

# WHAT CONTRIBUTES TO THE ENVIRONMENTAL FOOTPRINT OF THE CLOTHING INDUSTRY?

## SUMMARY

The article explores the environmental impact of the clothing and textile industry, a sector responsible for 2% of global GDP and notable pollution levels. As consumption patterns shift with rising fast fashion trends, the industry faces scrutiny for its high resource use and waste generation. Key stages in the clothing production process contribute to environmental degradation, including water-intensive fiber production, energy-heavy processing, and insufficient end-of-life recycling. Highlighting the urgent need for responsible consumption and production practices, the article advocates for systemic changes toward a circular economy to mitigate the industry's ecological footprint.

Our clothing is the output of one of the largest industrial sectors – clothing textiles, accounting for 2% of world's GDP and produces a significant US\$ 3,000 billion economic output. It is no wonder with this size of output, that it is easily considered as one of the largest polluting sectors, second only to oil industry<sup>1</sup>.

## Overview of the industry's composition and subcategories

Clothing textiles is a subset of the broader textile industry and constitute a major 75% of it. The other 25% constitute of other types of textile such as household and industrial textiles as shown in Figure 1<sup>2</sup>.

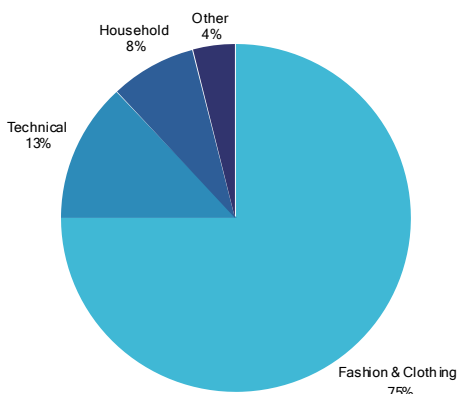


Figure 1

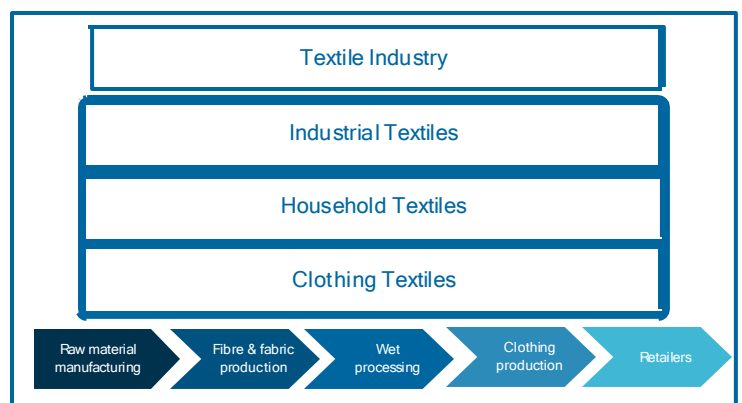
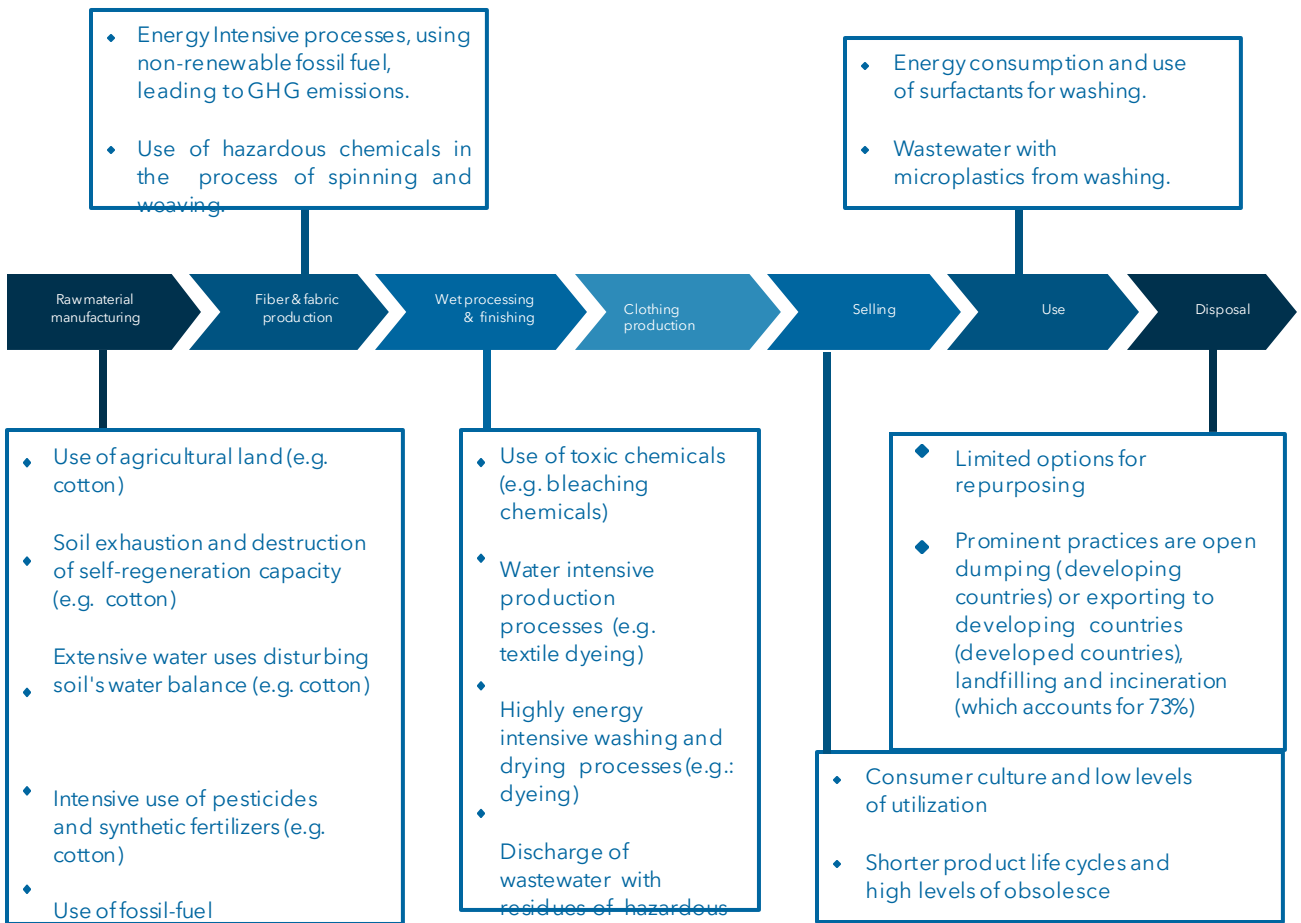


Figure 2



So, what makes the claim that the textile industry is a key polluter?

A deep scan suggests an alarming level of pollution at all parts of the supply chain, and it is far away from getting eco-friendly, and more importantly most elements show accelerating levels of pollution. Let's go over them one by one.

### 1. Consumption: A continuously growing industry and increasing levels of underutilization.

Textile industry is in a continuous growth trajectory particularly due to the emerging markets in Asia and Africa. While on one hand clothing industry sales volumes have doubled from 2000 - 2015, the utilization of clothes has reduced by 36%<sup>1</sup> due to key factors as mass production leading to lower prices and fast fashion culture. The patterns of consumption and purchasing differ from country to country as well as the levels of underutilisation. The USA is the biggest consumer with 37kg/user per year followed by Australia 27kg/user. For South Asia, India and Africa, this number is 5kg/user<sup>4</sup>.

The increasing consumer demand the industry to expand further and produce more, leading to what is described below.

## 2. Production: Higher amount of resource consumption and high levels of industrial waste generation.

Textile industry is a high resource intensive industry throughout its supply chain. According to the latest Textile Economy Report from Ellen MacArthur Foundation:

- It takes 2700 litres of water to make one cotton shirt, which is the drinking water consumption of one person for two and half years.
- The production of a polyester shirt results in 5.5kg of carbon footprint while a cotton shirt results 4.3 kg of carbon footprint.
- Annually, the industry relies on 98 million tons of non-renewable resources to produce synthetic fibres, chemicals and fertilizers to grow cotton.
- Textile production including the cotton farming stage use around 93 billion cubic metres of water annually which is a 4% of global freshwater withdrawal.
- In 2015, greenhouse gas (GHG) emissions from textiles production reached a total of 1.2 billion tonnes of CO<sub>2</sub> equivalent; more than those of all international flights and maritime shipping combined<sup>3</sup> or equal to emissions from 314 coal-fired power plants.

Each stage of the supply chain involves resources and dispose wastes.

Fiber production stage with high usage of land, water, fertilizers and petrochemicals for natural fibers and for synthetic one higher usage of non-renewable resources. A major 97% of the feedstock for the industry are virgin feedstock and with the increasing levels of production, stress over raw material generation keeps increasing<sup>3</sup>.

In the meantime, fiber production and clothing production stages are highly energy intensive stages, leading to high levels of consumption of fossil fuel. Wet processing stage is water and chemical intensive, leading to higher quantities of wastewater and the need to purify it using chemicals and energy.

During the production phase, the wastewater from textile industry is 20% from the industrial wastewater pollution, according to the World Bank<sup>3</sup>. The main concern is the hazardous chemicals (for humans, fauna and flora) and microplastics contained in this wastewater. Currently, available wastewater treatment techniques do not retain microfibers, and these end up in oceans<sup>9</sup>.

Below are some elements that contribute to pollution along the textile production and selling value chain.

### 3. End of life management: Post-consumption waste mostly reaching a dead-end with environmentally sound repurposing hardly practiced

According to the Ellen MacArthur Foundation<sup>3</sup>, 73% of feedstock into the textile industry ends up being incinerated or dumped. The main reason behind this is not having proper textile waste collecting and recycling or reusing systems. Before the end of 2017, a major portion of textile waste from developed countries were exported to China to be recycled or dumped in landfill. The recycling rates of textile remained as low as 10-15% in China, where the balance portion is landfilled or incinerated.

However, China's import ban of solid waste including discarded textile material led to textile waste flows being disrupted. This increased the severity of the textile waste problem of countries that have been generating large amount of post-consumption textile waste.

Even though used cloth collection happens efficiently in many developed countries (e.g. in Germany: a collection rate of 75%)<sup>3</sup> they are often directed to landfills in developing countries as textile recycling is energy intensive and costly. This restricts the chance of a second life.

### 4. Consumption: Washing for reusing also pollutes as there are microfibres released

Using synthetic materials for textile manufacturing during the production and consumption stages leads to releasing tiny plastic fibres that do not biodegrade. These fibres further breakdown into small pieces, which are known as microfibers. Primary microfibers are directly released to the environment.

Facts reveal that an alarming 35% of the primary microfibers in the ocean are from the textile industry.

These minute fibres that are not visible to the eye are then consumed by aquatic animals and get accumulated in food chains. Also, they cause stunt growth and starvation in some aquatic species<sup>3</sup>.

## Key findings

As producers and consumers linked to a massive industry with a vast environmental impact as this, how best can we tackle the environmental problems stemming from textile manufacturing and consumption? The first step could be to with acceptance and acknowledgement of the problem as is. It is an industry that needs to be one of the top in talking about the grave effects of pollution and requires clear and evidence-supported communication to provide due attention to how vast and damaging the problem is.

Overall, a careful evaluation of alternative practices in production, distribution and consumption needs to be looked at in line with a circular economy, with a specific focus on the upstream part of the value chain.

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## References

1. [Fashion Industry Environmental, Waste, and Recycle Statistics - Edge fashion intelligence](#)
2. [Textile Market Size, Share & Trends Analysis Report By Raw Material \(Wool, Chemical, Silk\), By Product \(Natural Fibers, Polyester\), By Application, By Region, And Segment Forecasts, 2024 - 2030 - Grand View Research](#)
3. [A New Textiles Economy: Redesigning fashion's future - Ellen Macarthur Foundation](#)
4. [Death by waste: Fashion and textile circular economy case, Kamyar Shirvanimoghaddam, Bahareh Motamed, Seeram Ramakrishna, Minoo Naebe](#)
5. [Encyclopedia: The free dictionary - Textile Industry](#)
6. [What is the difference between clothing textiles and garments - Quora](#)
7. [Between source and sea: The role of wastewater treatment in reducing marine microplastics - Freemana, A. M. \(2020\)](#)