



## **COTTON VS POLYESTER: UNFATHOMABLE GROWTH, MISINFORMATION AND THE URGENT NEED TO DIVEST FROM SYNTHETICS**

The production of polyester for use in the fashion industry is at an all-time high while investment in sustainable cotton remains relatively insignificant ([Textile Exchange 2025](#)). Unlike the inherently unsustainable petro-chemical industry – [which must be rapidly phased out if we are to avoid climate collapse](#) – the cotton industry has huge potential to reduce its impact while supporting millions of smallholder farmers who depend on it.

We see a combination of an irresponsible and opaque fast fashion industry and the resulting information gaps, paired with a spread of misinformation, as key factors in the dangerous proliferation of polyester.

While a massive reduction in the amount we produce and consume is the number one solution to a more sustainable fashion industry, investment in sustainable cotton production alongside a huge increase in effective textile-to-textile recycling can support a transition to a much less harmful fashion industry.

### **Sustainable cotton farming counts**

Through the Sustainable Cotton Hub's series of cotton papers published over the past three years, we have looked at how and why [corporate investment](#) in responsibly-grown cotton is essential for the future of the industry.

This is because, grown in a nature-positive way, cotton has the potential to:

- [restore biodiversity](#) and reduce water and energy use
- provide [better livelihoods and working conditions](#) for an estimated 24–32 million cotton farmers worldwide and
- [increase farm resilience](#) in the face of the climate crisis

For example, in our [Biodiversity and Cotton report](#), we share a case study from a Solidaridad programme in Maharashtra, India. Since 2020, 8,000 participating cotton farmers have been implementing regenerative agriculture practices, including tree planting, organic compost creation, and reducing chemical fertilizer and pesticide use. As of May 2025, 39,498 hectares were under regenerative agriculture in the region, where on-farm benefits included a 12-30 percent reduction in cultivation costs, a 12-18 percent increase in yields and 35 percent water savings since the programme began.

### **Meanwhile, huge growth in polyester production represents the industry's complete disregard for people and the planet**

A [recent report](#) from Textile Exchange shows that fibre production continues to increase with a record 132 million tonnes produced globally in 2024, of which around 69% is synthetic. Polyester fiber production makes up around 59% of the fibre production market, increasing from around 71 million tonnes in 2023 to around 78 million tonnes in 2024.

### **Polyester is an inherently unsustainable material, made from petro-chemicals**

Set against a backdrop of persistent calls to phase out fossil fuels, the fashion industry's continued investment in polyester production – undermining its commitment to the Paris Agreement and the [Fashion Industry Charter for Climate Action](#) – is both irresponsible and unnecessary. Unlike cotton, there is no way this fibre can have a positive impact on the climate and biodiversity.

Some may argue that polyester is a sustainable choice due to its durability. However, this ignores the fibre's environmental costs across its full lifecycle. As a plastic derived from fossil fuels, its production is linked to high energy consumption and greenhouse gas emissions. Furthermore, its supposedly preferable durability quickly becomes a liability at the end of its (often short) life, as it doesn't biodegradable and persistently sheds microplastic fibers.

Each laundry cycle can release up to [900,000 microplastic fibres](#). Changing Markets Foundation's [Spinning Greenwash report](#) reveals that recycled polyester releases even more microplastic fibres than virgin polyester as the recycling process makes it brittle, concluding; "recycled polyester has become a convenient cover for the industry, allowing brands to claim progress on reducing virgin plastic reliance while increasing overall synthetic fibre production."

## **Petro-chemical based synthetics are undermining sustainable cotton's potential for growth**

While synthetic fibres continue to be produced in record-breaking quantities, cotton's share in the global market has remained more stable over the last four years, representing between 19-22%.

Of the 24.5 million tonnes of cotton produced globally in 2023/24, 34% was produced by the cotton programs that shared data for the Textile Exchange report. These programmes cover cotton grown with improved environmental and/or social sustainability outcomes when compared with conventionally farmed cotton. It's positive to see a growth in the market share of these programmes; up from 31% in 2022/23 – however this win for sustainable cotton is overshadowed by polyester's market domination.

The findings in our recent Cotton Rankings, which cover the cotton sourcing of the top 100 fashion brands, echo Textile Exchange's latest Materials Market report in highlighting the dominance of virgin polyester in fast fashion.

In our analysis of the rankings we note sustainable cotton's potential for growth being undermined by major brands' rising dependence on synthetic fibres. For example, we found that Shein uses 82% synthetic materials, a meagre 10% cotton and 8% other. Only three companies – notably all sports wear brands – use more (Brooks Sport, Colombia Sportswear and Speedo). The amount of recycled polyester used by these brands was either very low or non-existent. As a globally-known, low-cost high-speed fashion brand, Shein's huge reliance on polyester is of deep concern.

## **Total Cotton vs Total Synthetics**

[See the full set of rankings]



## **Lack of transparency industry-wide**

A number of organisations campaigning for a more responsible fashion industry are on a mission to improve transparency, but evidently, brands are reluctant to share the numbers.

As Fashion Revolution mentioned in their [2023 Fashion Transparency Index](#): “despite the indisputable fact that clothing waste reaches all facets of life, from microplastic particles in the Mariana Trench to piles of discarded clothes visible from space, 88% of brands still do not disclose their annual production volumes.”

This lack of transparency is echoed in our [Cotton Ranking analysis](#). Only 35 out of 100 participating companies provided detailed information about their cotton certifications, making comprehensive analysis impossible.

The OR Foundation is working to change this with its [Speak Volume's campaign](#). By cataloguing and exposing the number of garments from different brands found on Ghana's beaches they encourage supporters to tag companies asking them to share their production figures. Over 150 brands of varying size are now listed on the campaign's site.

For a global industry with far-reaching impacts on our environment and day-to-day lives, both top level figures and deeper investigation into the nuances of fibre production is needed.



## Information gaps

As a result of the industry's unwillingness to share production and impact figures, we lack a comprehensive, independent resource providing data on full life cycle assessments of fibres. While there are academic papers that break down the impact of cotton into conventional and organic cotton in specific locations, for example, [literature on full life cycle assessment research in the textile industry is limited](#). This creates an information gap that must be filled if we are to truly understand the implications of producing both natural and synthetic fibres.

Leading fibre research organisation Textile Exchange's [Climate+ dashboard](#) shares arguably the most comprehensive and reliable open source data outlining fibre production's contribution to GHG emissions, water (consumption, scarcity and eutrophication) and biodiversity. The data covers cradle-to-gate processes, with 'gate' meaning up to Tier 4: Raw Material Production and Primary Processing.

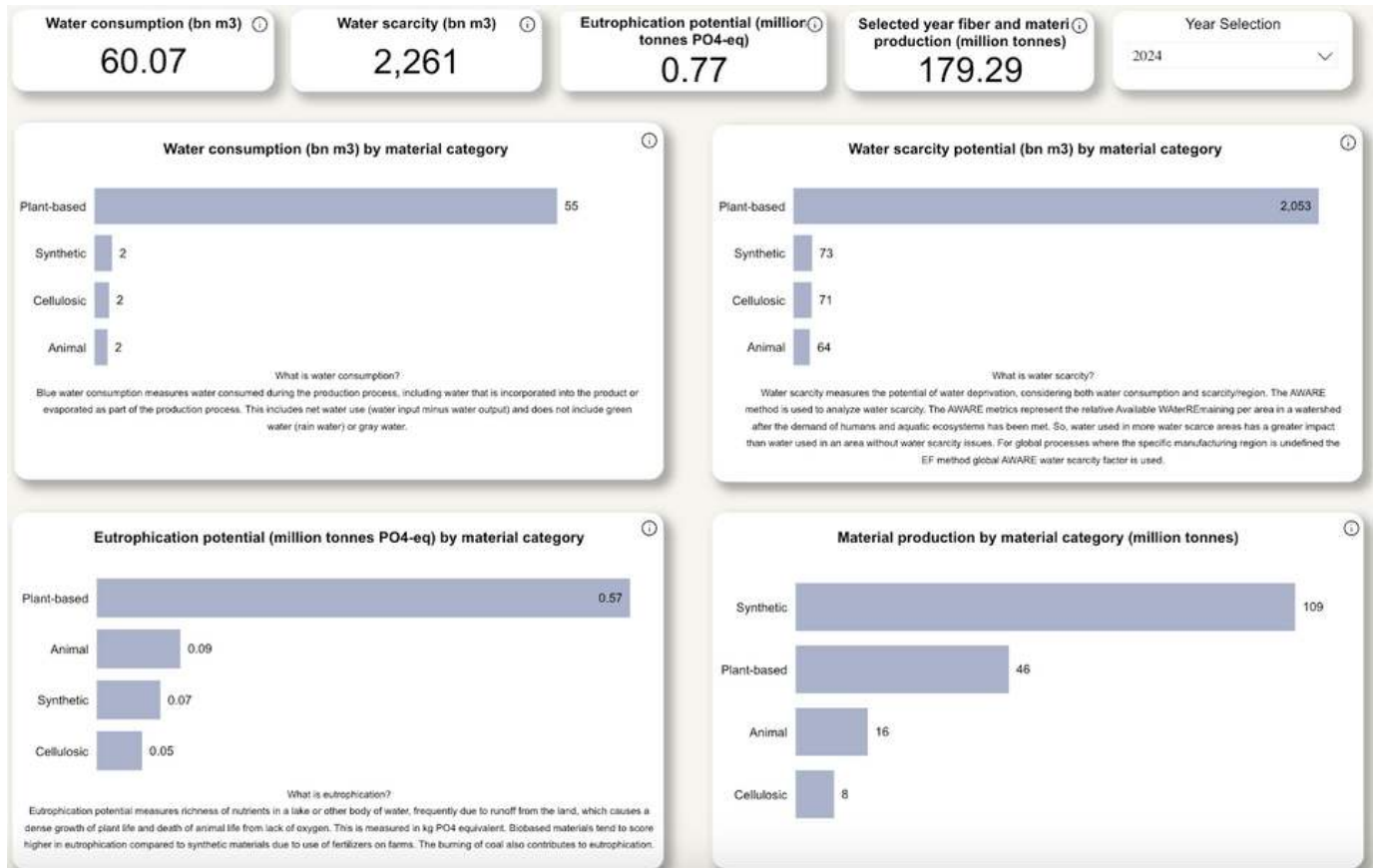
We understand that no data is perfect, and Textile Exchange acknowledges the limitations to the data it uses in this progress report. We equally appreciate the organisation's in-depth work to improve the information available; encouraging the industry to divulge figures and sharing its resources and reports publicly.

While complex to measure and collect data, to gain a more complete picture of the impact of mass produced fibres, alongside production and primary processing we would need to include:

- The impact of spinning, weaving, dyeing and other finishes, plus garment production, wearing and washing.
- The potential for different fibres to be recycled, biodegrade or be safely disposed of.
- Polyester production's impact in terms of biodiversity. Currently only plant-based fibres feature in the Climate+ biodiversity dashboard. The major proliferation of [microplastics released by synthetic clothing when they are worn, washed and disposed](#) does not factor in a cradle-to-gate assessment, but plays a major role in synthetic fibres' negative impact.

Without considering these factors, the Climate+ overview shows synthetic fibres outperforming natural ones on multiple levels. In terms of water consumption we see that plant-based fibres use a huge amount more water than all other categories, however, there is no breakdown of fibre-type, or how responsibly fibres were produced.

This is important when we consider, for example, how we perceive cotton in terms of its sustainability.



How cotton is produced varies greatly from farm to farm and region to region. Is it conventionally or organically grown cotton? Do its growers use careful integrated pest management or poorly administered agrochemicals? Was it mainly rain fed or irrigated? For example, cotton growers in Turkmenistan have been reported to use more than 800 times as much irrigation water as their counterparts in Brazil. How cotton is produced plays an important role in its impact on the environment. (Read more in our [Cotton and Biodiversity paper](#).)

With so little publicly available data that comprehensively compares the full life cycle impact (cradle to grave) of natural and synthetic fibres, brands may be tempted to highlight top-level figures that don't tell the complete story about polyester's impact on the environment.



### **The danger of misinformation**

On top of undivulged production figures and the gaps in knowledge and responsibility this creates, careful use of what data is available is vital if we are to move in the right direction.

As the Transformer Foundation highlights in its [Cotton: A Case Study in Misinformation \(2023 update\)](#); the fashion industry has a "misinformation problem, with half-truths and context-free data spread by various actors. [...] This misinformation undermines efforts to promote responsibility and transparency in the industry, and has serious consequences for public trust and democratic institutions."

As one example of this, the foundation's [earlier report on the same subject](#) notes "the complexities of cotton's water impacts and the challenges of analyzing it in a nuanced and accurate way". It goes on to clarify why the often shared statement that it takes 20,000 liters of water to grow the cotton needed to make a t-shirt or pair of jeans is inaccurate.

Simultaneously, leading fast fashion brands promoting recycled polyester collections as a sustainable option have been accused of greenwashing, relying on 'the false solution of downcycling single-use plastic bottles'.

The vast majority (around 98%) of recycled polyester clothing is made from plastic bottles. Once the bottles have been downcycled into clothing, these textiles cannot be recycled again – they are destined for landfill or incineration.

An estimated 2% of recycled polyester clothing comes from textile-to-textile recycling. Textile to textile recycling has some way to go before it's viable on the mass scale needed to deal with today's textile waste.

### **Beyond fibre choice**

Let's be honest; the number one solution to a more sustainable fashion industry is to massively reduce what we all produce and consume – no matter the fibre. And this requires a level of transparency the majority of big brands refuse to adhere to. As well as a host of other challenging – but certainly possible – changes, such as:

- a new model that focuses on people and nature above profit
- an emphasis on quality over quantity
- an overhaul of the fashion industry's narrative on consumption
- championing ethical practices, including a fair distribution of profit, living wages and safe working conditions throughout the supply chain.

It also requires the industry to reuse what it's already created in huge excess (circular production) to create new textiles.



## **Invest in responsible cotton, divest from fossil-fuels**

We know that using regenerative or organic farming practices, whether certified or not, offers cotton farmers around the world the potential to improve soil health and livelihoods, start to restore biodiversity and improve farm resilience against drought and flooding. It also has the potential to support a huge number of people; according to a [2019 Ellen MacArthur Foundation article](#), cotton farming accounts for almost 7% of all employment in some low-income countries.

Certification, which can support the transition to more responsible cotton farming, doesn't come cheap and can be inaccessible, particularly to smallholder farmers. So, rather than further investment in petro-chemicals, we urge brands to invest in the farmers in their supply chain to produce cotton in a nature-positive way that improves the sustainability of the entire supply chain.

Nature-positive farming practices must be accompanied by fair and safe working conditions, fair prices, the right to a living income and wage, improved due diligence by brands and retailers, and the regulation of agrochemicals by governments, for example. (Read more in our [Cotton and Labour](#) paper.)



## **We must work towards a fairer future for smallholder cotton farmers**

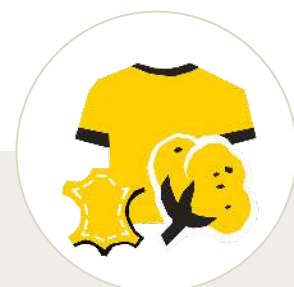
While the market for environmentally devastating fossil-fuel based fibres continues to grow, sustainable cotton and recycled fibres take a back seat. A lack of transparency, information gaps and misinformation industry-wide support an irresponsible reliance on polyester's growth.

There is much work to be done by the many stakeholders involved in cotton production to ensure it works well for everyone. But we know what we need to do ([see our recommendations](#)).

We need the fashion industry to improve transparency while drastically reducing its demand for virgin fibre production (and consumption) and divesting from polyester.

Fundamentally, Solidaridad believes brands must invest more in supporting cotton farmers to farm sustainably using regenerative or organic practices, while supporting in the development of effective, wide-scale textile-to-textile recycling and fibre innovation.

We urge the fashion industry to play its part in creating this vision of the future.



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