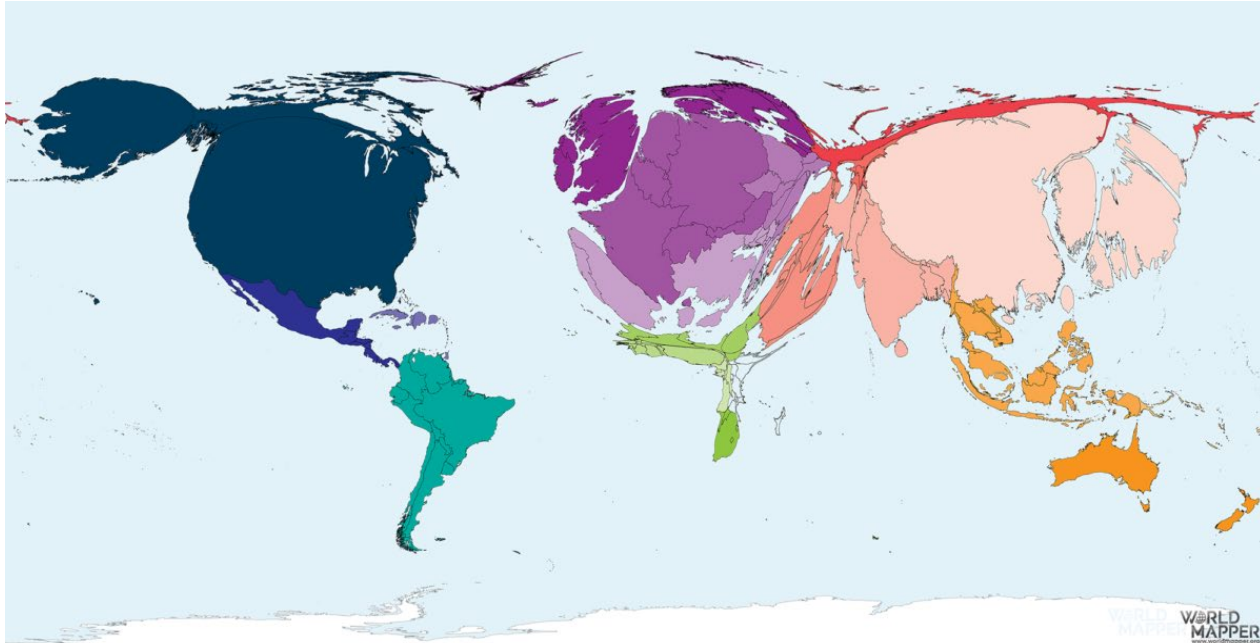


# Equal Opportunities and Expenses? A Positioning on ... Ecological Footprint



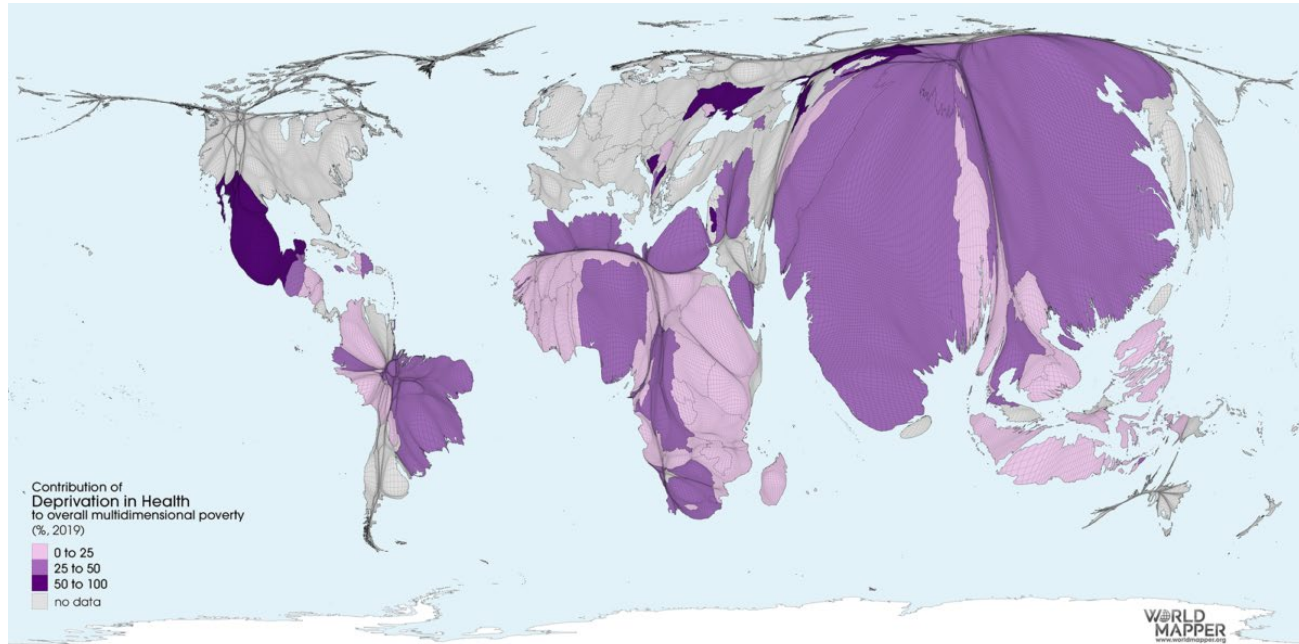
Find further aspects of inequalities, e.g.: Environmental pollution, waste water, etc.

# Equal Opportunities and Expenses? A Positioning on ... Gross National Income



Find further aspects of inequalities, e.g.: Higher, fair prices along the supply chain, etc.

# Equal Opportunities and Expenses? A Positioning on ... Health

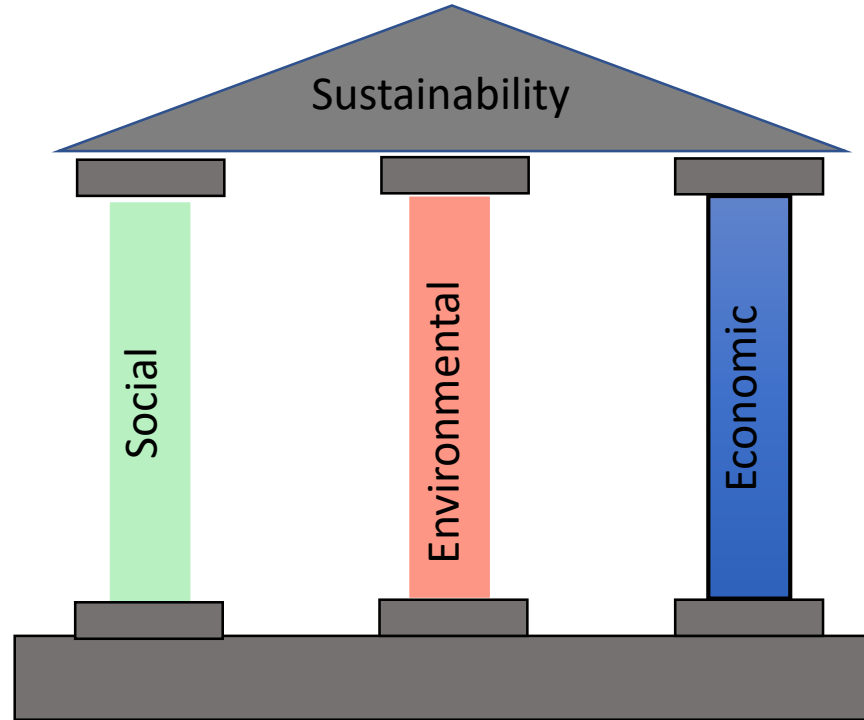


Find further aspects of inequalities, e.g.: Exposure to harmful chemicals directly or via ecosystems, enhanced health and safety measures etc.

# Introducing the Triple Bottom Line TBL Concept

- The TBL concept describes a sustainable development taking *all stakeholders* into account. The concept was defined by the Brundtland Commission of the UN in 1987. It comprises an accounting framework with three dimensions: *social, environmental* and *financial*.
- These three pillars were then defined as the *TBL concept* (coined by John Elkington) which consists of *social equity, environmental* and *economic* factors.\*
- According to the phrase '*people, planet and profit*', these factors should be balanced permanently.

# A 'classic' Representation of Sustainability – Triple Bottom Line with three Dimensions



Author's interpretation of John Elkington's work

# A 'Fashionable' Representation of the TBL-Concept



Natural fibre exploitation  
 Man made fibre production  
 Textile and fashion industry  
 Textile and fashion handcraft  
 Old clothes market  
 Disposal  
 Recycling

Textile ecology:  
 Production ecology  
 Utilization ecology  
 Waste ecology  
 Human ecology

Social impact along the  
 textile value chain

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# Society and Culture as Part of the Sustainability Dialogue

- In Western countries there is a huge deficit of knowledge and experience on textiles and clothing. Fast fashion habits are driven by media, celebrities and influencers which results in mass-consumption of clothing.
- However, clothes are also important parts of culture and the body, standing in a larger cultural context with its material qualities and specific designs.
- Clothes thus symbolise and reify social relations, constructions of identity, mentalities and relation of power.

# Health Impacts of Textiles in Production and Consumption are no longer Negligible

Textile materials and chemicals in production and consumption can be harmful to human health, despite attempts that textile ecology aims not to harm the environment (*textile ecology*) and people (*human compatibility*) in all phases.

However, people no longer feel themselves as part of the environment and so in many cases a liable appreciation is missing that a healthy environment is an inevitable and natural precondition for the existence of mankind.



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# Profiling today's Textile and Clothing Industry – The Top Fashion Retailers\*

- L Brands (USA)
- The Gap (USA)
- Fast Retailing Co./ Uniqlo (Japan)
- H&M (Sweden)
- Inditex / Zara (Spain)
- Shein (China)



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# Profiling today's Textile and Clothing Industry - The Size

- Third biggest manufacturing industry.
- Three trillion-dollar industry (FashionUnited, 2020) (textile, clothing and leather combined).
- Employs 300 million people along the value chain.



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# Profiling today's Textile and Clothing Industry - Its Supply and Demand Side

- The *Supply side* is mostly concentrated in developing countries like China, India, Bangladesh, Vietnam, Myanmar, Cambodia etc.



- The *Demand side* is mostly concentrated in developed countries such as United States, United Kingdom, Japan and the European Union etc.

# Profiling today's Textile and Clothing Industry - Its Nature

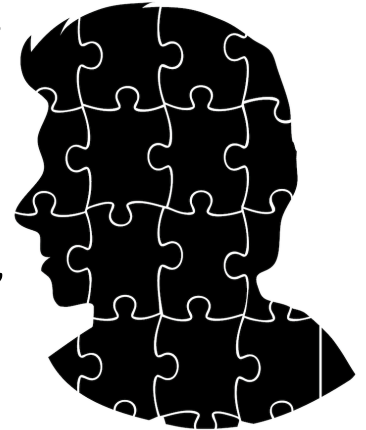
- Globally, the TC industry is stretched, complex and fragmented.
- It runs a fast fashion practice, a design, manufacturing, and marketing method focused on rapidly producing high volumes of clothing.
- Fast fashion results in a race to the bottom, a competitive situation where a company, state, or nation attempts to undercut the competition's prices by sacrificing quality standards or worker safety (often defying regulation), or reducing labour costs.



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# The Unmanagable Supply Chain of the Textile and Clothing Industry

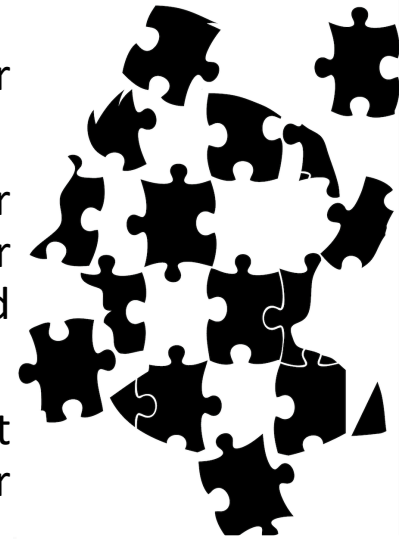
- The TC supply chain is *highly fragmented* with many leeways. That makes it hard for customers to build up confidence, e.g. trust in eco- and social labels.
- The further away the brand headquarter is from the supplier, the less controllable and transparent it becomes. (Patwary, 2020).
- 4 C's of the textile and clothing industry: Confusion, Competition, resistance to Change and Complexity.



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# Profiling today's Textile and Clothing Industry - Its Sustainability Profile

- One of the most polluting industries (Berg et al., 2020).
- Second largest greenhouse gas emitter (The UN Alliance for Sustainable Fashion, 2020).
- Depletes 98 million tons of non-renewable resources each year including oil, in the production of synthetic fibres, fertilisers for growing natural fibres and chemicals for producing, dyeing, and finishing purposes (Morlet et al., 2017).
- Causes 20% of all global industrial water pollution. That makes it the second largest polluter of freshwater resource. Its annual water demand is 1.84 trillion U.S. gallon.
- Liable for slave labour practices, causes massive social cost.



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# Levels of Sustainability in the Textile and Clothing Industry

- *Weak sustainability* is the current prevailing approach in the textile and clothing industry, where economic growth dominates and positive economic outcomes outweigh negative social or environmental impacts, i.e. a superficial “*green business-as-usual*” prevails.
- *Strong sustainability* in contrast emphasises the importance of sustaining the environment and is much more qualitative in its approach.

# Supply Chain Transparency is Crucial

- Transparency ensures proper identification of what materials are being used and who is making the products.
- Transparency gives brands and retailers good control over supply chain optimisation, it helps improve brand loyalty of consumers and identifies risks (Morlet et al., 2017).
- Transparency will reduce undocumented subcontracting, especially when transparency is required by law, e.g. supply chain acts.

***“A company is no more sustainable than its supply chain.”***  
(Krause et al., 2009)



# Negative Impacts of the Textile and Clothing Industry still Prevail



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# Negative Impacts of the TC Industry - Examples

- Shoppers have responded to lower prices and greater variety by buying more items of clothing. The number of garments purchased per capita between 2000 and 2014 increased by about 60 percent.
- The number of garments produced annually has doubled since 2000 and exceeded 100 billion for the first time in 2014: i.e. nearly 14 items of clothing for every person on earth.
- For every 5 garments produced, the equivalent of 3 end up in a landfill or are incinerated each year. U.S.: 11.9 million tons of clothing and footwear were discarded in 2015, of which 8.2 million tons ended up in landfills.
- Germany outperforms most countries by collecting almost three-quarters of all used clothing, reusing half and recycling one-quarter. German consumers buy approximately 15 kg of clothing per year (Berg et. al., 2020)
- Ethiopia: wages average are just a third of the rates paid in Bangladesh. Rates of 7 €/week are typical. In pre-Covid-19 times, Bangladesh firms typically paid approximately 100 €/month (David, 2019).

# Environmental Impact of the Textile Industry - The World Divided in East and West

## Consumers

developed countries like the  
U.S., EU, UK, Japan  
(demand-side: responsible for  
60% of worlds import)

### WEST

Negative environmental impact

Transportation  
Post-consumer waste  
Consumer use phase

## Suppliers

developing countries like  
China, Bangladesh, Vietnam  
(supply-side: responsible for  
49% of worlds export)

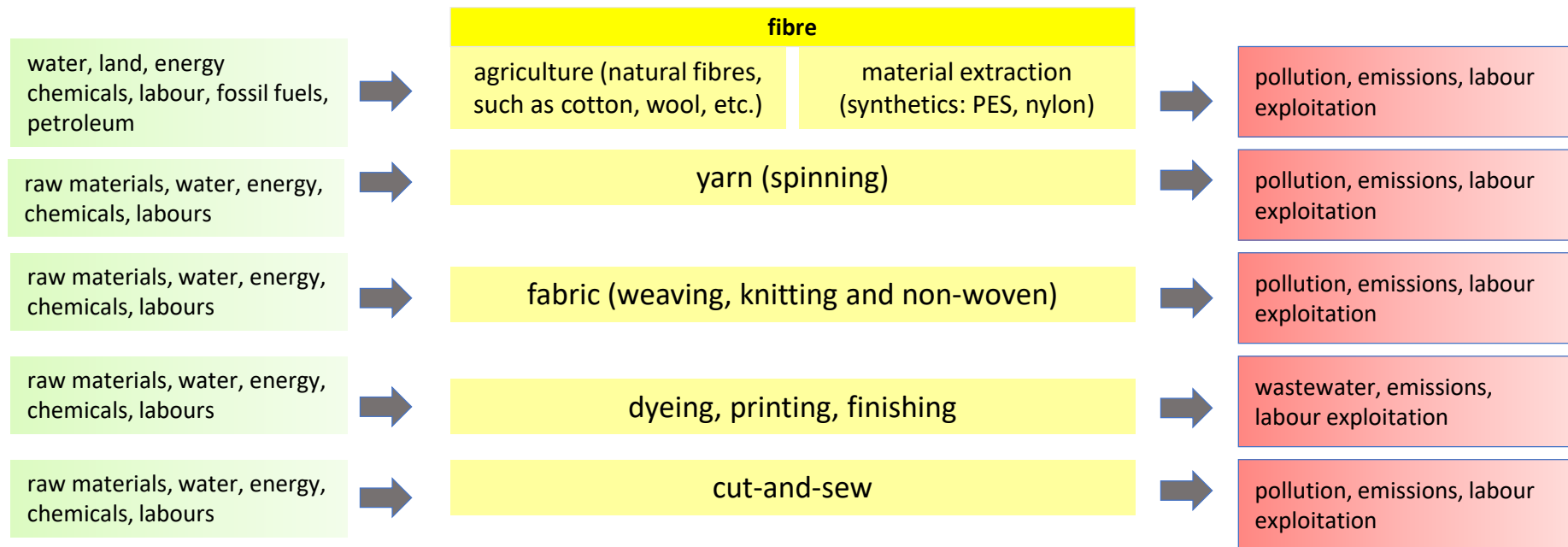
### EAST

Negative environmental impact

Fibre and garment production  
Material processing  
Waste water and solid waste

Figure modified from Patwary, 2020

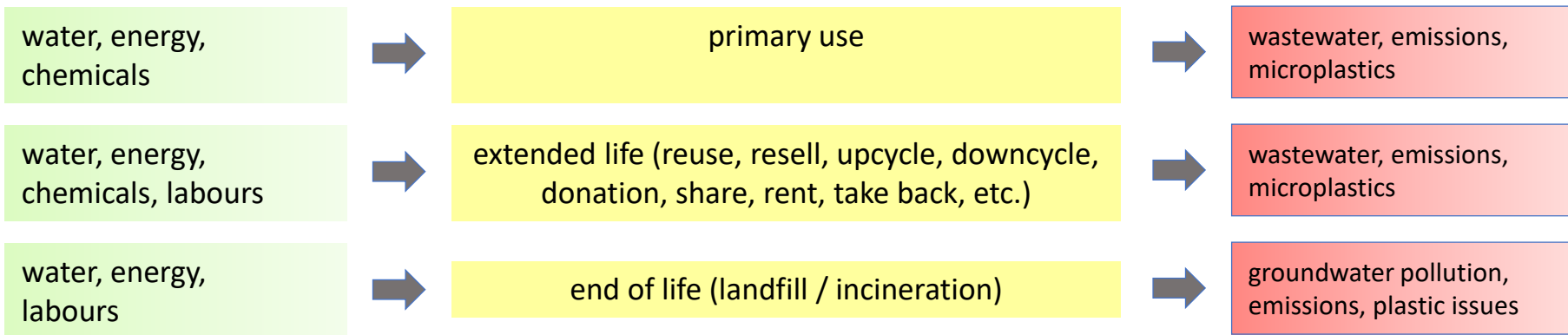
# Resources – Supply Chain – Burden



**EAST**

Figure modified from Patwary, 2020

# Resources – Supply Chain – Burden



**WEST**

Figure modified from Patwary, 2020

# Environmental Hotspots of Life Cycle Stages

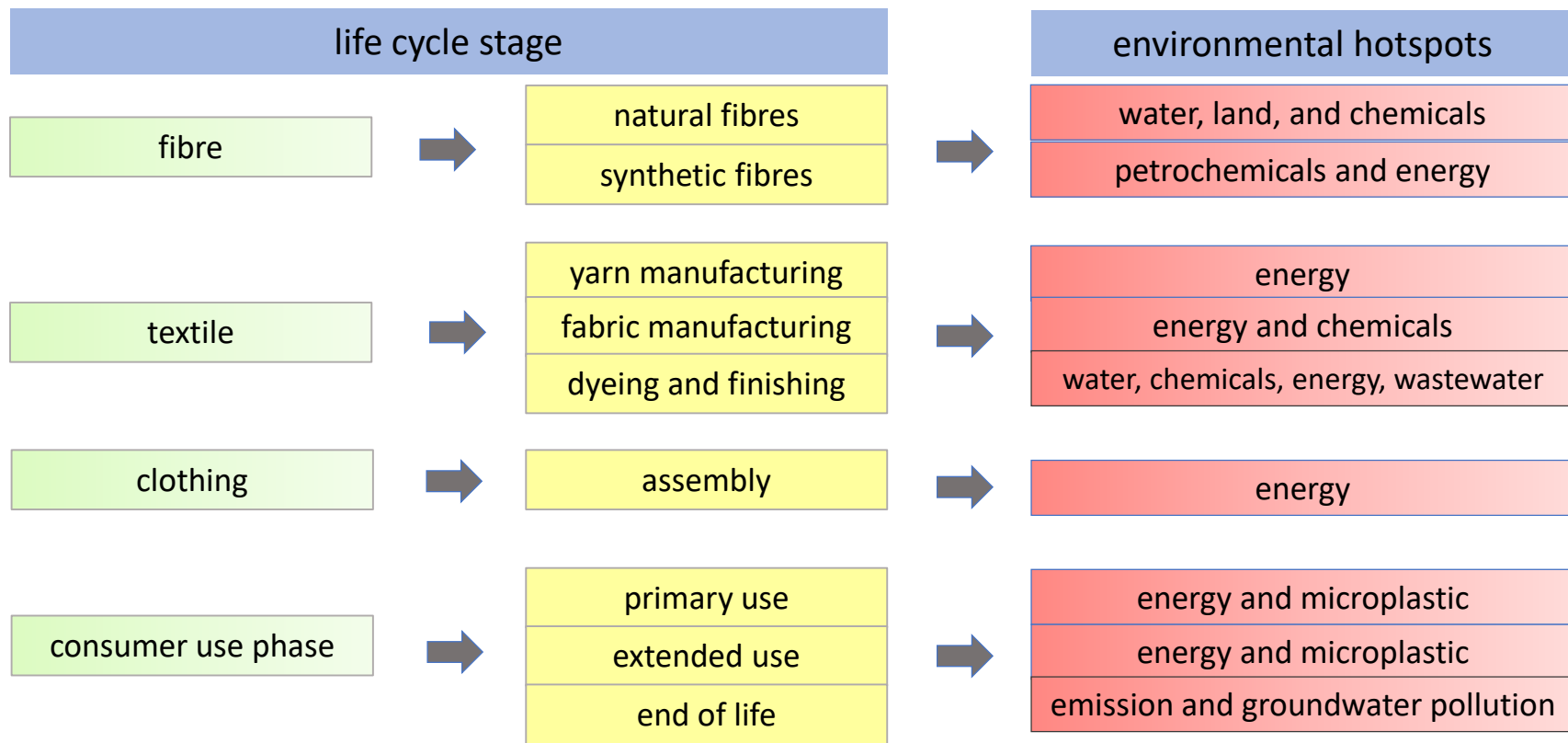


Figure modified from Patwary, 2020

# Sustainable Production – Eco-Friendly Raw Materials

- Oil-based synthetic fibres should be replaced by plant-based materials because of their comparatively low carbon footprint.
- Cotton cultivation consumes 11% of all pesticides and 24% of all insecticides produced globally. Consumers therefore should use plant-based alternative fibres.
- There are about 3,600 different types of textile dyes in the market and the textile industry uses 8,000 different chemicals in the dyeing and finishing activities. Most of these dyes and chemicals are harmful and have a tremendous environmental cost (Posner & Jönsson, 2014).

# Sustainable Production – Renewable Energy and Energy Efficiency

- Most of the environmental impact of the clothing supply chain comes from non-renewable energy-related greenhouse gas emission.
- Textile production is liable for approximately 10% of global GHG (WRAP, 2012).
- Textile production generates 1.2 billion tons of carbon dioxide equivalent (CO<sub>2</sub>) annually, more than international flights and maritime transport combined (Morlet et al., 2017).
- Therefore, it is very urgent to identify energy-intensive hotspots in different stages of the textile and clothing supply chain and make a transition to renewable energy.



# Sustainable Production – Designer Engagement

About *80 percent* of environmental impact and costs are the outcome of the decisions made in the design phase. Increasing garment longevity lies in designers' hands. They decide on how emotionally attached consumers will be with apparel, what material are being used and how long the product lasts in terms of its appeal (Sphera, 2019).

- Hence, designers need knowledge to choose from sustainable materials.
- Designers need to incorporate some types of consumer attachment to the product. Two strategies might be:
  - *Emotional durability* - right fit, transparency of the production, brand loyalty, transparency of the place and the people making the products.
  - *Co-creation* can be achieved by customers designing their products through some kind of a platform, adding their valuable input.

# Sustainable Production – Product Longevity

- Longevity is a major attribute of quality products.
- Emotional durability can be achieved by offering the right fit, transparency of production and brand loyalty to sustainable brands.
- Product longevity and a longer use of fashion clothing items can reduce the environmental impact significantly (Allwood et al., 2006).
- Life cycle assessment has found that extending garments' active life via design, maintenance and re-use of clothing is the most effective method of reducing the impact of the clothing industry on the environment (WRAP, 2012).

# Sustainable Action Needs a Global Collaboration of all Parties

*...including producers (brands) and customers:*

- Brands should push suppliers to carry their operations sustainably.
- Local governments should establish sustainability guidelines.
- Local governments need to be guided by international bodies to align environmental regulations with global science-based targets.
- Sustainable business should be done pro-actively by brands.

# Profiling today's Textile and Clothing Industry - Consumer Characteristics



- Today's consumer is fast fashion oriented.
- Consumers know little about sustainability in the textile and clothing industry (Zwickle & Jones, 2018).
- Their purchasing decision is driven mainly by fit, price, colour, style and easy care etc., and influenced by celebrities, trends and social media etc. (Gupta & Gentry, 2018).
- Their product consumption and care decisions are guided by habit and custom.
- Consumers' disposal behaviour is mainly driven by convenience.



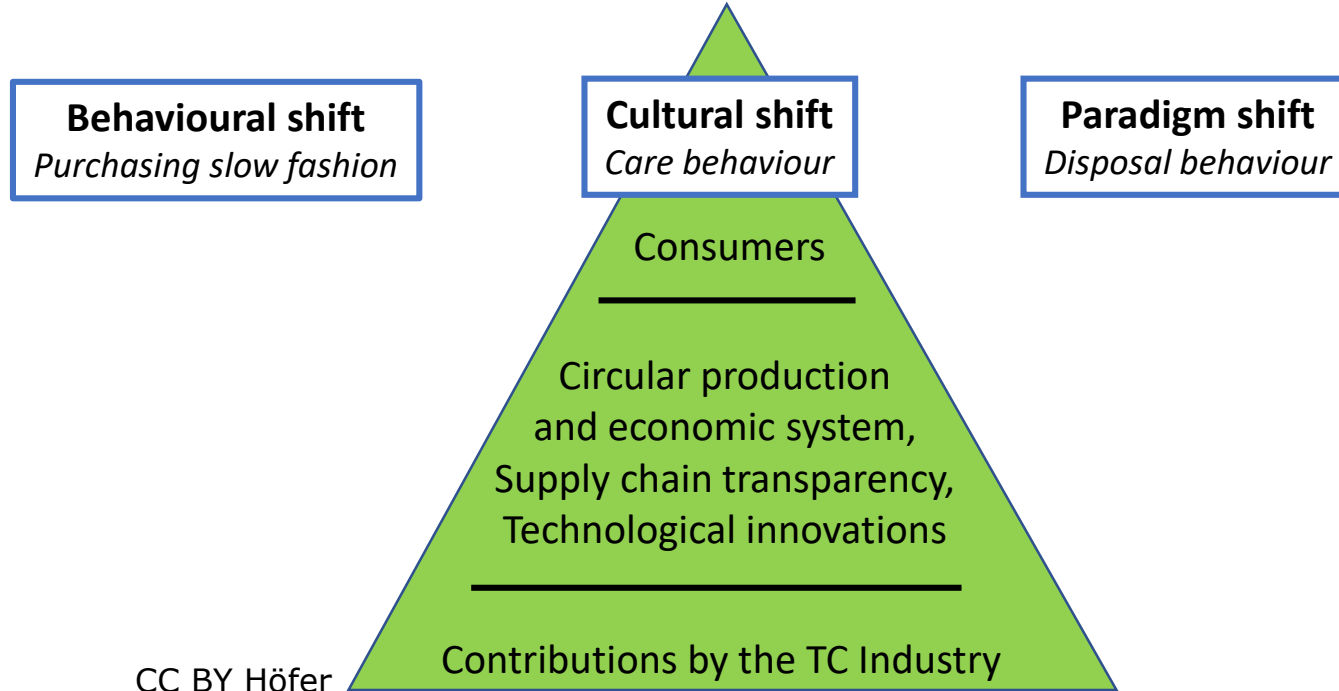
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# Knowledge on Sustainable Actions is Key to Conscious Clothing Consumers

- Consumers are unaware and 'lazy' and show habits (Patwary & LeHew, 2018).
- Brands and retailers should offer different value propositions by slowing down the pace of product offerings that are supported by marketing.
- Local governments, traditional and social media, NGOs as well as non-profit and international organisations should disseminate relevant information on sustainability.

# Interdependencies of the TC Industry and Conscious Clothing Consumers



# 7 Actions to Buy Clothes Consciously



modified from Dr. Anna Brismar,  
[www.greenstrategy.se](http://www.greenstrategy.se)

# Circular Fashion - An Economy based on the Closed Loop or Cradle2Cradle principle

- A circular fashion industry is one in which waste and pollution are designed out, products and materials are kept in use for as long as possible, including through reusing and recycling, and where natural systems are regenerated. <https://www.circle-economy.com>
- Current linear system: 'take-make-waste'
- Purchasing and consumption patterns of consumers need to be changed through education.
  - *Fashion for Good* <https://fashionforgood.com>
  - *Redress Design Award* <https://www.redressdesignaward.com>
  - *Friday's for Future campaign* <https://fridaysforfuture.org>
  - *Campaign: #whomademyclothes*

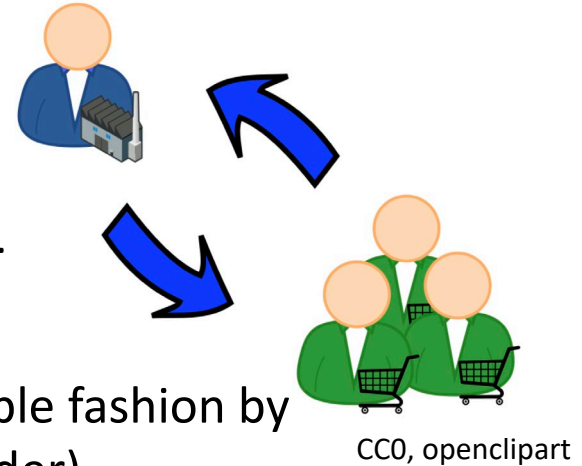


# Changing Consumers' Fashion Mindset

- Consumers should value...
  - quality over quantity,
  - tradition over speed,
  - ecological well-being over resource-depleting growth.

Best: In the run-up of the purchase!

- Consumers may drive the brands towards sustainable fashion by social media (everyone can become an opinion leader).
- Consumers need to be educated regarding the proper care of the garments, i.e. techniques of everyday culture like washing, drying, ironing, repair, mending etc.



# Conclusions

- The global textile and clothing industry is facing immense criticism due to its enormous environmental pollution and socially unethical business practices. While demonstrating a slow adoption, brands, retailers and manufacturers are recognizing the unsustainable nature of the industry. However, the plethora of information, ideas, suggestions, and strategies make it difficult to get a holistic idea of the sustainability challenges that the industry is facing and the necessary actions it should take.
- In order to overcome this situation, the triple bottom line concept is a universal method for building economic, social, and environmental resources while fostering sustainable livelihoods. So, while the environmental, social, and economic consequences associated with the textile and clothing supply chains are still serious, there are promising signs that a significant paradigm shift towards sustainability and a focus on the triple bottom line is gaining momentum. For that, it needs an unbiased view on the industry's business profile.
- Consumers are also becoming more aware of the sustainability issues of the industry and that they are highly influential in advancing it. To exert their influence more strongly, consumers need to become more collaborative, educated and conscious.

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